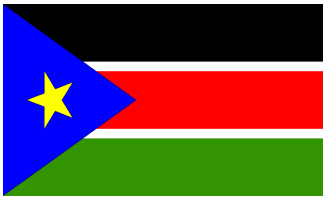


The Republic of South Sudan

Ministry of Agriculture and Food Security

Ministry of Livestock and Fisheries

Ministry of Environment and Forestry

Comprehensive Agriculture Master Plan

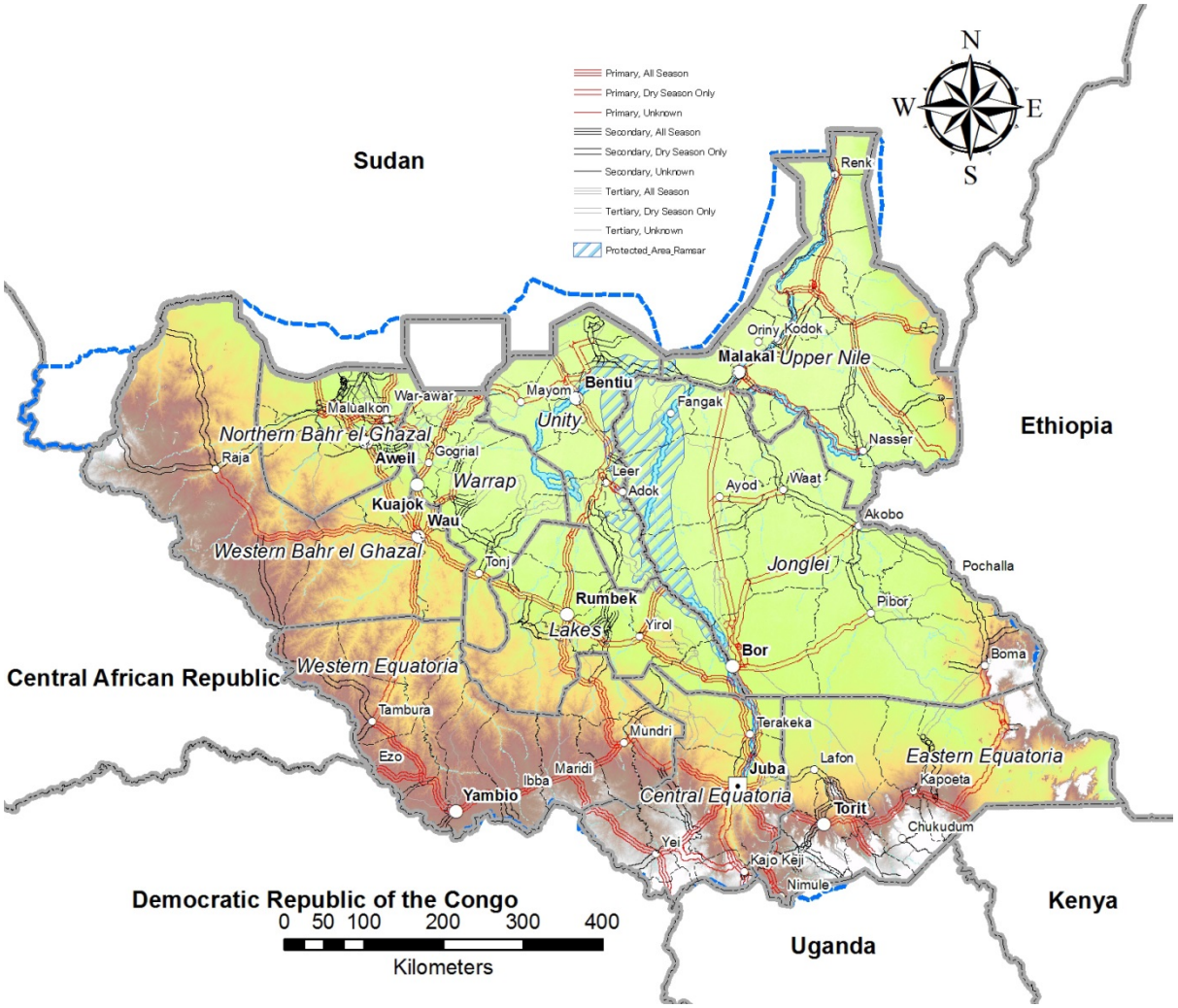
CAMP

Annex IV

Situation Analysis Report 2013/2015

October 2016

Map of the Republic of South Sudan



Source: Data from the National Baseline Household Survey 2009.
Prepared by NBS/CAMP Task Team.

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Abbreviations

ACF	Action Contre la Faim/ Action Against Hunger
ACORD	Agency for Coordination of Research and Development
ACTED	Agency for Technical Cooperation and Development
ADESCO	African Development Solutions
AEC	African Economic Community
AECOM	A commercial company, which operates in South Sudan as an NGO providing development services, usually funded by USAID.
AEO	Agricultural Extension Officer
AfDB	African Development Bank
AGRA	Alliance for a Green Revolution in Africa
AHA	Animal Health Auxiliary
AIMS	Aid Information Management System
AIRS	Aweil Irrigation Rice Scheme
Amadi RDI	Amadi Rural Development Institute
ANLA	Annual Needs and Livelihood Analysis
ASARECA	Association for strengthening Agricultural Research in Eastern and Central Africa
ASPF	Agriculture Sector Policy Framework
AU	African Union
AU-IBAR	African Union Inter-African Bureau Animal Resources
AusAID	Australian Government Overseas Aid Program
AWODA	Aweil Window of Opportunities and Development Agency
AWPB	Annual Work Plan and Budget
BLL	Blue Lakes Limited
BOU	Bank of Uganda
BPS	Budget Planning System
BRAC	Bangladesh Rural Advancement Committee
BSF	Basic Services Fund
BSP	Budget Sector Plan
BXW	banana xanthomonas wilt
CA	Competent Authority
CAADP	Comprehensive Africa Agriculture Development Programme
CAFOD	Catholic Agency for Overseas Development
CAHW	Community Animal Health Worker
CAMP	Comprehensive Agriculture Master Plan
CANS	Civil Authority of New Sudan
CAR	Central African Republic
CARE	Cooperative for Assistance and Relief Everywhere
CASI	Community Agriculture and Skills Initiative
CBEW	Community Based Extension Worker
CBS	Central Bureau of Statistics
CBSD	cassava brown streak disease
CBSV	cassava brown streak virus
CBTF	Capacity Building Trust Fund
CCIA	Chamber of Commerce, Industry and Agriculture
CCU	County Coordination Unit
CDO	Community Development Officer
CES	Central Equatoria State
CESVI	Cooperazione E Sviluppo
CETC	Central Equatoria Teak Company
CF	Community Forest
CFA	Central Forest Act
CFR	Central Forest Reserve

CFSAM	Crop and Food Security Assessment Mission
CHF	Common Humanitarian Fund
CIA	Central Intelligent Agency
CIDA	Canadian International Development Agency
CM	Carbon Monoxide
CMD	Christian Mission for Development
CMV	cassava mosaic virus
CO	Cooperative Officer
CoM	Council of Ministers
COMESA	Common Market for Eastern and Southern Africa
COMSTAT	COMESA's database
Cordaid	Catholic Organisation for Relief & Development Aid
CPA	Comprehensive Peace Agreement
CPC	County Project Coordinator
CRADA	Christian Recovery and Development Agency
CTA	Civil Transaction Act
CTC Yei	Crop Training Centre Yei
DAFED	Directorate of Animal and Fisheries Research (of Ministry of Animal Resources and Fisheries)
Daga'a	Dried *Rastrineobola argentea*, the silver cyprinid, imported in dried form from Uganda.
DCA	Dan Church Aid
DD	Deputy Director
DDR	Disarmament Demobilization and Reintegration
DFID	Department for International Development
DG	Director General
DLCO-EA	Desert Locust Control Organization for Eastern Africa
DoFAD	Directorate of Fisheries and Aquaculture Development
DoLFE	Directorate of Livestock and Fisheries Extension (of MARF)
DoPSD	Directorate of Planning, Statistics and Documentation (of MARF)
DP	Development Partner
DPSD	Directorate of Planning, Statistics, and Documentation
DRC	Democratic Republic of Congo
DRC	Danish Refugee Council
EAC	East African Community
EC	European Commission
ECA	Economic Commission for Africa
EES	Eastern Equatoria State
EMIS	Education Management Information System
ESAMI	East-South Africa Management Institute
ESIA	Environmental and social impact assessment
ETC	Equatoria Teak Company
EU	European Union
FA	Forest Act
FAO	Food and Agriculture Organization of the United Nations
FAPF	Food and Agriculture Policy Framework
FARM	Food, Agribusiness and Rural Markets Project
FERA	UK Food and Environment Research Agency
FEWS NET	Famine Early Warning Systems Network
FFA	Food for Asset
FNC	Forests National Corporation
FNCA	Forests national Corporation Act
FPMP	Fisheries Production and Marketing Project (part of SPRCP)
FR	Forest reserve

FRTC	Feeder Road Technical Committee
FSC	Forest Stewardship Certificate
FSLC	Food Security and Livelihood Cluster
FY	Financial/Fiscal Year
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Agency for International Development)
gms	grammes
GoJ	Government of Japan
GoSS	Government of Southern Sudan
GRS	Government of the Republic of the Sudan
GRSS	Government of the Republic of South Sudan
HACCP	Hazard analysis and critical control points, is a systematic preventive approach to food safety
HDC	Humane Development Council
HH	High production potential and high population density
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HL	High production potential and low population density
HM	Her Majesty (of the United Kingdom & North Ireland)
HPF	Health Pooled Fund
HWSD	Harmonized World Soil Database
IAA	Integrated Agriculture Aquaculture
ICB	international competitive bidding
ICCO	Inter-Church Organisation for Development Cooperation
ICRAF	World Agroforestry Centre (aka International Centre for Research in Agroforestry)
IDA	International Development Association
IDMP	Irrigation Development Master Plan
IDP	Internally Displaced Person
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
IFDC	International Fertilizer Development Centre
IFMIS	Financial Management Information System
IFPRI	International Food and Policy Research Institute
IGAD	Intergovernmental Authority on Development
IGs	Interest Groups
IIASA	International Institute for Applied Systems Analysis
IMAC	Inter-Ministerial Appraisal Committee
IMF	International Monetary Fund
IOM	International Organisation for Migration
IQF	Individually Quick Frozen
IRC	International Rescue Committee
IRW	Islamic Relief Worldwide
ISC	Inter-Ministerial Steering Committee
ISRIC	International Soil Reference and Information Centre
ISSCAS	Institute of Soil Science - Chinese Academy of Sciences
IUSS	International Union of Soil Sciences
JAM	Joint Assessment Mission
JICA	Japan International Cooperation Agency
JRC	Joint Research Centre of the European Commission
JRIEP	Juba Rapid Impact Emergency Project
KATTC	Kapuri Agricultural and Technology Transfer Centre
KCB	Kenya Commercial Bank
KFTC	Kagelu Forestry Training Centre

kg	Kilogramme
KNBS	Kenya National Bureau of Statistics
LC	Land Commission
LCB	Local Competitive Bidding
LGP	Length of Growing Period
LRSIC	Land Resource Survey and Information Centre
LSS	local services support
MACE	Ministry of Agriculture, Cooperatives and Environment
MAERD	Ministry of Agriculture, Environment and Rural Development
MAF	Ministry of Agriculture and Forestry
MAFCRD	Ministry of Agriculture, Forestry, Cooperatives and Rural Development
MAFI	Ministry of Agriculture, Forestry and Irrigation
MAFTARF	Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries
MARF	Ministry of Animal Resources and Fisheries
MCII	Ministry of Commerce, Industry and Investment
MCMV	maize chlorotic mottle virus
MCRD	Ministry of Co-operatives and Rural Development
MDTF	Multi-donor Trust Fund
MFI	micro-financial institution
MH	Medium production potential and high population density
ml	millilitre
MLLTC	Marial Lou Livestock Training Centre
MLND	maize lethal necrosis disease
MLPSHRD	Ministry of Labour, Public Service and Human Resource Development
MoCA	Ministry of Cabinet Affairs
MoE	Ministry of Education
MoEnv	Ministry of Environment
MoFAIC	Ministry of Foreign Affairs and International Cooperation
MoFEP	Ministry of Finance and Economic Planning
MoGC&SW	Ministry of Gender, Child and Social Welfare
MoH	Ministry of Health
MoHADM	Ministry of Humanitarian Affairs and Disaster Management
MoLPS	Ministry of Labor and Public Service
MoT	Ministry of Transport
MoU	Memorandum of Understanding
MPI	Ministry of Physical Infrastructure
MPIPU	Ministry of Physical Infrastructure and Public Utilities
MPIRD	Ministry of Physical Infrastructure and Rural Development
MPS	Ministry of Public Service
MRB	Ministry of Roads and Bridges
MRDA	Mundri Relief and Development Association
MRDI	Ministry of Rural Development and Irrigation
MSME	micro, small and medium sized enterprise
MSY	Maximum sustainable yield
MT	Metric Tonne
MTRB	Ministry of Transport, Roads, and Bridges
MWRI	Ministry of Water Resources and Irrigation
MWRRDC	Ministry of Water Resources, Rural Development and Cooperatives
N	North
NALEP	National Agriculture and Livestock Extension Policy
NATTC	Nzara Agricultural Technology Training Centre
NBG	Northern Bahr el Ghazal State
NBS	National Bureau of Statistics
NCA	Norwegian Church Aid

NDDRC	National Demobilisation, Disarmament, and Reintegration Commission
NEAT	National Effort for Agricultural Transformation
NEPAD	New Partnership for Africa's Development
NFA	Nzara Farmer Association
NFR	National Forest Reserve
NGO	Non-governmental Organization
NHDF	Nile Hope Development Forum
NLA	National Legislative Assembly
NPA	Norwegian Peoples Aid
NRC	Norwegian Refugee Council
NRSWG	South Sudan Natural Resources Sector Working Group
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
OIE	World Organization for Animal Health
OLS	Operation Lifeline Sudan
OoP	Office of President
P4P	Purchase for Progress
PBG	Producer Business Group
PFA	Provincial Forest Act
PFE	Permanent Forest Estate
PFM	public financial management
PFMAA	Public Financial Management and Accountability Act 2011
PFR	Provincial Forest Reserve
PFTC	Padak Fisheries Training Centre
PMU	Project Management Unit
PPS	public-private partnership
QGDF	Quarterly Government-donor Forum
RAAH	Rural Action Against Hunger
RAI	Rural Accessibility Index
RAPID	Response Assistance for Priority Infrastructure Development
ROSS	Republic of South Sudan
SAFDP	Support to Agriculture and Forestry Development Project
SAs	Spending Agencies
SDG	Sudanese Pound
SE	South east
SEA	Strategic environmental assessment
SEL	Sercham Equatoria Limited
SICBP	Sudan Infrastructure Capacity Building Program
SIDA	Swedish International Development Cooperation Agency
SMARF	State Ministry of Animal Resources and Fisheries
SMART	Specific, Measurable, Achievable, Relevant and Timebound
SMEs	Small and Medium Sized Enterprises
SNV	Netherlands Development Organization
SPCRP	Sudan Productive Capacity Recovery Programme
SPLA	Sudan People's Liberation Army
SPLM	Sudan People's Liberation Movement
SSARP	Southern Sudan Agricultural Revitalization Program
SSCCSE	Southern Sudan Centre for Census, Statistics and Evaluation
SSDP	South Sudan Development Plan 2011-2013
SSDP-TWG	South Sudan Development Plan Technical Working Group
SSLA	South Sudan Legislative Assembly
SSLC	Southern Sudan Land Commission
SSLDP	Southern Sudan Livelihoods Development Project

SSP	South Sudanese pound
SSPF	South Sudan Partnership Fund
SSRA	Southern Sudan Roads Authority
SSRF	South Sudan Recovery Fund
SSRRC	South Sudan Relief and Rehabilitation Commission
SSRRP	South Sudan Rural Roads Project
SSTCM	South Sudan Transition Conflict Mitigation (project)
SWG	Sector Working Group
TC	Technical Committee
TT	Task Team
UBOS	Uganda Bureau of Statistics
UK	The United Kingdom of Great Britain and Northern Ireland
ULA	Unregistered Land Act
UMCOR	United Methodist Committee on Relief
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees
UNMISS	United Nations Mission in South Sudan
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNOPS	United Nations Office for Project Services
UNS	Upper Nile State
USA	United States of America
USAID	United States Agency for International Development
USD	United States Dollar
USOB	Uganda Bureau of Statistics
VSF	Vétérinaires Sans Frontières
WB	World Bank
WBGS	Western Bahr el Ghazal State
WES	Western Equatoria State
WFP	World Food Programme
WHO	World Health Organisation
WRB	World Reference Base for Soil Resources
YATC	Yei Agricultural Training Centre
YMCA	Young Men Christian Association
ZEAT	Zonal Effort for Agricultural Transformation

EXECUTIVE SUMMARY

About CAMP

Background

South Sudan became independent on 9 July 2011, following the signing of the Comprehensive Peace Agreement in 2005 and after decades of civil war. Endowed with oil wealth, it is the richest country, in terms of GDP per capita, in East Africa. Over 95% of the total area (658,842 km^2) is considered suitable for agriculture, 50% of which is prime agricultural land. Yet, the counrty remains one of the least developed in the world and faces formidable challenges. While a majority of the population is dependent on subsistence farming and pastoralism as sources of livelihoods, a considerable number of people continue to rely on relief assistance to meet their needs.

With increased focus on the potential of agriculture, the Government of the Republic of South Sudan (GRSS) realized the need to formulate a comprehensive master plan to guide the agricultural development of the country. The then Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD) and the then Ministry of Animal Resources and Fisheries (MARF)[1] took the decision to formulate the Comprehensive Agriculture Master Plan (CAMP) and formally requested technical assistance from the Japan International Cooperation Agency (JICA) in November 2011. They signed a technical cooperation agreement with JICA in June 2012, which was later joined by other development partners (DPs), e.g., the Canadian International Development Agency (CIDA) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Objectives

The objectives of the CAMP process are as follows.

1) Formulate a comprehensive agriculture master plan that will identify the potential of different products all over the country, priority programmes/projects and the resources required to implement them.
2) Recommend a feasible institutional setup for the implementation of potential priority programmes/projects and spell out the roles of different stakeholders participating in agricultural development activities in the country.
3) Strengthen the capacity of the national task team members[2] through the process of formulating related policies and plans of the respective ministries in a number of key areas to be prioritized by government and other stakeholders.

Once formulated, the GRSS will ensure that all public and private investments and programmes supported by development partners (DPs) in the sector are aligned with CAMP. The implementation of all programmes/projects will be directed, coordinated, monitored and reviewed by the government in collaboration with the stakeholders.

Target Subsectors and Geographic Area

CAMP covers the subsectors of agriculture, forestry, livestock and fisheries, while the geographic coverage is, in principle, the whole area of South Sudan.

Implementing Ministries

The following two ministries are responsible for the CAMP formulation:

[1] The two ministries, together with the Directorate General of Tourism from the former Ministry of Wildlife Conservation and Tourism, were merged into the Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries (MAFTARF) in August 2013.

[2] The CAMP Task Team has national members and international members (consultants and experts).

1) Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries (MAFTARF)
2) Ministry of Electricity, Dams, Irrigation and Water Resources (MEDIWR).

Guiding Principles

CAMP formulation is guided by the following principles:

1) Government-led formulation
2) Capacity development through the formulation process
3) Formulation of an implementable plan
4) Alignment with existing policies, plans and institutional arrangements
5) Coordination with other stakeholders.

Coordination Mechanism

A mechanism has been set up to ensure a harmonized and coordinated framework for effective and efficient management of activities and resources for CAMP formulation. The central driving and coordinating force of the mechanism is the CAMP Task Team, consisting of the staff of the two implementing ministries and experts deployed by DPs. The national Task Team members carry out all the tasks required for the master plan formulation in cooperation with the experts. The Technical Committee composed of Undersecretaries and Directors General of the implementing and collaborating ministries supervises the Task Team's activities and reports to the Inter-Ministerial Steering Committee, the highest decision-making body for CAMP. The Task Team consults with various stakeholders such as government and private institutions, universities, DPs and NGOs.

Workflow

The overall flow of major activities to formulate CAMP is as follows:

1) Stakeholder consolidation
2) Situation analysis
3) Framework formulation and priority identification
4) Preparation of investment plans
5) Proposing implementation framework.

The CAMP process is roughly divided into two periods, a 6-month preparation period (July 2012-December 2012) and a 24-month formulation period (January 2013-December 2014). In each activity, the CAMP Task Team will build consensus among the stakeholders by discussing the results at a stakeholder meeting and then move on to the next activity. Important characteristics of the CAMP process are that the master plan formulation is based on the situation analysis and that it clarifies the roles and responsibilities of various actors, funding mechanisms and M&E systems through designing an implementation framework.

About this Report

This report presents preliminary results of the situation analysis conducted from February 2013 to July 2013. Part I contains findings on cross-subsectoral and cross-cutting issues including the economy, policy and institutional frameworks, public financial management and rural society and livelihoods. Part II reports on the crops, livestock, forestry and fisheries subsectors and Part III on preliminary discussions of key issues and challenges in the agricultural sector. A complete situation analysis report, together with a framework of the master plan and priority programmes, will be included in the Interim Report to be prepared by December 2013.

Key Issues and Challenges in the Agriculture Sector

The following is a summary of key issues and challenges in the agricultural sector identified through the situation analysis. The framework of CAMP, including objectives, timeframe, targets, strategies, priority pillars and programmes, etc., will be developed based on these issues.

Overall

Preliminary conclusions on overall issues and challenges presented below are mainly regarding the first two of the four objectives of the situation analysis: 1) to understand the issues and challenges in agricultural service delivery; 2) to understand the issues and challenges in the agriculture sector; 3) to analyse the mechanisms and processes of agricultural transformation; and 4) to identify information useful to estimate the expected impact of public service delivery on the sector. The third and fourth objectives will be dealt with in the Interim Report.

1) Private sector-led development: The formulation and implementation of CAMP should be guided by the principle of "small-government and private sector- and market-led development". The government's roles should be confined to policy formulation, the establishment of a regulatory framework and the provision of public goods and safety nets for the socially vulnerable. Public sector institutional capacity and financial resources are extremely limited compared to the huge demand for support services, though a substantial amount of oil revenues could be utilised upon the resumption of oil production. There are also a number of issues external to the agricultural sector but that shape it, such as macroeconomic management, basic infrastructure development (e.g., road transport, electricity, water supply, ICT, etc.) and social development (e.g., re-integration, health, education, etc.), which are mainly the responsibility of the government. To realise effective and efficient service delivery under the existing constraints, it is essential for the government to recognise and support the efforts of the private sector.
2) Understanding the private sector: To design mechanisms to deliver agriculture services which could encourage private sector- and market-led development with minimum public sector resources, an in-depth understanding of the behaviour of private sector actors, including farmers, is needed. The present situation analysis has revealed that vibrant rural-to-rural and rural-to-urban market economies exist despite poor road conditions, lack of support services and competition with products imported from neighbouring countries. The majority of the rural population is resilient to erratic climatic conditions, engaging in various activities to cope with food insecurity. The situation analysis has also proved that the government needs to: 1) regulate private sector activities for fair competition in the market; 2) ensure the supply of safe and sanitary foods for consumers; and 3) build trust with the private sector for reciprocity.

Cross-cutting Issues

1) Access to land: Access to land and land use is a key factor of agricultural development, but land rights are not secured for many people in South Sudan, particularly for returnees, IDPs and women. Procedures for large-scale land acquisition have not been clarified nor properly followed. The absence of an audit and monitoring system reduces transparency and accountability in statutory land administration. As a result of decades of civil war, customary laws were weakened and are not effective in securing equal land rights for every community member.
2) Food security: The food security situation has deteriorated in recent years due to a large number of returnees, refugees from Sudan and IDPs, natural population growth, a reduced harvest (in 2011) and food price inflation caused by greater demand and tight foreign reserves following the oil shutdown. The GRSS and DPs have been providing food assistance to vulnerable groups, and it could be necessary to continue such

services for some time. The impact of food assistance should be examined within the context of long-term agricultural development in terms of linkages with markets and behaviour changes of food aid recipients.

3) Coping mechanisms: The diet becomes insufficient and less nutritious during the period of seasonal food insecurity, especially in dry lands. Household food security in the country traditionally depends on a complex system of food production, livestock, seasonal migration, informal trade, fishing and the collection of wild fruits, which was severely disrupted by the war. Activities to cope with this seasonal food scarcity might include selling livestock, charcoal and other homemade products and providing labour for cash or food. Introducing an appropriate number of livestock would be particularly helpful since they are more drought-resilient than crops and can supply food as well.

4) Support to returnees and IDPs: The influx of over two million returnees and IDPs since the signing of the CPA[3] has placed pressure on communities across the country and has increased competition over scarce resources and worsened living conditions among vulnerable groups. The agricultural production of returnees and IDPs is considerably smaller than that of non-returnee farmers. More systematic support regarding access to land, farming and other income generating activities is needed to facilitate the reintegration process and thus to ensure their long term economic independence.

5) Gender equality: There are significant gender disparities in ownership of land and other property, education, health and human rights protection. Since women play important roles in agricultural production and marketing, it is essential to improve their living and work environment and enhance their capacity for agricultural development. Equal land rights should be given to women by strengthening land administration and accelerating implementation of the land laws. Support to female-headed households, who are among the poorest, is urgently required.

6) Security: The legacy of insecurity and violence significantly undermines steady development of the agricultural sector. Further disarmament is expected to reduce armed incidents, mitigate conflict damage and contribute to agricultural development, as demonstrated in the attempts by the GRSS and DPs. Since conflicts over scarce resources tend to occur during the dry season, a drought management system could be established as a conflict mitigating measure.

Institutional Development

1) Institutional and human capacity building: Public sector capacity for administration and financial management is weak, particularly at the state and local levels. Inadequate professional knowledge and skills and poor coordination between the GRSS and the state governments hinder performance at all levels. Low governance, accountability and transparency are reported throughout the system. Many of the issues identified by the four subsectors are also directly or indirectly linked to the weak public sector capacity for service delivery. Capacity development should be an integral part of CAMP for its effective and efficient implementation.

2) Funding: Inadequate funds for operating costs and capital investment, together with limited institutional capacity, severely affect public investment and service delivery, especially at the lower levels of government. It would be necessary to secure external funds for CAMP implementation, through project support, earmarked funding, pooled funding or budget support. Whatever the funding modality may be, the ministries concerned at the national and state levels would be required to follow properly prescribed procedures for budget execution, control and monitoring. This also implies a need to strengthen their management capacity.

[3] International Organization for Migration South Sudan. 2013 Country Programme. Juba: IOM South Sudan. p. 6.

3) Service delivery: Public services are not effectively and efficiently delivered to target groups with respect to location, timing, size and content. Among these, timeliness is critical to agricultural support services because of the seasonality of production activities. The government relied heavily on NGOs for service delivery and failed to establish sound service delivery systems during the CPA period. It is vital to design a simple but effective system for agricultural service delivery through the CAMP formulation and deliver it in CAMP implementation.

Crop Subsector

1) Agricultural production: Low yield per unit area and small harvested area per capita lead to low cereal production, causing food insecurity in South Sudan. Even farm households face food insecurity. Despite favourable natural conditions (e.g., rainfall, temperature, soils, etc.) for various cash crops (e.g., vegetables, fruits, tea, coffee and oil seeds), the potential has not been fully exploited.
2) Costs of production: Compared to neighbouring countries, South Sudan's costs of production, particularly labour costs and input prices, are larger due to higher commodity prices brought about by poor infrastructure and strong currency from oil exports. The higher costs of production reduce the competitiveness of agricultural products, resulting in large food imports from Uganda, Kenya, Ethiopia, etc.
3) Infrastructure: Infrastructure for transportation, irrigation, storage and processing is underdeveloped and electricity services are not available in rural areas. In particular, the poor infrastructure for road transport leads to very high transportation costs and long transit time, which impedes collection of products from production areas.
4) Security: Insecurity and conflicts disrupt crop cultivation and displace farmers, casing serious food insecurity in many areas. Livestock accompanied by armed pastoralists often destroys crops. Most farmers cannot afford preventive measures such as fencing.
5) Service delivery: Public sector service delivery to farmers is very limited. Agricultural Extension Officers (AEOs) are deployed at the payam level, but their number remains negligible. While NGOs provide some short-term training and extension, most farmers have no access to such services. The public sector has also yet to provide other support services such as agricultural research, control of migratory pests and diseases, and financial services.
6) Farmer organisations: There are few active farmer organisations, such as cooperatives and Farmer Based Organisations (FBOs). Farmers lack the capacity to organise themselves for marketing (e.g., gather crops into a larger volume for sale), which is one of the reasons why traders purchase products in bulk from neighbouring countries.
7) Environment for investment: The policy environment is not favourable for private sector activities in general and investment in particular. The uncertainty of land acquisition is a factor adversely affecting investors' decision about agricultural investment. Multiple taxation and infrastructure deficiencies increase costs of operation and hinder all kinds of economic activity.

Livestock Subsector

1) Policy, legal and strategic framework: There is a lack of a comprehensive sector policy framework and subsectoral policies and lead institutions for the development of livestock-related industries. Current strategic frameworks are more focused on public sector issues than on the needs of the subsector. There is need to review the existing acts and bills and to institute mechanisms for their enforcement. An unclear and incomplete legal, policy and regulatory framework for land tenure has resulted in inconsistencies in implementation, adversely affecting land for livestock production, migration, marketing and processing in both rural and urban areas.

2) Conceptual framework: The sub-sector potential is poorly understood and articulated as a result of lack of reliable livestock population data which has undermined strategy development, planning, investment and coordination at all levels and across the stakeholders. Areas of comparative advantage at the state, national and regional levels have not been identified. Mutually beneficial linkages to the crop sector are not harnessed for an integrated approach.

3) Institutional framework: Public sector institutions at the national and state levels do not have the necessary levels of staffing, in terms of number, qualification and capacity; neither do they have infrastructure and budgets to carry out their mandates. Coordination and communication within the public sector and with other stakeholders are poorly defined and resourced. Institutional arrangements to address natural resource issues are poorly developed; issues include water for production, rangeland management, drought and flooding, resource-based conflict, protection of key production and trade migration routes, and shared transboundary resources.

4) Production and productivity: The subsector is dominated by subsistence producers who rely on indigenous breeds, knowledge and technologies and aim to produce for household consumption. There is scope for making initial substantial gains in filling the large production and productivity gaps and eliminating seasonality of production by using low-level technologies already in existence in the region and by organization of producers. There is also scope for diversifying both the species and production systems to utilise a broader range of resources and strategies.

5) Animal health and food safety assurance: The prevalence of diseases due to the lack of facilities, human resources and investment impedes the delivery of animal health services. The impact of the 13 priority diseases is the largest on food security with losses in meat and milk production and related costs of treatment, amounting to hundreds of millions of USD. Hygiene standards for food of animal origin are inadequate and unenforceable due to lack of legal and regulatory frameworks, deterring private investment in meat and milk processing.

6) Market development: Around 60-90% of livestock production is consumed within producing households, i.e., low integration into value chains. Domestic value chains are faced with stiff competition from regional and global actors and encumbered by high transaction costs due to poor transport infrastructure, conflict and insecurity, low product quality and poor sanitary and phytosantiary standards. Neighbouring countries might benefit from adding value to cheaper raw materials from South Sudan for their domestic markets or re-exporting to more lucrative markets.

7) Taxation: Livestock and livestock products suffer from the multiple formal and informal taxes due to the lack of an integrated taxation framework with proper supervision on the ground. Production inputs such as day old chicks and feeds attract high taxes, which deters the growth of livestock inputs businesses and results in farmers and organisations purchasing them only on an ad hoc basis. Exports of hides and skins also attract high taxes.

8) Investment: Public sector expenditure on the subsector is far below the stipulated Maputo Declaration allocation of 3% of the national budget, needed to improve food security, reduce poverty and stimulate economic growth. Development assistance to the subsector has been minimal and mostly short-term and/or emergency funding. Subsidies by NGOs and some government initiatives have a mixed effect on ownership, growth of business acumen and sustainability. Financing for the majority of sector value chain actors is not forthcoming, and they are unable to get access to innovative financing opportunities in the region.

9) Training, research and extension: The four public universities offering training in animal production, animal health and veterinary sciences suffer from inadequate funding, limited

qualified staff and weak capacity for practical training, and are not linked to regional university consortiums. Only one institution offers short-term training and refresher courses for those who deliver services on the ground. There are no dedicated public livestock research facilities, with only minimal research being conducted by the universities. Without effective public extension services, farmers and other actors rely on NGOs, radio broadcasts, farmer-to-farmer exchange and the Internet for information, but the information is often not appropriate or complete.

10) Security: Conflict and insecurity, including cattle raiding and rustling, disrupt livestock activities, resulting in loss of human lives and livestock, displacement of communities, inaccessibility to grazing and water resources and underutilisation of stock routes for production and marketing. In some counties, insecurity has reduced livestock populations and deprived people of their livelihoods; this has aggravated food insecurity and poverty.

Forestry Subsector

1) Commercial forestry: While some agroforestry and small-scale plantations have been developed in the Greater Equatoria region, teak plantations and woodlots for sustainable production are not fully exploited. Traditional and micro- and small-scale enterprises oriented to marketing forest products and services dominate the subsector. Large-scale private investment can be found only in forest management under concession arrangements. A limited volume of a few specific products, i.e., teak timber and gum acacia, are exported to regional and global markets. This can be attributed to the lack of a legal framework, poor infrastructure, inadequate government technical and regulatory support and a speculative market environment. Further investment is necessary to explore market opportunities for other forest products and services.

2) Community forestry and agroforestry: Although the concept of community forestry is defined in the Forest Policy 2013, the government does not have a legal framework consistent with varying customary laws and has insufficient expertise to deliver technical services for community forestry and agroforestry. The same issues arise with the collaborative management of Central Forest Reserves (CFRs) and other types of public forestry reserves involving forestry communities, private concessionaires, processors and traders. The legal framework and government expertise must be established to realise a community management regime.

3) Conservation: The country has experienced rapid degradation of biodiversity resources due to the widespread illegal and uncontrolled exploitation of such resources. The current management of CFRs is extremely weak and its strengthening is urgently needed to avoid further uncontrolled exploitation of forest resources, and encroachment. The public sector is unable to implement conservation measures in an effective manner because of weak collaboration among authorities at the national and state levels to manage and conserve forest resources, and due to the inadequacy of legal frameworks, expertise and resources for communication and transportation.

4) Institutional arrangements: A legal framework to clarify responsibilities and financial modalities of the national, state and local governments is under development. Coordination within the public sector is lacking, and low accountability, both upwards and downwards, is causing serious reporting and supervision problems. The viability of the South Sudan Forest Commission and Forest Development Consultative Forum, proposed in the Forest Policy 2013, in promoting private investment and decentralised forest management needs to be thoroughly analysed.

5) Policy implementation: The government's delineation of responsibilities is inadequate for the implementation of the Forest Policy 2013. Key legal instruments such as the Forestry Law, related acts and other legal instruments are not in place or only partially implemented. Completeness, fairness and efficiency of forest revenue collection are

neither achieved nor can be achieved due to unrealistic administrative provisions with respect to the human and financial resources allocated. Impediments to forestry development include corrupt practices, distrust between the public and private sectors, poor coordination within the public sector and with the private sector and DPs, and insufficient fund allocation for human resource development, application of science and technology and knowledge creation activities.

Fisheries Subsector

1) Management: This is mainly the responsibility of the government at the national and state levels. The key issue to be tackled by the government is the lack of skills, coordination and finance within the administrations involved in fisheries. Currently most government bodies involved in fisheries are not sufficiently active, and do not contribute to the good management nor development of fisheries in South Sudan. Until this lack of capacity is addressed, it will be difficult for the government to carry out its role, and implement necessary legal and regulatory obligations, as recognised in its own policies and strategies.
2) Production and marketing: This is mainly the responsibility of the private sector. The private sector is capable of improving production and post harvest in fisheries by itself, without government assistance (but necessarily under government regulatory supervision). The private sector however faces several challenges, greatest amongst them being poor transport and communications, the high cost of energy and utilities and informal taxation. All of these could be alleviated by direct government interventions.
3) Crosscutting issues: Major cross cutting issues, not only affecting fisheries, impact the whole sector, such as general health provision, education in fishing communities and poor security. As an example, the upcoming HIV epidemic is a hidden threat to fisheries and will hit the sector badly unless action is taken quickly.

Part 1: Situation Analysis 2013

1. Introduction

1.1 Background and objective

1.1.1 Background

South Sudan became independent on 9th July 2011, following a referendum in January 2011 and after decades of civil war. The total population was 8.26 million at the time of the Population Census 2008, 83% of which was living in rural areas (Table 1-1). Endowed with oil wealth, it is the richest country, in terms of GDP per capita, in East Africa. Oil exports accounted for 70% and 64% of GDP in 2010 and 2011, respectively, and provided 97% of government revenue.[4] Yet, the counrty remains one of the least developed in the world, as characterized by a high poverty incidence (particularly in rural areas), low social indicators and virtually non-existent infrastructure. While a majority of the population is dependent on subsistence farming and pastoralism as sources of livelihoods, a considerable number of people continue to rely on humanitarian relief assistance to meet their needs.[5]

Faced with a declining trend in oil production, attention has been increasingly focused on the potential of its agriculture. Over 95% of the total area of South Sudan (658,842 km^2) is considered suitable for agriculture, 50% of which is prime agricultural land where soil and climatic conditions allow for production of a variety of crops and livestock.[6] The country has the sixth largest livestock herd and the highest livestock per capita holding in Africa with an estimated livestock population of 11.7 million cattle, 12.4 million goats and 12.1 million sheep.[7] Dense forests occupy about 25% of the total land area, mainly in the Greater Equatoria, Greater Bahr el Ghazal and Upper Nile States.[8] The potential sustainable fisheries production from the River Nile, the *Sudd* and Bahr el Ghazel and Sobat rivers and floodplains has variously been estimated to range between 100,000 and 300,000 tons per annum, though the higher of these historical estimates is probably optimistic.

Despite such enormous potential in the agricultural sector, South Sudan has been suffering from low agricultural performance, high food insecurity and pervasive poverty, particularly in rural areas. This is due mainly to the following.[9]

- Recurrent natural and man-made disasters
- Insignificant public and private investments in agriculture
- Absence of productive rural infrastructure
- Inadequate access to improved agricultural technologies and inputs
- Inadequate research and extension services
- Inadequate access to animal health and veterinary services
- Low level of human development

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[4] South Sudan National Bureau of Statistics (NBS). 2012. *Release of new South Sudan Gross Domestic Product (GDP) estimates for 2011, and revised figures for 2008-2010*. Press release 02 October 2012. Juba: NBS

[5] Baseline Technical Team. 2010. *Joint Baseline Survey Report on the Agriculture and Animal Resources in Southern Sudan*. Juba: Government of Southern Sudan. p. 40.

[6] World Bank. 2007. Final Proposal for a Multi Donor-Trust Fund Grant to the Government of Southern Sudan for the Support to Agriculture and Forestry Development Project (SAFDP). Washington D.C.: World Bank. p. 30. (Government of the Republic of the Sudan, Sudan People's Liberation Movement, World Bank and UNDP. 2005. *Joint Assessment Mission: Framework for Sustained Peace, Development and Poverty Eradication. Volume III Cluster Reports;* Tothill, J.D. ed. 1948. Agriculture in the Sudan. London: Oxford University Press; and Craig, G.M. ed. 1991. The Agriculture of the Sudan. London: Oxford University Press)

[7] FAO. October 2009. Livestock Population Estimates.

[8] World Bank. 2007. Final Proposal for a Multi Donor-Trust Fund Grant to the Government of Southern Sudan for the Support to Agriculture and Forestry Development Project (SAFDP). Washington D.C.: World Bank. p. 32.

[9] Kanisio, John O. 2012. "Overview of CAMP Formulation Process." Presentation at the preparatory workshop for the formulation of the Comprehensive Agricultural Development Master Plan (CAMP). Slide 2.

- Effects of over-reliance of the economy on oil revenues.

Table 1-1: South Sudan's key indicators

	Number	%	Source
Land use (km^2)	646,883	100.0	World Bank. 2012. Strategic Choice for Realizing South Sudan's Agricultural Potential (Table 1, p. 4) (Aggregated from FAO. 2009. Land Cover Database)
Cropland	24,777	3.8	
Grass with crops	3,251	0.5	
Trees with crops	17,073	2.6	
Grassland	96,338	14.9	
Tree land	405,269	62.6	
Flood land	94,976	14.7	
Water and rock	4,827	0.7	
Urban	370	0.1	
Population (2008)	8,260,490		SSCCSE. 2010. Southern Sudan Counts: Tables from the 5th Sudan Population and Housing Census 2008 (Table 1-1, p. 9)
Urban	1,405,186	17.0	
Rural	6,855,304	83.0	
Male	4,287,300	51.9	SSCCSE. 2010. Southern Sudan Counts: Tables from the 5th Sudan Population and Housing Census 2008 (Table 1-1, p. 9)
Female	3,973,190	48.1	
Population density (person/km^2)	13		NBS. 2012. Key Indicators for South Sudan
Population growth rate (2012) (%)	4.7		NBS Projection. NBS. 2012. South Sudan Statistical Year Book 2011 (p. 17)
Natural increase (%)	2.7		
Net migration rate (per 1,000 pop.)	20.5		
Mid-year population (2012)	10,386,101		NBS Projection. ditto.
Population below poverty line (%)	50.6		SSCCSE. 2010. Poverty in Southern Sudan: Estimates from NBHS 2009 (p. 44). Poverty is defined as persons with the value of monthly total consumption below SDG 72.9 in 2009.
Rural	55.4		
Urban	24.4		
Returnees (Oct. 2010 - July 2012)	407,239		OCHA. 2012. Cumulative No. of returnees
IDPs (Status 15/08/2012)	164,331		OCHA. 2012. Cumulative figures of new conflict related
People at risk of food insecurity (June	4.7		UNHCR, OCHA and IOM, 2012
HHs using improved drinking water (%)	69		MoH. 2011. Sudan Household Health Survey 2010
Under-five mortality rate (2010) (1,000 live	105		MoH. 2011. Sudan Household Health Survey 2010
Maternal mortality rate (2006) (100,000 live	2,054		MoH. 2007. Sudan Household Health Survey 2006
Literacy rate (15-24 years) (2009) (%)	40		NBS. 2012. National Baseline Household Survey 2009
Male	55		
Female	28		
Primary school gross enrolment rate	69		MoE. 2010. Education Management Information System (EMIS)
Male	81		
Female	55		
Main source of livelihood (2009) (%)			NBS. 2012. National Baseline Household Survey (NBHS) 2009
Crop farming and animal husbandry	76		
Households (%)			SSCCSE. 2010. Southern Sudan Counts: Tables from the 5th Sudan Population and Housing Census 2008 (Table 9-1, p. 109)
Engaged in cultivation	81		
Engaged in fishery	22		
Owing livestock	74		
GDP (2011) (SSP million*)	54,249		NBS. 02 October 2012. Press release
GDP per capita (2011) (SSP*)	5,481		ditto.
Oil exports' share of GDP (2011) (%)	64		ditto.
GDP (2008) (USD million)	15,274		ditto. SSP 31,923 million, calculated at SSP 2.09/USD
Value of agricultural production (2008)	808		World Bank. 2012. Strategic Choice for Realizing South Sudan's
GRSS revenue and expenditure 2011/12			Government of the Republic of South Sudan. 2012. Approved Budget 2012/13
Revenue (SSP billion*)	10.18		
Oil revenue (SSP billion*)	9.88	97.1	
Expenditure (SSP billion*)	10.14		
Annual rainfall in Juba (mm)	1,028.7		NBS. 2012. South Sudan Statistical Year Book 2011 (p. 3)

Note*: The official rate has been set by the Bank of South Sudan at SSP 2.95/USD since September 2009 while the market exchange rate was around SSP 4.00/USD in May 2013.

1.1.2 *Justification for CAMP formulation*

In the light of the above-mentioned situation, the Government of the Republic of South Sudan (GRSS) realized the need to formulate a comprehensive master plan to guide agricultural development at the national and state levels in order to:[10]

1) Address hunger and food insecurity through increased food production;
2) Leverage the agricultural sector to improve rural livelihoods and generate income;
3) Diversify the economy through a modernized, competitive agricultural sector; and
4) Harmonize and streamline public and private investments and development assistance in the sector through enhanced capacity for planning and implementation.

The then Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD) and the then Ministry of Animal Resources and Fisheries (MARF)[11] took the decision to formulate the Comprehensive Agriculture Master Plan (CAMP) and formally requested technical assistance from the Japan international Cooperation Agency (JICA) in November 2011. Following a scoping mission in March-May 2012, the two ministries signed a technical cooperation agreement with JICA in June 2012.

1.1.3 *Objective of the CAMP process*

The objectives of the CAMP process are as follows.[12]

1) Formulate a comprehensive agriculture master plan that will identify the potential of different products all over the country, priority programmes/projects and the resources required to implement them
2) Recommend a feasible institutional setup for implementation of potential priority projects and spell out the roles of different stakeholders participating in agricultural development activities in the country
3) Strengthen the capacity of the national task team members through the process for formulating related policies and plans of the respective ministries in a number of key areas to be prioritized by government and other stakeholders

Once formulated, the GRSS will ensure that all public and private investments and programmes supported by the development partners (DPs) in the sector are aligned with CAMP. The implementation of all the programmes will be directed, coordinated, monitored and reviewed by the government in collaboration with all stakeholders.

1.1.4 *Target subsectors and geographic area*

The master plan covers the subsectors of agriculture, forestry, livestock and fisheries, while the geographic coverage is, in principle, the whole area of South Sudan.

1.1.5 *Implementation and collaborating ministries*

The following two ministries are responsible for CAMP formulation.

1) Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries (MAFTARF)
2) Ministry of Electricity, Dams, Irrigation and Water Resources (MEDIWR)

[10] Kanisio, John O. 2012. “Overview of CAMP Formulation Process.” Presentation at the preparatory workshop for the formulation of the Comprehensive Agricultural Development Master Plan (CAMP). Slide 3.
[11] The two ministries, together with the Directorate General of Tourism, the Ministry of Wildlife Conservation and Tourism, were merged into the Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries (MAFTARF) in August 2013.
[12] Udo, Mathew Gordon. 2012. “Overview of CAMP Formulation Process.” Presentation at the South Sudan Agriculture Conference. Slide 5.

MAFTARF is the lead ministry in the process. MEDIWR is formulating the Irrigation Development Master Plan (IDMP) as a sub-component of CAMP, also assisted by JICA.

Collaborating ministries and agencies include:

1) Ministry of Finance, Commerce and Economic Planning
2) Ministry of Petroleum, Mining, Industry and Environment
3) Ministry of Interior and Wildlife Conservation
4) Ministry of Transport, Roads and Bridges
5) Ministry of Lands, Housing and Physical Planning
6) South Sudan Land Commission
7) National Bureau of Statistics (NBS)
8) State Governments.

1.2 Guiding principles

CAMP formulation is guided by the following principles.

(1) Government-led formulation

While supported by the DPs, MAFTARF leads the entire process. The national CAMP Task Team will carry out all the tasks required for the master plan formulation in cooperation with experts and consultants deployed by DPs. The process is also expected to advance through government-led stakeholder coordination. Special emphasis is placed on the GRSS's leadership in and ownership of the CAMP process.

(2) Capacity development throughout the formulation process

Government-led formulation, and later implementation, will demand a greater capacity of the ministries concerned and their staff. To build capacity, it is essential for the CAMP Task Team members, including experts and consultants, to work collaboration. Master plan formulation associated with capacity development is expected to be more time-consuming, but it is indispensable for bringing about lasting results.

(3) Formulation of an implementable plan

To ensure the effective implementation of CAMP, it is crucial to formulate a master plan with:

- Attainable goals and targets;
- Realistic timeframe for implementation;
- Concrete programmes, projects and activities;
- Roles and responsibilities of various actors, especially national and state governments;
- Feasible funding mechanisms; and
- Appropriate M&E systems.

(4) Alignment with existing policies, plans and institutional arrangements

CAMP will be consistent and fully aligned with the national agenda of agriculture and rural development, such as South Sudan Vision 2040, the South Sudan Development Plan (SSDP) 2011-2013 and the Comprehensive Africa Agriculture Development Programme (CAADP), government policies (including policy frameworks, sub-sector policies, strategic plans, etc.) and government systems in the agricultural sector of South Sudan.

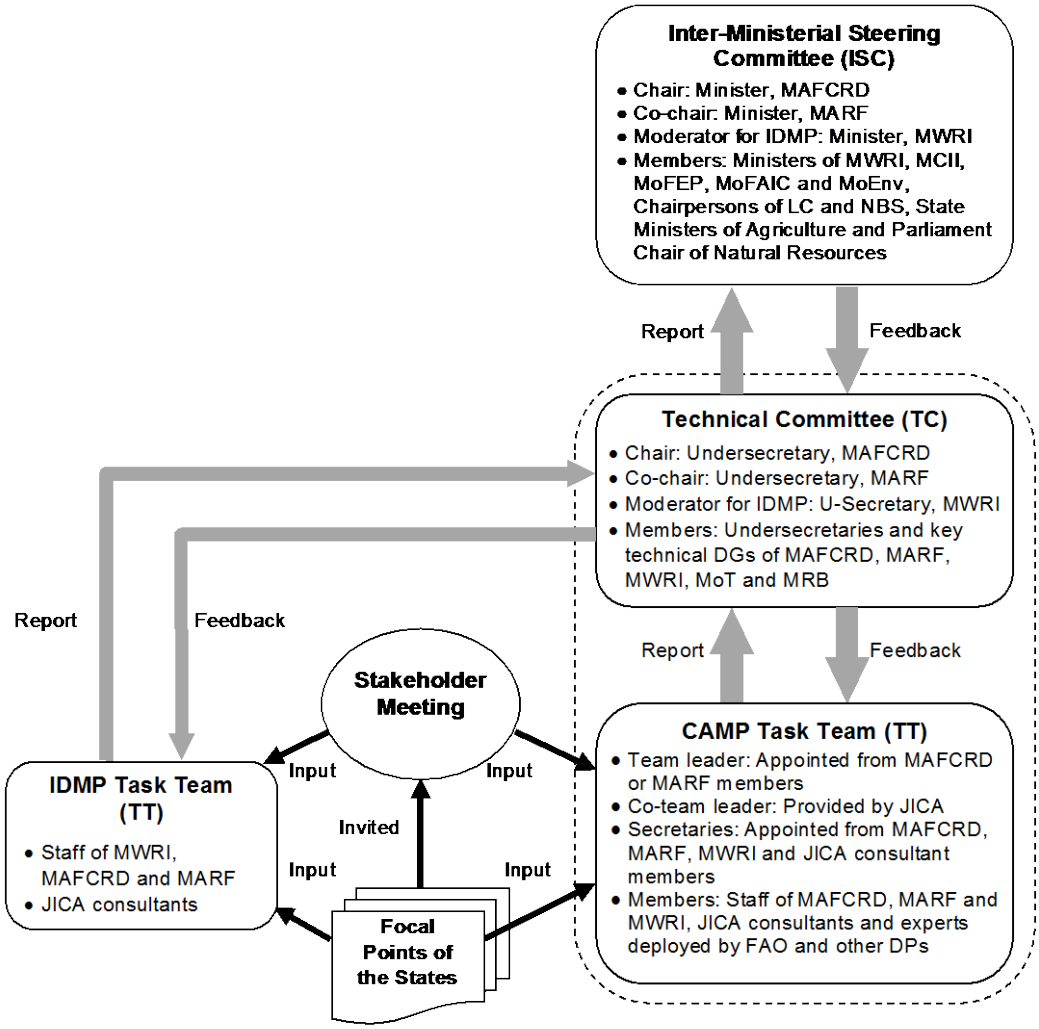
(5) Coordination with other stakeholders

MAFTARF will coordinate with other stakeholders, such as other government agencies, DPs, NGOs and the private sector to ensure the successful formulation and implementation of CAMP. Communication, information sharing, consultation, collaboration and maintaining transparency and accountability are all important elements of coordination. CAMP formulation is currently supported by experts of JICA, CIDA and GIZ.

1.3 Coordination mechanism

The wide range of stakeholders involved in the CAMP process requires a harmonized and coordinated framework for effective and efficient management of activities and resources for the master plan formulation. A coordination mechanism has thus been set up for CAMP formulation as illustrated in Figure 1-1. Table 1-2 summarises the composition and functions of the institutions involved in the CAMP coordination mechanism. In addition to the above-mentioned ministries, the CAMP Task Team will consult with various government and private institutions, universities, DPs and NGOs to solicit their technical advice and any information necessary for the master plan formulation. It may be necessary to maintain the coordination mechanism throughout the implementation period to prepare annual plans and budgets and monitor the performance of the master plan. The mechanism should be revised as a need arises.

Figure 1-1: Coordination mechanism of the CAMP process



Source: Prepared by the CAMP Task Team and approved by the Technical Committee on 24 September 2012.
Notes: 1) The names of institutions are as of April 2013.
2) Abbreviations are as follows. FAO = Food and Agriculture Organization; DP = Development Partner; IDMP = Irrigation Development Master Plan; ISC = Inter-Ministerial Steering Committee; JICA = Japan International Cooperation Agency; LC = Land Commission; MAFCRD = Ministry of Agriculture, Forestry, Cooperatives and Rural Development; MARF = Ministry of Animal Resources and Fisheries; MCII = Ministry of Commerce, Industry and Investment; MoEnv = Ministry of Environment; MoFAIC = Ministry of Foreign Affairs and International Cooperation; MoFEP = Ministry of Finance and Economic Planning; MRB = Ministry of Roads and Bridges; MoT = Ministry of Transport; MWRI = Ministry of Water Resources and Irrigation; NBS = National Bureau of Statistics; TC = Technical Committee; TT = Task Team.

Table 1-2: Composition and main functions of the CAMP institutions[13]

Name	Composition	Main Functions
Inter-Ministerial Steering Committee (ISC)	- Chair: Minister, MAFCRD - Co-chair: Minster, MARF - Moderator for IDMP: Minister, MWRI Members: Ministers of MWRI, MCII, MoFEP, MoFAIC and MoEnv, Chairpersons of LC and NBS, State Ministers of Agriculture and Animal Resources and Parliamentary Chair of Natural Resources	• The highest decision-making body for CAMP (including IDMP as its sub-plan). • Provide political support and policy directives to CAMP formulation. • Approve budgets for CAMP formulation. • Approve the final drafts of CAMP and IDMP. • Present the final drafts to the Council of Ministers and pass them to Parliament. • ISC meets biannually.
Technical Committee (TC)	- Chair: Undersecretary, MAFCRD - Co-chair: Undersecretary, MARF - Moderator for IDMP: Undersecretary, MWRI - Members: Undersecretaries of MWRI, MoFEP and MoEnv and DGs of key technical DGs of MAFCRD, MARF, MWRI, MoFEP, MRB, MoT and MHPP - Secretariat: CAMP TT Secretariat	• Supervise the work of CAMP-TT and IDMP-TT and give technical and strategic advice to TTs. • Monitor the progress of CAMP formulation by reviewing minutes of meetings, progress reports, draft plans, etc. and give feedback to TTs. • Report the progress of CAMP formulation to ISC and make recommendations to ISC on the compliance of CAMP (including IDMP) with national policies and strategies. • Review and submit budgets to ISC. • Submit the final drafts of CAMP and IDMP to ISC. • TC meets three times a year and as required.
CAMP Task Team (CAMP-TT)	- Team leader: Appointed from MAFCRD or MARF members in consultation with TC - Co-team leader: Provided by JICA - Secretary: Appointed from MAFCRD, MARF, MWRI and JICA consultant members in consultation with TT - Assistant Secretary: ditto. - Members: Staff of MAFCRD and MARF, two members of MWRI, JICA consultants and experts deployed by FAO and other DPs	• Undertake all activities and tasks necessary for CAMP formulation (e.g., plan and budget for all activities, coordinate and communicate with the stakeholders, organize meetings and workshops, prepare minutes of the meetings, collect and analyse data, conduct field visits, disseminate information, draft and write up CAMP documents, submit drafts to TC, etc.). • Report the progress of CAMP formulation to TC regularly and obtain feedback from TC. • Formulate and submit budgets to TC. • CAMP-TT meets weekly and as required.
State Focal Points	- Two staff members of each state ministry concerned with agricultural development (including crop production, forestry, animal resources and fisheries) - One staff member of each state directorate of rural water and sanitation	• Bridge between national and state governments. • Coordinate with government staff of each state. • Create awareness of CAMP in each state. • Provide information on the present situation of the agricultural sector of each state. • Facilitate data collection at the state level. • Participate in workshops on planning, M&E and implementation to be organized by the two TTs. • They meet CAMP-TT biannually on the occasions of stakeholder meetings.
Stakeholder Meeting	- Representatives of national government institutions, state focal points, DPs, NGOs, the private sector, universities, etc.	• Be consulted by the two TTs and provide input useful for CAMP formulation. • The meetings are held biannually.

Source: Prepared by the CAMP Task Team and approved by the Technical Committee on 24 September 2012.
Notes: TT = Task Team; DP = Development Partner; IDMP = Irrigation Development Master Plan; ISC = Inter-Ministerial Steering Committee; JICA = Japan International Cooperation Agency; LC = Land Commission; M&E = Monitoring and Evaluation; MAFCRD = Ministry of Agriculture, Forestry, Cooperatives and Rural Development; MARF = Ministry of Animal Resources and Fisheries; MCII = Ministry of Commerce, Industry and Investment; MoEnv = Ministry of Environment; MoFAIC = Ministry of Foreign Affairs and International Cooperation; MoFEP = Ministry of Finance and Economic Planning; MRB = Ministry of Roads and Bridges; MoT = Ministry of Transport;

[13] The roles and responsibilities of each institution relating to CAMP are described in detail in the GRSS. December 2012. Coordination Mechanism and Terms of Reference (TOR) for Institutions concerned with the Formulation of the Comprehensive Agricultural Development Master Plan (CAMP).

MWRI = Ministry of Water Resources and Irrigation; NBS = National Bureau of Statistics; TC = Technical Committee.

1.4 Work schedule

Table 1-3 describes tasks of each activity and the work schedule for CAMP formulation. The CAMP process is roughly divided into two periods, a 6-month preparation period (July 2012 - December 2012) and a 24-month formulation period (January 2013 – December 2014). In each activity, the CAMP Task Team will build a consensus among the stakeholders by discussing the results at a stakeholder meeting and then move on to the next activity. An important characteristic of the CAMP process is that the master plan formulation is fully based on the past experience, current situation and issues for development to be identified through the situation analysis. No less important in the process is the designing of an implementation framework that clarifies the roles and responsibilities of various actors, funding mechanisms and M&E systems.

Table 1-3: Work schedule for CAMP formulation

Activities and Tasks	2012						2013												2014											
	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Activity 1: Stakeholder consolidation																														
Preparation/finalization of Inception Report and Work Plan																														
Activity 2: Situation analysis of the agricultural sector																														
[Review of agriculture development policies]																														
Review of policy frameworks																														
Review of sub-sector policies																														
Review of relevant legal frameworks																														
[Analysis of present conditions]																														
Collection of existing data																														
Review of overall performance of the agricultural sector																														
Analysis of present conditions of the agricultural sector																														
[Review of institutional arrangements]																														
Review of institutional arrangements and capacity of the institutions concerned																														
Review of challenges facing stakeholders in agricultural investment																														
Review of existing implementing bodies for programmes/projects																														
Preparation of Progress Report 1																														
Activity 3: Formulation of a framework for agriculture development and identification of priority areas																														
Clarification of key issues and challenges in agricultural development																														
Formulation of a framework for agriculture development (e.g., objectives, timeframe, targets, strategies, etc.)																														
Identification of priority pillars to achieve development targets																														
Identification of priority programmes by pillar																														
Formulation of medium- and long-term targets by pillar/programme																														
Preparation of Interim Report																														
Activity 4: Preparation of investment plans																														
Formulation of investment plans by programme (institutional and physical)																														
Cost estimation for projects/activities																														
Formulation of implementation plans for projects/activities with quick impact and higher priority by programme																														
Preparation of Progress Report 2																														
Activity 5: Proposing the implementation framework to materialize the master plan																														
Clarification of roles of national and state governments and the private sector																														
Modelling of the implementation arrangements for projects to be managed by state governments																														
Identification of appropriate funding mechanisms for projects/activities by national and state governments																														
Identification of measures to promote public-private partnership (PPP) in the agriculture sector																														
Identification of appropriate systems of monitoring and evaluation by the national and state governments																														
Preparation of Final Report (master plan document)																														

Source: Originally prepared by the CAMP Task Team in August 2012 and revised in August 2013.

1.5 Objectives and methodology of the situation analysis

1.5.1 Objectives

Situation analysis is an important step of the CAMP process to achieve its overall objectives described in Section 1.1.3. The objectives of the situation analysis are:

1) To understand the past and present status, issues and opportunities of agricultural service delivery for designing the CAMP implementation framework;
2) To understand the past and present status, issues and opportunities of the agriculture sector from cross-cutting and subsector perspectives, and local, national, and regional market perspectives for the development of investment plans;
3) To analyse the mechanisms and processes of agricultural transformation to determine future sector development scenarios for the period of 2015-2040; and
4) To identify information useful to estimate the expected impact of public service delivery to determine the priority, location, timing and size of public interventions in the form of programmes and projects.

The first and second objectives are tightly interlinked and are set to answer the questions of i) how CAMP can be integrated into the government system, ii) how a devolved CAMP implementation mechanism can be designed, and iii) how changes in behaviour of beneficiaries such as producers, traders and investors can be promoted. To develop the CAMP implementation framework and investment plans, it is necessary to understand the past and current status, issues and opportunities of both public sector interventions and private sector activities, and interactions between them in the agriculture sector. Gaps between the current and expected institutional arrangements and capacity are to be examined to develop public sector capacity development components. The establishment of a government-led stakeholder coordination mechanism, together with a funding mechanism for CAMP implementation, is to be an important element of the CAMP process. Investment plans with cross-cutting and subsector programmes and projects in support of farmers, traders and agro-businesses will also be developed based on issues and opportunities identified.

The third and fourth objectives are necessary to facilitate discussions on 25-year agriculture sector development scenarios for and prioritisation of cross-cutting and subsector public interventions. To define private sector-led agriculture development scenarios for food security, poverty reduction and economic growth and sector transformation, it is important to understand the mechanisms of agriculture sector development involving private and public sector actors. The scenarios will include long-, medium-, and short-term targets. To develop investment plans consistent with the scenarios, it is necessary to specify priorities, locations, timing and size of programmes and projects based on preliminary assessment of impacts, assuming that public services are delivered at optimal efficiency and effectiveness with respect to public resources. The required level of public sector capacity and time to achieve that level will influence the development scenarios.

The concept of agricultural transformation within the context of CAMP is to be defined. Transformation is demonstrated by changes in agricultural production, distribution and consumption modes plus increases in labour productivity and returns on capital. It is also manifested by the development of commercial farming, agro- and export businesses, formalisation of informal sectors, increase in tax revenues from the formal sector and accumulation of commercial and industrial capital derived from agricultural activities. It is further shown by factors external to the agriculture sector, such as road networks, rural-urban migration, increase in off-farm employment, demographic change, and the availability of healthier and better-educated labour in rural areas.

1.5.2 Methodology

Micro-level in-depth case studies in 10 states were conducted using various study tools such as questionnaires, focus group discussions and thematic interviews. For macro-level studies, analysis of the existing national framework datasets was conducted in collaboration with the National Bureau of Statistics (NBS). Information collected through these micro- and macro-level studies was summarised and analysed by applying the following analytical framework and methodologies.

(1) Efficiency of service delivery by the GRSS and state governments

To achieve the first objective of the situation analysis in-depth case studies, interviews, and literature surveys were conducted to describe cross-cutting issues regarding policy and legal frameworks, institutional frameworks, and public financial management and related institutional capacities. Each subsector investigated its own legal and institutional arrangements. It is assumed that counties are responsible for on-the-ground and front-line service delivery whereas the GRSS and state governments are responsible for providing technical and financial support to counties and supervision of their activities.

(2) Markets, food security, poverty reduction and agricultural transformation

To achieve the second objective of the situation analysis, cross-cutting and subsector oriented situation analysis was conducted. The private sector was identified as the driving force of agricultural transformation. Subsector micro-level in-depth case studies and macro-level analysis of existing national framework datasets and studies of crosscutting issues were conducted.

At the same time, a simple analytical framework focusing on the location and socioeconomic extent of the market for each product and its value chain was adopted. As shown in Table 1-4, markets are categorised into: 1) subsistence production; 2) local market (rural-rural transaction); 3) domestic market (rural-urban transaction); 4) regional market; and 5) global market. The contributions of agricultural activities in each category to food security, economic growth (i.e., poverty reduction and income increase) and agriculture sector transformation are summarised in the table. The type of market is defined by the length of value chains and extent of movement of products.

It is assumed that a product's contribution to food security, economic growth and sector transformation comes from market transactions that add value in its value chain. The addition of value equates to additional income. This discussion implies that the additional income can be used to purchase food in times of food insecurity and, so have a positive impact on food security.

(3) Mechanisms and processes of agricultural transformation

To achieve the third objective of the situation analysis, it is assumed that the private sector is the main agent of change for agricultural transformation. Analysis was conducted at the micro- and macro-level for each subsector, as well as of cross-cutting and overarching issues. The aim was to describe the historical dynamism of the sector, coping mechanisms, market integration of farmers, movement of goods and services through value chains, and the agents involved. Areas analysed included the historical background of the agriculture sector, macro- and regional economies, food security, rural society and livelihoods, land tenure and the rural labour market. The situation analysis also identified obstacles to market and private sector development, and private investment in the sector plus the government's role in the market to address issues of market efficiency.

(4) Collection and compilation of data for preliminary project impact assessment

To achieve the fourth and last objectives of the situation analysis, the existing national framework datasets are examined. Since CAMP is a national master plan with a set of programmes and projects with timelines and locations designed for optimal impact, a national scope analysis and comparison of the expected impacts of candidate programmes and projects needs to be performed. For this reason, population distribution, road networks, land-use and other datasets with a national scope were identified and compiled for a preliminary impact assessment.

Table 1-4: Markets and food security, poverty reduction and economic growth

Extent of market	Characteristics of value chain and value added*	Expected impacts on food security, poverty reduction and economic growth
(1) Subsistence production	• No value chain • Intra household value transfer • Substitution of market goods by own production	• No significant effect on food security except substitute effects on availability of food items • Labour productivity diminishes as population density increases due to closed economy. Limited room to increase labour productivity. • Little or no capital accumulation by the informal sector and no room to increase capital returns.
(2) Local market (rural-rural	• Short value chain with small value added	• Household-wide food insecurity can be addressed through inter household value transfers.

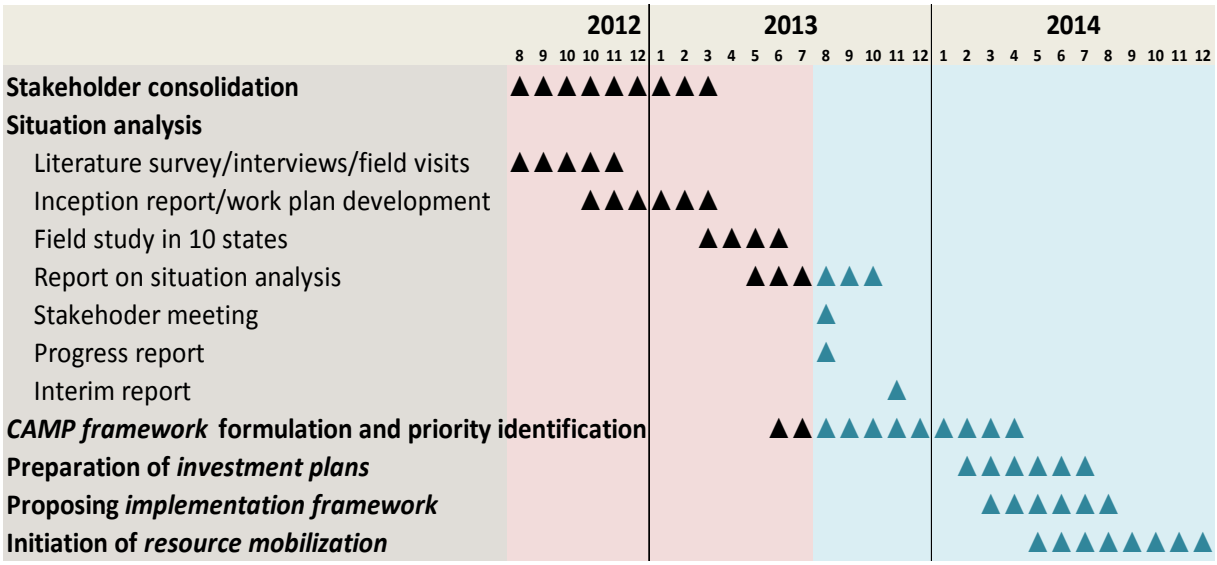
transaction)	• Inter household value transfer within a locality	• Labour productivity can be increased by education. • Small-scale capital accumulation mainly by the informal sector, and limited room to increase capital returns.
(3) Domestic market (rural-urban transaction)	• Medium value chain with medium value added • Inter local value transfer within South Sudan	• Local-wide food insecurity can be addressed through domestic value transfers. • Labour productivity can be increased by education and technology investment from accumulated capital. • Medium-scale capital accumulation mainly by the formal sector and increase in capital returns through adoption of advanced technologies.
(4) Regional market	• Long value chain with high value added • International value transfer in the region	• Nation-wide food insecurity can be addressed through regional value transfers. • Labour productivity can be increased by education and technology investment from accumulated capital. • Large-scale capital accumulation by the formal sector and increase in capital returns though adoption of advanced technologies and scale of economy.
(5) Global market	• Long value chain with high value added • International value transfer in the world	• Region-wide food insecurity can be addressed through global value transfers. • Labour productivity can be increased by education and technology investment from accumulated capital. • Large-scale capital accumulation by the formal sector and increase in capital returns though adoption of advanced technologies and scale of economy.

Note (*): Opportunity costs for capital and labour inputs should be accounted for in the estimate of value added.

1.6 Progress from August 2012 to July 2013

Figure 1-2 indicates progress made by the CAMP Task Team for the period from August 2012 to July 2013. Major achievements during the period are that the current situation and key issues of the agricultural sector have been identified through data collection and analysis at the national, state, county, payam and farm levels. The Task Team visited all 10 states and 47 counties, about 60% of the total 79 counties. In addition, issues and opportunities were preliminarily identified and discussed at a Technical Committee meeting.

Figure 1-2: Progress of the CAMP process



Source: Prepared by the CAMP Task Team.

This report presents preliminary results of the situation analysis conducted from August 2012 to July 2013. Part I contains findings on cross-subsectoral and cross-cutting issues including the economy, policy and institutional frameworks, public financial management and rural society and livelihoods, Part II reports on the crops, livestock, forestry and fisheries subsectors and Part III on preliminary discussions and a work plan for the master plan formulation. A complete situation analysis report, together with a framework of the master plan and priority programmes, will be included in the Interim Report to be prepared by December 2013.

Challenges ahead in the CAMP process include: completion of the situation analysis, consensus building among the stakeholders on key issues and the framework for agricultural development, further involvement of the state and local governments in the process and continuous capacity development for master plan formulation and implementation.

2. South Sudan's economy and agriculture: an overview

2.1 South Sudan's economy in a historical context[14]

The current economic situation of South Sudan is deeply rooted in Sudan's modern economic system that emerged during the colonial era and that was established around cotton-based irrigated agriculture. It is also a result of the longest civil war in African history. As pointed out by the Joint Assessment Mission in 2005, "the bureaucracy, infrastructure and services were all geared towards this economy and did not enable broad-based development for the vast majority of the population in the rain-fed regions, most notably the South."[15] This section presents a historical overview of economic development in South Sudan. Table 2-1 shows major historical events related to South Sudan from the early 19th century to independence.

Table 2-1: Chronology of South Sudan: from the 19th Century to independence

Date	Event
1821-1885	Turco-Egyptian regime
1885-1898	Mahdist regime
1899-1955	Anglo-Egyptian Condominium
1955-1972	First Civil War
February 1953	Anglo-Egyptian Accord signed for Sudan's self-government
January 1956	Independence of Sudan from Britain and Egypt
February 1972	Addis Ababa Accords signed between the Southern Sudan Liberation Movement (SSLM) and the Government of the Sudan Southern Sudan Autonomous Region established
1978	Oil discovered in the Bentiu area
June 1983	Addis Ababa Accords abrogated by a Presidential decree
July 1983	Southern People's Liberation Movement/Army (SPLM/SPLA) founded
1983-2005	Second Civil War
1999	Advent of oil
January 2005	Comprehensive Peace Agreement (CPA) singed between SPLM/SPLA and the Government of the Sudan, followed by the Joint Assessment Mission (JAM)
January 2011	Referendum on independence
July 2011	Independence of Southern Sudan as the Republic of South Sudan

Sources:
World Bank. 1973. *Sudan - Economic Development of Southern Sudan*. Washington, DC: World Bank.
Yongo-Bure, B. 2007. *Economic Development of Southern Sudan*. Lanham: University Press of America.
SPLM. 2008. The Manifesto of the Sudan People's Liberation Movement.
http://en.wikipedia.org/wiki/History_of_Sudan.

2.1.1 Pre-Independence Sudan

In the 19th century, the southern region of the Sudan was physically isolated from the north and the rest of the world due to limited accessibility caused by the *Sudd*. Military expeditions from the north aimed at establishing control over the south and other invasions for collecting slaves and ivory continued. Throughout the colonial period, the region remained isolated and largely an area of a subsistence economy. The development of a cash economy was hindered by the distance from potential markets, coupled with poor transport and marketing

[14] Unless otherwise noted, this section is largely based on: 1) Southern Development Investigation Team. 1955. *Natural Resources and Development Potential in the Southern Provinces of the Sudan. A Preliminary Report 1954*. London: Sudan Government; 2) World Bank. 1973. *Sudan - Economic Development of Southern Sudan*. Washington, DC: World Bank; 3) World Bank. 2003. *Sudan - Stabilization and Reconstruction: Country Economic Memorandum*. Washington D.C.: World Bank; and 4) Yongo-Bure, B. 2007. *Economic Development of Southern Sudan*. Lanham: University Press of America.

[15] Government of the Republic of the Sudan, SPLM, World Bank and UNDP. 2005. *Joint Assessment Mission: Framework for Sustained Peace, Development and Poverty Eradication. Volume III Cluster Reports*. p. 80.

facilities, by lack of interest and incentives, by shortage of capital and the limited supply of labour**.** The isolation was reinforced by the separate development policy for the south, the Closed Districts Ordinances created by the British in the 1920s which restricted northern Sudanese from entering or working in the south. The so-called Southern Policy, while it was intended to allow the south to develop along indigenous lines, contributed to the isolation and became the root of north-south discord in later years.[16]

British interest in the south was closely linked to the control of the whole Nile Valley so as to maintain a favourable position over the use of the Suez Canal. With no resource base in the south to generate revenue, the British colonial administration paid no serious attention to the economic development of the south until the late 1930s. In 1938, the then Director of Agriculture in Sudan, Dr J. D. Tothill, proposed a ten-year development plan for the south, but the outbreak of World War II prevented its implementation. In 1945, the government approved a proposal for the Zande Scheme, including the establishment of the Equatoria Agricultural Projects Board.[17] The board promoted the cultivation and manufacturing of such products as cotton, sugar cane and oil palm (for soap) mainly for the needs of local people, while private entrepreneurs developed limited quantities of coffee, tobacco and tea. Other activities of the Zande Scheme included: 1) the establishment of an agricultural research institute and a training institute for agricultural workers in Yambio; 2) the establishment of a small industrial complex in Nzara; 3) fisheries development with the export of dried fish to Uganda and the former Belgian Congo; and 4) a forest plantation programme, principally hardwoods. However, the overall impact of the scheme was insignificant, and the economic gap between the south and the north became evident by the end of the colonial period.

2.1.2 Independence of Sudan

(1) First civil war period (1955-1972)

In 1953, Britain and Egypt agreed to grant independence to Sudan, and during the three-year transition period to self-government, the new Sudanese government started to replace British colonialism with Arab/Islamic colonialism and increasingly moved away from commitments to create a federal system to give the south autonomy. “Sudanisation in the administrative, political and industrial fields”[18] had already outraged southerners, but two events in 1955 became an immediate trigger for the first civil war that would continue till 1972. The first was the dismissal of 300 workers in the Zande Scheme and a demonstration by them, which the police and army quelled by gunfire. The second was the more serious mutiny of the Equatoria Corps (the battalion established in 1917 consisting entirely of southerners) in Torit and other southern towns, which soon led to a general revolt. The mutinies were suppressed, but survivors fled the towns and began an uncoordinated insurgency in rural areas, and gradually developed a secessionist movement.

The characteristics of the southern economy towards the end of the colonial era are vividly described in the Southern Development Investigation Team’s study,[19] conducted in 1954 and perhaps the most comprehensive multi-disciplinary study of South Sudan till today. The study indicates that the mainstay of the southern economy was subsistence agriculture, including animal husbandry, fisheries and forestry (Table 2-2). Most of the 2.4 million southerners lived in rural areas and residents in urban areas, such as Malakal, Bor, Rumbek Aweil and Torit, were mainly traders and government employees. The Investigation Team

[16] Mayo, D. N. 1994. *The British Southern Policy in Sudan: An Inquiry into the Closed District Ordinances (1914-1946)*. Northeast African Studies, Volume 1, Numbers 2-3, 1994 (New Series). pp. 165-185. East Lansing: Michigan State University Press.

[17] Wyld, J. W. G. 1949. The Zande Scheme. *Sudan Notes and Records*, Volume XXX, 1949. pp. 47-57.

[18] The Report of the Commission of Enquiry. 1955. (As cited in World Bank. 1973. *Sudan - Economic Development of Southern Sudan*. Washington, DC: World Bank. p. 5.)

[19] Southern Development Investigation Team. *Natural Resources and Development Potential in the Southern Provinces of the Sudan. A Preliminary Report 1954*. London: Sudan Government.

concluded that in the initial stage the economic development of the south would "have to depend largely on the financial resources of the North, and capital must be made available."[20]

Table 2-2: Population and characteristics of economy by district in 1954

District (HQ)	Ethnic Group	Estimated Population	Ecological Region (Figure 2-1)	Characteristics of Economy	Est. Animal Pop.	
					Cattle	Sheep & Goats
Upper Nile Province		**868,185**			1,079,150	559,100
Renk (Renk)	Abialang Dinka, Paloich Dinka, Maban, Ta'aisha, Malakia, etc.	52,350	Central Rainlands and Flood	In Renk, originally mainly pastoralists, now predominantly cultivators with surplus of grains. In other areas, mainly sedentary cultivators with some livestock.	21,000	17,500
Malakal (Malakal) and Shilluk (Kodok)	Dunjol Dinka, Ngok Dinka, Shilluk	141,380	Flood and Central Rainlands	In Malakal, originally mainly pastoralists, turning to dura cultivation. In other areas, mixed economy with emphasis on crop production and fisheries (Kodok).	46,000	127,000
Eastern Nuer (Nasir)	Eastern Jikaing Nuer, Koma	101,040	Flood	Predominantly pastoral, with adequate grain supplies.	97,000	100,000
Lau Nuer (Akobo)	Lau Nuer	74,750	Flood	Predominantly pastoral. Occasionally surplus of grain.	152,000	30,000
Zeraf Valley (Fangak)	Lak Nuer, Thiang Nuer, Gaweir Nuer, Ruweng Dinka, etc.	120,860	Flood	Mixed pastoral economy or predominantly pastoral with seasonal movements.	132,000	31,000
Western Nuer (Bentiu)	Bul Nuer, Leik Nuer, Western Jikaing Nuer, Jagey Nuer, Dok Nuer, Nuong Nuer, Ruweng Dinka	193,935	Flood and Central Rainlands	Predominantly pastoral with seasonal movements. In Central Rainlands Region (Ruweng Dinka areas), mixed economy in permanent settlements.	257,000	111,000
Bor (Bor)	Bor Gok Dinka, Bor Athoich Dinka, Monythany Dinka, Twi Dinka, Nyareweng and Ghol Dinka, etc.	148,155	Flood	Predominantly pastoral; cultivations liable to extremes of flooding. Monythany Dinka - predominantly fishermen on small islands of *Sudd* area.	274,150	92,600
Pibor (Akobo)	Anuak, Murle	35,715	Flood	Anuak - predominantly sedentary cultivators; Murle - predominantly pastoral.	100,000	50,000
Bahr el Ghazal Province		**896,887**			1,078,200	1,323,000
Lakes (Rumbek, Yirol)	Agar Dinka, Gok Dinka, Jur (Beilli), Aliab Dinka, Chich Dinka, Atwot Dinka	268,670	Flood and Ironstone Plateau	Dinka groups - mixed economy with emphasis on animal husbandry or predominantly pastoral. Jur - settled cultivators on the Ironstone Plateau.	280,000	480,000
Jur River (Tonj, Gogrial)	Rek Dinka, Luac Dinka, Bongo, Twu Dinka	325,140	Flood and Ironstone Plateau	Mixed economy with emphasis on animal husbandry. Permanent settlers mainly on the Ironstone Plateau.	540,000	648,000
Aweil (Aweil)	Malwal Dinka, Abiem Dinka, Palioping Dinka,	217,105	Flood and Ironstone Plateau	Mixed economy. People are more progressive cultivators than in most other areas.	251,000	190,000

[20] Southern Development Investigation Team. *Natural Resources and Development Potential in the Southern Provinces of the Sudan. A Preliminary Report 1954*. London: Sudan Government. p. 1.

District (HQ)	Ethnic Group	Estimated Population	Ecological Region (Figure 2-1)	Characteristics of Economy	Est. Animal Pop.	
					Cattle	Sheep & Goats
	Baliet Dinka					
Western (Wau, Raga)	Jur, Rek Dinka, Balanda Bor, Balanda Bviri, Golo, etc.	85,972	Ironstone Plateau	Occupied by a large number of small tribes of mixed origin, but all are settled cultivators.	7,200	5,000
Equatoria Province		**647,801**			239,800	680,000
Juba (Juba)	Bari, Mandari, Fajulu, Nyangwara, Lokoiya and Luluba	94,030	Central Hills, Ironstone Plateau, and Flood	Predominantly settled cultivators or mixed economy, with some sections owing fair numbers of cattle (Juba - Terakeka).	35,000	68,000
Torit (Torit-Katire)	Latuka-Lango, Madi, Acholi, Lokoro (Pari)	122,409	South-Eastern Hills and Mountains	Mixed economy with emphasis on crop production or predominantly settled cultivators (grain and cotton).	66,200	118,000
Eastern (Kapoeta)	Toposa, Didinga, Boya	89,726	South-Eastern Hills and Mountains	Toposa and Boya - Predominantly pastoral; Didinga - mixed economy.	131,000	319,000
Moru (Amadi)	Moru, Madi, Mundu, Avokoiya, Makaraka, Baka, Jur	64,555	Central Hills, Green Belt and Ironstone	Now predominantly settled cultivators with scarcely any cattle owing to tsetse fly.	1,600	--
Yei (Yei)	Kakwa, Kaliko, Fajulu, Moru, Avokoiya, Baka, Makaraka, Kuku, Ngepo	107,862	Green Belt and Central Hills	Settled cultivators with some sheep and goats and a few cattle (mainly Kuku). Tribes mainly of the Bari group.	6,000	175,000
Zande (Yambio, Tembura, Ibba)	Zande	169,219	Green Belt	Primarily cultivators with a few subsidiary activities (fishing, hunting, honey extraction).	--	--
Total		**2,412,873**			2,397,150	2,562,100

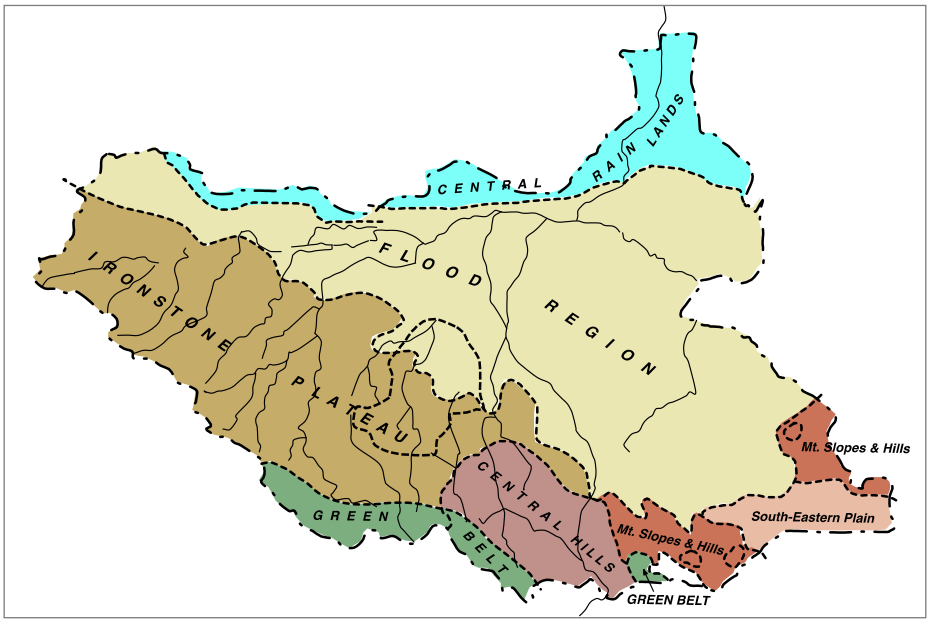
Note: Spellings of ethnic groups and places are as cited in the source and may be different from those common at present.
Sources:Southern Development Investigation Team. 1955. *Natural Resources and Development Potential in the Southern Provinces of the Sudan. A Preliminary Report 1954*. London: Sudan Government. pp. 77-98.

The Sudanese government, while interfering in various ways in the affairs of the south, failed to take any major initiatives in the economic field. For the period of 1955-1972, there was hardly any significant economic development in the south. The overall economic situation in 1973 was more or less the same as that in 1954, i.e., "a predominantly agrarian economy based on subsistence-oriented production."[21] Even the limited development that had taken place before Sudan's independence was mostly destroyed during the first civil war.

The estimated GDP and output shares by region in 1956 show that the south was much weaker economically (Table 2-3). The GDP per capita of Southern Sudan was less than half of the average GDP per capita of other parts of Sudan. The southern provinces, which accounted for 27% of the total population, contributed only 13% of GDP of the whole Sudan, while generating 15% of the country's agricultural output, 18% of industrial output and 8% of services. Agriculture was even a more important economic activity in the south, accounting for about 70% of the southern GDP, as compared to 60% for the whole Sudan.

[21] World Bank. 1973. *Sudan - Economic Development of Southern Sudan*. Washington, DC: World Bank. p. 7.

Figure 2-1: Ecological regions of South Sudan as of 1954



Source: Southern Development Investigation Team. 1955. *Natural Resources and Development Potential in the Southern Provinces of the Sudan. A Preliminary Report 1954*. London: Sudan Government. Figure D.

Table 2-3: Estimated GDP per capita and output shares by region, 1956

Region	Province	Population share (%)	GDP per capita (USD)	Share of total GDP (%)	Share of agricultural output (%)	Share of industrial output (%)	Share of services (%)
Northeast	Northern, Kassala, Khartoum	23	92	29	14	38	48
Blue Nile	Blue Nile	20	118	29	37	23	20
Northwest	Kordofan, Darfur	30	76	29	34	21	23
Total excluding southern provinces		73	93[a]	87	85	82	91
Southern provinces	Bahr el Ghazal, Equatoria, Upper Nile	27	39	13	15	18	9
Sudan Total		**100**	**78[b]**	**100**	**60[c]**	**5[d]**	**35[e]**

Source: A. A. G. Ali, I. A. Elbadawi and A. El-Batahani. 2002. *On the Causes, Consequences and Resolution of Civil War in Sudan*. (As cited in World Bank. 2003. *Sudan - Stabilization and Reconstruction: Country Economic Memorandum*. Washington D.C.: World Bank. p. 5).

[a] Average GDP for Sudan excluding southern provinces. [b] GDP for Sudan.
[c] Share of agriculture in total GDP. [d] Share of industry in total GDP.
[e] Share of services in total GDP.

(2) Peace period (1972-1983)

Following the Addis Ababa Accords signed in 1972, the Southern Regional Government was established in Juba and became responsible for undertaking and coordinating development efforts in Southern Sudan until the peace agreement was abrogated by Khartoum in June 1983. The period from 1972 to 1983 marked the only period where serious efforts to develop Southern Sudan were made before the Comprehensive Peace Agreement (CPA) was signed in 2005. In 1977, the Regional Government embarked on the implementation of the Six-Year Plan for Economic and Social Development of the South as an integral part of the national six-year plan. This was a period of positive economic growth in Sudan as a whole due to relative peace associated with large inflows of funds from the oil-exporting Arab countries,[22] but the realised investment for the six-year plan was far below that planned (Table 2-4) and most of the planned projects did not materialise. The central government was reportedly more interested in the implementation of the Jonglei Canal and Bentiu oil projects.

Table 2-4: Planned and realised investment for the Six-Year Development Plan (1977/78-1982/83) in South Sudan (million Sudanese Pounds)

Year	Original	Revised	Realised	Original	Revised (%)
1977/78	32.49	32.49	6.13	18.9	18.9
1978/79	39.45	22.50	7.82	19.8	34.8
1979/80	41.59	20.50	10.31	24.8	50.0
1980/81	38.14	20.50	12.80	33.6	62.0
1981/82	36.60	16.00	13.40	36.6	83.7
1982/83	43.04	16.00	8.13	18.9	50.6
Total	**231.31**	**127.99**	**58.57**	**25.3**	**45.8**

Source: B. Yongo-Bure. 1985. *The First Decade of Development in the Southern Sudan*. Institute of African and Asian Studies, University of Khartoum. pp. 386-387.
(As cited in Yongo-Bure, B. 2007. *Economic Development of Southern Sudan*. Lanham: University Press of America. p. 32.)

In addition to government projects, there were a number of development activities and projects supported by international organisations and foreign governments, such as Canada, Denmark, Germany, the United States, the then European Community, UN agencies, the World Bank, etc. Although substantial resources were obtained, they were earmarked for specific project and programmes, not necessarily priorities for the south nor complementary to those the Southern Regional Government. The lack of basic infrastructure and trained personnel also severely constrained development activities that took place during this period.

Although the overall growth target of the six-year plan ranging from 4.5% to 7.0% was not achieved,[23] there seems to have been some economic growth during the peace period. Estimates of southern macroeconomic variables, undertaken by the then Bank of Sudan, indicate that the GDP of Southern Sudan, at market prices, was about 20% of that of the whole Sudan (the average GDP was estimated at about 2,920 million Sudanese Pounds) for the period 1976-1980.[24] The southern share of total GDP can be compared with the southern share of Sudan's total population (19.9%) in 1973 (Table 2-5). The 1973 census was reportedly conducted before the resettlement of the returnees of the civil war had been completed[25] and, therefore, the southern population in the latter half of the 1970s might be significantly bigger than 2.95 million. Primary sector activities accounted for 48.8% of

[22] World Bank. 2003. *Sudan - Stabilization and Reconstruction: Country Economic Memorandum*. Washington, DC: World Bank. p. 14.
[23] Yongo-Bure, B. 2007. *Economic Development of Southern Sudan*. Lanham: University Press of America. p. 32.
[24] Bank of Sudan. *Annual Report 1981*. Khartoum: Bank of Sudan. p. 7. (As cited in Yongo-Bure, B. 2007. *Economic Development of Southern Sudan*. Lanham: University Press of America. pp. 9-10.)
[25] Yongo-Bure, B. 2007. *Economic Development of Southern Sudan*. Lanham: University Press of America. p. 8.

southern GDP (crop production 17.7%, animal husbandry 15.5%, forestry 10.6%, fishing 3.5%, and hunting 1.5%), while industrial activities and tertiary activities accounted for 12.7% and 38.5%, respectively. The increased share of tertiary activities (including trade and transport) as compared to that of 1956 is presumably due to the population growth and larger demand for trade and services during this period.

Table 2-5: Population (census of 1955/56, 1973, 1983 and 2008)

Province	1955/56	1973	Province	1983	State	2008
Upper Nile	889	761	Upper Nile	674	Upper Nile	964
					Unity	586
			Jonglei	797	Jonglei	1,359
Bahr el Ghazal	991	1,322	Bahr el Ghazal	1,493	Northern Bahr el Ghazal	721
					Western Bahr el Ghazal	333
					Warrap	973
			Lakes	773	Lakes	696
Equatoria	904	722	Western Equatoria	359	Western Equatoria	619
			Eastern Equatoria	1,047	Central Equatoria	1,104
					Eastern Equatoria	906
Total (1,000)	2,783	2,805		5,223		8,260
SSCCSE 2010 (million)*	*2.76*	*2.95*		*5.54*		*8.26*
Sudan Total (million)	*10.3*	*14.8*		*19.1*		*39.2*
Southern Sudan (%)	*27.0*	*19.9*		*28.9*		*21.1*

Sources (Second-hand citations):
1955/56: Government of the Republic of the Sudan. Department of Statistics. 1961. *First Population Census of Sudan 1955/1956 Final Report*. Khartoum: Central Bureau of Statistics.
1973: Government of the Republic of the Sudan. Department of Statistics. 1977. *Second Population Census of Sudan 1973 Final Repor*t. Khartoum: CBS (CBS. 2009. *Statistical Year Book for the Year 2009*. Khartoum: CBS)
1983: Government of the Republic of the Sudan, Ministry of Finance and Economic Planning, Population Census Office, Department of Statistics. 1989. *Population and Housing Census of the Sudan, 1983*. Khartoum: CBS (Operation Lifeline Sudan. 1996. *OLS Southern Sector Needs Assessment*. Nairobi: OLS).
2008 (South): Southern Sudan Centre for Census, Statistics and Evaluation. 2010. *Southern Sudan Counts: Tables from the 5th Sudan Population and Housing Census, 2008*. Juba: GOSS/SSCCSE.
2008 (Sudan Total): Sudan Central Bureau of Statistics. *Fifth Population and Housing Census 2008 Priority Results*
Sudan Total for 1955/56-1983: Ahmed, A. H. Ali. 2008. *The Fifth population census in Sudan: A census with a full coverage and a high accuracy*. UN Statistics Division
Note (*): Since several adjustments were made after each census was taken, these (final) numbers for South Sudan were taken from SSCCSE 2010, *Southern Sudan Counts: Tables from the 5th Sudan Population and Housing Census*. p. 2.

(3) Second civil war period (1983-2005)

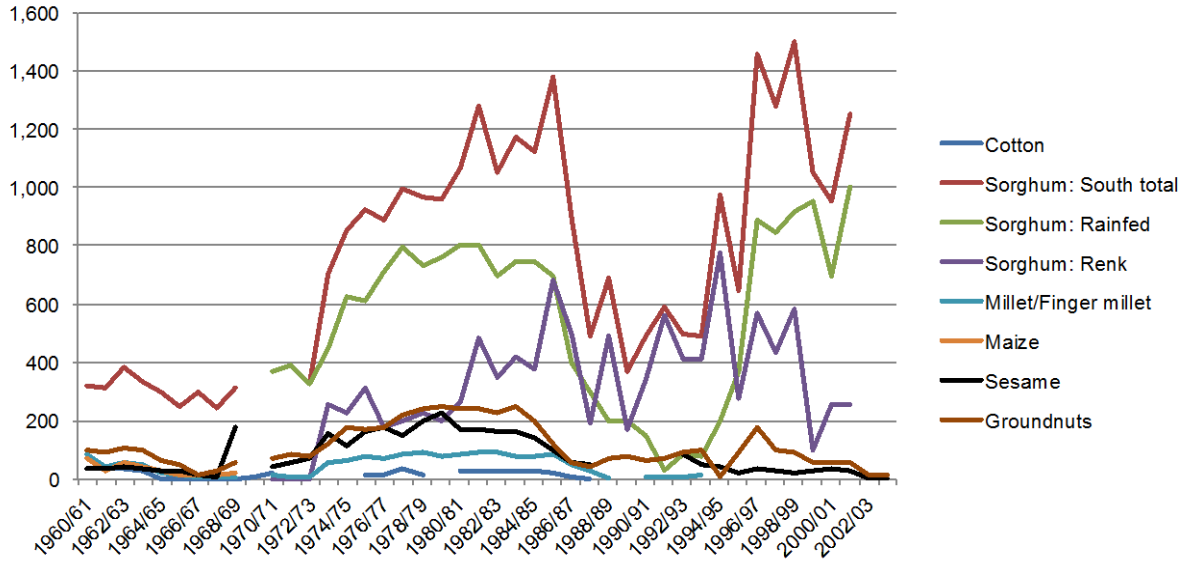
Upon the abrogation of the Addis Ababa Accords in 1983, civil war resumed and intensified, and the southern economy fell into decline once again.[26] For the following 22 years, southern economic growth was probably amongst the lowest of Sudan's states. In 1999 oil exports started and significantly boosted the Sudanese economy,[27] but the wealth was not adequately shared with the south. The situation was worsened by the lack of transport and communications. However, trade and economic activity slowly recovered, especially in areas free from major fighting for some time. Economic growth was therefore unequally distributed in favour of the stable zones in Eastern and Western Equatoria, Lakes, and Bahr el Ghazal.

[26] World Bank. 2003. *Sudan - Stabilization and Reconstruction: Country Economic Memorandum*. Washington, DC: WB. pp. 14-16.
[27] Oil exports rose from zero in 1998 to USD3,948 million in 2005, accounting for 82% of total exports. (Central Bank of Sudan. 2007. *Annual Report* No. 47. Khartoum: Central Bank of Sudan.)

Economic growth had benefited some people more than others, notably those engaged in trading larger quantities of goods and who had access to means of transportation.

The impact of the civil war is reflected in the crop acreage statistics (Figure 2-2). Although the reliability of data collected during the war period may be questioned, the graph illustrates the tendency that crop production reduced drastically when the civil war intensified, particularly from the mid-1980s to the mid-1990s. It is also shown that sorghum acreage in the government-controlled Renk (mechanised rain-fed) area did not decline as much as in traditional rain-fed areas in the south. Household food security traditionally depends on a complex system of food production, livestock, seasonal migration, trade, fishing and the collection of wild fruits, but it was severely disrupted by the war.[28] In 1988-89 and 1998-99, famine caused by the war killed an estimated 250,000 and 50,000-100,000 respectively.[29]

Figure 2-2: Major crops area harvested in Southern Sudan in 1960/61-2004/05 (1,000 feddans)



Data sources:
1960/61-1968/69 - Ministry of Agriculture. *Bulletin of Agricultural Statistics of the Sudan 1968/69*. Khartoum: Ministry of Agriculture (as cited in World Bank. 1973**.** *Sudan - Economic Development of Southern Sudan*. Washington, DC: World Bank**.** p. 13)
1970/71-2004/05 - Ministry of Agriculture and Forests. 2007. *Time Series of Area, Production & Yield Data of the Main Food & Oil Crops by States & Mode of Irrigation (70/1971-04/2005) Volume 2*. Khartoum: Ministry of Agriculture and Forests.
Note: 1 feddan = 0.42 hectares = 1.038 acres

Despite the prolonged war, the SPLM started socio-economic development, especially after the National Convention of New Sudan in 1994. The convention established three branches of government (legislative, executive and judiciary) and a five-tier decentralised system (central, regional, county, payam and boma), and in 1996 created the Civil Authority of New Sudan (CANS) separate from the SPLA. Many areas under the control of the SPLM/SPLA, e.g., Western Equatoria, Lakes and the southern parts of Central Equatoria, Jonglei and Warrap, reached almost a post-war stage of development by 2005.[30] Some international organisations, particularly USAID, initiated development activities from the mid-1990s in the

[28] FAO/WFP. 2004. *Crop and Food Security Assessment Mission to Sudan*. 11 February. Rome: FAO/WFP. p. 29.
[29] Natsios, A. S. 2012. *Sudan, South Sudan, and Darfur*. Kindle Edition. New York: Oxford University Press.
[30] Yongo-Bure, B. 2007. *Economic Development of Southern Sudan*. Lanham: University Press of America. p. 197-199.

south. Among those, the most notable is the USAID Southern Sudan Agriculture Revitalization Project that aimed at increasing the capacity for agricultural production and marketing by spending $22.5 million for a five-year period from 2002 to 2007.[31]

2.1.3 After the Comprehensive Peace Agreement

The Comprehensive Peace Agreement (CPA), signed in January 2005, ended the long civil war and established an autonomous government for Sothern Sudan. In a short period after the signing of CPA, the south made substantial progress.[32] A large number of returnees resettled and the former militia were largely integrated into the SPLA. A central government with ten state governments and counties was formed. To overcome the lack of physical and institutional infrastructure rapidly, a significant number of roads and other structures were constructed and/or rehabilitated, and education and health facilities were established across Southern Sudan. Essential institutions were established such as commercial banks, court assemblies and civil society groups.

Macroeconomic indicators show the growth achieved during the period 2008-2011 (Table 2-6). Accounting for around 60% of GDP, oil revenues mainly brought about the growth in GDP, which, therefore, slowed down when oil GDP declined. Meanwhile, the spending of the Government of Southern Sudan (GOSS) substantially increased, which, together with greater demand for imported food and other goods due to a massive influx of returnees (over 1.8 million in 2004-2008[33]), led to high inflation, particularly food price inflation (Figure 2-3). This situation would worsen in the post-independence period, when oil production was closed down in January 2012 and the South Sudanese Pound (SSP) continued to depreciate in the parallel market.

Table 2-6: South Sudan's GDP by expenditure method in 2008-2011

	2008	2009	2010	2011
GDP (current - SSP million)	31,923	27,379	34,507	54,249
Oil GDP	19,550	14,792	20,000	32,666
Non-oil GDP	12,373	12,587	14,506	21,582
GDP (constant 2009 price - SSP million)	26,247	27,379	28,533	29,084
Oil GDP	13,313	14,792	14,475	14,325
Non-oil GDP	12,934	12,587	14,059	14,759
Real GDP growth (annual %)		4.3	4.2	1.9
Oil GDP		11.1	-2.1	-1.0
Non-oil GDP		-2.7	11.7	5.0
Share of GDP (%)	100.0	100.0	100.0	100.0
Oil GDP	61.2	54.0	58.0	60.2
Non-oil GDP	38.8	46.0	42.0	39.8
Nominal GDP per capita (current USD)	1,700.4	1,246.7	1,504.9	1,858.8
Nominal GNI per capita (current USD)	1,044.6	923.2	967.4	1,513.4
Inflation, consumer prices (annual %, end of year)	12.8	2.2	12.8	65.6
Inflation, consumer prices (annual %, period average)	..	5.0	1.2	47.3
Official exchange rate: LC/USD (period average)	2.09	2.31	2.30	2.83
Parallel exchange rate: LC/USD (period average)	..	..	..	3.78

Sources:
GDP at SSP - NBS. 2012. *Release of new South Sudan Gross Domestic Product (GDP) estimates for 2011, and revised figures for 2008-2010*. Press release 02 October 2012. Juba: NBS
Other data - IDA and IFC. 2013. *Interim Strategy Note (FY2013-2014*) *for the Republic of South Sudan* Washington D.C.: World Bank. p. 8.

[31] Reliefweb. http://reliefweb.int/report/sudan/usaid-southern-sudan-agriculture-revitalization-project

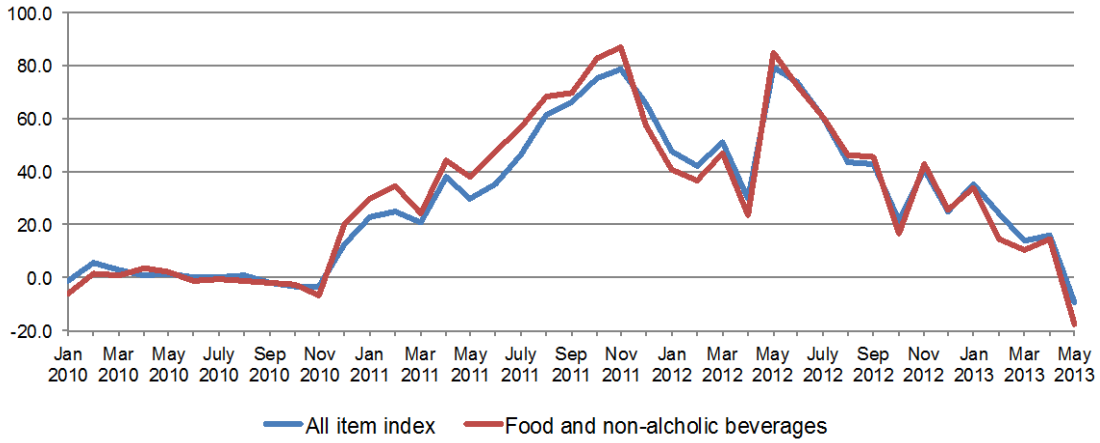
[32] World Bank. 2009. *Sudan - The Road toward Sustainable and Broad-based Growth*. Washington D.C.: World Bank. p. 121.

[33] SSCCSE. 2011. *Statistical Yearbook for Southern Sudan 2010*. Juba: SSCCSE. p. 103.

Note: Local Currency refers to Sudanese Pounds until July 2011 and to South Sudanese Pounds (SSP) from that date.

Agricultural development was widely recognised as a key to attaining food security, poverty alleviation and economic growth as expressed in the SPLM's vision for the post-war era published in 2004[34]. In October 2005, GOSS quickly established the Ministry of Agriculture and Forestry (MAF) and the Ministry of Animal Resources and Fisheries (MARF) as the successor to the SPLM's Secretariat of Agriculture and Animal Resources.[35] To promote agricultural development, MAF prepared the Food and Agriculture Policy Framework 2007-2011 and Strategic Plan 2007-2011; and MARF the Animal Resources Sector Policy and Strategic Plan 2006-2011 and Fisheries Sector Policy and Strategic Plan 2006-2011.

Figure 2-3: CPI Annual changes (%)



Sources: NBS. http://ssnbs.org/storage/CPI website May 2013.xlsm

After the CPA, Southern Sudan became a major recipient of development assistance. Total committed official development assistance (ODA) to Southern Sudan in 2010 was approximately USD1,152 million.[36] During the period 2005-2010, ODA averaged 30-40% of the approved government budget. The share of the natural resources sector (including agriculture, forestry, animal resources and fisheries) in total assistance gradually declined from more than 30% in 2007 to around 5% in 2011, while support to social and humanitarian needs steadily rose towards independence. Rather than using it to build government capacity, development partners (DPs) provided their assistance mainly by employing NGOs and project implementation units to deliver services directly to beneficiary communities.[37]

2.1.4 Independence of South Sudan

South Sudan became independent in July 2011 as determined by the referendum in January 2011. Independence was followed by the events that have seriously affected South Sudan's economy, namely, the closure of the border with Sudan in July 2011, an increased influx of returnees, the shutdown of oil production in January 2012, the execution of an austerity budget from February 2012, a decline in food production in 2011 and accelerated inflation. The oil shutdown has had an unfavourable influence on the development activities planned for the post-independence period (e.g., those of the South Sudan Development Plan 2011-2013) since the country is highly dependent on oil revenues, which previously accounted for

[34] SPLM Economic Commission. 2004. *Strategic Framework for War-to-Peace Transition*. New Site: SPLM.

[35] World Bank. 2007. *Final Proposal for a Multi Donor-Trust Fund Grant to the Government of Southern Sudan for the Support to Agriculture and Forestry Development Project (SAFDP)*. Washington D.C.: World Bank. p. 30.

[36] This amount includes reported humanitarian funds. (OECD. 2011. *2011 Report on International Engagement in Fragile States: Republic of South Sudan*. Paris: OECD Publishing. pp. 20-21.)

[37] International Development Association and International Finance Corporation. 2013. *Interim Strategy Note (FY2013-2014) for the Republic of South Sudan*. Washington D.C.: World Bank. p. 12.

98% of its public expenditure and 99% of foreign currency export earnings.[38] Thus, there is growing concern over possible consequences for the economy, poverty and food security.

As imports of food and other essential goods from Uganda and Kenya rapidly increased, the depreciation of the SSP has led to higher inflation, immediately after independence and again after the shutdown of oil production (Figure 2-3). Other key drivers of inflation are deemed to be: on the supply side, trade restrictions on the northern border, import bottlenecks on the southern border, poor road infrastructure and security challenges within the country and the decline in food production; and, on the demand side, a larger number of returnees and increased government spending.[39] The high inflation appears to have hit most severely the poor through reduced purchasing power and the northern states where price increases have been generally larger than in the southern states due to their distance and inaccessibility from the south. Even in rural areas, many households do not produce enough and rely on imported food and, therefore, have been affected by inflation.

Following the oil shutdown, the national government has adopted an austerity budget, reducing government consumption, transfers to the states and the development budget, while maintaining salaries for staff.[40] South Sudan did not inherit any of the official external debt of Sudan, but the government has started borrowing funds from external sources to pay salaries and operating expenditures. Even if oil exports are resumed, the oil-based economy will continue to be vulnerable to changes in international oil prices and oil production levels. The oil sector generates little employment and does not significantly contribute to broad-based development. Furthermore, oil production has peaked and is projected to decline sharply over the next ten years.[41] In pursuit of non-oil economic growth, the government has placed increasingly greater emphasis on agricultural development as the main key to food security, poverty reduction and economic growth in the country as discussed in Section 2.3.

2.2 South Sudan's economy in a regional context

To formulate a realistic strategy for South Sudan's agricultural development, it is essential to take into account the situation of the international and regional markets, particularly that of neighbouring countries such as Uganda and Kenya. South Sudan's agricultural potential can be realised only through enhancing its competitiveness to the levels of those countries from which South Sudan is currently importing food and other agricultural products that can be grown domestically. This section compares the socioeconomic situation of South Sudan, as one of the factors affecting its competitiveness, with that of other countries in the region and reviews South Sudan's economic relations with them, focusing on trade of goods and services. Product-specific competitiveness analyses vis-à-vis major exporting countries to South Sudan can be found elsewhere in this report.

2.2.1 Comparison of socioeconomic situation with neighbouring countries

The comparison of major socioeconomic indicators with its East African neighbours reveals that South Sudan has a relatively modest size of GDP and much higher GDP per capita because of oil incomes but a significantly lower level of human development as a legacy of the protracted conflict (Table 2-7 and Figure 2-4). It is also known that the country's physical and institutional development is far behind its neighbours.

Table 2-7: Major socioeconomic indicators of South Sudan and its neighbours (2011)

[38] GRSS. 2012. *2011/2012 Budget Speech to the National Legislative Assembly by Hon. Kosti Manibe Ngai, Minister of Finance and Economic Planning*. p. 1.

[39] World Bank. 2012. *Inflation in South Sudan*. South Sudan Economic Brief Issue No. 1. Washington D.C.: WB.

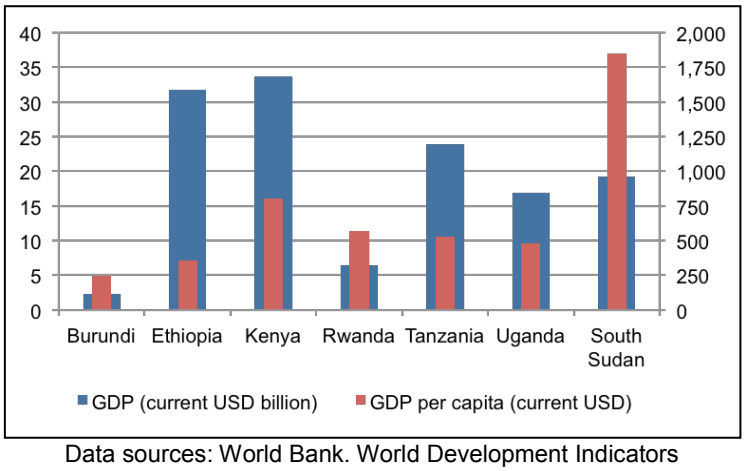
[40] MoFEP Office of the Minister. 2012. *Guidelines for compiling budgets for 2012/13*. Juba: GRSS.

[41] GRSS. 2011. *South Sudan Development Plan 2011-2013*. Juba: GRSS. pp. 24-25.

Indicator	Burundi	Ethiopia	Kenya	Rwanda	Tanzania	Uganda	South Sudan	Sources for SS
Land area (km^2)	25,680	1,000,000	569,140	24,670	885,800	199,810	658,842	NBS1
Arable land (% of land area)*	35.8	14.6	9.7	49.5	13.1	33.8	4.2	NBS1
Population, total (million)	9.5	89.4	42.0	11.1	46.4	35.1	10.4	
Population growth (annual %)	3.3	2.6	2.7	2.8	3.0	3.4	4.3	
Rural population (% of total population)	89	83	76	81	73	84	82	
Poverty headcount ratio at national poverty line (% of population)	67[4)]	30	46[5)]	45	33[3)]	25[2)]	51	NBS2
School enrolment, primary (% gross)	165	106	113[2)]	142	102[1)]	113	69[1)]	MoE
Male	164	111	115[2)]	140	101[1)]	112	81[1)]	MoE
Female	165	101	112[2)]	143	103[1)]	114	55[1)]	MoE
Literacy rate (% of ages 15 and above)	67[1)]	39[3)]	87[1)]	71[1)]	73[1)]	73[1)]	27[2)]	NBS2
Male	73[1)]	49[3)]	91[1)]	75[1)]	79[1)]	83[1)]	40[2)]	NBS2
Female	62[1)]	29[3)]	84[1)]	68[1)]	67[1)]	65[1)]	16[2)]	NBS2
Mortality rate, under-5 (per 1,000 live births)	139	77	73	54	68	90	105[1)]	NBS1
Maternal mortality ratio (national estimate, per 100,000 live births)	500[1)]	680	488[2)]	480[1)]	450[1)]	440	2,054[4)]	MoH
Improved water source (% of pop. w/ access)	72[1)]	44[1)]	59[1)]	65[1)]	53[1)]	72[1)]	69[1)]	NBS1
GDP (current USD million)	2,356	31,709	33,621	6,354	23,874	16,822	19,173	
GDP per capita (current USD)	247	355	800	570	530	479	1,847	
GDP growth (annual %)	4.2	7.3	4.4	8.2	6.4	6.6	1.9	
GDP per capita growth (annual %)	0.8	4.5	1.6	5.3	3.3	3.1	-2.4	
Agriculture, value added (% of GDP)	34.7	46.4	28.5	32.1	27.7	23.4	15.0[1)]	WB
Agriculture, value added (annual % growth)	4.4	5.2	1.6	4.7	3.4	2.7	-48.0	

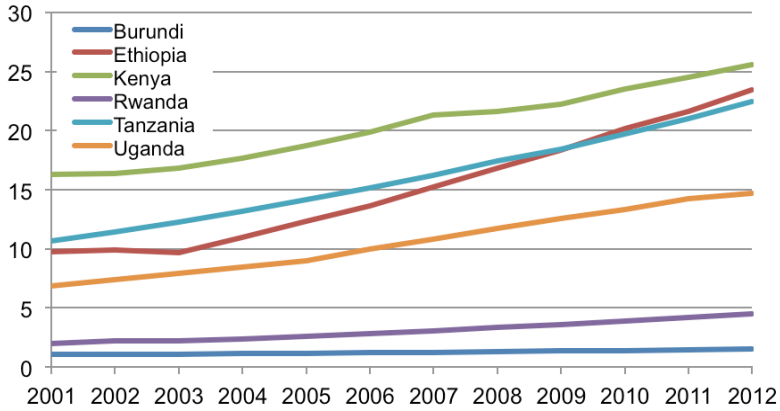
Data sources: World Bank. World Development Indicators. http://databank.worldbank.org/ (accessed 10 July 2013)
For South Sudan, data sources indicated in the table are as follows. Other data are from the World Development Indicators.
NBS1 = National Bureau of Statistics. 2012. *South Sudan Statistical Year Book 2011*. Juba: NBS.
NBS2 = National Bureau of Statistics. 2012. *National Baseline Household Survey 2009*. Juba: NBS.
MoE = Ministry of Education. 2010. *Education Management Information System (EMIS) Report*. Juba: GOSS.
MoH = Ministry of Health and SSCCSE. 2007. *Sudan Household Health Survey*. Juba: GOSS.
WB = IDA and IFC. 2013. *Interim Strategy Note (FY2013-2014) for the Republic of South Sudan* Washington D.C.: World Bank.
Notes: Data for years other than 2011 are indicated as 1) 2010, 2) 2009, 3) 2007, 4) 2006 and 5) 2005.
*: Defined by FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. South Sudan's data is for "agriculture."

Figure 2-4: GDP and GDP per capita of South Sudan and its neighbours in 2011



Data sources: World Bank. World Development Indicators http://databank.worldbank.org/ (accessed 10 July 2013)

Figure 2-5: GDP of South Sudan's neighbours in 2001-2012 (constant 2005 USD billion)



Data sources: World Bank. World Development Indicators. http://databank.worldbank.org/ (accessed 10 July 2013)
Note: GDP at constant 2005 USD for South Sudan are not available in the World Bank database.

For example, South Sudan's adult literacy rate (27%), critical to agricultural transformation, is the lowest in the region and the maternal mortality rate (2,054 per 100,000 live births), according to the 2006 survey, is one of the highest in the world. Gender inequality is more evident as implied by large differences in literacy and school enrolment rates. Education and health related indicators are not only lower than those of the neighbours but also have remained constant or deteriorated after notable improvement in the post-CPA period.[42] While South Sudan has been heavily dependent on oil revenues and its agriculture remains at bare subsistence level, its neighbours have achieved relatively steady growth in the last decade even though they were also adversely affected by the global food price crisis and the global financial crisis during this period (Figure 2-5). However, South Sudan is still endowed with oil resources that can be used to develop an institutional and infrastructure base and is expected to contribute to the regional economy through expansion of trade and investment.

2.2.2 Economic relations with neighbouring countries

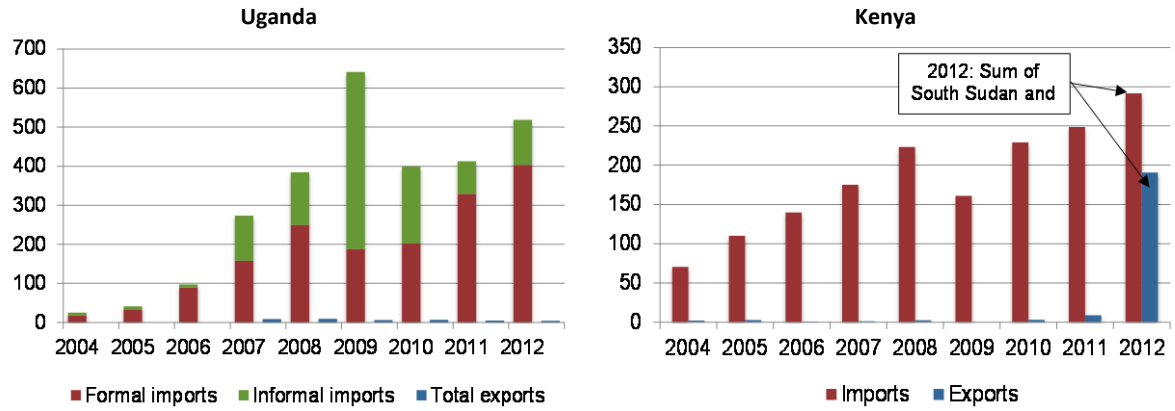
Trade statistics for South Sudan are not available, but according to the Ministry of Finance and Economic Planning (MoFEP), the country's self-sufficiency rate in agricultural products is low and imports of these products accounted for around 12% of GDP in 2010.[43] Even before the civil war, the region was a net importer of food and other essential items while exporting various agricultural products to the north and its neighbours. The policy during the late colonial period was to promote agricultural production and processing for import substitution, as exemplified by the Zande Scheme.[44] During the civil war, both agricultural and industrial goods were supplied mainly from the northern region through northern Sudanese traders and partially across the southern borders.

A major change after CPA was a substantial increase in imports from the East African neighbours, particularly Uganda. Total imports (including informal) from Uganda dramatically increased from USD41 million in 2005 to USD641 million in 2009 (Figure 2-6). The increase

[42] World Bank. 2013. *Public Expenditures In South Sudan: Are They Delivering?* South Sudan Economic Brief Issue No. 2, Washington D.C.: World Bank. pp. 10-15.
[43] Government of the Republic of South Sudan. 2012. *Approved Budget 2012/13*. Juba: GRSS. p. 12.
[44] World Bank. 1973. *Sudan - Economic Development of Southern Sudan*. Washington, DC: World Bank. p. 18. For the Zande Scheme, see Section 2.1.1 above.

was driven by the consumption and the construction booms during this period.[45] The exports to Southern Sudan accounted for more than a quarter of Uganda's total exports in 2009. After imports slowed in 2010 due to Southern Sudan's decreased foreign exchange earnings from oil exports, imports started increasing again during 2011, presumably affected by the closure of the northern border with Sudan after independence. Imports from Kenya also increased after CPA, but not to the extent observed in imports from Uganda (Figure 2-6) and South Sudan's share of Kenya's total exports is not so significant, ranging from 3% to 4%.[46]

Figure 2-6: Imports from and exports to Uganda and Kenya (USD million)



Data sources:
Imports from Uganda - Bank of Uganda (BOU). http://www.bou.or.ug/
Exports to Uganda - Uganda Bureau of Statistics (USOB). 2010, 2011 and 2012. *Statisti* *1* and *2012*. http://www.ubos.org/ (both accessed 7 July 2013).
Trade with Kenya - COMESA COMSTAT Data Portal. http://comstat.comesa.int/ (accessed 8 July 2013).
2012: Sum of South Sudan and Sudan
Notes: The trade data of BOU and UBOS classify the destination/origin as "Sudan", but the exports were directed mainly to Southern/South Sudan (Bank of Uganda and Uganda Bureau of Statistics. 2012. *The Informal Cross Border Trade Survey Report* 2011. Kampala: BOU/UBOS.). The Kenyan trade is also with Sudan except 2012 for which separate date are available for South Sudan whose imports from and exports to Kenya were USD213.5 million and USD178.7 million, respectively.

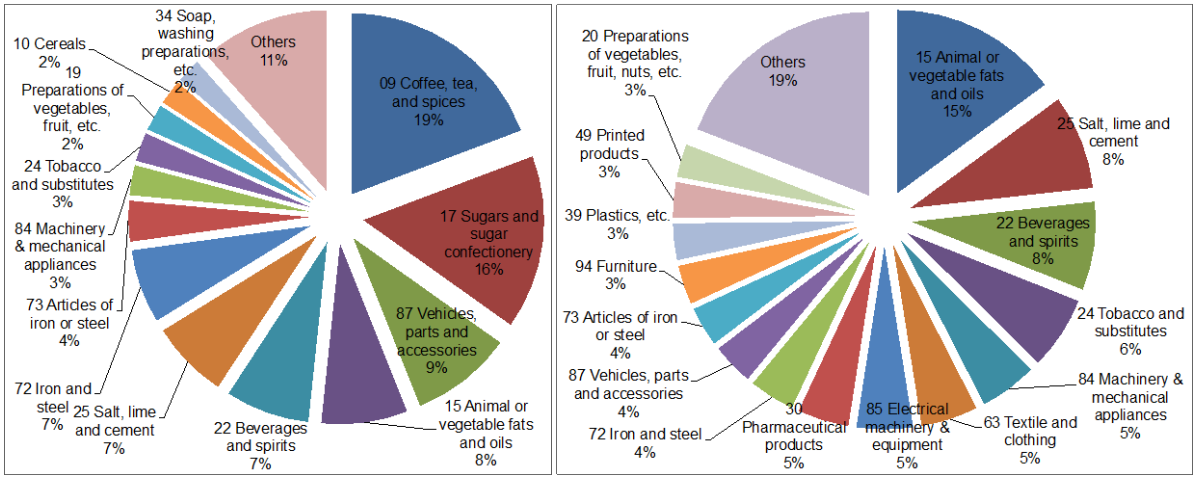
Imports from Uganda are mainly food (e.g., sugar, beer, water, cooking oils, maize grains, maize/wheat flour, etc.), vehicles and construction materials (e.g., cement, iron sheets) (Figure 2-7). South Sudan used to export a range of products such as hides and skin, honey, groundnuts, sesame, beans, gum acacia and forestry products, but after independence there are virtually no exports to Uganda.[47] The major informal imports from Uganda are similar to formal exports.[48] It is reported that imports of food items from Uganda has reduced since 2011 because South Sudan is realising its agricultural potential,[49] but the Bank of Uganda has attributed the decline in late 2012 to a shortage of foreign currency in South Sudan.[50] Imports from Kenya consist of a wider range of good, including vegetable oils, beverages, cements, vehicles, machinery and equipment, pharmaceutical products, etc. (Figure 2-7).

[45] Yoshino Y., G. Ngungi, and E. Asebe. 2012. Enhancing the Recent Growth of Cross-border Trade between South Sudan and Uganda. In Brenton, P. and G. Isik eds. *De-fragmenting Africa: Deepening regional trade integration in goods and services*. Washington D.C.: World Bank. p. 43.
[46] COMESA COMSTAT Data Portal http://comstat.comesa.int/
[47] Information obtained from the Nimule Customs Office by the CAMP Task Team on 8 March 2013.
[48] Bank of Uganda (BOU) and Uganda Bureau of Statistics (UBOS). 2012. *The Informal Cross Border Trade Survey Report* 2011. Kampala: BOU/UBOS, Appendix IV.
[49] World Bank. 2013. *Uganda Economic Update: Bridges across Borders Unleashing Uganda's Regional Trade Potential*. Washington, D.C.: World Bank. p. 42.
[50] Mugume, A. Executive Director of Research, Bank of Uganda. (As cited in M. L. Oketch. 2013. Uganda's exports to South Sudan decline by 80 per cent. *Daily Monitor*. 7 January 2013 http://www.monitor.co.ug))

South Sudan has also been providing new business opportunities for the regional economy in the service sector, such as banking, hotels and restaurants, transport and communications, engineering and construction, and education.[51] For example, Kenyan-based banks, already leading regional integration in the banking sector, have established subsidiaries in South Sudan. Kenya Commercial Bank (KCB) and Equity Bank are the two largest commercial banks and had started operating in South Sudan before independence. Commercial Bank of Ethiopia has also been operating since 2009 in Juba. The planned but as yet funded construction of a railway line to join the East African railway system and construction of a pipeline to Lamu for oil exports from South Sudan are expected to boost the regional economy and benefit the country.

Figure 2-7: Imports from Uganda and Kenya by commodity

Uganda (2011: Total USD316.8 million) **Kenya (2012: Total USD213.5 million)**



Data sources: COMESA COMSTAT Data Portal. http://comstat.comesa.int/ (accessed 9 July 2013)
Notes: 1) The 2-digit number of each commodity is a HS2007 code.
2) Uganda's exports include those to Sudan (though mostly to South Sudan), while Kenya's are only to South Sudan.

2.2.3 *Participation in regional economic integration*

Regional organisations promoting economic cooperation and integration among African countries and with partners from outside the continent have been facilitating South Sudan in establishing physical and institutional grounds for international trade and investment. Table 2-8 lists the most relevant to South Sudan among such organisations.

South Sudan's potential membership in the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) is generally considered to be beneficial for the country's economic development because it will enable access to these free trade areas (Table 2-9). Prior to independence, GOSS expressed its intention to seek membership of EAC, and in November 2011 GRSS applied to join the community. In November 2012, however, the summit of EAC Heads of State directed its Council of Ministers to "commence negotiations with South Sudan", deferring South Sudan's membership.[52] The reason for the decision is not clearly stated in the summit's communiqué, but further institutional strengthening seems to be required to meet EAC's admission criteria. South Sudan has also been invited to the COMESA summits since 2011. On the other hand, there is concern in

[51] Kenyan Export Promotion Corporation. 2012. *Market Survey Report for South Sudan* (Presentation slides). http://epckenya.org/images/stories/Reports/south sudan survey presentation.pdf)
[52] EAC Secretariat. 2012. *Communiqué of the 14th Ordinary Summit of EAC Heads of State*. Arusha: EAC. p. 3.

South Sudan that the country has not been sufficiently developed to compete with other member states of these free trade areas.[53]

Table 2-8: Organisations promoting regional economic cooperation and integration relevant to South Sudan

Organisation	Acronym	Established[1)]	Number of member states	South Sudan's membership
African Union	AU	2002	50[2)]	Joined in 2011
African Economic Community	AEC	1991 (by the then Organization of African Unity)	(AU members)	--
Intergovernmental Authority on Development	IGAD	1996	8	Joined in 2011
Common Market for Eastern and Southern Africa	COMESA	1994	19	--
East African Community	EAC	2000	5	Applied in 2011

Sources:
AU http://www.au.int; IGAD http://www.igad.org: COMESA http://www.comesa.int: EAC http://www.eac.int/
Notes:1) The year of establishment of current form. Most of these organisations evolved from their predecessors.
2) Four countries have been suspended as of July 2013.

Table 2-9: Profiles of East African Community (EAC) and Common Market for Eastern and Southern Africa (COMESA) (2011)

Regional bloc	Area (1,000 km²)	Population (million)	GDP (current USD)		Member states
			(million)	(per capita)	
EAC	1,817.7	135.4	84,699	732.3	Burundi, Kenya, Rwanda, Tanzania, Uganda
COMESA	11,603.0	443.9	518,793	1,168.9	Burundi, Comoros, D.R. Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, Zimbabwe

Source: EAC Secretariat. 2012. *East African Community Facts and Figures - 2012*. Arusha: EAC; and COMESA. *COMESA at glance*. http://comstat.comesa.int/Documents/COMESA at a glance.pdf

2.3 Importance of agriculture in the national economy

Although official estimates of GDP by production (sector) and recent employment data are not yet available, the importance of agriculture in the national economy is widely recognised by the government and the international community. Some available estimates indicate the importance of agriculture quantitatively (Table 2-10).

For example, the 2008 Population Census indicates that 63% of those aged 15 and above, who are working or who worked previously, were employed in agriculture, animal husbandry, forestry, fisheries and mining, though employment patterns are likely to have changed since 2008 due to the large influx of returnees.[54] A strategy note recently published by the World Bank proclaims, "subsistence agriculture and pastoralism, which account for less than 15% of GDP but engage about 78% of the population".[55] In view of the projected decrease in oil

[53] Amos, Michael. 2011. South Sudan delays membership in regional bloc. *Daily Nation.* 17 September 2011. http://www.nation.co.ke)

[54] GRSS. 2012. *Approved Budget 2012/13*. Juba: GRSS. p. 4

[55] IDA and IFC2013. *Interim Strategy Note (FY2013-2014*) *for the Republic of South Sudan*. Washington D.C.: World Bank. p. 6. The sources of these numbers are not shown in the document.

production, future economic growth in South Sudan is expected to be mainly dependent on the agriculture sector.

Table 2-10: Shares of agriculture in the national economy

Indicator	Estimate	Date	Source
GDP	15% of GDP	2010	World Bank
Employment	63% of working population (aged 15 and above)	2008	SSCCSE
	78% of total population	Unknown	World Bank
Trade	Imports: 12% of GDP Exports: Less than 1% of GDP Trade deficit: 11-12% of GDP (SSP3.5 billion)	2010	MoFEP
Rural population	83% of total population	2008	SSCCSE
Households			
Engaged in cultivation	81% of total households; 89% of rural households	2008	SSCCSE
Engaged in fisheries	22% of total households; 24% of rural households	ditto.	ditto.
Owing livestock	74% of total households; 80% of rural households	ditto.	ditto.
Main source of livelihood			
Crop farming	69% of total population; 78% of rural population	2009	NBS
Animal husbandry	7% of total population; 8% of rural population	2009	NBS

Sources:
World Bank - IDA and IFC, 2013. *Interim Strategy Note (FY2013-2014*) *for the Republic of South Sudan*. Washington D.C.: World Bank. p. 6 and p. 36.
SSCCSE - Southern Sudan Centre for Census, Statistics and Evaluation. 2010. *Southern Sudan Counts: Tables from the 5th Sudan Population and Housing Census, 2008*. Juba: GOSS/SSCCSE. pp. 85-86 and p. 109.
MoFEP - Government of the Republic of South Sudan. 2012. *Approved Budget 2012/13*. Juba: GRSS. p. 12.
NBS - National Bureau of Statistics. 2012. *National Baseline Household Survey 2009*. Juba: NBS. pp. 32-33.

Furthermore, the food balance estimated annually by the FAO/WFP Crop and Food Security Assessment Mission (CFSAM) suggests the importance of agriculture to South Sudan in terms of food production and foreign exchange earnings (Table 2-11). Although cereal production increased to 761,000 tons in 2012 from 563,000 tons in 2011 due to favourable rains and no outbreaks of pests and diseases, the overall cereal deficit is estimated to be nearly 371,000 tons and about 4.1 million people, nearly 40% of the total population, to be facing food insecurity in 2013. [56] The large food deficits in recent years are caused by a combination of factors such as the continued influx of returnees and associated urbanisation, natural population growth and unstable production affected by natural disasters. The shortfall has been supplemented with food imports and food aid.

Following the oil shutdown, the President, Parliament and the government began to address agriculture, food production in particular, as a top priority for the country. For example, the MoFEP has highlighted the potential for increased agricultural production in the budget book for 2012-13 and declared that the government would seek financing of SSP 5 billion to promote agriculture over a five-year period from September 2012.[57] In his opening address at the Second Governors' Forum in November 2012, the President announced the following two key objectives in the War on Poverty.[58]

1) South Sudan will achieve food security by 2014.
2) South Sudan will produce for export as a regional breadbasket by 2020.

[56] FAO/WFP. 2013. *Crop and Food Security Assessment Mission to South Sudan Special Report*. 22 February. Rome: FAO/WFP. *p.* 5.
[57] GRSS. 2012. *Approved Budget 2012/13*. Juba: GRSS. p. 12.
[58] GRSS. 2012. *Final Resolutions of the Second Governors' Forum 26-29 November 2012, Freedom Hall, Juba*. Juba: GRSS.

In response to the President's call, the Second Governors' Forum adopted a resolution, "Immediately produce a highly prioritised Rapid Action Plan for Food Security by the end of 2014, ready for implementation in the financial year 2013/14 to serve as an interim 'good enough' measure to guide actors until the Comprehensive Agricultural Master Plan is ready in 2014, and to work on rapidly implementing the relevant resolutions of the Second Governors' Forum". [59] In early 2013, MAFCRD has launched the National Effort for Agricultural Transformation (NEAT) and, as a component of NEAT, started the Zonal Effort for Agricultural Transformation (ZEAT) which will serve as a prioritised rapid plan to meet the national food security goal by 2014 while awaiting the longer term CAMP to be completed.[60]

Table 2-11: Estimated cereal area harvested, production, consumption and balance in Southern/South Sudan in 2009-2012

Year	Area harvested	Net production	Mid-year population in the following year	Requirement in the following year	Surplus/deficit in the following year
	(1,000 ha)	(1,000 tons)	(1,000 persons)	(1,000 tons)	(1,000 tons)
2009	851.6	541.0	8,973.6	951.0	- 410.0
2010	920.8	695.2	9,157.7	986.2	- 291.0
2011	859.6	562.6	9,634.4	1,036.3	- 473.7
2012estimate	1,084.1	761.4	10,368.9	1,132.4	- 371.0

Sources:
FAO/WFP. 2010. *Crop and Food Security Assessment Mission to Southern Sudan Special Report*. Rome: FAO/WFP. p. 22.
FAO/WFP. 2011. *Crop and Food Security Assessment Mission to Southern Sudan Special Report*. Rome: FAO/WFP. pp. 8-14; FAO/WFP. 2012. *Crop and Food Security Assessment Mission to South Sudan Special Report*. Rome: FAO/WFP. p.19.
FAO/WFP. 2013. *Crop and Food Security Assessment Mission to South Sudan Special Report*. Rome: FAO/WFP. p. 24.
Note: FAO/WFP's crop and food security assessments conducted prior to the 2009 mission were based on their own population estimates and, therefore, the cereal consumption and surplus/deficit estimates were inconsistent with those by the 2009 mission that started using the results of the 2008 Population Census.

2.4 Overview and recent performance of the agricultural sector

South Sudan has a huge but largely unrealised agricultural potential. Over 95% of the total area (658,842 km^2) is considered suitable for agriculture, 50% of which is prime agricultural land where soil and climatic conditions allow for production of a variety of crops and livestock.[61] A large part of the country, particularly the southern part, has high rainfall for 8-9 months a year, ranging from 500-600 mm/year to more than 1,500 mm/year.[62] Despite the abundant water resources, 97% of the lands used for farming are not irrigated,[63] which implies a potential for irrigated agriculture equipped with appropriate facilities and technology.

[59] GRSS. 2012. *Final Resolutions of the Second Governors' Forum 26-29 November 2012, Freedom Hall, Juba*. Juba: GRSS. p. 3.
[60] GRSS. 2013. *The National Effort for Agricultural Transformation (NEAT), Draft Integrated Zonal Transformations in South Sudan, Juba, South Sudan, February 2013* (Presentation slides)
[61] World Bank. 2007. *Final Proposal for a Multi Donor-Trust Fund Grant to the Government of Southern Sudan for the Support to Agriculture and Forestry Development Project (SAFDP)*, Washington D.C.: World Bank. p. 30. (Based on Tothill, J.D. ed. 1948. *Agriculture in the Sudan*. London: Oxford University Press; and Craig, G.M. ed. 1991. *The Agriculture of the Sudan*. London: Oxford University Press.)
[62] Salih, A. 2010. *Southern Sudan: Preliminary Water Resources Assessment Study.* Draft Final Report. Washington D.C.: World Bank. p. 5.
[63] Baseline Technical Team. 2010. *Joint Baseline Survey Report on the Agriculture and Animal Resources in Southern Sudan*. Juba: GOSS. p. 101.

Figure 2-8: Livelihood Zones of South Sudan

Source: Southern Sudan Centre for Census, Statistics and Evaluation. 2007. *Southern Sudan Livelihood Profiles. 2nd Edition*. Juba: SSCCSE, p.19.

South Sudan has the sixth largest livestock herd and the highest livestock per capita holding in Africa with an estimated livestock population of 11.7 million cattle, 12.4 million goats and 12.1 million sheep.[64] These vital resources have an asset value estimated at SSP 7 billion[65] and account for 15% of GDP.[66] Considering the vast land suitable for livestock rearing, the country has a great potential to meet the domestic demand for livestock products, export surpluses and improve the livelihoods of the population that depend on the sector, particularly pastoralists and agro-pastoralists predominating in the dry lands of the country.

Dense forests occupy about 25% of the total land area, mainly in the Greater Equatoria, Greater Bahr el Ghazal and Upper Nile state.[67] The economic potential of forest resources is deemed significant, though data on the resources are not available as records were lost during the war. In addition to teak plantations of an estimated area from 5,000 to 8,000 ha, there are large areas of natural indigenous forest with mahogany and other commercial species. Non-wood natural products include medicinal plants, spices, gum, rubber and silk.

The potential sustainable fisheries production from the River Nile, *Sudd* region, and Bahr el Ghazel and Sobat rivers and floodplains has variously been estimated to range between 100,000 and 300,000 tons per annum. Catches are currently less than the lower estimates, so there is probably some room for expansion. A very large potential for aquaculture development exists particularly in the Greenbelt zone (Figure 2-8), which has permanent water and an ideal climate. Both large-scale commercial farming near the main population centres and subsistence type agriculture/aquaculture systems hold great promise.

Table 2-12: Livelihood zones of South Sudan

[64] FAO. 2009. Livestock Population Estimates. (As cited in AO/WFP. 2013. *Crop and Food Security Assessment Mission to South Sudan Special Report*. 22 February. Rome: FAO/WFP. p. 29.)

[65] Musinga, M., J. Gathuma, O. Engorok and T. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft. Juba: GOSS. p. iv.

[66] FAO South Sudan. 2012. *Common Programming Framework (CPF) to End Drought Emergencies in the Horn of Africa Country Programme Paper for South Sudan*. Draft 23 March 2012. p. 2.

[67] World Bank. 2007. *Final Proposal for a Multi Donor-Trust Fund Grant to the Government of Southern Sudan for the Support to Agriculture and Forestry Development Project (SAFDP)*, Washington D.C.: World Bank. p. 32.

Zone	State	Major Food and Income Sources
Greenbelt	Western Bahr el Ghazal, Western Equatoria, Central Equatoria, Eastern Equatoria	Households in the wetter south-western areas of the zone rely almost exclusively on agriculture to meet their food needs. Surplus production is common and households cope with dry years by increasing their dependence on root crops and exchange (barter).
Ironstone Plateau	Northern Bahr el Ghazal, Western Bahr el Ghazal, Warrap, Lakes, Western Equatoria, Central Equatoria, Eastern Equatoria	Households are heavily dependent on crop production and well placed to access surpluses in the neighbouring Greenbelt.
Hills and Mountains	Central Equatoria, Eastern Equatoria, Jonglei	This zone falls somewhere between the Greenbelt zone (agriculture) and the Arid/Pastoral zone (pastoralism) with reliance on cattle, trade and root crops increased in difficult years.
Arid/Pastoral	Jonglei, Eastern Equatoria	This zone occupies the south-eastern tip of the country, households practice a nearly pure form of pastoralism and there is almost exclusive reliance on livestock and livestock trade for food. Seasonal migrations in search of both water and pasture provide opportunities for substantial trade and exchange with neighbouring communities.
Nile and Sobat Rivers	Jonglei, Unity, Upper Nile	Apart from crops and livestock, wild foods and fish contribute significantly. Fish and wild foods are collected in varying quantities depending on the season and the location.
Western Flood Plains	Northern Bahr el Ghazal, Lakes, Warrap	Livestock and agriculture, supplemented by fish and wild foods, are the main food sources.
Eastern Flood Plains	Jonglei, Upper Nile	Similar food sources are available, but with an additional option of game hunting.

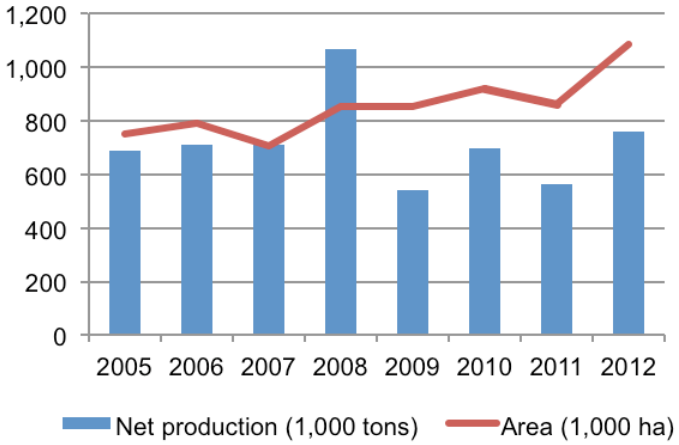
Source: Southern Sudan Centre for Census, Statistics and Evaluation. 2007. *Southern Sudan Livelihood Profiles. 2nd Edition*. Juba: SSCCSE. pp. 21-22.

After CPA, GOSS classified the country into seven livelihood zones according to livelihood patterns determined by physical geography, agro-ecology, market access, etc. with assistance of the European Commission Humanitarian Organisation (ECHO), USAID Famine Early Warning Systems Network (FEWS NET) and Save the Children UK (Figure 2-8). The seven livelihood zones range from areas normally producing surpluses to areas suffering from chronic food shortages (Table 2-12). This zoning is intended for use in policy formulation and development planning as well as an introductory guide to livelihoods and food security in South Sudan and for use in early warning and response planning.[68] This implies the importance of taking into consideration the diversity in agricultural development planning.

Despite such an enormous potential as described above, South Sudan has been suffering from low agricultural performance, high food insecurity and pervasive poverty, particularly in rural areas, but it is difficult to grasp the performance of the agricultural sector precisely due to the lack of reliable data. Partial evidence has suggested that agricultural activities have expanded somewhat since the signing of CPA but seemingly not to such an extent that it has a significant impact on the economy.

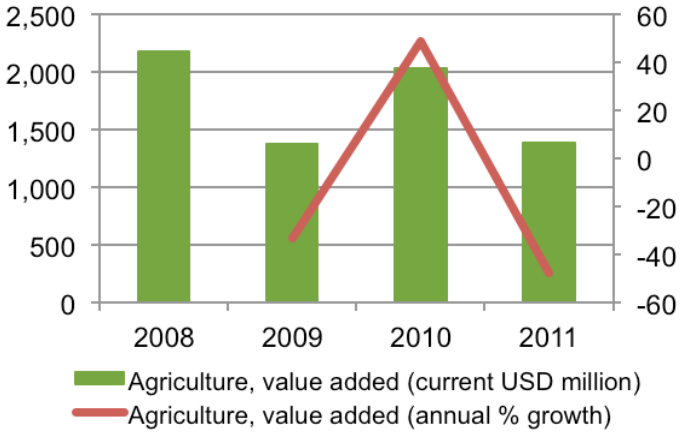
[68] Southern Sudan Centre for Census, Statistics and Evaluation. 2007. *Southern Sudan Livelihood Profiles. 2nd Edition*. Juba: SSCCSE. pp. 10-12.

Figure 2-9: Estimated cereal area harvested and production in 2005-2012



Data source: FAO/WFP. 2010. *Crop and Food Security Assessment Mission to Southern Sudan*. Rome: FAO, p. 23;
and FAO/WFP. 2013. *Crop and Food Security Assessment Mission to South Sudan*. Rome: FAO/WFP, p. 25.

Figure 2-10: Agricultural value added and growth in 2008-2011



Data sources: World Bank. World Development Indicators.
http://databank.worldbank.org/ (accessed 11 July 2013)
Note: The annual growth rate for agricultural value added is based on constant local currency.

According to the FAO/WFO CFSAM, for example, the cereal area harvested increased from 751,000 ha in 2005 to about 1.1 million ha in 2012, though there were fluctuations from year to year and the quantities produced are on an upward trend (Figure 2-9). Cereal yield remains low, which was estimated at 0.88 tons/ha (gross) on average and ranged from 0.4 tons/ha in Unity State to 1.25 tons/ha in Western Equatoria State in 2012.[69]

Livestock numbers are reported to be increasing, though no official estimate is available. Based on its observations on death, reproduction and retention of cattle, the FAO/WFP CFSAM has concluded that the cattle population growth rate used in Ethiopia, 0.06% per annum, can be applied to South Sudan.[70] However, the growth rate is much lower than

[69] FAO/WFP. 2013. *Crop and Food Security Assessment Mission to South Sudan Special Report*. 22 February. Rome: FAO/WFP. p. 21.
[70] FAO/WFP. 2013. *Crop and Food Security Assessment Mission to South Sudan Special Report*. 22 February. Rome: FAO/WFP. p. 28.

those of other neighbouring countries, for example, Uganda's rate of 3% per annum between 2008 and 2011.[71]

Agricultural value added estimated by the World Bank shows negative growth in 2009 and 2011 (Figure 2-10). Although these numbers should be taken into account, the sector's performance has yet to be studied since GRSS is in the process of estimating GDP and other indicators by sector. Moreover, some areas and people of South Sudan have demonstrated significant growth in producing and marketing agricultural products, which may not be officially recorded but is reported in other chapters of this report.

[71] Uganda Bureau of Statistics. 2012. *Statistical Abstract 2012*. Kampala: USOB. p. 162.

3. Natural conditions and environment

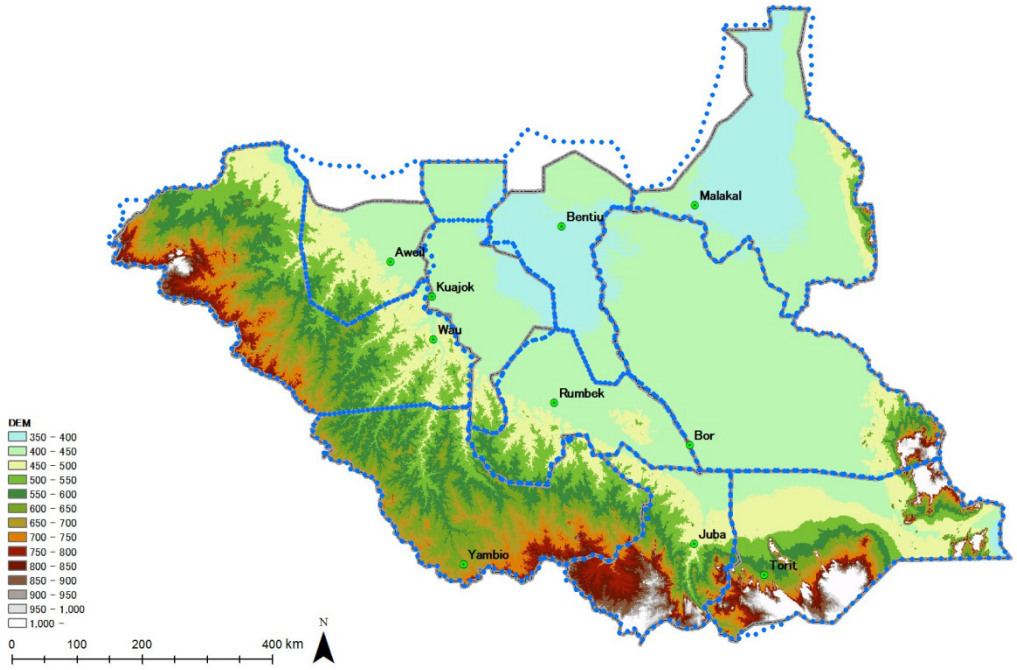
This chapter describes the natural conditions and water and land resources of South Sudan based on data prepared by the Irrigation Development Master Plan (IDMP) Task Team and some other information additionally collected by the CAMP Task Team. Environmental issues relevant to agricultural development in the country are also discussed.

3.1 Natural conditions[72]

3.1.1 Topography

South Sudan lies between latitudes 3°N and 13°N, and longitudes 24°E and 36°E. It is covered in tropical forest, swamps and grassland. The While Nile, locally known as the Bahr el Jabel, traverses the country from south to north, passing through major cities, such as Juba, Bor and Malakal. The river forms the Sudd, a vast swamp whose area varies from 30,000 km^2 to 40,000 km^2. The country inclines gently toward the north-east from the south-west (Figure 3-1). The highest peak in South Sudan is Mt. Kinyeti, 3,187 m above sea level, located in Eastern Equatoria State near the border with Uganda. The lowest part is around 400 m above sea level, near Renk, Upper Nile State.

Figure 3-1: Topographic map of South Sudan



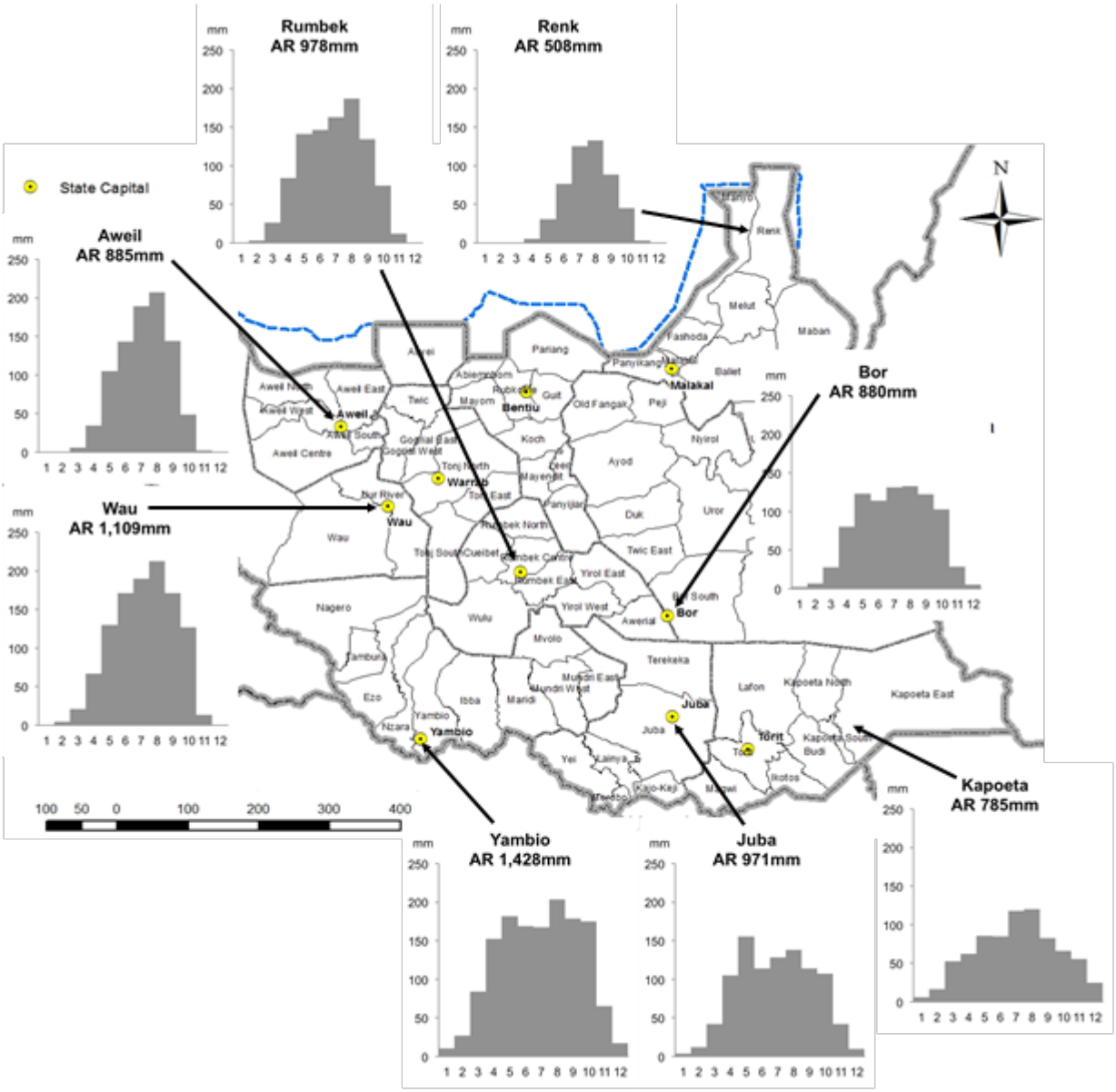
Source: Irrigation Development Master Plan Task Team. September 2013. *Irrigation Development Master Plan (IDMP): Progress Report (1) Draft*. GRSS: Ministry of Electricity, Dams Irrigation and Irrigation and Water Resources and Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries, Cooperatives and Rural Development; and Japan International Cooperation Agency (JICA). p. 2-1.

[72] Unless otherwise noted, this section relies on information from: Irrigation Development Master Plan Task Team. September 2013. *Irrigation Development Master Plan (IDMP): Progress Report (1) Draft*. GRSS: Ministry of Electricity, Dams Irrigation and Irrigation and Water Resources and Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries, Cooperatives and Rural Development; and Japan International Cooperation Agency (JICA).

3.1.2 *Climate*

The climate of South Sudan ranges from Tropical Semi-Humid climate with a short rainy season in the north to Tropical Wet-Dry and Tropical Rainy climates with progressively longer wet seasons in the south.[73] There is much more rainfall in the south and strong seasonal annual variations. Mean annual rainfall ranges between 500 mm in the north to 1,500 mm in the south (Figure 3-2). The country can be broadly classified into two major rainfall regimes, unimodal and bimodal. The unimodal rainfall regime occurs in the north (e.g., Renk, Aweil and Wau), with a 6-month wet season from May to October; the bimodal rainfall regime in the south (e.g., Yambio and Juba) has a 7-8-month wet season from March/April to October/November with a few drier weeks in June-July.

Figure 3-2: Rainfall regimes at eight locations in South Sudan



[73] Walsh, R. P. D. 1991. Climate, hydrology, and water resources. In Craig, G. M. ed. *The Agriculture of the Sudan*. New York: Oxford University Press. pp. 19-21.

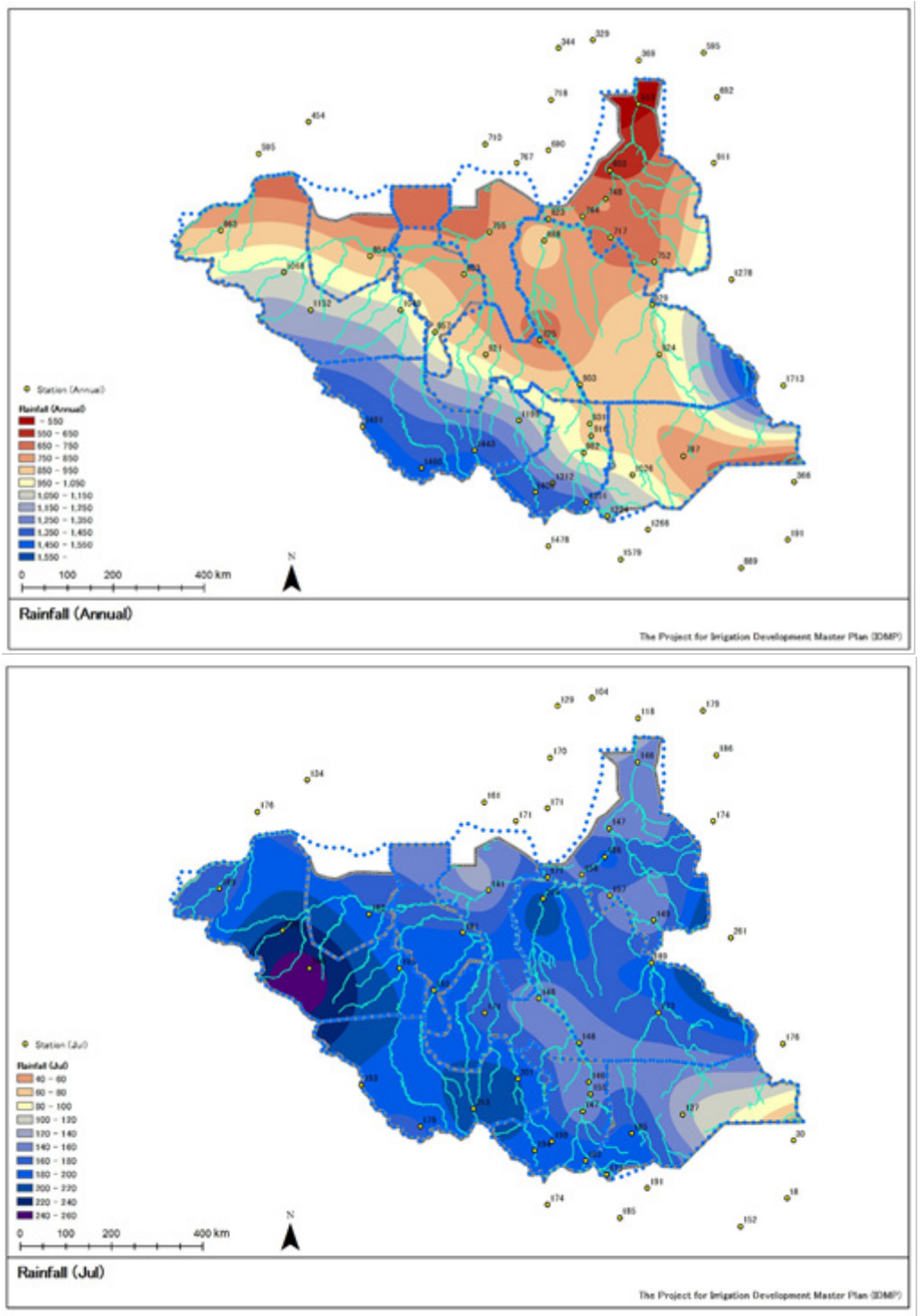
Data source: Worldclimate.Com (http://www.worldclimate.com) (accessed 13 October 2013). Data were derived from The Global Historical Climatology Network, version 1 (GHCN 1) for the following periods.

Aweil:	368 months between 1950 and 1984	Bor:	889 months between 1906 and 1984
Juba:	1,045 months between 1901 and 1988	Kapoeta:	362 months between 1951 and 1981
Renk:	976 months between 1906 and 1987	Rumbek:	857 months between 1908 and 1985
Wau:	1,008 months between 1904 and 1987	Yambio:	687 months between 1921 and 1979

AR = Mean annual rainfall

The IDMP Task Team has estimated the average rainfall for the last 30 years at each rainfall observation station and created contour maps for annual and monthly rainfall. Figure 3-3 shows the contour maps of annual and July rainfall. Major trends discovered are: 1) annual rainfall decreases from southwest to northeast with the exception of the Sudd which has relatively higher rainfall compared to surrounding areas; 2) the south-eastern part has lower rainfall; and 3) the north-western part has extremely high rainfall in July and August.

Figure 3-3: Rainfall contour maps: Annual and July (mm) (created by IDMP)



Source: Irrigation Development Master Plan Task Team. September 2013. *Irrigation Development Master Plan (IDMP): Progress Report (1) Draft*. GRSS: Ministry of Electricity, Dams Irrigation and Irrigation and Water Resources and Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries, Cooperatives and Rural Development; and Japan International Cooperation Agency (JICA). p. 4-34.

According to rainfall and moisture regimes, the IDMP Task Team has classified South Sudan into three major rainfall zones: 1) high rainfall zone; 2) pastoralist zone; and 3) moisture deficit zone, as shown in Table 3-1.

Table 3-1: Rainfall zones classified by rainfall and moisture regimes

Zone	Annual rainfall	Characteristics
High rainfall zone	> 1,500 mm	The south-western part of the country and far southeast and Kapoeta Hills, known as the Green Belt. Although rainfall is significant, it only occurs for a limited period (7-8 months) of the year and is highly variable. Irrigation would be supplementary to the rainfall to produce a second crop and increase productivity.
Pastoralist zone	< 1,000 mm	Most areas of the country in the central, eastern and western parts. Irrigation would provide livelihood options and increase food production.
Moisture deficit zone	< 500 mm	The north-eastern part of the country. Rainfall is highly variable. Irrigation could secure and increase food production and improve livelihoods.

Source: Elaborated by the CAMP Task Team based on: Irrigation Development Master Plan Task Team. September 2013. *Irrigation Development Master Plan (IDMP): Progress Report (1) Draft*. GRSS: Ministry of Electricity, Dams Irrigation and Irrigation and Water Resources and Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries, Cooperatives and Rural Development; and Japan International Cooperation Agency (JICA). p. 4-34.

Temperature varies little over the country or with the seasons, although it is generally higher in the north and during the dry season. The most significant meteorological variables are rainfall and the length of the dry season. Variations in the length of the dry season depend on the dominance of airflows: dry north-easterly winds or humid south-westerly winds. Diurnal ranges of temperatures are generally low, averaging 13.7°C at Malakal, 12.7°C at Juba and 13.1°C at Yambio; diurnal ranges are less than 10°C in the wettest months and higher in the cloud-free dry season.[74]

Humidity is generally high throughout the year with a minimum of around 40% and a maximum of 80%. The least humid months are January and February in the middle of the dry season all over the country. The temporal pattern of the average monthly evaporation correlates with the monthly mean maximum temperature distribution. The average monthly maximum evaporation occurs from February to May and the minimum from June to September. Potential evapo-transpiration is lowest over the highlands and increases progressively towards the lowlands. Rates of 1,450 mm/year occur in the southern mountains and increase northwards to 2,500 mm/year.

3.1.3 Geology and hydrogeology

The geological setting of South Sudan is simple; the Pre-Cambrian Basement Complex, mainly consisting of granites and gneiss, occurs throughout the country. It outcrops in the south-western third of the country and along its northeast edge. In the Sudd basin it is overlain by Nubian Sandstone in the northwest, and by the Umm Ruwaba Formation elsewhere. There are alluvial deposits along the major rivers.

The Sudd basin is a rift basin or depression, which owes its existence to the rifting activities of the Western, Central and East African Rift Systems. It was formed by the sinking of a land-surface made of the Basement Complex.[75] The depression was at one time covered by continental deposits of the Nubian Sandstone and later by alluvial deposits of the Umm Ruwaba Formation. On the south-eastern edge of the depression thick lava flows were poured out, now forming the highest areas in South Sudan composed mainly of basalt. The geological features of South Sudan are presented in Table 3-2 and Figure 3-4.

[74] Walsh, R. P. D. 1991. Climate, hydrology, and water resources. In Craig, G. M. ed. *The Agriculture of the Sudan*. New York: Oxford University Press. p. 31.

[75] Southern Development Investigation Team. 1955. *Natural Resources and Development Potential in the Southern Provinces of the Sudan. A Preliminary Report 1954*. London: Sudan Government. p. 4.

The Sudd basin is also a closed groundwater basin with 3 major aquifers generally corresponding to the underlying geological formation – alluvial, Nubian Sandstone and Umm Ruwaba. Where the Basement Complex outcrops there is a small aquifer system but in other places it is the impervious base (bottom) of all other aquifers (see Figure 3-5).

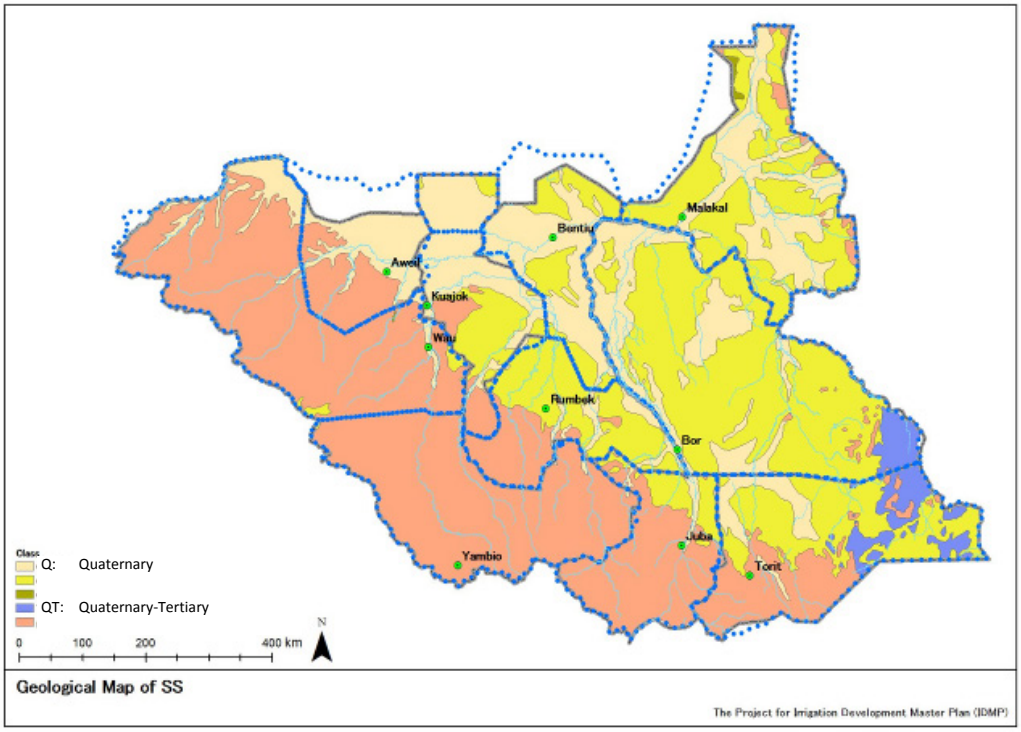
Table 3-2: Geology of South Sudan

Era	Period	Common name in Africa	Local name	Class in Figure 3-4
Cenozoic	Quaternary	Alluvium	Alluvium	Q
	Tertiary	Continental Terminal	Umm Ruwaba Formation	QT
	Tertiary-Quaternary	Volcanic	Volcanic, mainly basalts	Ti
Mesozoic Paleozoic	Cretaceous	Continental Intercalary	Nubian Sandstone	Qe
Proterozoic	Precambrian	Basement Complex	Basement Complex	pC

Sources:

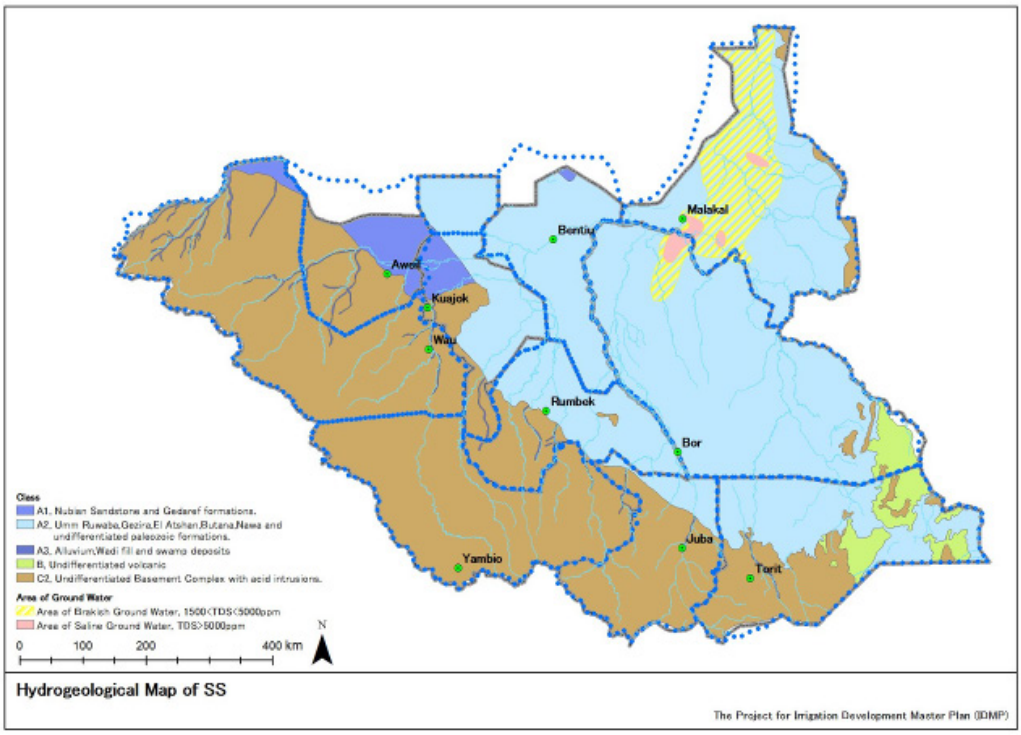
1) Irrigation Development Master Plan Task Team. September 2013. *Irrigation Development Master Plan (IDMP): Progress Report (1) Draft*. GRSS: Ministry of Electricity, Dams Irrigation and Irrigation and Water Resources and Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries, Cooperatives and Rural Development; and Japan International Cooperation Agency (JICA). p. 4-42.
2) Geological and Mineral Resources Department, Sudan. 1991. *Geological Map of the Sudan*. Government of the Sudan.
3) Mitchell, C. W. 1991. Physiography, geology, and soils. In Craig, G. M. ed. *The Agriculture of the Sudan*. New York: Oxford University Press. pp. 4-5.

Figure 3-4: Geological map of South Sudan



Source: Irrigation Development Master Plan Task Team. September 2013. *Irrigation Development Master Plan (IDMP): Progress Report (1) Draft*. GRSS: Ministry of Electricity, Dams Irrigation and Irrigation and Water Resources and Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries, Cooperatives and Rural Development; and Japan International Cooperation Agency (JICA). p. 4-44.

Figure 3-5: Hydrogeological map of South Sudan



Source: Irrigation Development Master Plan Task Team. September 2013. *Irrigation Development Master Plan (IDMP): Progress Report (1) Draft*. GRSS: Ministry of Electricity, Dams Irrigation and Irrigation and Water Resources and Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries, Cooperatives and Rural Development; and Japan International Cooperation Agency (JICA). p. 4-44.

3.1.4 Soils[76]

There are 34 soil types in South Sudan as illustrated in Figure 3-6. Major soil types in descending order of area are vertisols, fluvisols, leptosols, lixisols, regosols, and cambisols. The area of other soil types is not large. Vertisols are dark, cracking, montmorillonitic clay known as “black cotton soils” and widespread on the detrital plains derived from the Ethiopian uplands and Basement Complex outcrops. In South Sudan, they are found mainly in the eastern part. Fluvisols are soils on recent alluvium and distributed along rivers, lakes and alluvial plains. Leptosols are very shallow soils over hard rock or highly calcareous materials and found in the south-western part. Lixisols are soils with subsurface accumulation of low activity clays and high base saturation and distributed in the western part. Regosols are soils with no significant profile development and distributed from northwest toward to the central area. Cambisols are soils composed of medium and fine-textured materials derived from a wide range of rocks and distributed partly in the southern and central areas.

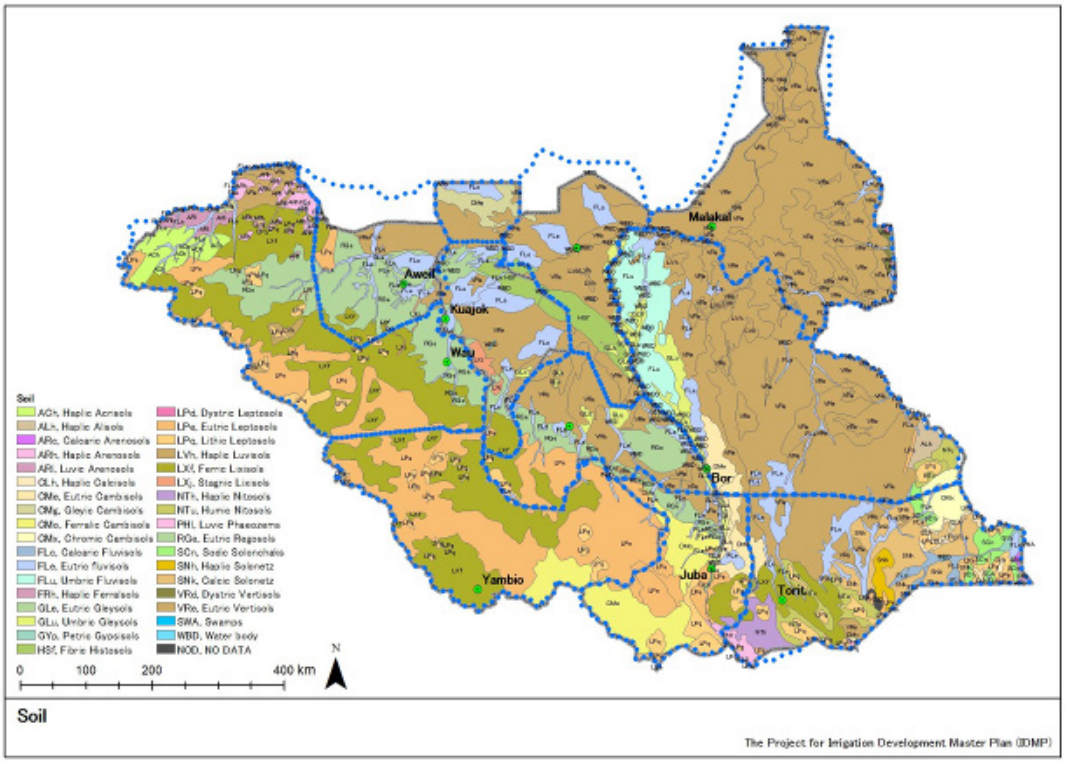
3.1.5 Hydrology and water resources

(1) Surface water

South Sudan is rich with surface water resources, with four main river basins: Bahr el Jebel, Bahr el Ghazal, River Sobat, and White Nile as illustrated in Figure 3-7.

Figure 3-6: Soil map of South Sudan (created by IDMP)

[76] Besides the above-cited IDMP report, this section is based on: 1) Mitchell, C. W. 1991. Physiography, geology, and soils. In Craig, G. M. ed. *The Agriculture of the Sudan*. New York: Oxford University Press. pp. 11-15; 2) FAO, IIASA, ISRIC, ISSCAS and JRC. February 2012. Harmonized World Soil Database Version 1.2; and 3) IUSS Working Group WRB. 2007. *World Reference Base for Soil Resources 2006*. First update 2007. World Soil Resources Report No. 103. Rome: FAO.



Source: Irrigation Development Master Plan Task Team. September 2013. *Irrigation Development Master Plan (IDMP): Progress Report (1) Draft*. GRSS: Ministry of Electricity, Dams Irrigation and Irrigation and Water Resources and Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries, Cooperatives and Rural Development; and Japan International Cooperation Agency (JICA). p. 4-13.
Note: The IDMP Task Team used a digital atlas with the spatial resolution of 1 km^2 for their soil mapping and analysis. The atlas was produced in 2009 by NBS based on the Harmonized World Soil Database (HWSD), developed by the Land Use Change and Agriculture Program of the International Institute for Applied Systems Analysis (IIASA) and FAO.

Figure 3-7: Main basins of South Sudan

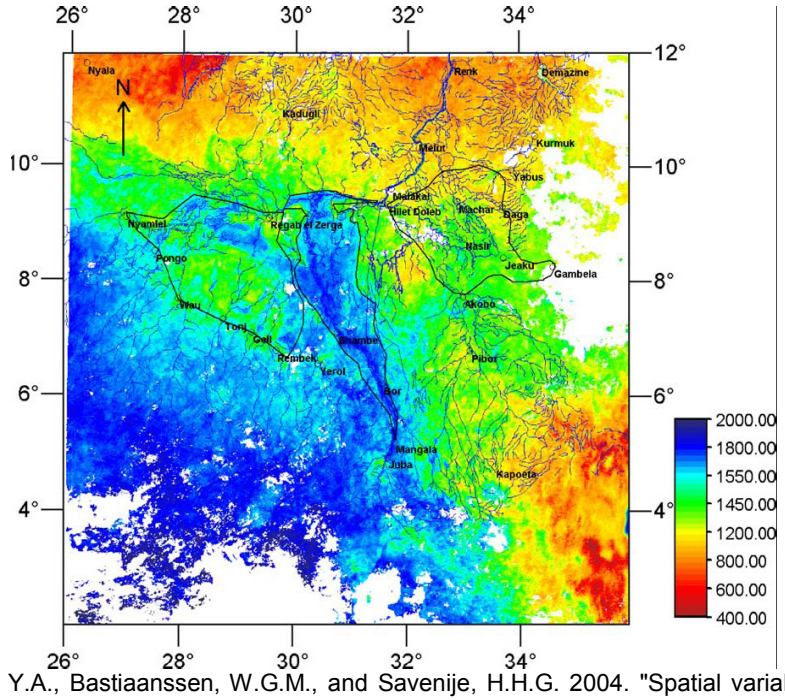
Source: Irrigation Development Master Plan Task Team. September 2013. *Irrigation Development Master Plan (IDMP): Progress Report (1) Draft*. GRSS: Ministry of Electricity, Dams Irrigation and Irrigation and Water Resources and Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries, Cooperatives and Rural Development; and Japan International Cooperation Agency (JICA). p. 2-30. (Originally prepared by the Ministry of Water Resources and Irrigation)
The total average annual supply of the Bahr el Jebel basin is 28 billion m^3 at Mongalla (45 km north of Juba), but due to the large volumes of water being lost in the Sudd wetlands, the volume reaching Malakal (over 550 kms north of Juba) is only 14 billion m^3, or half the total inflow. Similarly, the total average annual supply of the Bahr el Ghazal basin is around 14.0 billion m^3, out of which only about 0.5 billion m^3 reaches the White Nile; again water is lost in the Sudd. The total average annual supply of the River Sobat basin at Hillet Dolieb (15 km south of

Malakal) is 13.5 billion m^3, with the daily discharge fluctuating between 8.7 million m^3 in April and 64.7 million m^3 in November.

The average total annual supply of the White Nile at Malakal is from these three basins and hence calculated at 28.0 billion m^3. Due to high losses in the Sudd for the Bahr el Ghazal, the White Nile essentially comes from two sources: the Bahr el Jebel/Zeraf with a constant flow and the River Sobat with a considerable annual fluctuation. On average, the daily discharge of the White Nile, being the sum of these two, varies from 46 million m^3 to 106 million m^3. The minimum discharge is in March or April and the maximum discharge is in October or November.

The Sudd wetland is one of the main hydrological features of South Sudan. It is located in the middle of the country and is created by the overflow of the Nile over an extensive area (30,000 to 40,000 km^2), composed of permanent and seasonal swamps.[77] The annual rainfall estimate is around 800-900 mm. The average evaporation over the Sudd wetland is around 1,800 mm and due to uneven rainfall distribution, evaporation is lower in the northern part of the image (600-700 mm/year), as well as on the south-eastern corner (Figure 3-8).

Figure 3-8: Annual evaporation map of the Sudd basin (mm/year)



Source: Mohamed, Y.A., Bastiaanssen, W.G.M., and Savenije, H.H.G. 2004. "Spatial variability of evaporation and moisture storage in the swamps of the upper Nile studied by remote sensing techniques". *Journal of Hydrology* Volume 289, Issues 1-4, pp. 145-164. Figure 7.

(2) Groundwater

As explained in section 3.1.3, there are four major aquifers, namely, Alluvial, Umm Ruwaba, Nubian Sandstone, and Basement Complex in South Sudan. The Sudd basin is the only groundwater basin in the country.

(3) Rainfall

Rainfall is the ultimate source of water in many parts of South Sudan, with surface water, groundwater, and other water sources all fed by rain. South Sudan has relatively significant rainfall as described in section 3.1.2. Based on rainfall contour maps, the mean annual

[77] Salih, A. 2010. *Southern Sudan: Preliminary Water Resources Assessment Study.* Draft Final Report. Washington D.C.: World Bank. pp. 25-26.

rainfall and the land area, the IDMP has estimated that the country receives about 1 billion m^3 of rain annually.

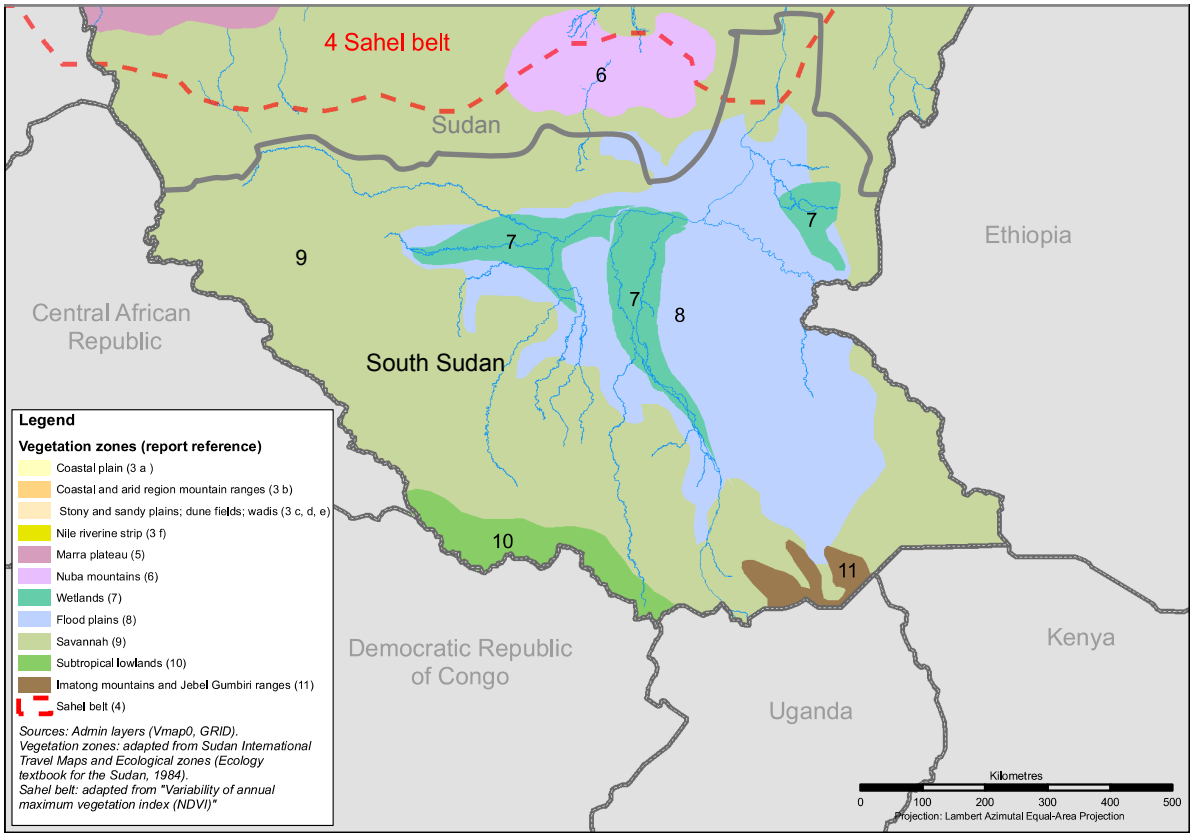
3.1.6 Vegetation[78]

The area of South Sudan can be classified into five vegetation zones: 1) wetlands, 2) flood plains, 3) savannah, 4) subtropical lowlands, and 5) mountain ranges (Figure 3-9). It should be noted that there are different versions of ecological, soil, vegetation, and livelihood zoning for South Sudan (also see Section 3.3 Livelihood zones). The zones discussed below are adapted from UNEP's *Sudan Post-Conflict Environmental Assessment* published in 2007. These zones are a simplified blend of these classifications with a focus on major variations between ecosystems.

(1) Wetlands (Legend: 7)

Permanent wetlands make up approximately 5% of the area of South Sudan, while a much greater area, both north and south, is seasonally flooded. The largest wetlands and flood plains are all linked to the Nile tributaries that traverse the central plains. The largest wetland is the Sudd, which is formed by the White Nile in very flat topography between the towns of Bor and Malakal. Covering more than 30,000 km^2, the Sudd comprises multiple channels, lakes and swamps, with a maze of thick emergent aquatic vegetation. The wetlands are essentially undeveloped and represent a safe haven for wildlife, including migratory birds.

Figure 3-9: Vegetation zones of South Sudan



Source: Adapted from UNEP. 2007. *Sudan Post-Conflict Environmental Assessment*. Nairobi: UNEP. p. 43.

[78] This section is based on: UNEP. 2007. *Sudan Post-Conflict Environmental Assessment*. Nairobi: UNEP. pp. 42-55.

(2) Flood plains (Legend: 8)
Much of the central plains is covered by sediment deposited in the Nile basin and known locally as "black cotton soil". Due to its high clay content, the soil in these areas retains water in the wet season to form very soft and virtually impassable shallow flood plains. In the dry season, the water disappears from all but a few swamps, waterholes and tributaries, and the clay shrinks and cracks. These areas are relatively fertile but difficult to cultivate. The geographic border between flood plains and the drier Sahel belt (Legend: 4) is somewhat arbitrary in the clay soil regions, as even the dry areas flood easily during high rainfall events. The boundary between flood plains and wetlands is also often arbitrary, as many parts of South Sudan consist of a network of seasonally variable wetlands interlacing multiple small flood plains.

(3) Savannah (Legend: 9)
Large areas of South Sudan are considered to be savannah, classified as low-density woodland, mixed scrub and grassland. Within this broad class, the density and proportions of the three vegetation types vary significantly according to regional climates, soil types, topography and the influence of deliberate seasonal burning, which tends to favour the development of grasslands.

(4) Subtropical lowlands (Legend: 10)
The extreme south and south-west of the country can be classified as subtropical. This is reflected in the vegetation, which changes relatively abruptly from savannah to semi-tropical forest in the region south and south-west of Juba. The land bordering the Democratic Republic of Congo in the south-west rises to form a continuous low range known as the Ironstone hills. These hills also form the boundary between the Nile and Congo watersheds. The region supports intensive agriculture and some forestry, but is otherwise undeveloped.

(5) The Imatong, Dongotona, Acholi and Jebel Gumbiri mountain ranges (Legend: 11)
The Imatong, Dongotona and Acholi mountain ranges flank the White Nile in the extreme south of the country. Their average altitude is 900 m, with a peak elevation of 3,187 m at Mount Kinyeti, which is the highest point in South Sudan. They are characterized by steep slopes and high rainfall, resulting in dense forest and high-yield agriculture. The Gumbiri mountains, south-west of Juba, support extensive teak plantations.

3.2 Land resources and land use[79]

South Sudan is endowed with abundant land resources. Over 95% of its total area (658,842 km^2) is considered suitable for agriculture, 50% of which is prime agricultural land where soil and climatic conditions allow for production of a variety of crops and livestock.[80] It is also reported that more than 70% of South Sudan's land area has a Length of Growing Period (LGP) longer than 180 days and is therefore suitable for crop production.[81] However, the FAO land cover data show that most of the land that is suitable for agriculture is still under

[79] This section is largely based on: World Bank. October 2011. *Strategic Choices for Realizing South Sudan's Agricultural Potential*, which relies on data from: FAO. 2009. Land Cover Database.

[80] World Bank. 2007. *Final Proposal for a Multi Donor-Trust Fund Grant to the Government of Southern Sudan for the Support to Agriculture and Forestry Development Project (SAFDP)*. Washington D.C.: World Bank. p. 30. (The description is based on: Government of the Republic of the Sudan, Sudan People's Liberation Movement, World Bank and UNDP. 2005. *Joint Assessment Mission: Framework for Sustained Peace, Development and Poverty Eradication. Volume III Cluster Reports;* Tothill, J.D. ed. 1948. Agriculture in the Sudan. London: Oxford University Press; and Craig, G.M. ed. 1991. The Agriculture of the Sudan. New York: Oxford University Press)

[81] Diao, X., V. Alpuerto, R. Folledo, C. Guvele and L. You. 2009. "Assessing Food Security and Development Opportunities in Southern Sudan." Paper prepared by Development Strategy and Governance Division of IFPRI for US Agency for International Development. Washington, D.C.: IFPRI.

natural vegetation. Only 3.8% (2.5 million ha) of the total land area (64.7 million ha)[82] is currently cultivated, while the largest part of the country (62.6%) is under trees and shrubs (Table 3-3). The ratio of cropland to total land is very low in South Sudan compared to Kenya and Uganda, where despite less favourable LGPs, cropland accounts for 28.3% and 7.8% of total land area. Most of the cropland in South Sudan is rain-fed. The irrigated area is limited to only 32,100 ha, mainly in Upper Nile State. Flood land used for rice production is also limited, at about 6,000 ha, and is located primarily in Northern Bahr el Ghazal (Figure 3-10).

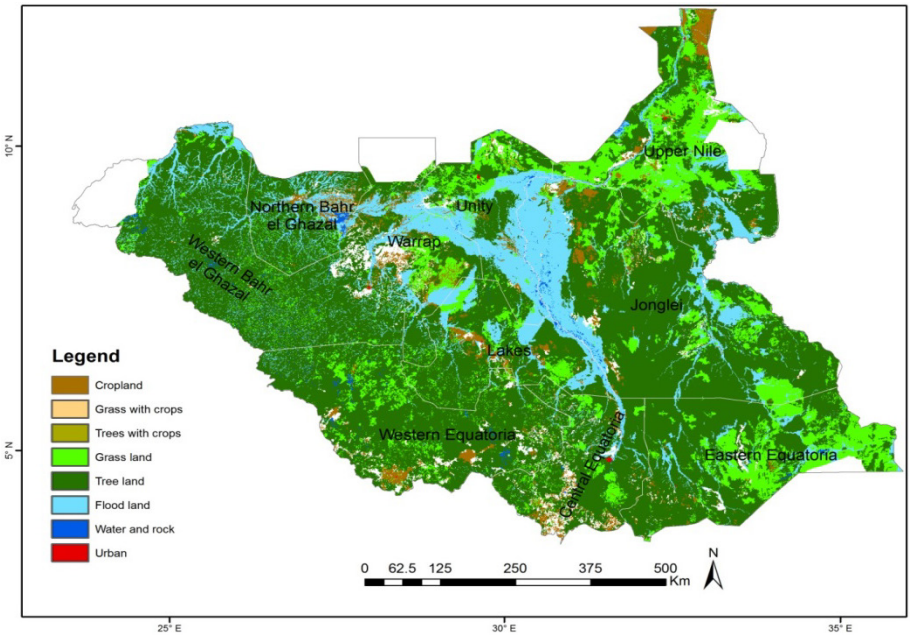
Table 3-3: Area and share of aggregated land use in total land area of South Sudan

Land use	Area (ha)	Share of total land (%)
Cropland	2,477,700	3.8
Grass with crops	325,100	0.5
Trees with crops	1,707,300	2.6
Grassland	9,633,800	14.9
Tree land	40,526,900	62.6
Flood land	9,497,600	14.7
Water and rock	482,700	0.7
Urban	37,000	0.1
Total	**64,688,300**	**100.0**

Source: World Bank. October 2011. *Strategic Choices for Realizing South Sudan's Agricultural Potential*. p. 4. (Aggregated from FAO. 2009. Land Cover Database)

Note: In the World Bank study, a two-step sequential process was used to derive land use/cover data from a 295 land use types depicted in the FAO land cover map for South Sudan. First, the 295 land use types were resampled and aggregated into 22 land use types, 13 of them agriculture-related (including trees and tree crops). In the second step, the 13 agriculture-related land use types were further aggregated into the six categories shown above.

Figure 3-10: Aggregated land use/cover map



Source: World Bank. October 2011. *Strategic Choices for Realizing South Sudan's Agricultural Potential*. p. 4. (Modified from FAO. 2009. Land Cover Database)

[82] In the World Bank study, the total land area of South Sudan is estimated at 64.7 million ha, using the data from FAO's Land Cover Database. (World Bank. October 2011. Strategic Choices for Realizing South Sudan's Agricultural Potential.)

Most cropland is concentrated in five states: Upper Nile, Warrap, Jonglei, Western Equatoria, and Central Equatoria (Table 3-4). These five states account for 70% of national cropland and 56% of national territory. Almost all irrigated crops (mainly rice) are in Upper Nile; rice on flood land is all in Northern Bahr el Ghazal. Fruit trees and tree plantations are exclusively in Western, Central, and Eastern Equatoria, most probably due to the suitable climatic conditions in these states.

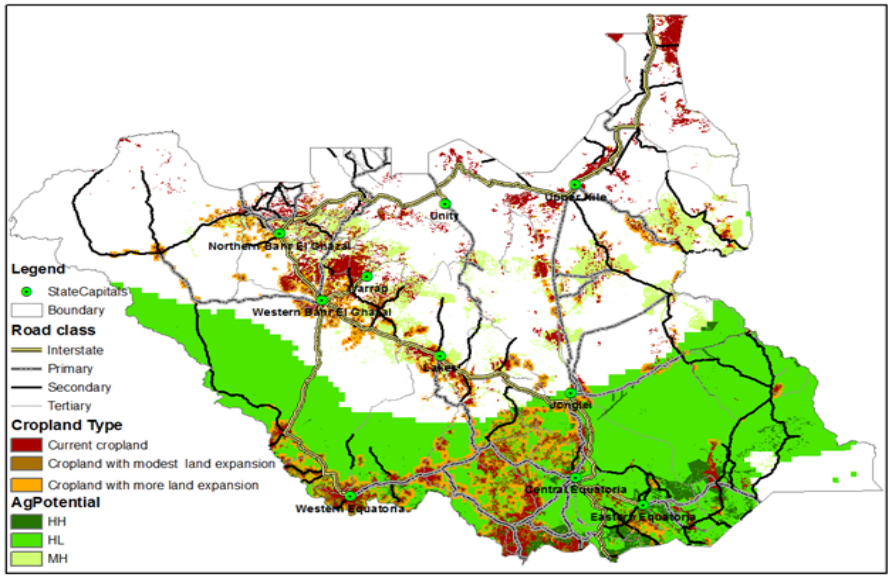
As shown in Figure 3-11, the World Bank study has identified areas with high agricultural (crops) potential in terms of favourable climate and population density and suggested that they should be prioritised for earlier investments to provide the fastest stimulus to agricultural growth in the country. High potential areas are found mainly in the three Equatorial states and Jonglei, which together account for nearly 80% of the road network of the country (as of 2011).

Table 3-4: Share of aggregated land use by state (%)

State	Cropland	Grass with crops	Trees with crops	Grassland	Tree land	Flood land	Water and rock	Urban	Total
Upper Nile	19.0	26.0	7.1	27.1	7.8	9.0	9.5	25.8	11.4
Jonglei	14.3	25.2	7.3	14.8	19.7	26.7	17.3	8.8	19.5
Unity	4.5	16.1	2.5	7.7	3.7	14.9	6.4	17.1	6.0
Warrap	15.3	8.1	14.9	5.2	3.5	11.4	1.8	0.9	5.6
Northern Bahr el Ghazal	9.8	1.1	4.2	1.0	4.7	7.3	15.3	3.2	4.7
Western Bahr el Ghazal	2.0	4.0	12.9	4.2	18.6	13.5	18.5	10.4	14.9
Lakes	9.9	0.6	2.7	5.6	7.1	9.0	4.3	5.1	7.0
Western Equatoria	11.4	7.5	19.9	9.0	15.7	1.4	17.5	3.7	12.5
Central Equatoria	11.2	8.6	21.4	4.5	7.7	2.4	3.7	22.1	6.9
Eastern Equatoria	2.6	2.7	7.1	21.0	11.6	4.4	5.6	2.8	11.4
National average	3.8	0.5	2.6	14.9	62.6	14.7	0.7	0.1	100.0

Source: World Bank. October 2011. *Strategic Choices for Realizing South Sudan's Agricultural Potential*. p. 5. (Estimates based on FAO. 2009. Land Cover Database)

Figure 3-11: Combination of roads, agricultural potential zones and cropland areas



Source: World Bank. October 2011. *Strategic Choices for Realizing South Sudan's Agricultural Potential*. p. 28.
Note: HH = High production potential and high population density; HL = High production potential and low population density; MH = Medium production potential and high population density

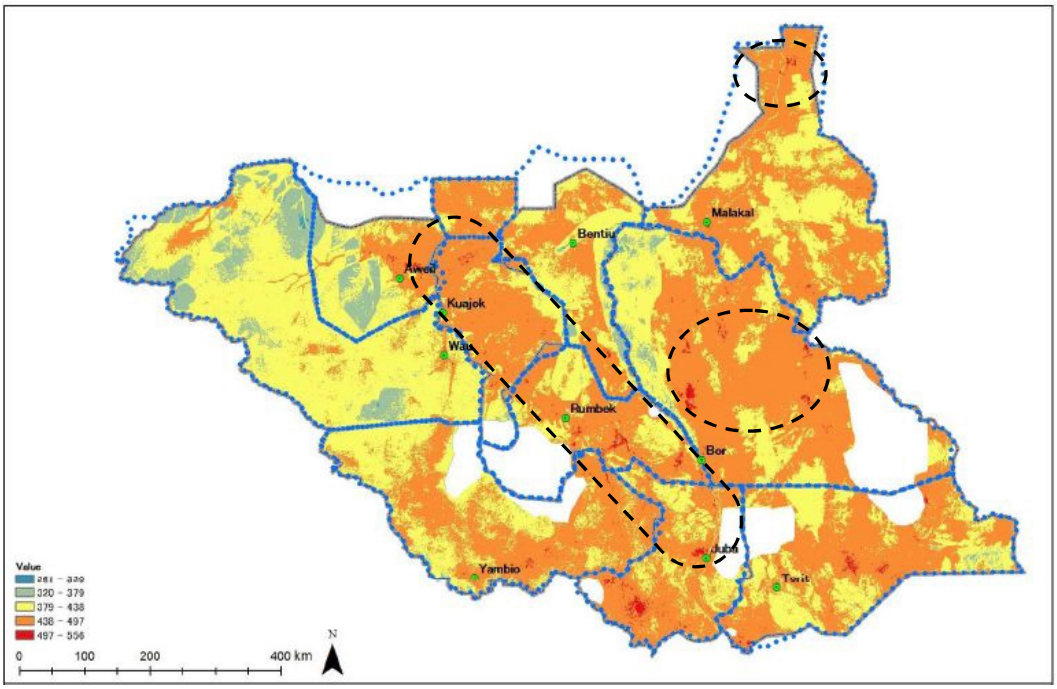
The IDMP Task Team has developed a land productivity map based on an assessment of irrigation development potential in terms of: 1) land productivity potential (temperature,

slopes, and soils), 2) water resources potential (land cover, wetness, river accessibility, grazing areas, and water bodies), and 3) socio-economic potential (road accessibility, population density, protected areas, oil and gas concessions, and market accessibility). Figure 3-12 indicates that areas circled by black dotted lines have higher irrigation development potential, though this map is to be finalised later.

3.3 Livelihood zones

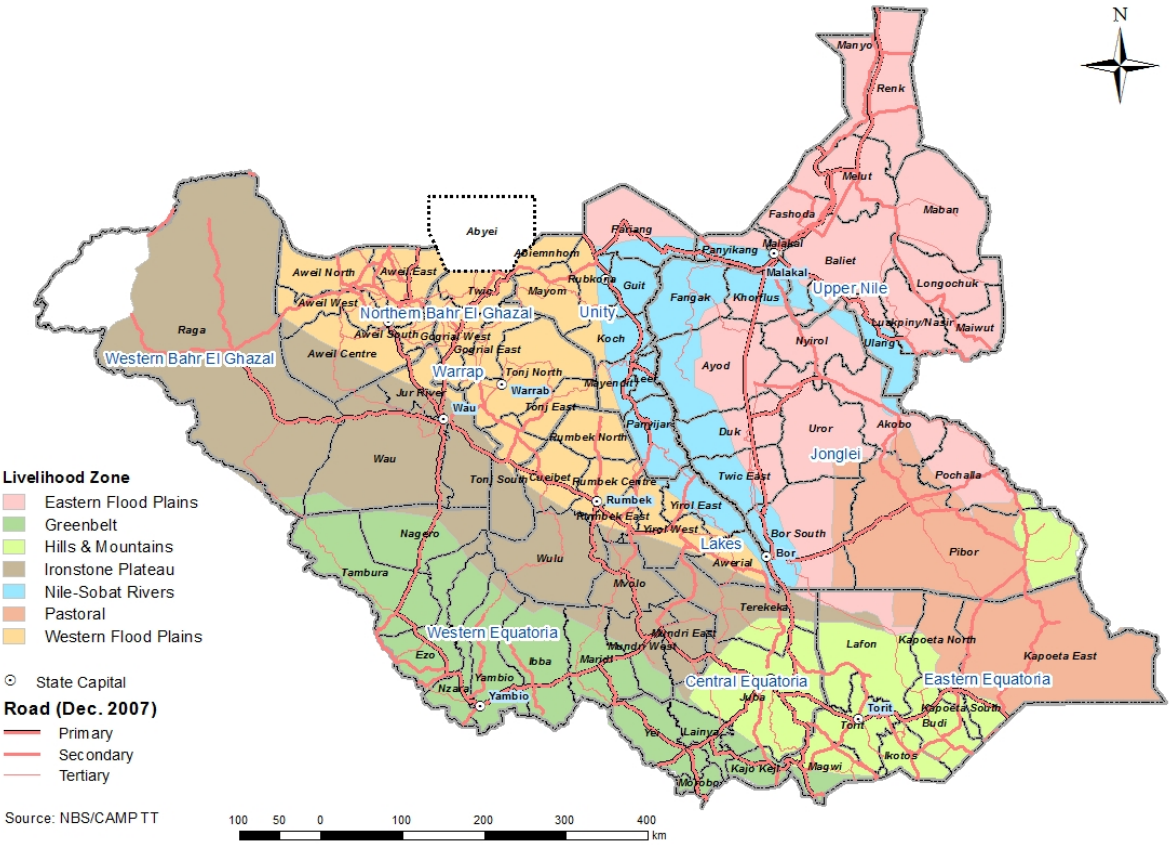
There are seven livelihood zones in South Sudan: 1) Greenbelt, 2) Ironstone Plateau, 3) Hills and Mountains, 4) Arid/Pastoral, 5) Nile-Sobat Rivers, 6) Western Flood Plains, and 7) Eastern Flood Plains, as shown in Figure 3-13. These zones were developed along livelihood patterns (crop production, livestock rearing, off-farm income generation, etc.) determined by physical geography, agro-ecology, market access, etc. and are therefore more often called "livelihood zones". For the characteristics of each zone, see Table 2-12 presented in Chapter 2 and Table 10-13 in Chapter 10.

Figure 3-12: Land productivity potential map of South Sudan (prepared by IDMP)



Source: Irrigation Development Master Plan Task Team. September 2013. *Irrigation Development Master Plan (IDMP): Progress Report (1) Draft*. GRSS: Ministry of Electricity, Dams Irrigation and Irrigation and Water Resources and Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries, Cooperatives and Rural Development; and Japan International Cooperation Agency (JICA). p. 4-23.

Figure 3-13: Livelihood zones of South Sudan



Source: Prepared by NBS/CAMP Task Team based on data from NBS. 2012. *National Baseline Household Survey 2009*.

3.4 Environmental issues

3.4.1 Climate change and disaster risk management

The Agriculture Sector Policy Framework 2012-2017 acknowledges that climate change is one of the environmental issues to address and policy measures are needed to mitigate the adverse effects of climate change in the medium and long-term.[83] The country is heavily dependent on rain-fed agriculture and has limited institutional and infrastructure capacity to cope with natural variability. Climate change will increase the frequency and intensity of extreme weather events such as droughts, floods and heat waves. Although no vulnerability and adaptation studies have been conducted, prolonged and severe droughts are known to have caused severe water shortage and crop failure. Climate change can also lead to outbreaks of human diseases as well as outbreaks of pests and emergence of new crop pests and diseases. It is necessary to identify risks and recognise and minimise obstacles to risk management through public and private action.[84]

3.4.2 Deforestation and land degradation

South Sudan has lost much of its forests since the 1950s and deforestation is ongoing.[85] There are several underlying causes of deforestation including: fuelwood and charcoal

[83] Ministry of Agriculture, Forestry, Cooperatives and Rural Development. 2012. *Agriculture Sector Policy Framework (ASPF): 2012-2017*. Juba: GRSS. p. 61.

[84] The World Development Report 2014 focuses on managing of various kinds of risks including natural disasters, pandemics, financial crises and crime. World Bank. 2013. *World Development Report 2014: Risk and Opportunity - Managing Risk for Development*. Washington, DC: World Bank.

[85] UNEP. 2007. *Sudan Post-Conflict Environmental Assessment*. Nairobi: UNEP. pp. 206-209.

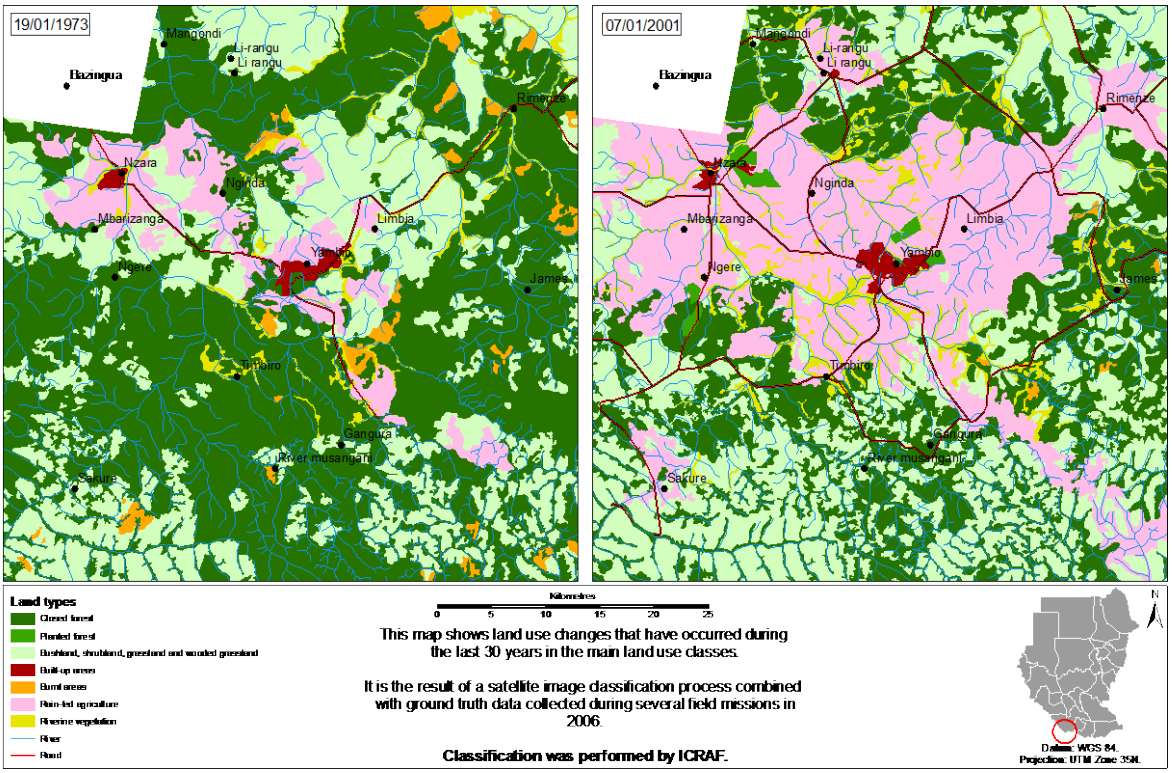
extraction, mechanized agriculture, rain-fed and shifting agriculture, drought and climate change, overgrazing and fires, and conflict impacts. Among these, fuelwood and charcoal extraction is considered one of the major causes due to the country's high dependence on fuelwood and charcoal as the main sources of energy. Therefore, deforestation is worst around major towns such as Malakal, Wau and Juba.

A general trend of intensification of traditional rain-fed agriculture and associated land degradation has been reported across Sudan including the regions of the present South Sudan.[86] The stress on the land is evidenced by the gradual replacement of *harig* (slash-and-burn) patterns of vegetation with large areas that remain permanently cleared of forest. Fieldwork and satellite image analysis conducted jointly by UNEP and ICRAF in 2006 indicated such a pattern of deforestation and growth in rain-fed agriculture in Yambio, Yei, Wau, Aweil and Bor. In certain areas such as Yei and Yambio counties, population pressure has reduced the fallow period from an estimated average of 20 years to 5 years or less. Such short turnover periods are insufficient for forest regeneration or restoration of soil fertility. In Yambio, cleared agricultural land increased from 6.8% of the UNEP-ICRAF study area to 27.7%, mainly at the expense of closed forest and wooded grasslands, between 1973 and 2006 (Figure 3-14). In Wau, forests have been replaced largely by expanding traditional slash-and-burn agriculture and rangeland and degraded land has appeared in previously forested areas.[87]

Land degradation due to cattle-rearing has also been widely observed in South Sudan. Though it is difficult to distinguish between bare earth caused by overgrazing and bare earth associated with tilled and empty fields for crops, the UNEP-ICRAF fieldwork and analysis estimated that in Renk, Upper Nile State, the proportion of bare and degraded land increased from 0.8% of the total studied area (2,500 km^2) in 1973 to 15.4% in 2006.[88] Some of the abandoned cultivated land has reverted to bushland and could potentially be used for grazing, but it has major access constraints. While land degradation is generally limited to strips alongside watercourses in the southern clay plains, it is severe in the drier south-east. Particularly in the Imatong region in Eastern Equatoria State, where the low valleys receive 25-50% less rainfall than the plains to the north, soil erosion is occurring and bare subsoil is visible.[89] The primary cause of this degradation is overgrazing of pastures that are naturally vulnerable to erosion due to poor soil quality and low rainfall.

[86] UNEP. 2007. *Sudan Post-Conflict Environmental Assessment*. Nairobi: UNEP. pp. 169-171.
[87] UNEP. 2007. *Sudan Post-Conflict Environmental Assessment*. Nairobi: UNEP. p. 208.
[88] UNEP. 2007. *Sudan Post-Conflict Environmental Assessment*. Nairobi: UNEP. p. 180.
[89] UNEP. 2007. *Sudan Post-Conflict Environmental Assessment*. Nairobi: UNEP. p. 182.

Figure 3-14: Deforestation and expansion of rain-fed agriculture in Yambio



Source: UNEP. 2007. *Sudan Post-Conflict Environmental Assessment*. Nairobi: UNEP. p. 171.

These warning signs of land degradation indicate that any expansion of farming areas and increase in cattle numbers would constitute a risk of significant damage to lands which are already worked close to or over their sustainable yield. Agricultural development projects should therefore include land sustainability and, in degraded areas rehabilitation, components to avoid exacerbating the existing problems and creating new problems.

3.4.3 Loss of biodiversity resources

The country has also experienced rapid degradation of biodiversity resources due to the widespread illegal and uncontrolled exploitation of such resources.[90] The public sector is unable to implement conservation measures in an effective manner because of weak collaboration among authorities at the national and state levels to manage and conserve forest resources, and due to the inadequacy of legal frameworks, expertise and resources for communication and transportation. It is urgent that the management of Central Forest Reserves (CFRs) be strengthened to avoid further uncontrolled exploitation of forest resources, and encroachment.

3.4.4 Lack of effective environmental governance[91]

The key environmental issue for agricultural development in South Sudan is the lack of effective governance including legislation, policy, institutions, and implementation framework for environment management. The establishment of environmental assessment, e.g.,

[90] For details about this issue, see Chapter 12 Forestry.

[91] Environmental governance has been severally defined and one adapted by UNEP is: multi-level interactions (i.e., local, national, regional and international) among three main actors, i.e., state, market, and civil society, which interact with one another, whether in formal and informal ways; in formulating and implementing policies in response to environment-related demands and inputs from the society; bound by rules, procedures, processes, and widely-accepted behavior; possessing characteristics of "good governance"; for the purpose of attaining environmentally-sustainable development. (Original source: http://ecogov.blogspot.com/2007/04/definition-of-environmental-governance.html [Accessed 20 October 2013]).

strategic environmental assessment (SEA) and environmental and social impact assessment (ESIA), is also one of the areas that require immediate attention. The lack of effective governance will leave the environment highly vulnerable to unplanned and unmanaged exploitation of resources such as land, forest and fish. The ministries concerned with agricultural development are currently under strong pressure to provide policies and projects that will rapidly increase food security. This may result in a tendency to promote agricultural development projects that will be environmentally unsustainable. Therefore, it is important for the CAMP to incorporate institutional and technical capacity building to improve environmental governance within its framework.

4. Policy and legal framework for agricultural development

The purpose of this chapter is to explain that CAMP supports the existing policy and legal frameworks for agricultural development in South Sudan; and, that CAMP and these frameworks will mutually strengthen each other. To do so, major policies, strategic plans and Acts are discussed in relation to CAMP. Subsequent chapters about more specific topics of CAMP (public financial system, natural conditions and environment, sub-sectors, etc.) will further investigate them.

4.1 South Sudan Development Plan (SSDP)

SSDP 2011-13 was delivered in response to major challenges for development during the first three years of the South Sudan's independence. The following are the overall objective of SSDP and its four core components to achieve that objective.

Box 4-1: Objective of SSDP

Overall Objective

To ensure that by 2014 South Sudan is a united and peaceful new nation, building strong foundations for good governance, economic prosperity and enhanced quality of life for all.

Four Core Components

Improving governance:
Institutional systems including government organizations' accountability, transparency and coordination mechanisms need to be improved. This is especially important when it comes to the issue of redistribution of the oil revenues for development of the nation. Capacity building of government members is necessary to improve the system.

Achieving economic development (particularly rural development) to improve livelihoods and expand employment opportunities:
This requires various measures such as development of transport infrastructure to promote trade; clarification of land issues to enhance utilization of the abundant natural resources of South Sudan; improvement of access to extension, basic farming tools and markets. Also, the regulatory environment needs to be developed and access to finance should be promoted in order to encourage private activities and investment.

Accelerating social and human development:
Universal access to basic social services (education and health care) needs to be improved for social and human development.

Preventing conflict and enhance security:
In order to promote peace building, sovereignty and territorial integrity should be protected through provisions of access to justice and maintenance of laws. At the same time, government institutions need to improve their transparency and accountability.

Source: GRSS. 2011. *SSDP 2011-2013*. Juba: GRSS. (Partially modified by the CAMP Task Team)

CAMP will align with SSDP, and directly covers the first and second components mentioned above. The third and fourth components will be addressed during the implementation of CAMP. For instance, economic development achieved through agricultural development will

promote provision of social services including education and healthcare; increasing opportunities for employment and income will reduce the risks of conflicts such as cattle raids.

4.2 Current agricultural policies and strategic plans

The CAMP process is primarily led by MAFCRD and MARF. Therefore, CAMP must align its framework (including objectives and strategies) with their policies and strategic plans.

MAFCRD's Agriculture Sector Policy Framework (ASPF): 2012-2017 states the ministry's vision, mission and policies as follows.

Box 4-2: Vision and Mission of MAFCRD

Vision of MAFCRD

Food security for all the people of the Republic of South Sudan, enjoying improved quality of life and environment

Mission

To create an enabling environment for the transformation of agriculture from a subsistence system into a modern, socially and economically sustainable system through science-based, market-oriented, competitive and profitable farming while maintaining the natural resources for the benefit of future generations of South Sudanese people.

Key Policies

1) Policies on crops sub-sector:
   Yields of food crops both as nutritional sources and cash crops are targeted to double. R&D and infrastructure development should be encouraged to support this.
2) Policies on agricultural production support services:
   Smallholders, commercial farmers, processors and agribusiness operators need to be supported through extension services and agricultural education training.
3) Policies in support of agricultural markets, value chain development and finance
   Commercial farming and agribusiness requires well-developed agricultural markets for both inputs and produce.
4) Policies on food security and nutrition:
   Food security has been a key issue for South Sudan and it is mentioned in the National Food Security Action Plan (NAFSAP) 2008-2011.
5) Policies on forestry development and management:
   Sustainable development of forest resources needs to be reinforced.
6) Policies on the role of agriculture and forestry for socio-economic change and social justice:
   Young people will be provided with access to training, credit, information technology, etc.
7) Policies on sustainable agriculture, environment and climate change:
   In order to cope with the risks of climate changes, the ministry will support diversification of crops, environmental conservation, etc.
8) Policy coordination and monitoring and evaluation:
   Since agricultural development requires coordination of different central ministries, different tiers of government and other stakeholders at all levels, an Inter-Ministerial Committee will monitor and evaluate the implementation of the ASPF.

Source: MAFCRD/GRSS. 2012. *ASPF 2012-2017*. Juba: GRSS. (Partially modified by the CAMP Task Team)

MARF's Policy Framework and Strategic Plans 2012-2016 states the Vision, Mission and Strategic Goals as follows.

In the formulation of CAMP, the Crop and Forestry subsectors of the CAMP Task Team will largely address MAFCRD's policies, while CAMP's Livestock and Fisheries subsectors will cover the strategic goals of MARF.

Box 4-3: Vision and mission of MARF

Vision

Productive livestock and fisheries sectors contributing 5% annually to improvement in food security, household income, job creation and the national Gross Domestic Product.

Mission

To accelerate socio-economic development of the South Sudanese and enhance the livelihoods and food security of livestock and fisheries producers.

Strategic goals

1) Key national data, legislation, regulations, policies, strategic plans and standards in support of the sustainable development and commercialization of the animal and fisheries resources of the Republic of South Sudan, researched, formulated, endorsed and operational.
2) Service-oriented, professional and accountable Ministry of Animal Resources and Fisheries developed, integrated and effectively collaborating with and building capacity of State MARFs, and providing quality and cost-effective services to the livestock and fishery sectors.
3) Investment opportunities identified and private investment expertise and capital realized for the sustainable development of private and public-private commercial enterprises in the livestock and fishery sectors.
4) An effective national livestock epidemio-surveillance and control system operational and meeting the requirements of the OIE[92] and potential livestock and livestock product export markets.
5) Significant and documented improvements in consumer protection achieved through improvements in the quality of marketed livestock and fisheries products resulting from improved processing infrastructure, hygiene, handling, processing and inspection.

Source: MARF/GRSS. 2012. *Policy Framework and Strategic Plans 2012-2016*. Juba: GRSS. (Partially modified by the CAMP Task Team)

4.3 Agriculture-related policies and strategic plans

CAMP will help meet the objectives of other agriculture-related policies of South Sudan. The following policy and strategic plan documents are waiting to be approved by the Council of Ministers and finally by the National Legislative Assembly.[93]

4.3.1 Land Policy

A major agriculture-related policy is the Draft land policy.

[92] OIE: World Organization for Animal Health

[93] GRSS, MAFCRD and the FARM Project; interviewed by the CAMP Task Team, Juba, June 2013, CAMP Situation Analysis

Box 4-4: Draft land policy

Vision

To provide secure land rights for all South Sudanese.

Policy goal

Strengthening land tenure security for all citizens.

The benefits of promoting tenure security

1) Peace building:
   Conflicts over land rights will be reduced. Those include issues over grazing rights and water-use rights, and competitions over territories between counties and between payams.
2) Economic development:
   Securing property rights facilitates farmers and investors investing in cultivation of their land. This is a key for agricultural development.
3) Unification of the nation

Current issues need to be tackled to improve tenure security

1) Dislocations due to civil war or natural calamities; post-war conflict over land rights (after decades of civil war, social, economic and political disorder deepened the conflicts over land)
2) Weak land administration and management
3) Lack of transparency and accountability
4) Gender bias and discrimination
5) Informal settlements in cities and towns
6) Conflicts over access to land with pasture and water
7) Land-grabbing; the acquisition of land without regard for the interests of existing land rights holders
8) Disagreements regarding boundaries between counties and payams

Source: SSLC. 2011. *Draft Land Policy. Juba: SSLC*. (Partially modified by the CAMP Task Team)

4.3.2 Strategy for cooperative development

CAMP will also take into consideration a strategic plan document with high relevance to agriculture called the National Strategy for Cooperative Development 2012-2015 drafted by MAFCRD. The document mentions that cooperatives have been used globally to achieve community development goals.

4.3.3 Other agriculture related policies and strategies

All the above agriculture related policies and strategic plans were drafted after independence; the following were drafted prior to independence:

- Forestry Policy 2007
- The National Agriculture and Livestock Extension Policy (NALEP)
- Aid Strategy
- Government Capacity Building Strategy
- The Medium-Term Capacity Development Strategy (MTCDS).

4.4 Major legal frameworks

Legal frameworks of South Sudan are based on the Constitution[94] that defines a wide range of matters such as political and economic structure, geographical boundaries, judicial system, regulations for utilization of natural resources including lands and forest, etc. Although descriptions on specific areas of agriculture, particularly the four subsectors of CAMP, are limited, improvement of agricultural productivity is emphasised in the document and food security is mentioned as part of the guiding objective. SSDP discusses agricultural development more and emphasises that South Sudan needs a transparent and supportive regulatory environment for its development. Major acts and laws that align with the four core components of SSDP and their relevance to CAMP are shown in Table 4-1 and Table 4-2. Legal documents are approved through the same process as the agriculture policies and strategic plans, by the Council of Ministers and finally by the National Legislative Assembly.
In addition to the legal framework mentioned above, the Ministry of Legal Affairs and Constitutional Development (MoLACD) and South Sudan Legislative Assembly (SSLA) are in the process of drafting and processing more legal documents.

Table 4-1: Major acts and laws that align with core components of South Sudan Development Plan (SSDP)

Laws and acts	Governance	Economic (rural) Development	Social and Human Development	Peace Building
Land Act		✓		✓
Cooperative Societies Act	✓	✓	✓	
Investment Promotion Act		✓		
Local Government Act	✓			✓
Public Financial Management Act	✓	✓		
Procurement Law	✓	✓		
Audit Act	✓	✓		
Central Bank Act	✓	✓		
Oil Revenue Management Act	✓	✓		

Source: The areas of relevance of the laws and acts were selected by the CAMP Task Team based on:
GRSS. 2011. *South Sudan Development Plan 2011-201*3. Juba: GRSS.
GOSS. 2009. *The Land Act, 2009*. Juba: GOSS.
GOSS. 2009. *The Local Government Act*, 2009. Juba: GOSS.
GOSS. 2009. *The Investment Promotion Act*, 2009. Juba: GOSS.
GOSS. 2011. *The Co-operative Societies Act*, 2011. Juba: GOSS

Table 4-2: Relevance of major legal frameworks to CAMP

Laws and Acts	Relevance
Land Act	Land Act is a key to solving conflicts and tensions over land rights and promoting security. It will also encourage the private sector to invest in development of land. This act should enhance peace and at the same time promote economic development.
Cooperative Societies Act	Since cooperatives can be a key to community development, this act will enhance economic development. Also, cooperatives will facilitate access to capacity development opportunities for rural communities including education, and to financial services such as savings and credit.
Investment Promotion Act	This act will help the nation develop a financial environment to facilitate investment by improving transparency and accountability. SSDP and CAMP require financial capital in their implementation stages. A large proportion of CAMP needs to be financed by investment by both DPs and the private sector in addition to the government.

[94] GOSS. 2011. *The Transitional Constitution of the Republic of South Sudan*, 2011. Juba: GOSS

Laws and Acts	Relevance
Local Government Act	This act defines the roles and responsibilities of customary institutions including their roles in administering community land rights.
Public Financial Management Act, Procurement Law, Audit Act, Central Bank Act	These acts are all related closely to the functions of the government's financial management. The Public Financial Management Act promotes efficient and effective use of limited public resources. Other acts strengthen public financial management.
Oil Revenue Management Act	This act regulates and manages oil revenues through monitoring, auditing and reporting mechanisms. Since well-over 90% of the total national revenue of South Sudan is from oil revenues, this act will help the country redistribute the revenues efficiently for its development.

Source: Elaborated by the CAMP Task Team based on: GRSS. 2011. *SSDP 2011-2013*.

4.5 Observations

While analysing the documents described above, especially MAFCRD and MARF's, the CAMP Task Team found that government policies and strategic plans, and processes can be improved further. Policies were sometimes formulated in a short time with minimal resources. The government was not fully involved in the development process of policies and strategic plans. As mentioned later in Chapter 9, various development partners and implementing organizations found challenges in cooperating with the government. Therefore government involvement was minimized in previous interventions. The government gained no expertise in managing budgets and executing projects, nor in using its own financial system; nor was the capacity of its staff in performing these activities improved. Based on these experiences, the CAMP formulation process is designed so it is led and owned by the government.

This will lead to creating good governance that is emphasised in SSDP. It is also very important for all phases of CAMP; it requires ownership by both central and local governments plus capacity development of government officers at all levels. These officers need to cooperate with various actors not only at the central and state levels but also at county, payam, boma and community levels. The government will also need to coordinate various DPs that will be involved in the implementation of CAMP. The government needs to distribute and audit financial capital efficiently and effectively in order to maximize agricultural productivity. Additionally, government institutions will have to tackle numerous challenges such as potential armed conflicts and limited regulatory frameworks. In order for the government to fulfil those numerous roles, CAMP will identify the areas of capacity that need to be enhanced and design institutional development strategies.

The Draft Land Policy and Land Act are keys for economic development in South Sudan and will be supported by CAMP. Based on analysis conducted by the CAMP Task Team, land issues are a hindrance to agricultural development in South Sudan. Various agricultural activities including irrigation and cultivation need clarity of land property rights. However, property rights and property owners are not always clearly defined, especially in rural areas; legal procedures on how to settle disputes over land property issues are also vague. As a result, violations of land rights and conflicts over land have hindered various development efforts. The government authority to utilize natural resources over certain lands is also undermined. The probability of conflict will increase when the government tries to implement agricultural development plans. Therefore, the successful implementation of CAMP requires the resolution of land issues.

Cooperatives can be an effective tool for agricultural development as mentioned above. They can facilitate financial services such as savings and credits which would help the

government redistribute financial capital for rural development. Such potential will be analysed further in the CAMP formulation process.

5. Institutional framework for agricultural development

5.1 Public sector organisations

The roles of public sector organizations will be a critical factor when CAMP is implemented. It is important to understand how national and state ministries function and their relationships with lower levels of government, such as counties, payams and bomas.

CAMP focuses on 4 subsectors; crop, forestry, livestock and fisheries. The Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD), Ministry of Animal Resources and Fisheries (MARF) and Ministry of Water Resources and Irrigation (MWRI) will manage the CAMP implementation process while the lower levels of government will be the actual implementers.

In this section, the institutional framework of the public sector is described; this needs to be understood both to know how government works and to propose realistic implementation mechanisms.

5.1.1 National government

The Comprehensive Peace Agreement (CPA), 2005 was a significant milestone for the current Government of South Sudan. After the CPA, the autonomous Government of Southern Sudan (GOSS) was established. On 9 July 2011, Southern Sudan became independent and a national government was formed with 10 state governments.

After the CPA, ministries were created, including the Ministry of Agriculture and Forestry (MAF), Ministry of Cooperatives and Rural Development (MCRD), Ministry of Animal Resources and Fisheries (MARF), and Ministry of Water Resources and Irrigation (MWRI).

The functions of GOSS were restricted in terms of allocation of human resources, policy planning and implementation, and budget.

The Interim Constitution of Southern Sudan, 2005[95], which was revised in 2011 as the Transitional Constitution of the Republic of South Sudan, 2011, defined the original functions and mandates of the ministries. Additionally, a Presidential[96] Decree in July 2008 further defined the functions of the ministries.

Table 5-1 lists the ministries found in the South Sudan Development Plan 2011-2013 (SSDP). As of 30 June 2013, there were 28 ministries.

Table 5-1: Ministries in SSDP

GRSS Ministries
• Cabinet Affairs
• Labour and Public Service
• Human Resource Development
• Parliamentary Affairs
• Regional Cooperation
• Finance and Economic Planning
• **Agriculture and Forestry**
• **Animal Resources and Fisheries**

[95] The function of MAF was defined in Chapter IV, Interim Constitution of Southern Sudan, 2005

[96] This is the President of Southern or South Sudan.

GRSS Ministries
• **Cooperatives and Rural Development**
• Wildlife Conservation and Tourism
• Environment
• Housing and Physical Planning
• Transport and Roads
• **Water Resources and Irrigation**
• Commerce and Industry
• Energy and Mining
• Information and Broadcasting
• Investment
• Telecommunication and Postal Services
• Health
• Education
• Higher Education, Research, Science and Technology
• Gender, Child and Social Welfare
• Culture and Heritage
• Youth, Sport and Recreation
• Humanitarian Affairs and Disaster Management
• Legal Affairs and Constitutional Development
• Internal Affairs
• Peace Building and CPA Implementation

Source: South Sudan Development Plan 2011-2013
Note: Ministry of Cooperatives and Rural Development merged into Ministry of Agriculture and Forestry and became Ministry of Agriculture, Forestry, Cooperatives and Rural Development.

5.1.2 Lead ministries

The CAMP is a government-led initiative and there are three lead ministries involved in this process, which are listed below.

5.1.2.1 MAFCRD

In 2011, the Ministry of Cooperatives and Rural Development (MCRD) was merged with the Ministry of Agriculture and Forestry (MAF), and became the Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD). As of June 30, 2013, MAFCRD had 7 directorates as shown in Table 5-2, but it is still in the process of restructuring.

Table 5-2: Organization of Ministry of Agriculture, Forestry, Cooperatives and Rural Development

Minister
Deputy Minister
Undersecretaries (2)
Directorate of Agriculture and Extension Services
Directorate of Forestry
Directorate of Cooperatives
Directorate of Finance and Administration
Directorate of Planning and Agricultural Economics
Directorate of Rural Development
Directorate of Research and Training

Source: Agriculture Sector Policy Framework (ASPF): 2012-2017. P.10

MAFCRD has broad functions including developing policies and legislation, setting up the necessary standards for agriculture and forestry as well as the promotion and regulation of cooperatives and coordinating various activities which contribute to poverty alleviation and promoting food security. In addition, coordination between national and state governments is important; MAFCRD is to support the state governments as they implement policy.

5.1.2.2 MARF

MARF remains as a single ministry which deals with the fields of animal resources and fisheries. MARF has 9 directorates as shown in Table 5-3, and it is also in the process of restructuring.

Table 5-3: Organization of Ministry of Animal Resources and Fisheries

Minister
Deputy minister
Undersecretary
Directorate of Planning, Statistics and Documentation
Directorate of States and Special Projects Coordination
Directorate of Administration, Finance and Human Resources Development
Directorate of Investment, Marketing and Supplies
Directorate of Animal Production and Range Management
Directorate of Fisheries and Aquaculture Development
Directorate of Veterinary Services
Directorate of Livestock and Fisheries Extension
Directorate of Animal and Fisheries Research and Development

Source: MARF Policy Framework and Strategic Plan 2012–2016, p3, p5.and MARF information.

According to the MARF Policy Framework and Strategic Plan 2012-2016, the functions of MARF include the formulation of legislation, regulations, policies and standards for the development of animal resources and fisheries; development of policy guidance; monitoring/documenting the performance of the livestock and fisheries sectors; provide technical advice on animal health and disease control policies and the development and implementation of plans to improve livestock health and production; monitoring and investigation of the prevalence, spread and impact of animal diseases; promotion of improved fishing, fish handling and fish processing technologies to improve the quality and quantity of fish catches; ensuring the sustainability of the fisheries sector through the development and enforcement of policies and regulations governing the exploitation of fish stocks; and promotion and development of aquaculture fish production.

5.1.2.3 MWRI

MWRI has the regulatory mandate for urban water provision and rural water facilities as well as controlling water resources development, conservation and management. MWRI has 6 directorates as shown in Table 5-4. It has broad functions such as developing policies, strategies, frameworks, guidelines and standards. Also MWRI plays an important role in coordinating various stakeholders such as state, donors and other ministries. In all, MWRI ensures development and management of water resources, and provision as well as sustainability of water and sanitation services.

Table 5-4: Organization of Ministry of Water Resources and Irrigation

Minister
Deputy minister
Undersecretary
Administration and Finance
Planning and Programming
Water Resource Management
Irrigation and Drainage
Rural Water Supply and Sanitation
Hydrology and Survey

Source: MWRI, Water, Sanitation & Hygiene (WASH) Strategic Framework, June 2011, p. 38.

5.1.3 State and local governments

Local government ceased in the southern part of Sudan in 1983 on the outbreak of the second civil war. The majority of skilled human resources joined the SPLA, became refugees or were internally displaced. Sudan became a federal state in 1992, when a three-tier system of government was created (the federal government, states, and local communities)[97]. A five-tier decentralized system (national, state, county, payam and boma) was established by the SPLM's National Convention of New Sudan in 1994 in Chukudum, with special emphasis on the formal separation of civil and military powers. This five-tier system is unique to South Sudan and was introduced all over Southern Sudan in 2005. The county, payam and boma levels are considered as local government and the boma is the lowest level. It is the domain of traditional authority, with the boma chief holding the position of Boma Administrator. The Local Government Act, 2009 articulates this decentralization of authority and power.

After CPA in 2005 and before independence, state level services were provided by the former garrison towns of Southern Sudan as these towns had the capacity to do so. Hence, this system was only found in Central Equatoria, Western Bahr el Ghazal, Northern Bahr el Ghazal, Upper Nile and Unity. However, other states (the former SPLM/A liberated areas) did not have this capacity and were mainly supported by NGOs and United Nations agencies.

The Republic of South Sudan consists of ten states which were formerly the provinces of Equatoria (Central Equatoria, Eastern Equatoria, and Western Equatoria); Bahr el Ghazal (Northern Bahr el Ghazal, Western Bahr el Ghazal, Lakes, and Warrap); and Upper Nile (Jonglei, Unity, and Upper Nile)[98].

5.1.4 Objectives of Local Government

The objectives of local government are clearly stated in the Local Government Act 2009, as are the principles of local governance.

Box 5-1: Objectives of local government

The objectives of the Local Government shall be to: (1) promote self governance and enhance the participation of people and communities in maintaining law and order and promoting democratic, transparent and accountable local government; (2) establish the local government institutions as close as possible to the people;

[97] World Bank, Country Economic Memorandum, 2003, p63

[98] http://www.goss.org/

(3) encourage the involvement of communities and community based organizations in local governance and promote dialogue among them on matters of local interest;
(4) promote and facilitate civic education;
(5) promote social and economic development;
(6) promote self-reliance amongst the people through mobilization of local resources to ensure the provision of services to communities in a sustainable manner;
(7) promote peace, reconciliation and peaceful co-existence among the various communities;
(8) ensure gender mainstreaming in local government;
(9) acknowledge and incorporate the role of traditional authorities and customary law in the local government system;
(10) consult and involve communities in decision making relating to the exploitation of natural resources in their areas;
(11) create and promote safe and healthy environment; and
(12) encourage and support women and youth activities and the training of local cadres.

GOSS. 2009. *The Local Government Act*. Juba: GOSS.

Box 5-2: Principles of local governance

The following principles of local governance shall be the basis for decentralization and democratisation of the Local Government Authority system in Southern Sudan:

(1) Principle of subsidiarity, where decisions and functions shall be delegated to the lowest competent level of Government;
(2) Self governance and democracy;
(3) Participation of all citizens in the exercise of their rights to express their opinions in the process of decision making in public affairs;
(4) Rule of law, maintain law and order and its enforcement in a fair and impartial manner while respecting and honouring the norms, virtues and values of the society;
(5) Transparency, to build mutual trust between government and citizens through the provision of information and guaranteed access to information;
(6) Equity, to provide an equitable distribution of resources throughout the Local Government Council;
(7) Equality, to provide equal services and opportunities for all members of the local community with the aim of improving their welfare;
(8) Responsiveness, to increase the sensitivity of the employees of government and non-governmental organisations to the aspirations of the people in service delivery and meeting public demands;
(9) Accountability, to ensure accountability of decision-makers to the people in all matters of public interest; and
(10) Efficiency and effectiveness, to ensure good public service delivery through optimum and responsible use of resources.

GOSS. 2009. *The Local Government Act*. Juba: GOSS

5.1.5 Functions of local government

The Interim Constitution of Southern Sudan stated that the state governments had the authority to deliver various public services such as education, health, public works, water, agricultural extension services and security services. Therefore, state governments had the responsibility to plan and programme the establishment, development, construction and maintenance of schools, hospitals, water supply plants, inter-county road networks, agricultural training centres etc., and sustain them. However, under the Local Government Act 2009 it is the local governments that should now deliver these services.

Table 5-5 shows the different levels of government and their functions as envisaged by the Local Government Framework for Southern Sudan 2006 and the Local Government Act

2009. However the Local Government Act 2009 has not been fully implemented due to financial and capacity issues and reality is somewhat different.

Table 5-5: Levels of government and their functions

Level	Description	Functions
National		• Policy development • National coordination of policy • implementation • Prioritization and planning • Resource mobilization • Monitoring and Evaluation • Technical support and backstopping • Capacity building
State	Actual: • 10 states with number of ministries	• Functional policy development • Policy implementation • Legislation • Regulation • coordination • Monitoring and evaluation of policy implementation
County	Actual: • 79 counties in 10 states Envisaged: • 70,000-100,000 people in county	• Service delivery planning • Programming and implementation
Payam	Actual: • Each county has 4-7 payams • 302 payams in total Envisaged: • 3-4 payams in a county	• Service delivery • Programme implementation
Boma	Actual: • Each payam has 6-7 bomas • Boma has 3-5000 people Envisaged: • 3-4 bomas in a payam • Boma has 5,000-10,000 people	• Service delivery • Programme implementation (neither functioning)

Note: Actual data is from the CAMP situation analysis. Envisaged is from Government of Southern Sudan. 2006. *The Local Government Framework for Southern Sudan*. Juba: GoSS.

5.1.6 Coordination among lead ministries

In order to develop feasible policies, the ministries need to develop strong institutional relationships at the national level. There are a number of working groups where ministries can discuss issues of mutual interest such as the Policy Working Group, Food Security Working Group, Budget Working Group, and Natural Resources Sector Working Group. CAMP promotes coordination and planning between MAFCRD, MARF and MWRI using technical committees and stakeholder meetings.

5.1.7 Coordination between levels of government

From policy making to its implementation, South Sudan faces many difficulties since the functions of ministries at the national level do not always align with those of the state. The reason for this is that the authority to set up ministries is given to each state government who may choose to divide responsibilities differently. This situation often causes confusion about the chain of command and misallocation or non-allocation of block grants from national

ministries to state ministries for their budgets. Table 5-6 shows the various different state ministries established.

Table 5-6: National and state ministries for different subsectors

		Crop	Forestry	Cooperatives	Rural Development	Livestock	Fishery	Irrigation
	National Ministry	**MAFCRD**				**MARF**		**MWRI**
State Ministry	Central Equatoria	MAF		MCRD		MARF		MPI
	Eastern Equatoria	MAFCRD				MARF		MPIPU
	Western Equatoria	MACE						MPI
	Jonglei	MAF		n/a		MLF		MPI
	Lakes	MAF		MCRD		MARF		MPI
	Upper Nile	MAF		n/a		MARF		MPI
	Unity	MAFCRD				MARF		MPI
	Warrup	MAF		MCRD		MARF		MCRD
	NBG	MAF		MWRRDC		MARF		MWRRDC
	WBG	MAFI				MARF		MAFI

MAFCRD: Ministry of Agriculture, Forestry, Cooperatives and Rural Development
MARF: Ministry of Animal Resources and Fisheries
MWRI: Ministry of Water Resources and Fisheries
MAF: Ministry of Agriculture and Forestry
MCRD: Ministry of Cooperatives and Rural Development
MPIPU: Ministry of Physical Infrastructure and Public Utilities
MPI: Ministry of Phsical Infrastructure
MRDI:Ministry of Rural Development and Irrigation
MWRRDC: Ministry of Water Resources, Rural Development and Cooperatives
MACE: Ministry of Agriculture, Cooperatives and Environment
MAFI:Ministry of Agriculture, Forestry and Irrigation
MLF: Ministry of Livestock and Fisheries
MPIRD: Ministry of Physical Infrastructure and Rural Development
Source: Interviews with state officers

Table 5-5 shows the functions of the various levels of government but reality is different. Some of the reasons are:

(i) Due to the austerity budget, there is no budget available for policy implementation.
(ii) Resources are not provided in a timely manner.
(iii) Operations at the county level face even more difficulties and the situation at payam and boma level is worse.
(iv) Communication between the different levels of government is not well established.
(v) Purposes of the policies are not fully shared and understood.

5.2 Public sector capacity

The CAMP Task Team carried out a capacity assessment of the main agriculture sector public institutions, namely the national government ministries and the state ministries and county offices.

5.2.1 National government

The CAMP Task Team conducted a rapid organizational scan of the Ministry of Agriculture, Forestry, Tourism, Animal Resources, Fisheries, Cooperatives and Rural Development

(MAFTARFCRD). The IDMP Task Team has gathered similar capacity information for the Ministry of Electricity, Dams, Irrigation and Water Resources. It should be noted that at the time the CAMP Institutional Development Subsector Team conducted the organizational scan, MAFTARFCRD was in the process of re-structuring and incorporating several former ministries.

5.2.1.1 Physical resources at national government

The main MAFTARFCRD office building is located in the government ministries complex in Juba with the Animal Resources and Fisheries Sector (AR&F) located in Gudele on the outskirts of Juba at the former Ministry of Animal Resources and Fisheries site and the forestry sector at the former Ministry of Electricity and Dams site in the Balu area of Juba. The buildings are of moderate to good construction and condition with the main buildings being permanent; the AR&F Sector also has some pre-fabricated temporary buildings. With the exception of the building housing the forestry sector which is privately owned and rented by the government, the rest of the buildings are owned by GRSS. The Ministry also operates several research and training centres in the states. These facilities are described in subsector specific chapters of this report.

Both Task Team observations and interview results show that office space in the main MAFTARFCRD building and for the forestry sector is not adequate to properly house all officers in a good working environment. Most officers felt the space allocation in the animal resources and fisheries sector was sufficient. Office furniture, e.g., desks, chairs and cabinets, are mostly in poor condition and of poor quality; due to some being damaged and not replaced, there is insufficient furniture for all officers in the main building to function well in their work. The same is found at the forestry sector. At AR&F some units, e.g., planning, have adequate office furniture, whereas other units do not. In all sectors, much of the office equipment, such as photocopiers, computers, printers and scanners, are of good quality but not all are functioning and should be repaired. The Task Team was told that there were no funds available for their operation and maintenance. The quantity of office equipment is insufficient for the number of staff. Internet is available, but not connected to all offices, e.g., the forestry sector, nor is it always reliable. Electricity is provided by generators which usually operate for seven hours per day but depends on fuel availability. Water is supplied by privately-owned tanker trucks. Toilets are inadequate for the number of staff as several have been closed due to lack of funds to repair them.

The Ministry has a transportation policy that officers of grades 1-5 are entitled to have a vehicle and driver to transport them between home and work, as well as for work-related transportation. For grades 7 and lower, a bus should provide a similar service. However the bus has been broken-down for a number of months and there is no maintenance or repair funds available. The exception appears to be the forestry sector where the Task Team was told that each department has a vehicle, with a small maintenance budget, strictly for work purposes. There is no standard fleet management system operating at the Ministry.

5.2.1.2 Organizational resources at national government

The former ministries each had vision, mission and goals statements which appeared in their policy documents. The statements are not displayed in a prominent place, such as the main entrance to the ministries, for the employees and public to see. The officers interviewed by the Task Team knew that such statements existed but could not recall what they were. While the strategic plans and departmental work plans exist, due to austerity measures and the resulting lack of funding, little implementation is taking place. MAFTARFCRD is in the process of developing a new organizational structure and organogram. Both MAFCRD and MARF established monitoring and evaluation units within their planning directorates and some staff were trained in M&E. Again, due to lack of funds, the units are not active.

Management at MAFTARFCRD is hierarchical with officers receiving their orders from their immediate supervisor, who has received them from above. Little individual initiative is encouraged by the management system in place. Data management is basic with hard and soft copies being stored within departments and some also placed in the library at MAFTARFCRD. Interviewees said staff turnover was “moderate”.

The staff recruitment procedure involves job advertisement, board interviews, and confirmation by the Ministry of Labour, Public Service and Human Resources Development (MLPSHRD). However, interviewees mentioned that some new staff are hired based on personal recommendations, i.e., political appointments, sometimes without advertising the vacancy. Job descriptions are available for some but not all positions. The Ministry is in the process of reviewing current and developing new job descriptions. There is an ongoing civil service reform programme within GRSS, headed by MLPSHRD. They have developed a new staff performance appraisal system and trained various ministry managers on its use. MAFTARFCRD has yet to implement the system. Due largely to the austerity measures and the coming implementation of the civil service reform programme, promotion within the Ministry does not reflect a consistent system. In the past progression to a higher grade was nearly automatic after a few years of good performance; board interviews were used, similar to the recruitment process. Currently, an individual can make their case to their manager who may make a recommendation to the undersecretary. It appears there has been little promotion of officers in the past few years. The Task Team was told that, in some cases, individuals have been promoted based on political influence rather than qualifications or performance.

Within the hierarchical setting, communication is taking place through circulars and memos from the top down, announcements being made during Monday prayer meetings, addresses by the undersecretary and periodic directorate or department meetings. More informally, face-to-face discussions are common amongst staff and with supervisors. Although direct service to the public, e.g., farmers, is mainly taking place at the state, county and payam levels, service to the public by national ministry officers takes several forms. Common activities are: information broadcast via the media, participation in field activities with state officers, conducting training events, conducting community meetings, and receiving the public in the officer’s office. However, several interviewees mentioned that these activities have been limited by lack of funds to carry them out. Many such activities are funded through donor projects or NGOs.

Table 5-7 and Table 5-8 provide an indication of the human resources and their level of education available to the new Ministry of Agriculture, Forestry, Tourism, Animal Resources, Fisheries, Cooperatives and Rural Development. Complete information was not available due to the on-going restructuring and reorganization.

Table 5-7 shows the number of staff and officers employed by the former MAFCRD in 2012. MAFTARFCRD was unable to provide the number of current vacancies at the new Ministry.

Table 5-7: Human resources at the former MAFCRD in 2012

Directorate	Classified	Unclassified	Total
Minister’s Office	7	9	16
Administration and Finance	60	23	83
Agriculture Headquarters	38	103	141
- Department of Plant Protection	14	-	14
- Department of Agriculture Engineering	21	-	21
- Department of Post-harvest and Home Economics	11	-	11
- Department of Horticulture	12	-	12
Forestry Headquarters	60	15	75
Planning and Programming	28	10	38

Directorate	Classified	Unclassified	Total
Research, Training and Extension Headquarters	32	9	41
- Paotaka Centre	3	25	28
- Yei Research Basic Seed Centre	4	25	29
- Halima Research Basic Seed Centre	3	22	25
- Yei Crop Centre	-	23	23
- Kagelu Forest Training Centre	16	23	39
- ATTC Yambio	15	21	36
- Department of Training	19	-	19
- Department of Extension	18	-	18
Totals	361	308	669

Source: MAFTARFCRD

Table 5-8 provides an example of qualifications of officers within the largest directorate in the former MAFCRD – the Directorate of Cooperatives and Rural Development, in 2012.

Table 5-8: Education level of officers at the Directorate of Cooperatives and Rural Development at MAFCRD in 2012

Directorate	PhD	MSc	Post-Grad	Bachelor	Diploma	SSC	Other	Total
Cooperatives and Rural Development Male = 63 Female = 43	0	7	1	22	31	43	2	106

Source: MAFTARFCRD

5.2.1.3 Human resources development at national government

This section of the report deals with the in-service human resources development (HRD) situation at the national level. For a discussion of pre-service education and training available to potential ministry employees see subsection 4.4 - Education and Training.

MAFTARFCRD has a training department which is responsible for conducting training needs assessments, coordinating training, setting the annual training budget, and following-up, monitoring and evaluating training that has taken place. With a limited budget, it is not considered to be very effective by the officers interviewed. Interviewees were not clear on whether or not there was a formal orientation programme for new staff. It was said that new employees are introduced to the various directorates and departments over a two week period, but then are left on their own to become familiar with the Ministry and where they fit within it. Most training and professional development activities, participated in by ministry officers, are sponsored by a donor country as a consequence of a bilateral relationship, or by an NGO. Government sponsored HRD is limited due to a shortage of funds.

5.2.2 State ministries and county offices

The CAMP Task Team visited all 10 states plus 20 counties, which were located close to the capitals of each state, to survey physical, organizational and human resources development capacities. The objectives of the visits to state ministries and county offices were to measure their capacity to carry out their work as public service providers and to determine their potential capacities to implement the Comprehensive Agriculture Master Plan in the future.

5.2.2.1 Physical resources at state ministries and county offices

The condition of the physical resources is more or less similar between states. The team focused on facilities and equipment used for regular work activities, such as office buildings, space allocation, utilities, office furniture and office equipment. Basic office furniture, e.g., desks, chairs and cabinets, was found to be allocated to the majority of government officers, but officer equipment, such as computers and printers, is only allocated to a few high ranking

officers, e.g., the Ministers, Director Generals and some Directors. As an overall observation of the 20 counties the CAMP Task Team visited, counties in the Equatoria states are better equipped in terms of offices and office facilities. These counties had their own office buildings, whereas in other states, there are counties that do not have offices at all. In some of the states and counties, e.g., Lakes State, the office buildings were constructed and equipped by donor-funded projects.

Transportation is an issue in all states. Most state ministries have at least three vehicles for the Ministers and DGs use and are not usually available for ministry officers to use. Some of the vehicles are broken down and cannot be repaired due to a lack of budget for parts. Lack of electricity is another debilitating factor. The austerity budget had a significant impact on operating generators at all state ministries. The usual duration of generator operation is three hours per day, which means a large part of the officers' work is done without electricity or not at all (Table 5-9). This lack of electricity reduces the efficiency and effectiveness of their regular work. In some cases, while the generator is not operating, the officers gather outside the office building, under trees or other shade. Over-sized generators were operating in some state ministries, leading to reduced fuel efficiency.

Table 5-9: Electricity supply time by state ministry

State	Ministry	Electricity Supply Period/Day
Central Equatoria	MAF	Less than 4-5 hours
	MARF	Less than 4-5 hours
Eastern Equatoria	MAFCRD	Less than 3 hours
	MARF	Less than 3 hours
Western Equatoria	MACE	Less than 3 hours
Jonglei	MAFCRD	Less than 4 hours
	MARF	Less than 4 hours
Lakes	MAF	Less than 2 hours
	MARF	Less than 2 hours
Upper Nile	MAERD	Less than 4 hours
	MARF	Less than 4 hours
Unity	MAFCRD	Less than 2 hours
	MARF	Less than 2 hours
Warrap	MAF	Less than 2 hours
	MARF	Less than 2 hours
Northern Bahr el Ghazal	MAF	Less than 4 hours
	MARF	Less than 4 hours
Western Bahr el Ghazal	MAFI	Less than 4 hours
	MARF	Less than 4 hours

Source: interviews with officers in each state ministry

Table 5-10 summarises the results of the capacity assessment of physical resources at the state level. All states have difficulties acquiring office infrastructure such as office buildings and equipment. In most states laboratories, demonstration farms, veterinary offices all lack infrastructure, equipment and consumables, as well as qualified staff. Technical equipment such as tractors and ox ploughs lack spare parts and maintenance. Transportation is a critical issue both for attending to daily work and monitoring and evaluation activities in the field. Since office furniture and equipment is not provided to all officers, knowledge products, statistical information and administrative documents are not adequately stored, retrieved or managed at state ministries and county offices.

Table 5-10: Challenges of physical resources by state

State	Challenges
Central Equatoria	• Lack of office equipment such as computers and printers. • Lack of transportation for daily commuting of officers.
Eastern Equatoria	• Lack of infrastructure (office building and equipment). • Luck of transportation for daily commuting of officers.
Western Equatoria	• Lack of infrastructure (office building and equipment). • Luck of transportation for daily commuting of officers and facilitation of existing projects
Jonglei	• Lack of infrastructure (office building and equipment). • Lack of transportation for daily commuting of officers.
Lakes	• Lack of county office buildings (4 counties). • Inadequate skilled staff in counties due to the lack of training opportunities. • Lack of equipment. • Lack of transportation which causes difficulties in commuting of officers, and facilitation of the work in the state/counties/payams. • Although some agricultural equipment is delivered by the national ministries, there is no plan of supplying spare parts and distributors.
Upper Nile	• Lack of infrastructure (office building and equipment). • Lack of transport to facilitate supervision of projects. • Lack of spare parts for vehicles and agricultural machinery such as tractors.
Unity	• Lack of infrastructure (office building and equipment). • Lack of transportation for daily commuting of officers.
Warrap	• The ministries have their own buildings but office space is limited. • Lack of office tools such as computers, printers and photocopiers. • Lack of transportation for daily commuting of officers. • Lack of office space in counties.
Northern Bahr el Ghazal	• MARF does not have a ministry building. • MARF has only one computer donated by GIZ, and MAF has eight computers in total. • MAF has an office block with a limited capacity to accommodate all its staffs. • Very limited office space at the state and county levels. • Limited transport capacity which may affect facilitation of projects, e.g., there is only one car used by DG of MAF. • Lack of laboratories and cold storage. • Counties visited do not have office space. One is provided by a NGO.
Western Bahr el Ghazal	• Various types of tractors provided by the national ministry, which lead to high cost for maintenance. For example, six out of seven Mahindra tractors are not functioning since such tractors are not suitable for the type of soil predominant in the state. • Lack of spare parts is a serious challenge. • Lack of office space except Raja County. • Lack of transportation for daily commuting of officers, e.g., only two out of six vehicles are working.

Source: Interviews with state officers

As shown in Table 5-11, few of the county offices have an appropriate amount of offices, desks, chairs, transportation and utilities. Regarding access to a sufficient amount of electricity, during the Task Team's visits there was not one county office observed to have electricity. Lack of electricity is also causing communication problems between state ministries and county officers, a mobile phone being the only communication tool. To overcome the difficulty of exchanging information, states and counties schedule regular face-to-face meetings.

Table 5-11: Physical resource confirmed from 20 counties visited

State	County	Physical Capacity
Central Equatoria		
	Juba	Office, desks, chairs, few computers, no regular electricity, a few vehicles
	Yei	Office, desks, chairs, few computers, no regular electricity, motorbike
Eastern Equatoria		
	Torit	Office, desks, chairs, few computers, no regular electricity, no transport for activities
Western Equatoria		
	Nzara	No office, desks, chairs, no regular electricity, bicycles
Jonglei		
	Bor South	Office, desks, chairs, no regular electricity
	Twic East	No office, no vehicle
Lakes		
	Rumbek Center	Office, desks, chairs, no regular electricity, no vehicle
	Rumbek East	No office, no vehicle
Upper Nile		
	Malakal	Office, desks, chairs, few computers, no regular electricity, one vehicle
	Panyikang	No office, one desk and chair, no vehicle
	Baliet	No office, one desk and chair, one computer, no regular electricity, no vehicle
	Akoka	No office, one desk and chair, no regular electricity, no vehicle
Unity		
	Koch	No office, no vehicle
	Leer	No office, no vehicle
Warrap		
	Twic	No office, no vehicle
	Gogrial West	No office, no vehicle
Northern Bahr el Ghazal		
	Aweil South	No office, no vehicle
	Aweil Center	No office, no vehicle
Western Bahr el Ghazal		
	Jur River	No office, vehicle
	Wau	No office, no vehicle

Source: Interviews with state officers in each ministries and observations

5.2.2.2 Organizational resources at state ministries and county offices

Austerity measures at the national and state levels have affected organizational activities at the county level. Even if the state approves an operating budget for a county, often not all the amount is distributed. Hence, activities at the county level are reduced or postponed to the following year. County officers stressed that if this situation continues, it could lead to a decline of yields of agricultural and livestock products. Similarly, policy interventions are inefficient. If this is repeated over the whole country, there could be a negative impact on the volume of crop and animal production.

It is not clear if the current situation of the lack of physical resources, as described in subsection 5.2.2.1 above, is due to the national austerity measures. The purchase of new equipment was suspended at the majority of state ministries since operating budgets were cut or decreased in their 2012/2013 budget. However, it appears that even before the austerity measures were introduced, the state ministries did not plan to upgrade their physical resources. A reason given was that the state Ministry of Finance and Economic

Planning approves budget items that have already been purchased (for example, chairs) but is less likely to approve items not previously asked for (so called 'repeat budgeting'). Even oil producing states, which receive 2% of the revenues from oil, have not upgraded their physical resources. While some revenue is generated through the renting of, for example, tractors, to farmers for ploughing, the income is typically delivered to the state Ministry of Finance and does not usually or directly assist in the operation and maintenance of the equipment. Several states have taken to seconding staff to NGOs as a means of reducing salary costs, thus further weakening government service provision. Some states have limited awareness of standard financial management practices with neither detailed annual plans to execute the budget or to account or report. There are weak procurement procedures and audits are rare.

The state ministries do not have adequate staff. The CAMP Task Team confirmed that most posts are occupied by officers sitting at the state headquarters. There are not enough officers assigned at the county level due to the inadequate number of officers as a whole. For example, the Ministry of Agriculture and Forestry, Central Equatoria State, has a total of 131 officers (Table 5-12). Of these only 42 officers are dispatched to 6 counties. This means roughly 7 officers are allocated to one county. Table 5-13 shows how many payams are in each county and the number of officers allocated to each county in the agriculture and forestry sectors. One of the officers in each county is the assistant commissioner, and the other officers look after the activities of the county and the payams they are responsible to. For example, in Terekeka County, one officer covers three payams, which is a challenge for him. Due to transportation issues, some state ministry officers do not come to their office or come late. There are other officers on the payroll who have either resigned or retired (ghost workers) who are still collecting their salaries.

Table 5-12: Distribution of officers in State Ministry of Agriculture and Forestry, Central Equatoria State

Directorate/Department	No. of Officers
Plant Protection	4
Mechanization	5
Horticulture	4
Planning and Statistics	16
Extension	22
Administration	9
Administration and Finance	22
Total HQ (Juba)	**89**
Dispatched to Six Counties	**42**
Total	**131**

Source: Strategic Plan for the Year 2012-2014, State Ministry of Agriculture and Forestry, CES

Table 5-13: Distribution of officers to counties in State Ministry of Agriculture and Forestry, Central Equatoria State

County	No of officers	Payams
Lainya	4	5
Morobo	6	5
Yei	6	5
Terekeka	5	10
Kajokeji	8	5
Juba	13	16
Total	**42**	**46**

Source: Strategic Plan for the Year 2012-2014, State Ministry of Agriculture and Forestry, CES

The same situation is observed in the livestock and fisheries sectors. As shown in Table 5-14, the number of officers dispatched to the counties is less than for the state MAF. This means these officers are expected to look after more payams with a smaller number of officers. In addition, some counties, such as Kajokeji have only assistant commissioners whose job descriptions are different from other officers. Kajokeji has no officers to perform on-the-ground activities. Terekeka is considered as a county with high potential for animal production but there is no officer assigned as livestock officer or veterinary assistant.

Table 5-14: Distribution of officers to counties in State Ministry of Animal Resources and Fisheries, Central Equatoria State

County	No of officers	Payams
Lainya	3(2)	5
Morobo	2(1)	5
Yei	2(1)	5
Terekeka	4(2)	10
Kajokeji	2(2)	5
Juba	15(2)	16
Total	**42**	**46**

Note: the number in bracket is the number of commissioners
Source: Strategic Plan for the Year 2012-2014, State Ministry of Animal Resources and Fisheries, CES

The distribution of officers assigned to counties in Lakes State is similar. Table 5-15 shows that there are 136 officers, but that only 70 are dispatched to the six counties. Counties near the state capital, Rumbek receive a relatively large number of officers with various educational backgrounds, but counties located far from the capital have fewer officers (Table 5-16).

Table 5-15: An example of officers' distribution in State Ministry of Animal Resources and Fisheries, Lakes

Directorate/Department	No. of Officers
Finance, Planning & Administration	32
Animal Production	21
Fisheries	13
Extension	N/A
Total HQ (Rumbek)	**66**
Dispatched to Six Counties	**70**
Total	**136**

Source: Strategic Plan for the Year 2012-2014, State Ministry of Agriculture and Forestry, CES

Table 5-16: Distribution of officers to counties in State MARF, Lakes

County	No of officer	Payams
Rumbek Centre	13	5
Rumbek East	12	7
Wulu	8	4
Yirol West	6	7
Awerial	3	8
Yiron East	7	6
Rumbek North	10	6
Cueibet	11	6
Total	**70**	**47**

Source: Strategic Plan for the Year 2012-2014, State Ministry of Agriculture and Forestry, CES

Interviews with officers of MAFCRD in Upper Nile, Western Bahr el Ghazal and Lakes States revealed that younger officers were employed at grade 9 [99] after South Sudan's independence in July 2011. These officers are qualified in terms of educational background and most of them have bachelor degrees or diplomas in specific subjects relating to agriculture, forestry, livestock or fisheries. However, they have no practical work experience. The CAMP ID Subsector Team observed that although these young officers, were given job descriptions for their positions as soon as they joined the ministry, they had difficulty in understanding and performing their major duties and regular activities. Their underperformance leads to inefficiency in overall performance in state governments. Some officers raised the issues of political appointments being made, instead of being based on qualifications or merit, as well as that of the lack of experience among younger officers. They said that support by the state to the public was hampered by the lack of agricultural extension workers, office space and well trained staff.

Table 5-17 shows the main challenges of each state ministry in terms of human resources as determined through interviews with state officers.

Table 5-17: Main challenges of each state in terms of human resources

State	Challenges
Central Equatoria	• Inadequate skilled staffs in counties due to lack of training opportunities. • Large proportion of budget is used for salaries and wages. • No external audit conducted
Eastern Equatoria	• Inadequate skilled staffs in counties due to lack of training opportunities.
Western Equatoria	• Inadequate skills and knowledge of officers at the state and country levels due to lack of training.
Jonglei	• Inadequate skills and knowledge at the state and county levels due to lack of training.
Lakes	• Many officers seconded to national or international NGOs in the State in order to reduce the payment of salaries to officers. • Current officers do not have adequate skills due to political recruitment. • Inadequate number of officers in counties
Upper Nile	• Inadequate number of officers assigned to counties or assigned officers not taking his/her post due to severe conditions at the county level. • Inadequately skilled officers due to the lack of training. • Inadequate number of professional agriculture/livestock officers with appropriate educational background. • Interference by political leaders in the process of recruitment.
Unity	• Inadequate skills and knowledge due to lack of training.
Warrap	• Lack of skilled officers at the state and county levels, e.g., no officers with a background in plant protection, mechanization, horticulture, research or agronomy. • No training provided by the state ministry.
Northern Bahr el Ghazal	• Limited number of officers in state ministries and more than half are aged over 60. • Lack of skilled officers at the state and county levels.

[99] New graduates after university or college are recruited at grade 9 after joining the ministry.

State	Challenges
Western Bahr el Ghazal	• Lack of skilled officers at the state and country levels • Many officers seconded to national or international NGOs in the State in order to reduce the payment of salaries to officers.

Source: Interviews with state officers

No state had an M&E system in operation to provide evidence of the effectiveness of government programming. The lack of an effective M&E system is also a contributing factor to the lack of coordination between state/county governments and NGOs working in the state/county. In many cases, NGOs are operating without regard to the local government plans or priorities. When speaking of coordination, many interviewees stated that there was a lack of communication, information sharing and coordination throughout the hierarchy of the national ministries: to/from the state ministries, to/from the county offices, to/from the payam offices.

Other issues mentioned by interviewees in the states, counties and payams, that hinder the proper delivery of services to the public include: lack of skills in the communities to fabricate basic parts such as ox ploughshares; uncontrolled roaming of livestock herds; lack of access to some productive areas; inter-tribal conflict; and political interference.

5.2.2.3 Human resources development at state ministries and county offices

It can be seen from the discussion in subsection 5.2.2.2 above, that little human resources development, particularly training, is taking place for the government officers at the state ministries and county offices. In addition, the austerity budget has reduced funds available for training and professional development through the state and county budgets. Most training, that has recently taken place, has been provided by NGOs operating in the vicinity of a state or county. Interviewees indicated that the lack of training was the greatest contributor to inadequate skills and knowledge of government officers at the state and county levels. There are no new-staff orientation programmes being delivered at the states or counties.

5.3 Private sector organizations

5.3.1 Farmers organizations

In some areas of South Sudan there was a tradition of farmers forming groups for land preparation and harvesting, but in many communities affected by the civil war, traditional social relationships have broken down, making such cooperation more challenging. Group formation and cooperation provides an important base to develop more commercially oriented farmer associations and cooperatives. Much work has been done by NGOs to form farmer associations, groups and cooperatives, but these groups have received little training on moving from subsistence farming to farming as a commercial business. Building the capacity of these groups to move towards a more commercial approach will require several years.

5.3.2 Agro-input dealers

Fertilizers and pesticides are rarely used and soil fertility is maintained by applying manure or leaving land fallow for some years.[100] As part of their joint commitment to promote food security, USAID, the Netherlands, International Fertilizer Development Centre (IFDC) and Alliance for a Green Revolution for Africa (AGRA), agreed to provide agricultural inputs through commercial agro-input dealers.

[100]According to an IFDC staff-member, interviewed by CAMP team, Dec 6, as part of CAMP Situation Analysis, fertilizer use in South Sudan is virtually non-existent.

IFDC and AGRA are supporting the Seeds for Development programme, which provides seeds to agro-input dealers. The programme is currently funded by USAID through AGRA.

In South Sudan, there is no formal body responsible for quality checks on the seeds being produced locally or imported. Both the government and DPs lack capacity to supervise and control seed quality. Additionally, there is no seed processing facility for grading, seed treatment (addition of a coating to reduce disease and protect against pests), and packing seeds. Most seed growers only clean and sort their seeds. In the absence of a reliable source of seeds, farmers often buy food grains to be used as seeds as it is difficult to distinguish between seeds and food grains in the market. In general, farmers prefer to use local varieties, while modern high-yielding varieties are introduced almost exclusively through emergency seed distributions and from imports in border areas.

Although the agro-input business is only just beginning, some forward looking private companies are assisting farmers to increase their productivity and incomes by educating them about the benefits of high quality seeds and modern fertilizer technologies and training them in their proper use. Some private companies have taken the initiative to broadcast educational radio programmes on crop cultivation and soil management.

5.3.3 Processors and traders

Historically, until independence the food trade was dominated by Arab traders and most traders obtained loans from financial institutions based in Sudan. However, after independence, Uganda has been South Sudan's largest trading partner for imports.

The new market system in South Sudan is dominated by the private sector; trade is driven by the individual trader's desire to make a profit. Distribution channels from seller to buyer of agricultural products are not well defined neither is the role of the different stakeholders; the same people often fulfil the role of middleman, transporter, wholesaler, retailer, importer and exporter simultaneously.

Traders play a critical role in facilitating the regular, year-round supply of major commodities which are sourced in Uganda and the major production areas in South Sudan. The cross-border traders are concentrated in major urban markets, particularly in Juba. They are predominantly Ugandans living in South Sudan who have good business connections enabling them to source produce from markets in Uganda. They can use large-capacity trucks which can import more produce and minimize overall costs.

The main transaction costs for traders are for searching, assembling and purchasing produce and then moving the produce to markets in South Sudan.

The perishable imported commodities are mainly bananas, white or Irish potatoes and onions. The volume of cross-border trade is not readily available, but the CAMP Task Team saw substantial imports of maize and cassava flour from Uganda, packed in different sizes and ready for consumption, in trucks in various markets. During harvest periods, the traders buy from farmers in Uganda and transport the produce in trucks across the border to markets in South Sudan; the retailers and consumers buy directly from the trucks.

The Chamber of Commerce, Industry and Agriculture (CCIA) is currently the only business organisation of national importance. It was established in 2009 and still does not fulfil all the functions required of a Chamber of Commerce. Membership is not mandatory and few processors and traders have joined. However, in the main market in Juba, the traders have formed a branch which is active in voicing their needs.

5.3.4 Financial institutions

5.3.4.1 Providers of financial services

(1) Finance to agriculture before Independence[101]

Many banks neglected agriculture because of farmers' lack of liquid assets and property to be used as collateral, the risky nature of their business such as drought or floods, the volatile prices of agricultural products, the shortage of farmers' business skills and few loan applications. It is estimated that not more than 1% of loans went to agricultural businesses.

Before independence in 2011, the main source of specialized credits for agriculture was the Agricultural Bank of Sudan (ABS). It was established by the then Sudanese Government. Approximately three quarters of the total ABS funds were provided for large scale farmers cultivating farms of 1,000-1,500 feddans in the areas demarcated under the Mechanised Farming Cooperation. Most of the remaining ABS funds went to irrigated agriculture and only a small part, 6-7%, to rain-fed agriculture. ABS estimated that its credits covered only 3% of the "rain-fed" farmers' financial needs, compared to 20 and 50 % of the irrigated and mechanized farmers' needs.

(2) Providers of financial services

In South Sudan, there is no direct finance, where individual or institutional investors directly invest in businesses through instruments such as stocks or bonds. All finance is indirect; financial institutions collect customer deposits and lend or make an investment with the customers' money.

There are both formal and informal financial institutions. Currently, formal financial institutions involved in agriculture consist of commercial banks, the Agricultural Bank of South Sudan (ABSS) and microfinance institutions.

The commercial banks, the largest loan lenders, are dominated by foreign owned banks. ABSS is the only source of specialised finance for agriculture.

There are several microfinance institutions, some founded by NGOs. The institutions founded by NGOs were donor initiated; they have demonstrated that success can be achieved in rural areas, but that sustainable operations require sound management and banking practices.

Additionally there are many informal financial institutions and arrangements, e.g. traders, moneylenders and families, which provide financial services to individual households. They are often the only source of financial services in the most geographically isolated areas. These informal arrangements are mainly built on trust, social and family relations. These informal institutions function among people who know each other and this knowledge is used to screen the transactions and to enforce informal agreements. Financial services provided by the above suppliers are summarised in Table 5-18.

Table 5-18: Financial services by formal and informal providers

Suppliers	Financial services provided
Formal financial providers	
Commercial Banks	• Deposit facilities (current accounts, saving accounts) • Business financing (letters of credit, guarantees) • Remittances (local, international) • International banking • Foreign currency exchange • Loans and advances

[101]Craig, G. M., ed. 1991. *The Agriculture of the Sudan.* New York: Oxford University Press. pp. 117-120.

Suppliers	Financial services provided
	Business loan: loans to fund capital requirements for business Development loan: loans to help pay for personal or business development projects Educational loan: loans to help pay for further education Agricultural loan: loans that enable farmers to buy farm inputs until they can sell crops (Large loans for commodity processing firms, trading companies. A few loans for individual large farmers) • Use of warehouse receipts, bonded warehouses, chattel and real estate mortgages, third party guarantees. • Leasing of vehicles and equipment. • Checking, savings and deposit services for firms and households in rural towns. • Saving services for saving groups and richer farm households in close proximity to bank branches. • Banking service for NGOs
Agricultural Bank of South Sudan (ABSS)	• Banking: receiving deposits, money transfers and establishing correspondence and others • Short term lending: maturity does not exceed 15 months • Long term lending: maturity is from 15 months to 5 years • Procurement of agricultural machinery (tractors, accessories), inputs (improved seeds, jute bags, fertilizers) and provision of cash loans for microfinance to support smallholder farmers • Provision of credit for the above machinery, inputs and others (farmers will pay in instalments)
NGOs	• Small group guaranteed and individual loans largely granted to small-scale traders in urban areas. • Compulsory savings for borrowers. • Experimental insurance linked to loans and remittance services. • Financial services linked with other development activities. • Small loans and savings services for farmers, rural traders, and non-farm businesses and households in rural towns and villages
Informal financial providers	
Processing companies, traders, input suppliers,	• In-kind loans and suppliers' credits for buyers, sellers and farmers throughout the production/ marketing chain.
Moneylenders	• Loans to any rural or urban business or household needing quickly disbursed, emergency or business loans. • Holds small amounts of savings for others
Family and friends	• Loans for emergencies and start-up of business activities.

Source: Financial Institutions, interviewed by CAMP team, February-March 2013 and September 2013, CAMP Situation Analysis

(3) Formal financial institutions in South Sudan

Formal financial institutions could play an important role in the development of agriculture through offering loans and investments. These institutions are summarised in Table 5-19.

Table 5-19: Formal financial institutions in South Sudan

Institution	Type of Company, staff	Type of Business Number of active borrowers	Coverage	Remarks
KCB Bank South Sudan Ltd.	• Company limited by shares • 100 % subsidiary of KCB group • 400 staff	• Established in 2005	20 branches including Juba, Bentiu, Rumbek, Yei, Yambio. Bor, Torit, Wau, Kuajok	Planning to open 20 new branches.
Equity Bank South Sudan	• Company limited by shares • 100% subsidiary of the Equity Bank Group • 300 staff	• Established in 2008 • Loans, foreign currency exchange • Value chain partnership with GIZ • 3509 people (2011)	Wau, Yambio, Wau, Nimule, Kaya	
Buffalo Bank	• Less than 100	• Established in	3 branches: 2 in	

Institution	Type of Company, staff	Type of Business Number of active borrowers	Coverage	Remarks
	employees	2008	Juba, 1 in Wau	
Nile Commercial Bank	• 50-60 staff	• Established in 2003 • Started to offer loans in 2006-8	10 branches (one in each State)	Some borrowers defaulted. Currently under government supervision
Agricultural Bank of South Sudan	• Government owned • 100 staff	• Established in 2013 • the source of institutionalized finance for agriculture	4 branches: Juba, Wau, Malakal, and Renk	Planning to open in Bentiu, Awell and Yambio
Cooperative Bank of South Sudan	• Company limited by Shares • 120 staff	• Planning to start business in 2013	Juba, etc.	120 staff: 52 staff in head office/ main branch, 68 staff under training in Kenya (Sept. 2013)
Bangladesh Rural Advancement Committee (BRAC) South Sudan	• NGO (locally incorporated INGO)	• Major microfinance institution • Expanding exponentially since establishment in 2007 • 3389 people (2011)	• Upper Nile • Jonglei • Lakes • Warrap • Eastern Equatoria • Central Equatoria • Western Equatoria	
Sudan Microfinance Institution	• Company limited by guarantee	• Major microfinance institution • Established in 2003 • 8489 people (2011)	• Lakes • Western Equatoria	
Finance Sudan Limited	• Company limited by guarantee	• Established in 2006 • 5623 people (2011)	• Upper Nile • Central Equatoria	
Amurt South Sudan	• Program of locally incorporated INGO	• Number was unidentified • Established in 2006	• Northern Bahr el Ghazal • Aweil East	
Mundri Relief and Development Association (MRDA)	• Program of MRDA	• Unidentified	• Western Equatoria	
Rural Finance Initiative	• Company limited by shares	• Unidentified	• Central Equatoria	

Source: Financial Institutions, interviewed by CAMP team, Feb-March 2013, CAMP Situation Analysis.

5.3.4.2 Financial practices by formal financial institutions

(1) Financial size of formal financial institutions

The commercial banks have an enormous potential for financing agriculture in terms of loan amounts. Current annual new loans by all commercial banks are estimated to be approximately SSP2,000 million. Less than 1%, SSP20 million, goes to agriculture.

Among the commercial banks, seven offer loans. The remaining banks mainly deal with the foreign currency exchange business which generates a substantial profit, as will be mentioned later.

KCB South Sudan [102] finances one half of loans, SSP1,000 million, and the remaining 6 banks, such as Equity Bank and Buffalo Commercial Bank, the other half. They offer loans at annual interest rates of 15-20% with a maximum maturity of 3 years, while their annual customer deposit rates are 1-2%. These commercial banks enjoy a substantial profit (14-19%) from the spread between lending and deposit rates. Not all banks have been successful.

ABSS offers short-term (less than 15 months) and long-term (between 15 months and 5 years) loans at annual interest rates of 1.5% and 2.5%. The main loan applicants are agribusiness companies and cooperatives. However, ABSS has never made any loan due to a lack of government budget. It is waiting for its first capital, SSP250 million, from the government.

(2) Limited finance to agriculture

There are limited loan applications to the commercial banks from agribusiness. Equity Bank receives 80-100 loan applications every year, totalling approximately SSP120 million. The bank usually authorises one half, SSP60 million. Applicants are mainly companies involved in commercial activities. Only one or two are agribusiness companies. From January to September 2013, 38 companies applied to the Buffalo Bank for loans totalling SSP35 million. Applicants were primarily importers, hotels and guesthouses. Similarly KCB received limited loan applications from agribusiness, only 1% of applicants.

In 2013, there were 36 applications to ABSS, for loans totalling SSP100 million. Applicants included companies, co-operatives and individual farmers; 80% of these companies were agribusiness companies, involved in cultivation, seed selling and production. Since these companies cannot afford loans at the higher rates charged by commercial banks, they apply for loans at ABSS. However, ABSS has not yet made any loans.

Table 5-20: Annual loan interest rates, loan applicants and authorized loans

	Annual loan interest rates and lending duration	Number of loan applicants in 2013	Loan application amount in 2013	Portion of Agribusiness (number of loan applications)	Authorized loans
KCB South Sudan Ltd.	15%, max. 3 years			1%	SSP1,000 million
Equity Bank South Sudan	18%, max. 3 years	80-100	SSP120 million	0.5%	SSP60 million
Buffalo Commercial Bank	18%, max. 1 year	38	SSP35 million	1.0%	SSP19 million
All commercial banks total				1% (estimate)	SSP2,000 million (estimate)
ABSS	1.5% (less than 15 months), 2.5% (more than 15month-5 years)	36	SSP100 million	80%	Zero

Source: Financial Institutions, interviewed by CAMP team, Sep.-Oct. 2013, CAMP Situation Analysis.

(3) Customer deposits

The absence of direct financial markets is to the advantage of the commercial banks. The banks obtain customer deposits at lower rates and lend them at higher rates. Current bank deposit rates are approximately 1-2% per annum. The main depositors are managers of private companies. They tend to open current accounts which do not earn any interest,

[102] KCB Bank Ltd, the parent company of KCB Bank South Sudan Ltd, was renamed from Kenya Commercial Bank in 2003. (http://ke.kcbbankgroup.com/about/history/)

rather than saving accounts which generate interest. Their businesses are so profitable that they do not need to earn such low rates of interest[103]. They use their current accounts to pay suppliers and salaries.

(4) Foreign currency exchange

The Bank of South Sudan allocates US dollars from oil revenues for foreign currency exchange to each bank. For example, a commercial bank can currently withdraw, from the Central Bank, USD300,000 every week, at the official exchange rate of 2.96 SSP/USD with a 2% fee. The commercial bank spends SSP905,760 and sells the USD300,000 to their customers at 3.16 SSP/USD to obtain SSP948,000. The margin is: SSP948,000 - 905,760 = SSP42,240 (42,240/948,000=4.5%). As mentioned before, some commercial banks mainly deal with the foreign currency exchange business to obtain a substantial profit.

(5) Credit analysis

Loan applicants have to provide: registration certificates of incorporation, import and export licenses, tax identification numbers, tax clearance, collateral, financial reports including balance sheets and income statements. The bank conducts a credit analysis by: evaluation of character of the loan applicants, their ability to pay, management ability, collateral value and financial reports.

KCB will only take owned land with land title as collateral. Community land farmed by most subsistence farmers has no land title and so cannot be used as collateral.

If a commercial bank requests lawyers to register collateral, it takes only one or two days. They would, however, charge 2% of the asset value. The bank registers the collaterals themselves which takes a week. This takes four or five visits to the registration office. The total registration expenses would be less than SSP1,000, including any bribe, which is less than lawyers charge.

Box 5-3: Case study - Equity Bank: successful management of a foreign-own commercial bank

Overview of the Equity Bank: establishment

Equity Bank was first incorporated in 1984 in Kenya, later transformed into a microfinance institution and eventually into a commercial bank. In 2008, the bank obtained regulatory approval to open a subsidiary in South Sudan. In addition to the Juba head office, the bank now maintains a network of 5 branches across the country (Yei, Yambio, Wau, Kaya and Nimule).

Financial analysis of Equity Bank

In financial analysis, the rate of return on assets (ROA) and rate of return on equity (ROE) are often used to evaluate profit ratios of the firm's assets and equity.

The Equity Bank Group operates in Kenya, South Sudan, Rwanda, Tanzania and Uganda. The consolidated financial reports of the Equity Bank Group show why it is very profitable for foreign-owned banks to operate subsidiary banks in South Sudan.

[103] A credit officer of a commercial bank, interviewed by CAMP team, Sep.-Oct. 2013, CAMP Situation Analysis

Figure 5-1: The Equity Bank, Consolidated Income statement and Balance Sheet

unit: million Kenyan shilling

Income statement	Jan.-Dec. 2010	Jan.-Dec. 2009
Interest incomes		
Loan and advances	10,497	8,286
Others	2,388	1,405
Interest incomes total	12,885	9,691
Interest expenses		
Customer deposit	1,270	675
Others	558	738
Interest expenses total	1,828	1,413
Net interest incomes	11,057	8,278
Other operating incomes	9,137	5,995
Other operating expenses	10,883	8,704
Profit or loss before taxes	9,311	5,569
Profit or loss after taxes	7,554	4,563

Balance sheet	Dec.31, 2010	Dec.31, 2009	Average balance
Total assets	133,889	96,511	115,200
Liability			
customer deposit	95,203	65,824	80,514
Others	10,379	7,350	
Liability total	105,582	73,174	89,378
Shareholders' fund	1,851	1,851	
Retained earning	11,940	7,394	
Others	14,516	14,092	
Shareholders' fund total	28,307	23,337	25,822
Liability and Shareholders' fund	133,889	96,511	115,200

Source: the Equity Bank, Oct. 2013.

Financial analysis shows:

1) The rate of return on assets (ROA) is:
9,311+1,828 / 115,200 = 9.669%.
and the ROE after taxes is:
7,554 / 25,822 = 29.254%.

On average, private equity funds, targeting investment in Africa, posted an 11.2% annualized return for the 10 years ending September 30, 2012.[104] Thus, the Equity Bank ROE after taxes of 29% is extremely high.

2) In Juba, the bank can obtain deposits at 1-2 % per annum and lend at 18%. The average interest income ratio for all Equity Bank assets, including loans/ bonds/ stocks, is 11.815% (12,885/115,200). It is much more profitable to lend in Juba which is an incentive for foreign-owned banks to open subsidiary banks in South Sudan.

3) In Juba, the bank can earn a substantial profit from the foreign currency exchange business because of the oil revenues. This is another incentive for a foreign-owned bank to operate in South Sudan.

Considering all these incentives, a bank would not be interested in business offering lower returns.

Box 5-4: Case study - Nile Commercial Bank: unsuccessful management of a commercial bank

Nile Commercial Bank is an example of unsuccessful management in a commercial bank due to poor credit analysis. Nile Commercial Bank was established in 2003. The bank has currently 50-60 staff and 10 branches, one in each state. After the Comprehensive Pease Agreement (CPA) in 2005, the bank started to operate. The interest rate was 20%. Loan duration was a maximum of 48 months. In April 2009, it was reported that the bank had ran out of cash, as a result of defaults made by GoSS officials[105] and the bank was temporarily closed. The bank received a capital injection of SDG102 million[106] by GoSS. Since then, the

[104] www.avca-africa.org/product/new-benchmark-for-african

[105] http://www.sudantribune.com/spip.php?article30971

[106] http://en.wikipedia.org/wiki/Nile_Commercial_Bank

bank has not given any new loans. The loan assets are valued at approximately SSP30 million, including SSP6 million of non-performing loans (NPL).

Box 5-5: Case study - Agricultural Bank of South Sudan: government-owned bank to provide specialised finance to agriculture

Overview of ABSS

On 6 June 2012, the President of GRSS issued provisional order no/25 to stipulate ABSS's roles for agricultural development:

1. Provision of necessary technical and financial services for agricultural development
2. Promotion, development and implementation of the agricultural sector of South Sudan
3. Alleviation of poverty and attainment of the Millennium Development Goals in relation to agriculture
4. Encouragement of cooperatives societies within the agricultural sector
5. Offering other services associated with current deposits and investment deposits
6. Promotion of agricultural activities that can contribute effectively towards the achievement of food security in South Sudan
7. Increasing productivity, production and raising the standard of small producers
8. Supporting family income generating activities and rural women activities as being principle cases for rural development and poverty reduction
9. Realisation of financial independence
10. Promotion of agricultural activities from hand tools to mechanized ones

The ABSS has currently 100 staff and four branches, Juba, Wau, Malakal, and Renk. The ABSS will move to counties and payams, making villages the places for distribution of bank services to the residents. In addition, the ABSS plans to build big silos in state capitals and to open new branches in Bentiu, Awell, and Yambio.

The ABSS has an authorized capital of SSP500 million. The bank is waiting for the first paid-in-capital, SSP250 million, from the government. In the future, another SSP250 million will be coming.

Actual practices

1) Procurement and selling of agricultural machinery

In 2010, the Agricultural Bank of Sudan (ABS) procured 110 sets of tractors and their accessories and distributed 44 sets to Greater Equatoria, 33 sets to Greater Bahr el Ghazal, and 33 sets to Greater Upper Nile (SDG84,000 x 110 = SDG9.24 million). They also purchased 150 water pumps and distributed 100 to the Juba branch, 25 to the Malakal and Renk branches and 25 to the Wau branch (SDG2,700 x 150 = SDG0.4 million). Farmers had to pay for these tractors and pumps in instalments with 2% interest annually. In addition, the ABS provided cash loans totalling SDG11 million for microfinance. However, the ABSS has not yet distributed any agricultural machinery.

2) Collateral

ABSS accepts as collateral:

a) Real estate (buildings) which is registered under land laws
b) Movable assets
c) Irrevocable letters of guarantee
d) Personal guarantees
e) Letters of guarantee.

As community land has no land title many smallholder farmers cannot offer any collateral. The then ABS had attempted to reach these farmers by various other arrangements, through

co-operatives, farmers' unions, local councils, village councils and farmers' groups.[107] ABSS is continuing this practice.

Issues

ABSS faces lack of funds, weak marketing techniques and lack of infrastructure.

Box 5-6: Case study - Co-operative bank of South Sudan: a newly established bank to assist co-operatives and farmers

Overview of the Co-operative Bank of South Sudan

The Co-operative Bank of South Sudan is a member of the Co-operative Bank Group, headquartered in Nairobi with subsidiaries in Kenya and South Sudan. The bank is a commercial bank licensed to operate in South Sudan. However, they have not started their banking business yet (as of September 2013).

The bank has its roots in the cooperative movement in Kenya and was established in 1965 by agricultural cooperative marketing societies. Over the last 15 years, the bank has been transformed into a strong international bank providing services to all market segments including the public sector, small and medium enterprises (SMEs), and cooperative sectors.

In South Sudan, the bank will provide banking services to individuals and to SMEs, as well as large corporate customers. It will support cooperative societies and credit unions, where farmers can access funds.

Capital and shareholders

The current capital is USD30 million: USD15.3 million, 51% share by the Co-operative Bank of Kenya and USD14.7 million, 49% share by GRSS. In the future, the bank will take over the 49% share of the GRSS and sell it to farmers. In addition, the bank will sell 10% of their share to farmers. The farmers will then have a 59% share and become the majority shareholders.

New branch plans

The bank intends to open 4 branches before the third quarter of 2014 in Juba Town. Later, 15 branches will open in all state capitals; then, the bank will expand its business to major county towns.

5.3.4.3 Constraints on finance to agriculture

People interviewed saw the following as constraints on finance to agriculture:

(1) Unstable rates of return on agribusiness

There are limited loan applications to the commercial banks from agribusiness because many agribusinesses cannot always achieve high rates of return on their investment. They are not necessarily able to pay the high rates of interest charged on loans due to the risky nature of agricultural production, volatile prices of agricultural products and lack of infrastructure. It is essential to ensure an increase in the productivity of agribusiness by an integrated strategy of transforming the existing agriculture in terms of infrastructure, marketing, finance and technology.

(2) Non-advisability of regulatory measures for commercial banks[108]

[107] Craig, G. M. ed. 1991. *The Agriculture of the Sudan*. New York: Oxford University Press. p. 121-122.

[108] Craig, G. M., ed. 1991. The Agriculture of the Sudan. New York: Oxford University Press. pp. 117-120.

Most foreign-owned commercial banks would not be interested in business offering lower returns, such as agriculture. It would not be advisable to enact regulatory measures promoting loans to agribusiness, such as obligations to supply loans at lower interest rates, to earmark a specific percentage of credits for agriculture, or to open branches in rural areas.

(3) ABSS fund and management capacity shortage

ABSS could play an important role in finance to agriculture, because ABSS is the only source of specialised finance for agriculture, offering soft loans. However, ABSS has not made any loans due to lack of government funding. In addition, ABSS staff does not enough management capacity, such as accounting and marketing. [109]

(4) Limitation of using land as loan collateral

Ownership of land is problematic in South Sudan, with regard to land title, registration, transfers, security of tenure and others. This problem is especially serious for agriculture. Currently policy and legal frameworks for land rights are still being drafted. These will include clear land title and facilitate the seizure and liquidation of land pledged as collateral for loans.

5.4 Greater Juba market in the context of regional integration

5.4.1 Regional market integration

It is a general trend worldwide that countries in close proximity to each other and with similar economic conditions and needs are merging into regional trade blocs. The reasons for this vary with the countries and blocs, but members normally seek to gain political and economic benefits. These blocs provide access to a wider and larger market, offering possibilities of diversification in production, processing and marketing for members. As a result, market participants are able to increase their business opportunities.

Since independence, South Sudan has made efforts to participate in the global economy involving various commodities. Easy travel between countries, formation of personal relationships, regional agreements and treaties have strengthened relationships with neighboring countries.

Significant market opportunities for agricultural commodities exist both within South Sudan and in neighboring countries. The East African Community (EAC) is a market of 130 million people with a GDP of USD75 billion. East African countries are already responsible for 80% of South Sudan's trade, and merchants from Uganda and Kenya have been coming to Juba in large numbers. Juba can assist in strengthening regional integration, which will help local and foreign companies participate in the regional economy.

5.4.2 Overview of Juba market

Juba is the capital and largest city of South Sudan. It also serves as the capital of Central Equatoria State (CES). It is comprised of three of the 16 payams of Juba County: Juba, Kator and Munuki. The border of the city is not clearly defined; the city has expanded into the surrounding rural payams of Northern Bari and Rajaf. Population density tends to be much higher in undemarcated areas than in the demarcated areas in Juba and Kator payams in the town centre. The urbanized area of Juba (Greater Juba[110]) is estimated to be approximately 52 km^2. Juba is the showcase of South Sudan's economic, political and social transformation.

[109] A manager of ABSS, interviewed by CAMP team, Sep.-Oct. 2013, CAMP Situation Analysis

[110] Ellen Martin and Irina Mosel. 2011. *City limits: urbanisation and vulnerability in Sudan, Juba case study*. UK aid and ODI.

Although there are no exact population figures for Juba, Juba's expansion has accelerated since the CPA. The NBS estimated it to be 230,195 in 2009; the Ministry of Physical Infrastructure was working on the basis of a population figure of between 500,000 and 600,000 in 2010. During the civil war, Juba was considered to be the only secure town within Central Equatoria State, making it a refuge for IDPs from other parts of the country as well as for people fleeing neighbouring countries. IDPs were organised into camps according to ethnicity and allowed to settle temporarily on the land of people who had fled Juba, with the understanding that they would have to leave once the original owners came back. After the CPA, Juba continued to attract large numbers of people such as returnees, former IDPs, and foreigners from neighbouring countries in search of better livelihoods and economic opportunities.

The presence of economic opportunities, as well as an increasing number of private businesses, attracts many people to Juba in search of employment. The opening of regional roads, especially the Juba-Nimule road, and the resulting boost in trade meant that many foreigners, mainly but not exclusively from neighbouring countries, are also moving to Juba to take advantage of the more promising business environment. Whereas jobs in Uganda and Kenya are often difficult to get and remuneration is low, in Juba many are able to find work in the expanding trade and retail business, especially in the section of agricultural commodities.

Collectively the markets in Juba are the largest in South Sudan, and are referred to in this report as the Juba market. The larger markets in Juba include Konyokonyo, Custom, Jebel, Munuki and Gudele which were part of the Juba market survey. There are many smaller markets. Juba market plays a role in both the:

- East African regional market (long value chain with high value added, international value transfer in the region)
- South Sudan domestic market (rural-urban, medium value chain with medium value added, local value transfer within South Sudan).

It is an urban market that provides a variety of agricultural products as well as non-agricultural commodities. As Juba market is part of the East African regional market, its merchants commonly collect commodities from all over East Africa.

5.4.3 Functions of Juba market

Juba market collects products from all main production areas, both inside and outside South Sudan, to be sold in Juba. Poor infrastructure is currently limiting such transactions. Most products coming from Uganda are traded via Juba even when they are consumed in areas other than Juba, which emphasises the importance of Juba as a waypoint in the East African regional market. This regional market is dominated by large scale actors working with small and medium traders.

Juba market is, in economic terms, a large market where the major actors are mostly engaged in non-farm occupations, in the government and commercial sectors. Juba market receives imported consumable goods from neighbouring countries and distributes them to smaller markets all over South Sudan. It is also a centre for pooling and bulking.

The volume of commodities arriving in Konyokonyo market is significantly larger than those in the other markets. The supply at Juba market is more stable than at markets in other South Sudanese towns, even though temporary shortages of commodities may occur during the year. Producers may come to the markets to sell their products but most trade is run by professional traders who collect commodities from both inside and outside South Sudan (either at the farm gates or at collection points). The markets surveyed are relatively well

organised and regulated, and the traders must register at the payam to be granted permission to trade at the market.

The large-scale traders sell various kinds of products including staple foods and vegetables from different regions. They travel far to get products and hire other people to attend their business while they go to buy products. For example, in the Konyokonyo market, vegetable wholesalers' turnover varies from SSP300 to SSP2,000 per day [111]. The large-scale wholesalers buy from known producers and are often able to get credit from the producers based on their long term working relationships. The medium- and small-scale wholesalers buy their products mainly from the large scale traders or local producers and trade quite a limited number of goods. They are more vulnerable to price fluctuations than the large-scale traders due to lack of capital to absorb a minor decrease in revenue.

Usually wholesalers perform their activities individually because they are unable to identify common objectives and instruments. The scale of their activities is only a few products, such as maize flour, beans, rice and vegetables.

Payment for transactions in the Juba market is in most cases immediate and cash, for traders as well as wholesalers and retailers. They are paid within a day after a transaction. The majority of domestic traders report paying immediately for transactions. Agricultural trading in Juba is largely in cash, with almost none of the transactions settled by checks or alternative means of payment.

The cross-border trader plays a critical role in facilitating a regular, year-round supply of major commodities sourced in Uganda. The main transaction costs entailed at this level include searching, assembling, purchasing and moving goods to the respective markets in Juba and neighbouring markets. Searching and assembling extend beyond the markets in Kampala and reach major production areas in Uganda. They commonly deal with perishable commodities and cereals, mainly bananas, Irish potatoes, onions, and maize and cassava flour. The volume and type of agricultural border trade is not readily available on the South Sudan side, but substantial imports of maize and cassava flour from Uganda, packed in different sizes and ready for consumption, are apparent. According to interviews with traders, imports for the army alone are 10,000-15,000 tons annually. During the harvest periods of commodities, they buy from farmers and transport them across the border to the markets in Juba. The trucks, loaded with commodities, arrive and are positioned at designated places from where the retailers and consumers can buy. Large-capacity trucks are particularly important for large-scale traders to transport stock as well as to minimize transaction costs. Because of the long distance travelled, large-scale traders commonly procure large volumes of commodities per trip as a way of minimizing transaction costs.

The flows to the markets in Juba entail large volumes of food commodities per procurement trip. Shipment by road involves large-capacity trucks ranging from 8 to 50 metric tons. Off-loading the trucks, as well as into-store delivery of the loads, is done manually. This demands heavy labour that is provided by porters. The off-loaders/porters are well-organised and have substantial control over off-loading and porterage services, as well as substantial bargaining status. They set service fees and organise offloading of all trucks arriving in the markets with goods. Their conduct is such that a trader cannot make off-loading arrangements independent of the organised porters.

[111] In the Konyokonyo market, there are around 40 traders who deal with vegetables. About 90% are of Ugandan nationality. Wholesalers. April to June 2013. Interviewed by CAMP team, Kyonokonyo Market. CAMP Situation Analysis.

At least in the Konyokonyo market, traders, porters, and retailers set up a committee to manage the market. The county owns the markets and collects fees from traders for use of the market.

5.4.4 Market arrivals

With the exception of locally grown fresh vegetables, some crops and livestock, the Juba market, particularly Konyokonyo, Custom and Jebel, is heavily dependent on imports as shown in Table 5-21. The merchants interviewed generally identified Kampala as their major source of supply, with less seasonal variation compared with domestic supply. Procurement from Kampala accounts for the bulk of maize flour, wheat flour, sorghum, rice, Irish potatoes and onions. This flow of goods to Juba from Kampala is part of the larger volume of cross-border trade which is well organised for its scale and impacts regional economic development. The monthly incoming volume to Juba has been partially recorded by the Directorate of Commerce and Supply, Central Equatoria State since 2011, as presented in Table 5-22.

Table 5-21: Major Commodities traded in Juba markets and their major origin

Commodities	Origin		
	Konyokonyo Market	Custom Market	Jebel Market
Sorghum	Uganda, Renk	Uganda	Uganda
Maize grain and Maize flour	Uganda	Uganda	Uganda
Rice	Uganda	Uganda	Uganda
Wheat flour	Uganda	Uganda	Uganda
Groundnuts	Terekeka	Terekeka	Terekeka
Sesame	Uganda	Uganda	Uganda
Cassava flour	Uganda	Uganda	Uganda
Okura	Rajaf, Yei	Rajaf	Rajaf
Beef	Uganda, Kapoeta	Uganda, Bor, Jonglei	Uganda
Goat meat	Uganda	Uganda	Uganda
Chicken	Uganda	Uganda	Uganda
Milk	Uganda, Juba	Uganda	Juba
Egg	Uganda	Uganda	Uganda
Fresh fish	Bor, Uganda	Bor, Uganda	Uganda
Dried/ Smoked fish	Jonglei, Lakes, Unity	Terekeka	Terekeka
Charcoal	Terekeka, Yei	Lainya	Lainya
Soft timber 2*3m	-	Uganda, DRC	Uganda, DRC
Hard mahogany (Timber) 2*6m	-	DRC, Uganda	DRC, Uganda
Teak pole	Yei	Yei	Yei
Bamboos	Uganda	Uganda	Uganda

Source: CAMP Market Survey, Directorate of Commerce and Supply, CES, Monthly report on wholesale and retail prices

Table 5-22: Monthly incoming commodities to Juba in 2011 (tonnes)

	2011												
Items	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	**Total**
W/flour	605	1,176	850	563	285	367	862	1,069	260	-	-	155	**6,191**
Sorghum	-	75	56	50	220	137	197	1	2	17	10	30	**795**
M/flour	984	1,076	207	900	21,048	1,413	1,733	3,791	26	-	-	-	**31,177**
M/grain	39	32	75	53	497	-	-	5	1	-	-	-	**702**
Cas/flour	173	19	19	35	9	25	32	7	17	-	-	-	**337**
Rice	25	283	329	256	192	286	253	723	-	-	3	28	**2,376**
G/Nut	103	271	388	323	226	7	133	5	6	3	549	-	**2,014**
Beans	17	8	2,539	221	203	67	133	74	-	-	-	-	**3,262**
Charcoal	218	428	432	421	49	651	597	1025	1932	168	122	976	**7,017**

Source: CAMP Market Survey, Directorate of Commerce and Supply, CES, Monthly report on wholesale and retail prices

The incoming volume of agricultural commodities to the Juba market fluctuates from month to month. The incoming volume tends to decrease in October and November. In 2011, maize flour was the biggest in volume (31,177 tonnes), followed by wheat flour (6,191 tonnes). As estimated by CAMP, the volume of imports accounts for over 80% of the agricultural commodity trade, implying a decidedly one-way trade to South Sudan. There is great potential for replacing imported agricultural commodities with domestic products in the Juba market, especially if transport and transaction costs of domestic products are equal to or lower than those of imported products. The market situation of major commodities by subsector is described below.

i. Crops

Major staple crops, including a variety of cereals, pulses, vegetables and processed products, can be seen in all the markets in Juba. Cereals are the most important crops and the staple element in the diet of the South Sudanese. The principal cereals are maize, sorghum, millet and rice. Pulses are the second most important staple food and a principal protein source. The consumption of vegetables and fruits is relatively limited, largely because of their high costs. Common vegetables include tomatoes, okra, onions, jew's mallow and cabbage. Konyokonyo market is the largest agricultural market selling to consumers in Juba; the supply is more reliable here than that at other markets in Juba.

The CAMP market survey[112] estimated that the total volume of Irish potatoes and onions brought from Uganda to the Konyokonyo market in September 2013 was approximately 3,840 tonnes, which was then transported by road to all the markets in Juba and other areas. There are around 80 cereal traders in the Konyokonyo market; on average 1,920 tonnes of cereal were brought from Uganda to Konyokonyo every week in September 2013 for similar onward distribution. However, demand is not stable and very different by season. According to the traders interviewed in the Konyokonyo market, their main strategy is to move a higher volume faster from Uganda rather than to sell at higher prices and gain larger profit margins. In the market, traders supply cereal year round which is enough to meet the demand of Juba and the other major cities of the country. A large amount of green leafy vegetables is not imported into the Juba market from other countries. Since leafy vegetables are highly perishable, farmers sell them by themselves at smaller markets. Increased demand for vegetables has stimulated horticulture farming around the main urban areas, in places such as Rajaf and Jebel Lado

ii. Forestry

In Juba, Gudele and Jebel are the main terminal markets for forestry products. The demand for charcoal in Juba has increased due to its economic development after CPA. It is also because of the lower transport and handling costs compared to firewood. While information on charcoal use in Juba is sparse, available trade volume records in Central Equatoria State indicate that charcoal provides energy for the majority of urban households. The charcoal trade significantly contributes to the economy by providing rural incomes. However, charcoal sold in Juba is mainly produced domestically in Central Equatoria State, in Juba itself and Lainya County. It is recorded that a total of 7,017 tonnes of charcoal was traded in 2011 in Juba markets[113]. One of the major factors affecting the supply of charcoal is the price difference between the dry and rainy seasons. According to traders, the price during the rainy season is linked to the increase in transportation cost, which is passed on to consumers.

iii. Fisheries

[112] Wholesalers. April to June 2013. Interviewed by CAMP team, Kyonokonyo Market. CAMP Situation Analysis

[113] This CAMP charcoal trade data is calculated based on Directorate of Commerce and Supply data although there is a similar estimated volume by the NBS in 2009.

The size of the sun dried fish trade[114] to the Juba wholesale market is estimated to be approximately 450 tonnes per year. The fish comes by boat to Juba and is then distributed by road across the Greater Equatoria region, although a large proportion is consumed within the greater Juba area and adjoining counties. The fish is processed by the fishing households and sold to consolidators (collectors) who transport it first to Bor and then to Juba markets. No figures are available for the total production of dried fish from Jonglei and adjacent areas. The trade is very diverse with many producing areas, many traders and many destinations. Dried fish comes to Juba from as far away as Nassir in Upper Nile State (UNS).

Fresh fish is also available in the Juba market. Fresh fish is transported in large insulated boxes by boat from Bor to Juba and sold to hotels and in the Juba markets. Additionally 10 trucks are carrying approximately 800 kg/load, up to 3 times a week by road to Juba markets. The trade by boat is no more than 2 tonnes per week, or 100 tonnes per year (2013), but the trade by road can be up to 25 tonnes a week for short periods at the peak season (Dec-April) and is normally 7-10 tonnes a week, or, perhaps, 1,000 tonnes/year.[115]

The origin of smoked fish sold in Juba markets is mainly Terekeka. This heavily smoked fish is well preserved and keeps for several months. The size of the smoked fish trade to Juba is not officially recorded, but it is probably significantly smaller than that of the dried fish trade, partly due to a shortage of firewood in the northern region. The price in Juba retail markets is SSP19-62, depending on the species and quality. Wholesalers sell to retailers at a price roughly 20% less than the retail price.

iv. Livestock

Livestock is highly important in many parts of the country, the main species being cattle, goats and sheep. Most cattle are kept for social reasons and as a traditional form of wealth and status; a relatively small proportion enters the market.

On average, more than 70 cattle are traded from Uganda and 30-80 local cattle are supplied to the market every day; 100-150 cattle are slaughtered in Juba. Also 300-400 sheep and goats are slaughtered on a daily basis at the 5 slaughter facilities in Juba.

The Nyankole breed and Luguwara breed constituted more than 80% of the total cattle arrivals in the retail cattle markets of Juba.[116] The Toposa breed is the major domestic species coming from Eastern Equatoria State (EES), while other species are mainly supplied by cattle traders. Marketing agencies experience seasonal variations in the total arrivals in the market because of the difference in road accessibility between the dry and rainy seasons. Poor road conditions affect cattle supply to the market during the rainy season. The major cattle species sold in the markets are the Nyankole breed and Luguwara breed from Uganda, followed by the Toposa breed from Eastern Equatoria and the Nilotic breed from Jonglei, Lake and Unity States. The Mangalla breed from Terekeka is also sold in some markets in Juba but is in short supply compared to market demand. Transportation costs from Uganda to Juba are about SSP350 per head while that from EES to Juba are SSP200 per head.

According to the traders interviewed in Juba, this year (2013) they have seen more poultry in the Juba market. Small scale local commercial poultry production has increased; the main constraint is the limited availability of feed and day-old chicks.

[114] The estimate is based on a market survey done in Juba by CAMP in 2013.

[115] Information from interviews with fish traders in Juba markets

[116] Interview with A/commissioner, Juba Veterinary clinic.

5.4.5 *Organisation of marketing in Juba*

In the Juba markets, traders are predominantly composed of non-South Sudanese, including a high proportion of Ugandan nationals who may not own land in South Sudan. Observation in the Juba market shows that participation of South Sudanese women in agricultural marketing is relatively low; they are active mainly in small-scale trade of non-agricultural goods. The use of rented shops or storage space is common and sharing of shop space among several traders is practiced. Generally in the Juba market, the businesses are still in their early stages.

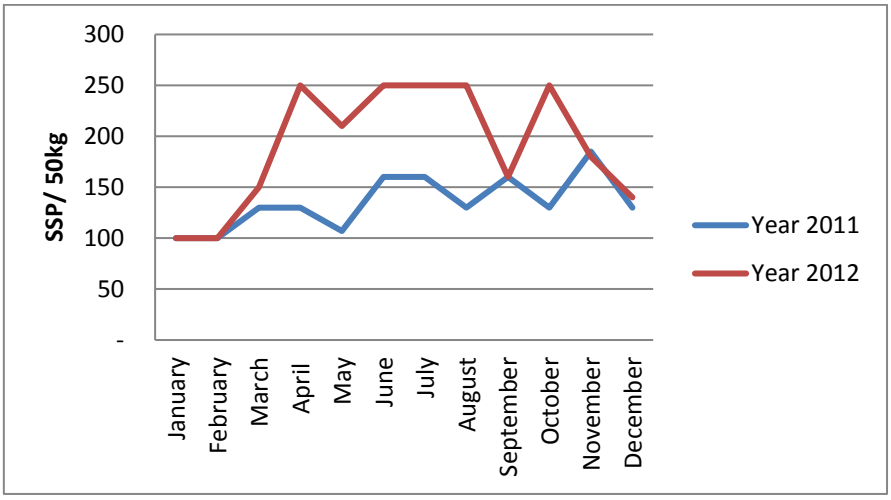
In view of the poor transport, storage is crucial in determining Juba's abilities to minimize the variability in the agricultural commodity trade. Agricultural commodity supply in Juba is closely linked to transportation. As the roads connecting Juba market to other smaller markets can be impassable during the rainy season, commodity procurement by road tends to be concentrated in the dry season.

Although imported agricultural commodities are dominant in Juba, domestic agricultural commodities are also an important component of the trade. Juba receives sorghum, groundnuts, okra and other local vegetables from Central Equatoria State (CES) or neighbouring states. Crops from CES are generally collected at the harvest site from the farmer by local traders and shipped to Juba markets. The domestic supply is at a significant disadvantage because of poor roads. Sourcing sorghum and groundnuts from local farmers involves assembling small quantities from many different farmers at the farm gate. The local trader travels to the production areas and spends several days organising and supervising the assembling activities, involving commodity collection and transport from several farms to central collection points. In some cases farmers have taken over the administration of collection stations and manage their own wholesale stores at the Juba markets.

5.4.6 *Market trend and competitiveness*

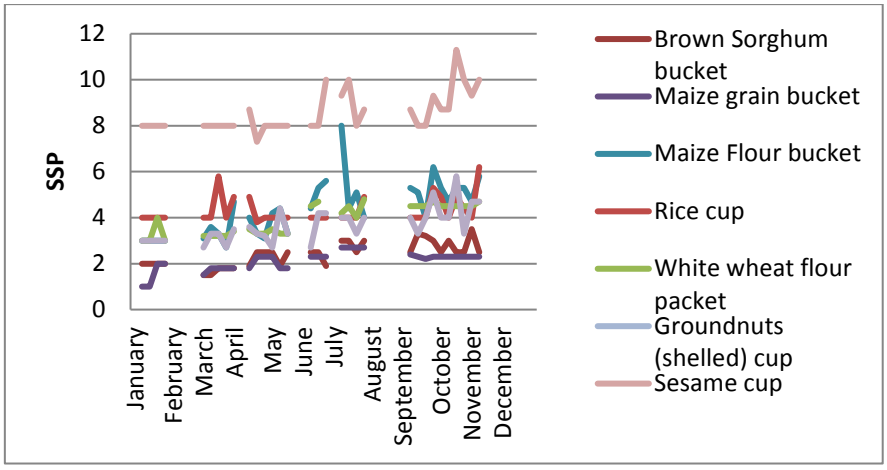
Seasonal price changes are observed in most of the agricultural commodities, where production is seasonal. Between 2011 and 2012, the maximum monthly prices were approximately 2 times the minimum monthly prices. As shown in Figure 5-2, the price of maize flour is cheaper from November to February, which is the crop's main harvest season in the Greenbelt zone. The price of maize flour in October 2012 was 40 to 50% more than in October 2011. The prices of most products increased during the period May to August 2012.

Figure 5-2: Monthly price of maize flour in Juba Market



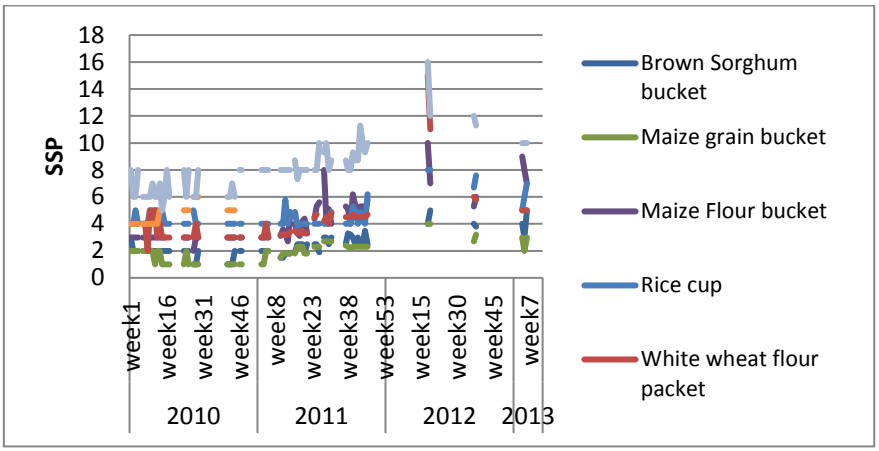
Source: Directorate of Commerce and Supply, CES, Juba

Figure 5-3: Monthly price of agricultural commodities in Juba market, 2011



Source: Directorate of Commerce and Supply, CES, Juba

Figure 5-4: Trends of prices of major agricultural commodities from 2010 to 2013



Source: Ministry of Agriculture and Forestry, CES, Juba

In general, price trends are not very different by commodity. Prices are relatively stable except for some seasonal fluctuations (Figure 5-3 and Figure 5-4). Because of the heavy dependence on imports, cereal prices in South Sudan's urban markets are significantly influenced by external forces. Import prices have set local prices in many markets. An event in Uganda can have an adverse effect on consumer markets in Juba.

The price differentials that exist between Juba market and other domestic markets can be primarily attributed to high transport costs, given the long distances between them and poor transport infrastructure. In addition, internal factors such as rising fuel costs due to the oil shutdown, the closure of the border and currency depreciation further contributed to the escalation of prices.

Through the marketing process, a number of items (marketing costs) significantly influence the prices of agricultural commodities. The most important are agricultural inputs, transportation and multiple taxes. Transportation costs are by far the largest cost component in the markets studied in Juba, accounting for 15 to 50% of the marketing costs, depending on the commodity. This is attributable to the long distances travelled on poor roads. Generally, cereal procurement is planned to coincide with the dry seasons, which increases demand for trucks, and hire rates. Road density in South Sudan is among the lowest in East African countries and road conditions are very poor, especially in the rainy season, forcing trucks to carry small loads over long distances, which directly increases the unit cost of transportation. One set of data indicates that the price of cereal in the Juba market is three times more expensive than in Ugandan cities both at the retail and wholesale levels.[117] Traders believe that the competitive nature of the Ugandan transport industry resulted in the improved roads found in Uganda. Limited competition in all commercial activities in Juba, high fuel prices and high risk factors also contribute to the high unit cost of transportation to the Juba market.

Multiple taxes are the next highest marketing cost. They account for between 5 and 15% of the marketing costs[118]. The CAMP market survey revealed that there are a large number of taxes and charges in the Juba markets. Some examples follow:

- State development tax, CES
- Business profit tax, CES
- Tax identify card, CES
- Capital gains tax, CES
- Tax clearance certificate, CES
- Stamp duty, CES
- Advance stamp duty, CES
- Market entrance tax, Payam

There is also a daily fee to be paid to the respective market organisations for cleaning and security. To some extent, they appear to be reasonably coherent and follow a similar pattern in all the markets visited.

Apart from the transport and taxation marketing costs, the process of commodity procurement and transportation from Uganda entails 4-5 days, which increases labour costs. In an interview with a cereal trader it was found that the cost of labour (for off-loading) in South Sudan is around 3.5 times that (for loading) in Uganda[119]. This demonstrates one of

[117] Yoshino, Yutaka, Grace Ngungi and Ephrem Asebe. June 2011. Africa Trade Policy Notes #21. *Enhancing the Recent Growth of Cross-Border Trade between South Sudan and Uganda*. Washington, DC: World Bank.

[118] Information from interviews with traders in Juba markets

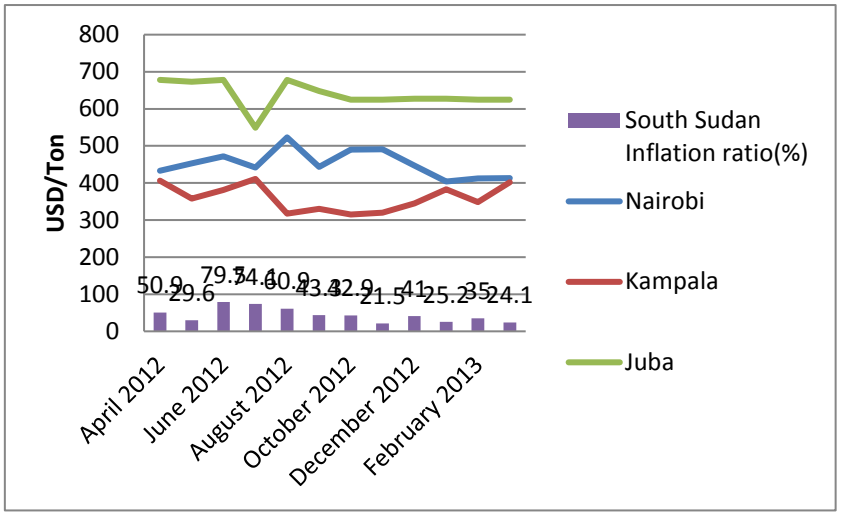
[119] Unit cost is per bag of labour. Information from interviews with cereal traders at the Nimule border point, March 2013, CAMP situation analysis.

the constraints in enhancing South Sudan's competitiveness in business with neighbouring countries. In addition, a more competitive business environment would increase the efficiency of both marketing and production; it would reduce transaction costs and ensure more competitive pricing. However, the current business environment is not efficient.

Most traders do not purchase grains within South Sudan, rather they prefer to import from Uganda. They can set prices given the lack of competitive options and can pass on additional transport costs to end consumers in Juba.

According to the NBS data in Figure 5-5, between April 2012 and March 2013 inflation peaked at 79.5% in May 2012, mainly due to high food prices and currency depreciation following the oil shutdown. On a monthly basis, the inflation rate declined from 41.5% in December 2012 to 25.2% in January 2013 due to a reduction in the price of staple foods.

Figure 5-5: Maize retail prices in Juba, Nairobi, and Kampala April 2012-March 2013



Source: NBS, Directorate of Commerce and Supply, CES, Juba and www.ratin.net.

The comparison of data from Juba, Nairobi and Kampala shows that retail prices of maize in Juba are higher (Figure 5-5). In particular, there is a significant gap in the maize retail price between Juba and Kampala. Ugandan maize prices are the lowest among the three countries and very competitive. The price gap between Kampala and Juba reached almost USD 400 per ton in August 2012. One factor for the large gap is the high marketing costs between South Sudan and Uganda.

In addition, rising fuel costs in South Sudan contributed to the escalation of prices in 2011/2012. The NBS [120] reported that the price of fuel approximately doubled in most markets between January and November 2011. This increase added considerably to inflation. The depreciation of the SSP also added inflationary pressure during 2011/2012. Another inflationary factor is the multiple unofficial road blocks and check points, which add to overall costs by collecting informal (illegal) taxes and increase delivery times.

The challenges[121] facing marketing domestic products are varied and numerous. The strong economic relationship with the East African regional markets further discourages the marketing of local produce.

[120] Press release in January 2012.

[121] 1) Infrastructure; 2) institutional framework, especially taxation and customs; 3) production capacity; 4) capacity of domestic traders, are raised as main challenges in the CAMP Juba market survey.

5.4.7 *Conclusions*

The CAMP market survey found that because of high dependence on imported agricultural produce, food prices in Juba are strongly influenced by external factors. An event in a major source country has a large (favourable or adverse) effect on Juba market. This suggests that measures to develop the Juba market should be examined in a broader context. Efforts to develop the marketing network should take into consideration the situation of supply of and demand for agricultural commodities in South Sudan and also in neighbouring countries. There is great potential in the East African region for increased trade opportunities for South Sudan's agricultural products. Effective and fully functioning infrastructure, as well as efficient government institutions to enhance trade, is the key to South Sudan's ability to gain benefits from the East African regional market.

5.5 Education and Training

5.5.1 *Background*

In the 1940s, the Government of Sudan established an agricultural training centre in Yambio. It was the first agricultural training centre in the southern part of Anglo-Egyptian Sudan.[122] Yambio Agricultural Training Centre was the only agricultural training centre in the southern part of Sudan until other training centres were established in the 1970s and 1990s.[123] The University of Juba was established in 1977; it was the only university where agricultural university degrees could be obtained in this part of Sudan until other universities were established in the 1990s.[124] Thus, for a long time, efforts made by the Government of Sudan in the southern part of Sudan, for training and education in agriculture, were limited.

In 2002, some relief agencies initiated a programme called the Southern Sudan Agriculture Revitalization Program (SSARP).The main objectives of the SSARP were to increase access to agricultural skills and technology, and to capital for agricultural enterprises, plus to increase the capacity of commodity networks to facilitate expanded trade.[125] SSARP also promoted training to improve agricultural production and marketing. To achieve SSARP's objectives, six training centres were selected to provide training and outreach to those who needed improved skills and knowledge. These centres were: Crop Training Centre Yei (CTC Yei), Kagelu Forestry Training Centre (KFTC), Marial Lou Livestock Training Centre (MLLTC), Padak Fisheries Training Centre (PFTC), Nzara Agricultural Technology Training Centre (NATTC) and Boma Wild Life Training Centre[126].

USAID was the main donor for the SSARP; in 2006, they announced the end of their support. The training centres were handed over to the Ministry of Agriculture, Forestry, Cooperatives, and Rural Development (MAFCRD) and Ministry of Animal Resources and Fisheries (MARF) in 2007.[127] Consequently, the Government of Southern Sudan took over salary payments for

[122] Sudan Government. 1955. Natural Resources and Development Potential in the Southern Provinces of the Sudan: A Preliminary Report by the Southern Development Investigation Team 1954. London.

[123] Crop Training Centre Yei was established in 1977. Kagelu Forestry Training Centre was established in 1990. Marial Lou Livestock Training Centre was established in 1996. Source: footnote 88

[124] WikiPedia. University of Juba. http://en.wikipedia.org/wiki/University_of_Juba#History

[125] Chemonics International Inc. 2003. Agricultural Enterprise Finance Program: A Component of the Southern Sudan Agricultural Revitalization Program (SSARP). Second Annual Workplan October 1, 2003 – September 30, 2004. Unpublished.

[126] SSARP included construction of MLLTC and NATTC as new establishments while CTC Yei, KFTC, and PFTC were renovated.

[127] USD 200,000 were provided to each centre for operation during the transitional period.

the training centres while responsibility for the operation of the centres remained in each training centre.[128]

Major government and non-governmental agricultural training institutions and other educational institutions, such as universities and vocational training centres, are reviewed to give an overview of the situation of South Sudan's agricultural education and training.

5.5.2 Government agricultural training centres

There are five government training centres related to agriculture in South Sudan.[129] Current conditions and characteristics of these centres are illustrated in Table 5-23.

Table 5-23: Government Agricultural Training Centres related to Agriculture in South Sudan

	Name of training centre	Location	Number of staff	Training courses and major contents offered	Number of trainees finishing courses
1	Crop Training Centre Yei	Yei, Central Equatoria State	1 Principal, 9 instructors, 11 management, 45 labourers	3 month agribusiness extension course and some other tailored courses based on demands.	29 trainees finished 3 months course in 2010. 25- 30 trainees finished 3 months course in the prior 5 years.
2	Kagelu Forestry Training Centre	Kagelu, Central Equatoria State	7 trainers, 20 administrative staff	Refresher courses. Agroforestry, apiculture/bee keeping, wood work/carpentry, business skills, and biomass energy courses. 2 year Forestry Technician course and 1 year forestry diploma course	280 trainees completed the available courses in 2012 and 5,000 received outreach training in 2012.
3	Marial Lou Livestock Training Centre	Marial Lou, Warrap State	11 staff, All of them teach and do administration.	There are 6 types of training courses. (1) 4 month Animal Health Auxiliary (AHA), (2) 5 month Stock person's Certificate, (3) General Livestock Extension Worker Certificate , (4) Short courses on demand basis, (5) 1 to 2 week Refresher course, (6) Outreach training programme. 3 new certificate courses will be implemented soon.	In 2012, 22 trainees completed 4 month AHA course. In 2011, 8 completed AHA, 18 completed 5 month Stockperson's Course.

[128] Nuffic. April 2010. ALFFAT Education, NICHE support for Agricultural Development in Southern Sudan. ALFFAT: Agriculture, Livestock, Fishery, Forestry & Agric. Technology. Final Report Assessment Agricultural TVET centres in Southern Sudan. Consultant's report. Unpublished.

[129] Boma Wildlife Training Centre is operated under the supervision of the Ministry of Wildlife and Conservation and Tourism and focuses on wildlife conservation. It is not part of the CAMP Situation Analysis.

	Name of training centre	Location	Number of staff	Training courses and major contents offered	Number of trainees finishing courses
4	Padak Fisheries Training Centre	Bor, Jonglei State	5 senior staff and 16 support staff	Offers two types of training courses. One is in-house training and the other is outreach training for fishermen. Course contents are fish processing and preservation modalities, fish extension education and community development, fish farming, business management, fisheries management, quality smoked fish techniques, boat building and repair, fish gear technology, net making and catching techniques, and fish data collection	In 2013, 20 trainees completed 3 months training course.
5	Nzara Agriculture Technology Training Centre	Nzara, Western Equatoria State	N/A	In the past, the centre offered training courses such as animal power utilisation and management, tractor operation and management, fabrication and repair of farm tools, operation and management of agro-processing equipment, post-harvest handling, preservation and packaging, small scale business management, product costing and pricing, etc.	Since 2007, training is not organised.

Sources: CTC Yei, Crop Sector Questionnaire for CTC Yei. Yei, 8 April 2013, CAMP Situation Analysis.
Padak Training Centre, Visit to Padak Training Centre. 29 May 2013. CAMP Situation Analysis.
Nuffic. April 2010. *ALFFAT Education, NICHE support for Agricultural Development in Southern Sudan. ALFFAT: Agriculture, Livestock, Fishery, Forestry & Agric. Technology. Final Report Assessment Agricultural TVET centres in Southern Sudan.*
Consultant's report. Unpublished., Nuffic. October 2011.*Support to CTC Yei, CTC Yei assessment C-report*.
Consultant's report. NICHE/SDN/096. Unpublished., Marial Lou Livestock Training Centre*. Marial Lou Livestock Training Centre (MLLTC) Background.* Unpublished.
Mott MacDonald, Interviewed by CAMP Task Team, Juba, 22 June 2013, CAMP Situation Analysis.
Marial Lou Livestock Training Centre, interviewed by CAMP Task Team*,* Juba. 1 July 2013. CAMP Situation Analysis.

5.5.2.1 Crop Training Centre Yei (CTC Yei)

Staff salaries at CTC Yei are provided by the Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD), but all other running costs are generated through its own efforts. The main course is a three month agribusiness extension course, but it is provided only once a year. Remaining courses are tailored based on demand. Sometimes they collaborate with NGOs to organise training courses. However, considering the number of staff at CTC Yei, the number of trainees graduating from the main training course is small. CTC Yei has the capacity to provide more training courses which would allow them to become more self-sufficient; this is one of their major challenges.

Currently, many trainees enrol in the three months course, but it does not necessarily provide sufficient knowledge. To improve the situation, the Dutch government is trying to establish a 9-12 months certificate accredited course at CTC Yei. The new curriculum will include not only crop production components but also livestock production and scientific

knowledge of agriculture. CTC Yei does not have a livestock training component in their courses so this would strengthen a weak part of the curriculum. The Dutch government also provides technical support to improve teaching skills. A training component about rice was added to the training courses through support by JICA. These efforts may increase the number of trainees.

With limited funds it is challenging to improve the quality of courses and to increase their number. State governments should send their staff to CTC Yei for training but have limited budgets to do so. CTC Yei currently has nine instructors, six of whom have recently joined. Keeping qualified instructors is another challenge. Nevertheless, considering the need to improve AEOs' knowledge and skills and increase their number, CTC Yei's role is important for bettering crop production.

5.5.2.2 Kagelu Forestry Training Centre (KFTC)

KFTC has been active in conducting outreach training while providing extension services to the public. The variety of their activities, such as providing training, consultation, carpentry work, research activities and accommodation, is their strength. However, even though the centre carries out a variety of activities to fund their running costs, it is a major challenge to meet these costs, especially as they lost their major funding source in 2008. There are insufficient trainers for the current training courses. Another challenge is that very few students enrol in the diploma course. They want to improve course quality, including accreditation of their diploma and certificate by a higher educational institution or the Ministry of Higher Education.

5.5.2.3 Marial Lou Livestock Training Centre (MLLTC)

Currently, the Dutch government is supporting MLLTC to improve the contents of their training curriculum. For example, the General Livestock Extension Provider and Animal Health Auxiliary certificate courses will start in July 2013.

However, MLLTC has some challenges. Limited budget to provide training is a major challenge. The main reason is that MLLTC has to rely on outside funding to meet its running costs to continue providing courses. Another reason is the high cost of the courses and an insufficient number of trainees. The courses are not attractive to trainees because employment opportunities are limited after completing the course. For example, even if a community animal health worker (CAHW) completes a course which improves their capacity in animal health, it is difficult for them to find employment afterwards. Another reason is the location of MLLTC which is far from large towns[130]. During the rainy season, access to MLLTC becomes even more difficult.

5.5.2.4 Padak Fisheries Training Centre (PFTC)

PFTC provides practical training, but there is no applied research conducted. PFTC has to rely on outside funding to meet its running costs. The centre was transferred from the Ministry of Animal Resources and Fisheries (MARF) to the John Garang Memorial University of Science and Technology in Bor. Despite the transfer, the salaries of PFTC are still paid by MARF; but there is no longer a strong linkage between the centre and MARF which means it is difficult for the centre to reflect the policy and plans of MARF.

Lack of training opportunities for PFTC staff is another challenge as they try to improve the quality of training. Each state is supposed to send staff to the centre, but training is not equally provided to staff of each state.

[130] For example, it is 294 kilometres from Rumbek.

5.5.2.5 *Nzara Agriculture Technology Training Centre (NATTC)*

NATTC used to function as an agricultural training institution. It provided some courses that are not available at the currently functioning training centres such as food processing and post-harvest handling. The presence of NATTC was unique and important for agricultural development. However, since 2007, no training has been organised due to the withdrawal of USAID from SSARP.

5.5.3 *Non-governmental institutions*

Various NGOs also provide training in different agricultural (technical/activity) areas. Since it is difficult to collect information about all NGOs' training activities in South Sudan, information about the Yei Agricultural Training Centre (YATC) is provided as an example of a non-governmental institution's activity. YATC was established in 1999 in Yei. The Norwegian People's Aid has been supporting them financially since then. Currently, much of their funds are generated through their own activities. Training is a major source of funds. The centre offers four training courses as shown in Table 5-24.

Table 5-24: Key Information about Yei Agricultural Training Centre (YATC)

Name of the training centre	Location	Number of staff	Training courses and major contents offered	Number of trainees finishing courses 1999-2010
YATC	Yei, Central Equatoria State	Seven staff (All of them are able to be trainers)	(1) Basic agriculture training course, (2) Specialised agriculture course, (3) Participatory agriculture course, (4) Short courses on demand basis. (Livestock training component is available for the courses.)	Basic Agriculture: 674, Participatory Methodologies: 124, Specialised Agriculture: 129, Short courses: 239

Sources: Yei Agricultural Training Centre, Crop Sector Questionnaire for YATC, Yei, 10 April 2013, CAMP Situtation Analysis.
Nuffic, October 2011. *Mission Report for Inception phase of project: "Upgrading Crop Training Centre Yei to offer accredited programmes in agriculture management and production with special emphasis on agricultural extension services."* Consultant's report. NUFFIC/NICHE/SDN/096. Unpublished.

YATC actively tries to improve farmers' agricultural skills and knowledge through providing extension activities. YATC also provides animal traction services to some target communities as part of their efforts to generate funds; animal traction has been well received by target farmers.

Increased funding based on its own effort is a major challenge that YATC has to overcome. To achieve this, YATC is collaborating with other NGOs. In the past, when an NGO participated in training at YATC, YATC took all responsibility for providing the training which was costly for the NGO. Now, venue and accommodation are provided by YATC; then most of the sessions are instructed by the NGO and others by YATC. This is beneficial for both parties. If the cost of training is reduced, NGOs can organise more training which means more business and funds for YATC. This kind of effort to expand business opportunities is necessary for the government training centres to improve their financial situation.

5.5.4 *Higher educational institutions*

5.5.4.1 *Universities*

Higher educational institutions such as universities play an important role in human resource development in the agriculture sector. There are five universities in the country which offer courses related to agriculture. They are listed by subsector in Table 5-25.

Table 5-25: Universities Offer Courses of Bachelor's Degrees in the four Agricultural Subsectors

	Subsector	Names of University
1	Crop Production	University of Juba, Upper Nile University, John Garang Memorial University, Catholic University of South Sudan
2	Livestock	University of Juba, Upper Nile University, John Garang Memorial University, Western Bahr El Ghazar University
3	Forestry	University of Juba, Upper Nile University
4	Fisheries	University of Juba, Upper Nile University

Sources: University of Juba. 2013. *College of Natural Resources and Environmental Studies. Revised Curriculum.* Unpublished. University of Juba. *College of Natural Resources and Environmental Studies. Department of Animal Production.* Unpublished. Catholic University of South Sudan. 2012-2013. *Handbook and Student Guide Fifth Academic Year.* Wau. Nuffic, 2010. Support to CTC Yei. *Final Report Assessment Agricultural TVET centres in South Sudan*. *CTC Yei assessment A report.* Consultant's report. NICHE/SDN/096. Unpublished. University of Juba, College of Natural Resources and Environmental Studies, interviewed by CAMP Task Team. June-July 2013. CAMP Situation Analysis.

The University of Juba University is given as an example of higher education in South Sudan. Under the College of Natural Resources and Environmental Studies, there are the following departments related to agriculture: (1) Agricultural Science, (2) Animal Production, (3) Forestry and (4) Fisheries. All the departments offer 5 year undergraduate programmes. The number of enrolled students in each bachelor's programme is indicated in Table 5-26.

Table 5-26: Number of Bachelor's Students at University of Juba in College of Natural Resources and Environmental Studies

Agricultural Science	Animal Production	Forestry	Fisheries	Grand Total
172	139	106	73	490

Source: University of Juba. 2013. College of Natural Resources and Environmental Studies Registrar's Office. Juba. Unpublished.

Due to a shortage of teaching staff for postgraduate programmes, there are no postgraduate students except for a few in the Fisheries Department. The university provides mainly theoretical classes as there is limited land to practice or experiment in agriculture on campus. Many graduates find employment opportunities at NGOs and government institutions at national and state levels. Funding sources of the university are the government, support from DPs and students' tuition fees.[131]

Lack of demonstration farms and laboratories and the limited number of teaching staff are major challenges for the College of Natural Resources and Environmental Studies.

Other major universities offer similar programmes although some offer only one or two agricultural subsector areas. Considering the number of students who study agriculture, the impact of higher education on the agricultural sector is large.

5.5.5 Other government institutions and schools

There are other training centres and schools which provide classes and/or courses related to agriculture. Basic information about these is presented in Table 5-27.

[131] Assistant Professors of Soil and Water Science, Professor of Forestry, Assistant Professor of Fisheries Science, College of Natural Resources and Environmental Studies, University of Juba. Juba. 27 June 2013. CAMP Situation Analysis.

Table 5-27: Key Information about Other Government Institutions that provide Agricultural Education and/or Training Courses

	Name of the training centre	Location	Major courses/subjects offered related to agriculture	Number of trainees/students finishing in 2012
1	Amadi Rural Development Institute (Amadi RDI)	Amadi, Western Equatoria State	1-2 weeks and 3, 6, and 9 month courses related to rural development are available, such as community development, social work, cooperative development, leadership, communication, budgeting and planning, vegetable gardening, food processing, agricultural extension, bee keeping.	Every year, about 30 Community Development Officers and 30 Cooperative Officers are trained. 22 trainees participated in two short training courses in 2012.
2	Kapuri Agricultural and Technology Transfer Centre (KATTC)	Juba, Central Equatoria State (About 12 kilometres from Juba town)	In the past 2 years, training has not been organised due to limited budget. 3 month training for tractor operation was provided in 2009, 2010, and 2011 (only once a year).	21 to 33 trainees attended each course in 2009, 2010, and 2011.
3	Vocational Training Centres	Juba, Wau, Malakal, and Rumbek (centre in Rumbek is available only for women.)	3 months, 6 months, and 1 year agricultural training courses, 3 months training covers agroforestry and livestock subjects. 6 month training covers fish farming as well. The school in Malakal offers a course for tractor operation and maintenance.	No information is available.
4	Public and private primary schools	Across the country, there are more than 300,000 primary schools in the country.	Basics about water, soil, farm tools and equipment, land preparation, crop production, farm structures, farm animals, animal products, agricultural business	Precise information is not available. Fourth to eighth year students are targeted[132]
5	Public and private secondary schools	Across the country, there are about 230 secondary schools in the country.	General introduction to agriculture, crop production, soil fertility, farm tools and equipment, animal production, animal health, agricultural mechanisation and engineering, agricultural economics	Precise information is not available. All students are targeted[133]

Sources: Amadi Rural Development Institute, interviewed by CAMP Task Team. Juba. 1 July 2013. CAMP Situation Analysis. Inspector for Mechanisation of Department of Agricultural Mechanisation and Kapuri Technology Transfer Centre, interviewed by CAMP Task Team. Juba. 28 June 2013. CAMP Situation Analysis. JICA Skills Vocational Training project, interviewed by CAMP Task Team. Juba. 24 June 2013. CAMP Situation Analysis. UN/RSS Joint Programme on Creating Opportunities for Youth Employment in South Sudan. 2011. *Standard and Harmonised Draft Vocational Training Programmes*. Juba. Senior Curriculum Development Officer

[132] Primary school years consist of eight years in total.

[133] Secondary school year consists of four years. There are some optional classes available for the third and fourth year students.

of Department of Curriculum Department, Ministry of General Education, interviewed by CAMP Task Team. Juba. 2 July 2013. CAMP Situation Analysis.
Director General of Education-New Sudan. Chairperson; National Curriculum Development Committee. 2002. *Syllabus for Primary Schools. Volume 2: Primary 6-8.* Government of Southern Sudan. Ministry of Education, Science and Technology. 2007. *Secondary Education. Syllabus for Southern Sudan Certificate of Secondary Education. Volume 1.*

5.5.5.1 Amadi Rural Development Institute (Amadi RDI)

AMADI RDI is a government training institution which mainly provides training courses concerning rural development, but it also provides management and leadership skills as well as agricultural extension courses. Three, six, and nine month courses are available. Depending on the needs of trainees, the institute can arrange training courses flexibly. Currently, they are preparing to start two nine month certificate courses on: 1) water and sanitation, and 2) water and irrigation with the support of the Dutch government.[134] AMADI RDI receives not only staff salaries but also some operational funds from MAFCRD which means they can provide some cost-free short term courses but not cost-free longer term courses.

Currently, Amadi RDI is not providing any training due to the construction of new buildings for the new courses and renovation of the existing buildings. Staff training for the new training courses is another reason. As soon as these activities are completed, operations will resume.

5.5.5.2 Kapuri Agricultural and Technology Transfer Centre (KATTC)

KATTC is under the Department of Mechanisation of MAFCRD. It is located about thirty minutes away from Juba. Three management staff, eighteen operators and eleven labourers are working at the centre. Their salaries and some operational budget are funded by MAFCRD. Because of the austerity measures, training in tractor operation has not been provided since 2012. They do not receive any support from donors. Thus, currently their only activity is lending tractors.[135] There is no demonstration farm or accommodation facility available at the centre. Hence, it is difficult to provide practical training at KATTC, even if there are sufficient funds available for tractor operation training.

5.5.5.3 Vocational Training Centre

There are three vocational training centres in the nation, Juba, Wau, and Malakal. The Aluakluak Women's Vocational Training Centre located in Rumbek will soon start operation.[136] The curriculums of vocational training centres contain not only crop production but also livestock and agroforestry; students can gain a broader knowledge of agriculture. A course for tractor operation and maintenance is available at the vocational training centre in Malakal which is beneficial; in other areas, such as Yei, there are no training courses that focus on tractor operation and maintenance. Tractor hire companies employ trained tractor operators from Uganda.

5.5.5.4 Primary and secondary schools

Primary and secondary schools have classes about agriculture. Therefore, South Sudanese who completed primary school after 2000 have basic knowledge of farming and animal

[134] The water and irrigation course focuses on the technical aspects of borehole drilling. It is not an agricultural irrigation course.
[135] Currently, KATTC owns six tractors, but only three of them are operational. Spare parts are not available in the country nor is there any budget to purchase spare parts.
[136] JICA Skills and Vocational Training Project, interviewed by CAMP Task Team. Juba. 24 May 2013. CAMP Situation Analysis.

husbandry. Key information about primary and secondary school classes related to agriculture is illustrated in Table 5-27.

The school curriculum is standardised for both public and private schools across the country.[137] Especially, in secondary schools, agriculture is a separate subject. Considering the large number of schools using the standard curriculum, primary and secondary schools are contributing to laying a foundation for the nation's agriculture.

5.5.6 Observations

One of the challenges in the agricultural sector is the limited technical skills and knowledge of government employees, especially at county, payam and boma levels. In the case of crop production these include agriculturally specialised skills such as agricultural production, extension, post-harvest, agribusiness and how to organise farmers' groups. Additionally, in crop production's case, not enough Agricultural Extension Officers (AEOs) are deployed in county and payam offices. In order to increase the number of AEOs with appropriate skills and knowledge, provision of training to prospective AEOs is necessary. The other challenge is farmers' lack of knowledge and skills in agriculture. Since the number of AEOs is limited, leading farmers in the community could be trained to lead and support other farmers. Existing training centres could play an important role in ameliorating this situation.

Limited funding is a major common challenge for the government training centres; they need to find ways to cover their running costs. For example, if they could lower the cost of training courses, so as be more affordable, they could increase the number of trainees and improve their financial situation. Lack of qualified teachers is another major challenge for these centres. Training curriculums should be standardised at all institutions. Collaboration between research centres and training centres is minimal meaning that new knowledge and skills are not included in training courses and then put into practice. Similarly, the University of Juba could consider how to collaborate with existing training institutions to provide practical field experience for its students.

Considering the growing demand for tractor use by farmers across the country, a training course on tractor operation could be beneficial for tractor hire companies and farmers.

5.6 Civil society organisations

There are a number of civil society organizations operating in South Sudan. As the country has experienced several decades of civil war, most organizations focus on humanitarian emergency aid, particularly for food security and livelihood improvement. Some organizations also target supporting returnees and peace building, reflecting the fact that the country is still vulnerable in its reconstruction stage. Other common activities focus on education, health care and gender issues. Table 5-28 is a list of civil society organizations and types of activities that each of them focuses on.

[137] The current curriculum for primary schools became effective in 2000 and that for secondary schools in 2006.

Table 5-28: List of civil society organizations

Organization	Common activities					
	Food security	Support returnees	Peace building	Education	Health care	Gender
Action Against Hunger-International (ACF) International	✓				✓	
Agency for Technical Cooperation and Development (ACTED)	✓	✓			✓	
African Development Solutions (ADESCO)	✓	✓				
Aweil Window of Opportunities and Development Agency (AWODA)	✓		✓	✓	✓	✓
Banga International	✓					
Catholic Agency for Overseas Development (CAFOD)	✓		✓		✓	
Cooperative for Assistance and Relief Everywhere (CARE)	✓				✓	
Community Agriculture and Skills Initiative(CASI)	✓		✓			✓
Cooperazione E Sviluppo (CESVI)						
Christian Mission for Development (CMD)	✓		✓	✓		
Concern Worldwide	✓	✓				
Catholic Organisation for Relief & Development Aid (Cordaid)	✓				✓	✓
Christian Recovery and Development Agency (CRADA)			✓			
Dan Church Aid (DCA)		✓	✓			
Danish Refugee Council (DRC)	✓		✓			
GOAL					✓	
Humane Development Council (HDC)	✓	✓	✓	✓		
Inter-Church Organisation for Development Cooperation (ICCO)	✓		✓			
Intermon Oxfam	✓	✓			✓	
International Rescue Committee (IRC)				✓	✓	
Islamic Relief Worldwide (IRW)				✓	✓	
Joint Aid Managemet International	✓					
Mani Tese	✓					
Mercy Corps	✓		✓	✓		
Norwegian Church Aid(NCA)			✓	✓	✓	✓
Nile Hope Development Forum (NHDF)					✓	
Norwegian People's Aid (NPA)					✓	
Nutrition Cluster/ACF	✓					
Oxfam Canada			✓			✓
Oxfam GB	✓			✓		
People in Need	✓			✓		
Plan International	✓		✓	✓		
Samaritans Purse		✓				
Save the Children				✓	✓	
Suatainet East Africa	✓					
Tearfund	✓			✓	✓	
Vétérinaires Sans Frontières(VSF) Belgium	✓					
Vétérinaires Sans Frontières (VSF) Germany	✓	✓				✓
Vétérinaires Sans Frontières (VSF) Suisse	✓		✓	✓		
World Concern	✓			✓		
World Vision International	✓		✓		✓	

Sources: The areas of relevance were selected by the CAMP Task Team based on the information obtained through each organization's website.

5.7 Development partners

There are at least 17 development partners (DPs) operating in South Sudan for agricultural development[138]. Table 5-29 is a list of major DPs[139]in the agricultural sector of South Sudan

[138] The number of DPs is based on a survey conducted by the CAMP team.

with a brief description of their areas of assistance, and projects/programmes conducted by them. Projects/programmes that do not seem to have a direct/strong relation to South Sudan's agricultural development have been omitted, such as those that improve the judicial system, primary education system and health care facilities.

It can be observed from the table that most projects/programmes target a major CAADP Pillar used by the South Sudan Natural Resources Sector Working Group (NRSWG), namely Food Supply, Security, and Access & Hunger. This reflects the position of the Government of the Republic of South Sudan (GRSS) that stresses the importance of food security as repeatedly stated in MAFCRD's Agriculture Sector Policy Framework (ASPF) 2012-2017 and MARF's Policy Framework and Strategic Plans 2012-2016. JICA's Technical Cooperation in the formulation of CAMP will take all five CAADP pillars into consideration: a) Food Supply, Security, Access & Hunger, b) Land & Water Management, c) Market Access (including roads), d) Framework for Agricultural Productivity, e) Institutional Development of Ministries.

Table 5-29: List of major development partners supporting agriculture in South Sudan

DPs	Focus areas	Projects/programmes	Period
BMZ/ GIZ	▪ Promoting institutional development (training administrative officers, establish state and municipal revenue and expenditure systems, etc.) ▪ Promoting conflict transformation and peace building (reintegrating former combatants, etc.) ▪ Improving water supply and sanitation (constructing dams, etc.) ▪ Improving food security and promoting market-oriented agricultural development (developing value chains, etc.) ▪ Developing transport infrastructure (roads)	Development-oriented Emergency and Transitional Aid (DETA)	Unidentified
		Food Security and Agricultural Development	2010-2012
		Food Security and Rural Development	2010-2012
		Regeneration and Stabilisation of the Livelihoods of Returnees and the Local Population in Central and Eastern Equatoria / Western Equatoria	2008-2013 / 2011-2014
		Rehabilitation and Upgrading of the Lui Water Supply System	2011-2012
		Transboundary Water Cooperation in the Nile Basin	2002-2013
		Basic Service Provision and Recovery	Unidentified
		Building Community Resilience	2011-2014
		Emergency Assistance to Displaced Populations in South Sudan - UNHCR 2009	2009-2009
CIDA	▪ Promoting health of children and youth including maternal, nNew-born and child health (increasing access to healthcare services such as vaccinations, etc.) ▪ Improving food security (increasing access to seeds and tools, establishing community based saving groups, etc.) ▪ Improving governance (prison reform, capacity building of the Land Commission, training government officials, etc.) ▪ Promoting humanitarian assistance	Emergency Support for Returnees in South Sudan - World Vision Canada 2008	2008-2010
		Food Security Through Community-Based Livelihood Development and Water Harvesting (FAO Food Security - South Sudan)	2011-2014
		Health Support for Blue Nile State in Sudan - World Vision Canada 2008	2008-2010
		Peace and Livelihoods in South Sudan	Unidentified
		Reintegration of Ex-Combatants into Agricultural Livelihoods (REAL)	2010-2010
		Return and Reintegration to South Sudan - UNHCR Appeal 2008	2008-2008
		South Sudan Emergency Nutrition Project - Save the Children 2009	2009-2010
		South Sudan Water and Sanitation	2009-2011

[139] The major Development Partners were selected by the CAMP team out of the projects identified by the team based on number of projects conducted and volume of funds budgeted by each organization. Those that are not listed here include international organizations such as UNDP and the World Bank.

DPs	Focus areas	Projects/programmes	Period
		Project - Oxfam Canada 2009	
		Sustainable Livelihoods and Mine Action (SLAM)	Unidentified
		African Enterprise Challenge Fund	2011-2015
		Capacity Building Trust Fund Phase II	2009-2014
		Protective Safety Nets Programme	2012
DFID	▪ Improving primary education (increasing access to education, distributing text books, etc.) ▪ Promoting access to healthcare and nutrition (prevention of malaria, etc.) ▪ Improving food security ▪ Improving governance and security (promoting women's access to security and justice services, etc.)	South Sudan Food Security and Livelihoods	2012-2015
		South Sudan Rural Feeder Roads Project	2011-2015
		Strengthening Economic Governance in South Sudan	2012-2015
		Aweil Irrigation Rehabilitation project (AIRP) - STABEX 03	Unidentified
		Bahr El Ghazal Livestock Production and Marketing Project - STABEX 02	Unidentified
		Environmental Protection and Sustainable Development: Building Local Capacities on Solid Waste Management in South Sudan	Unidentified
EU	▪ Improving justice/rule of law ▪ Increasing access to education and health ▪ Improving water management ▪ Promoting assistance for food security, feeder roads, extension and capacity building ▪ Promoting international trade (ensuring duty-free and quota-free access to EU markets under 'Everything But Arms', as soon as conditions are met)	Food Security Thematic Program (FSTP)	2007-2013
		Integrated and Environmentally Sound Livestock-crops Production and Marketing	Unidentified
		Livestock Epidemio-Surveliance Project (LESP) South Sudan	Unidentified
		Nyal-Shambe-Terakeka Fisheries Production and marketing Project - STABEX 04	Unidentified
		South Sudan Rural Development Programme (SORUDEV)	Unidentified
		Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA)	Unidentified
		Sudan Productive Capacity Reconstruction Program (SPCRP)	Unidentified
		Agriculture Extension Expert	Unidentified
		Project for Livelihood Improvement in and around Juba for Sustainable Peace and Development (LIPS)	2009-2012
		Support to Irrigation Master Plan Development	Unidentified
		Technical Assistance in support of Agriculture Extension services and Training for Rice Production	Unidentified
JICA	▪ Promoting state building (developing infrastructure, improving governance, etc.) ▪ Improving support for basic human needs ▪ Improving food security	Technical Cooperation in the Formulation of the Comprehensive Agricultural Development Master Plan of the Republic of South Sudan	2012-2014
		The Project for Capacity Development on Solid Waste Management in Juba	2011-2014
		The Project for Irrigation Development Master Plan	2012-2014
		Support to Agriculture and Forestry Development Project	Unidentified
		Food security and Livelihoods Program	Unidentified
		Food security and Livelihoods Program	Unidentified
		IFAD SSLDP South Sudan Livelihood	Unidentified

DPs	Focus areas	Projects/programmes	Period
		Development Project	
Nether lands	▪ Improving security and the rule of law (promoting capacity and accountability mechanisms within and outside the army, promoting governance and gender equity, etc.) ▪ Promoting food security and access to water (organizing farmers and providing training to strengthen their productive capacity, increasing access to inputs such as seeds and fertilizer, etc.)	Livestock Training Center (Marial Lou)	Unidentified
		Rural Drinking Water and Sanitation	Unidentified
		Support to Crop Training Centre (Yei)	Unidentified
		Water Program	Unidentified
		Food, Agribusiness and Rural Markets (FARM)	Unidentified
		International Small Group and Tree Planting Program (TIST)	Unidentified
		Rebuilding Higher Education in Agriculture – RHEA	Unidentified
		Seeds for Development	Unidentified
USAID	▪ Mitigating conflicts ▪ Strengthening effective, Inclusive, and accountable governance ▪ Develop essential services including health, education, nutrition, and water/sanitation ▪ Expand agricultural based economic opportunities (promoting public-private partnership for commercial agriculture, etc.)	Sudan Rural Land Governance Project	Unidentified
		Conservation of Biodiversity Across the Boma-Jongeli Landscape in Southern Sudan	Unidentified

Source: Information on the names of DPs, Projects/Programmes, and Periods was obtained from NRSWG. The focus areas are based on the information obtained through:Each DP's website; JICA. 2012. *Detailed Planning Survey for the Projects for the Comprehensive Agricultural Development Master Plan and the Irrigation Development Master Plan of the Republic of South Sudan – Preliminary Findings*. Juba: JICA

6. Public financial management and related institutional capacities

Public Financial Management (PFM) supports the effective and accountable use of public resources to implement government policies.

Since the signing of the Comprehensive Peace Agreement (CPA) in 2005 and independence in 2011, the coordination mechanisms between government and development partners (DPs) have evolved rapidly. The government's PFM system has to accommodate and manage resource contributions from the DPs, in addition to the oil and non-oil based national revenues.

CAMP formulation requires careful examination of the PFM practices of the Government of the Republic of South Sudan (GRSS), including state governments, in order to design implementation mechanisms consistent with these practices.

Without well-planned financial coordination, external interventions make a country's PFM system complex, incurring high transaction costs in the process of planning, budget preparation, execution, and monitoring and evaluation (i.e. PFM cycle). Under the situation of resource constraints and external interventions, the adoption of a well-designed master plan implementation mechanism, consistent with the existing PFM system, is important to ensure CAMP is cost effective and has maximum impact.

To make CAMP feasible, the mobilization of financial resources must be part of the CAMP process. CAMP will contain sub-sector projects with priorities, schedules and preliminary costs for implementation within a determined timeframe. CAMP also will capture current on-going projects under its agriculture development framework. To mobilize financial resources of the government and DPs in a coordinated and planned manner, the CAMP process should be aligned with the PFM system of the national and state governments. Provided that CAMP is a well-defined master plan supported by robust analyses of the agriculture sector, the CAMP process and the medium-term and annual planning cycles of all levels of government will need to be integrated to secure resources for CAMP implementation.

This chapter explains the current situation of PFM at national and state levels based on field visits to the 10 states of South Sudan. The capacities of state ministries and counties were assessed by interviewing key officers such as directors and county officers. Due to the time and financial limitations, the team visited 10 states and 20 counties.

6.1 Challenges

The field survey conducted by CAMP TT member reveals the lack of capacity of state ministries and counties. Table 6-1 shows the challenges as views obtained from state ministry officers. One of the major challenges is the absence of audits, internal and external. A number of officers said that there were many fraud cases during budget execution and procurement. As the operating budget is inadequate, regular operations are adversely affected. Additionally, the capacity of counties and other lower levels is very limited for budget execution and procurement due to the lack of accountants.

Table 6-1: Challenges of financial capacity by state

State	Challenges
Upper Nile	• Weak procedure for procurement of goods and services. • No external audit conducted

State	Challenges
Unity	• No external audit conducted. • Lack of detailed annual budget execution plans by each ministry. • Large proportion of budget is used for salaries and wages.
Warrap State	• Due to the financial condition, No projects are under way • Mismanagement of assets and funds. • No existence of procurement department in SMAF and SMARF. • There is no clear PFM in both state ministries and counties.
WBG State	• No external audit conducted. • No existence of procurement department in SMAF and SMARF. • Procurement of goods and services is conducted by SMoFEP. • Large proportion of budget is used for salaries and wages.
NBG State	• There is no funding for county activities although they are listed in the budget. • Constant delay in releasing of funds from SMOFEP. • No existence of procurement department in SMAF and SMARF. • Large proportion of budget is used for salaries and wages.
Lakes State	• No external audit conducted, internal audit rarely conducted. • No clear organogram for PFM in State Ministries. • Weak procedures for procurement of goods and services.
Jonglei State	• No external audit conducted. • Lack of detailed annual budget execution plan by each ministry. • Large proportion of budget is used for salaries and wages.
CES	• Lack of detailed annual budget execution plan by each ministry, counties. • Large proportion of budget is used for salaries and wages. • No external audit conducted
EES	• No external audit conducted. • Lack of detailed annual budget execution plan by each ministry. • Large proportion of budget is used for salaries and wages.
WES	• No external audit conducted. • Lack of detailed annual budget execution plan by each ministry. • Large proportion of budget is used for salaries and wages.

Source: Interviews with state officers

Issues and challenges are summarized as follows:

- Inadequate or insufficient human resources for planning, budgeting, procurement, accounting and auditing.
- Due to these reasons, cash flow and procurement is not transparent and accountable. There are many cases where a budget amount specified for a specific purpose is used for a different purpose.
- Limited funds for operating costs and investment.
- A large proportion of the budget is used for salaries and wages for officers employed by the ministries.
- Very limited or no capacity at the payam and boma levels.
- Very few counties and payams have any ongoing activities. Human, financial and physical resources are not distributed to counties and payams.
- No clear PFM procedures at state ministries and counties.
- Mismanagement of assets and funds.

6.2 Legal and institutional framework of PFM system

It is important to design CAMP so that it aligns with the current legal and institutional framework of the PFM system. In this section to facilitate discussion on the linkages between the government's PFM system and CAMP, the legal and institutional framework of the PFM system are described from the points of view of the medium-term and annual PFM cycles,

harmonization of government and DP resource allocations, and pooled funding mechanisms. The documents representing the legal and institutional framework published during the period between the establishment of the CPA signed in January 2005 and the country's independence in July 2011, and the period after independence, were examined. In this report the former period is called the pre-independence period and the latter is called the post-independence period.

6.2.1 Constitutions, acts, and regulations

Under the terms of the CPA the Government of Southern Sudan (GOSS) was formed as a governmental body in 2005, and relevant line ministries were established based on the provisions of the Interim Constitution of Southern Sudan. In July 2011 the Transitional Constitution of the Republic of South Sudan 2011 (the Constitution) was enacted and South Sudan became an independent country. Both constitutions provide basic provisions for the establishment of a PFM system including a financial calendar. During the pre-independence period, a Budget Call Circular setting the commencement of Annual Budget preparation was issued according to the provisions of the Interim Constitution, because no PFM acts were in place in this period. On the other hand, in the post-independence period a Budget Call Circular is issued under the provisions of the Public Financial Management and Accountability Act 2011 (PFMAA). Most of the other key regulations laying the foundation of the PFM system are of pre-independence origin.

The following is a list of relevant regulations presented in chronological order of enactment:

- Interim Public Procurement and Disposal Regulations 2006
- The Local Government Act, 2009
- The Transitional Constitution of the Republic of South Sudan 2011
- Public Financial Management and Accountability Act 2011

6.2.2 Definition of PFM

The Framework on State Public Financial Reform[140] defines:

> *Public Financial Management (PFM) supports the effective and accountable use of public resources and helps to underpin fiscal discipline.*

In addition, it also explains the meaning of 'fiscal discipline' as well as the objectives of PFM as follows:

> *Fiscal discipline means that there is effective control of the budget by setting ceilings on expenditure. It requires overall expenditure control, without which it is impossible to achieve effective prioritisation and implementation of policy priorities and programmes.*

The basic objectives of public financial management are:

1. To collect sufficient resources from the economy in an efficient and effective manner that minimises harm to economic activity

2. To allocate resources in accordance with government priorities

3. To utilise resources in an effective and efficient manner to ensure that services are delivered, and programmes implemented, cost-effectively.

[140] Ministry of Finance and Economic Planning (MoFEP), Framework on State Public Financial Reform, page 4, June 2010, Juba

6.2.3 Budget preparation guidelines and circulars

The national and state governments' medium-term plan (three-year plan) and annual budget preparation exercises have been guided by a number of guidelines issued by the national Ministry of Finance and Economic Planning (MoFEP). In terms of medium-term planning, the guidelines for Budget Sector Plans targeting all Spending Agencies (National Ministries and other government bodies) and DPs are followed. Although the inadequate level of alignment of planning and implementation is still an issue, detailed procedures for the alignment of DPs' interventions with the PFM system are defined by the guidelines. The medium-term planning is an annual recursive exercise where three year plans are reviewed and amended.

The Budget Call Circular includes the resource envelopes (or budget ceilings) of all the Spending Agencies, detailed cost estimation principles, unit costs including salary tables, and various budget formats; it is issued annually to facilitate organized budget compilation. The Circular assumes that Budget Sector Plans are a three-year planning and budget framework, and dictates that the Spending Agencies follow the framework for the formulation of the Annual Budget. For the allocation of the government's revenues, the concept adopted in the Budget Sector Plan and Annual Budget preparation is a top-down approach where resource envelopes are given from the higher authority for disaggregation into activities and expenditure items by lower authorities. Detailed discussion on this approach will be given in a later section.

The governments of states and counties (the local governments) follow a set of budget preparation guidelines to develop medium-term plans and budgets. The guidelines set out the local governments' planning and budget preparation cycles. The cycles are closely linked with the national cycle due to the fact that a large part of their financial resources are provided by the national government in the forms of unconditional and conditional transfers. For this reason, state governments start budget preparation in January for the following financial year (July-June). The guidelines also promote a participatory and bottom-up planning and budget preparation approach. Currently, it is perceived that the administrative and PFM capacity of the local governments is a challenging issue. Because the constitution provides high autonomy for the state governments, control over, for example, the conditional transfers by the national government is not well-secured or not transferred to the state governments. Local governments' inadequate PFM accountability, compounded by high fiscal risks, is a challenging issue to be addressed in the course of CAMP development. For CAMP implementation, state and county governments are the key players in the delivery of on-the-ground public services to rural communities and farmers. Without the engagement of the local governments, CAMP cannot be implemented, and therefore the capacity building of the local governments should be highlighted in CAMP.

The following is a list of examples of major guidelines and circulars issued by MoFEP:

Budget Sector Plans (National medium-term/three-year planning)

- Guidelines for drafting Budget Sector Plans 2011-2013, June 2010 (pre-independence)
- Development Partner guidelines for drafting Budget Sector Plans 2011-2013, June 2010 (pre-independence)
- Guidelines for drafting Budget Sector Plans 2012-2015, November 2011 (post-independence)

Annual Budget (National annual planning)

- Budget call circular for 2011 Budget preparation, October 2010 (pre-independence)
- Guidelines for compiling budgets for 2012/13, 2012 (post-independence)
- Budget call circular for 2012/13 Budget preparation, April 2012 (post-independence)

State and County Budget (Local governments' medium-term and annual planning)

- Guidelines for integrated state and county planning and budgeting, May 2010 (pre-independence)
- Participatory planning and budgeting guide for Local Governments in Southern Sudan, January 2011 (pre-independence)

6.2.4 Budget documents

The annually recursive Budget Sector Plan and Annual Budget preparation exercises produce a number of budget documents. Each Budget Sector produces a Budget Sector Plan, and thus ten Budget Sector Plans are developed annually. Every year one Consolidated National Annual Budget associated with a summary document are approved by the National Legislative Assembly (NLA) and published. Regarding the committed and disbursed DP contributions, Donor Book and other sector based documents are created. The Donor Book is created by the Aid Information Management System in South Sudan which is maintained by MoFEP. These documents are widely distributed in an effort to maintain upward and downward accountability of the application of public funds.

The following is a list of budget documents issued by MoFEP (examples of Budget Sector Plans are only for the Natural Resources Sector):

Budget Sector Plan for Natural Resources Sector
- Natural Resources Sector Budget Sector Plan 2011-2013 (July 2010; pre-independence)
- Natural Resources Sector Budget Sector Plan 2012/13-2014/15 (to be obtained; post-independence)

National Annual Budget
- Approved budget 2011 (pre-independence)
- 2012/13 approved budget (August 2012; post-independence)
- National budget plan financial year 2012/13 (a summary of the approved budget; post-independence)
- 2013/14 approved budget (Under processing; post-independence)
- National Budget Plan financial year 2013/14 (Under processing; post-independence)

Indicative financial contributions for DP supported projects
- South Sudan Donor Book 2011 (pre-independence)
- South Sudan Donor Book 2012/13 (post-independence)
- Natural Resources Sector Aid financing plan FY2012/13-FY2014/15 (post-independence)

6.2.5 PFM policies

To guide the improvement of legal instruments and resource appropriation laws (i.e. budgets) for planning and budget preparation, the establishment of a development policy with priority areas and indicative costing, and strategies for improvement of the country's PFM is essential. Since the country receives a large amount of externally sourced aid financing, a strategy to integrate the aid with the PFM system is also needed. Currently the highest level development policy of GRSS is the South Sudan Development Plan 2011-2013 (SSDP). To define partnership principles, mechanisms for aid coordination, benchmarks for aid delivery, design of aid operations, and implementing the aid strategy, the Aid Strategy for the Government of South Sudan was adopted by the government in November 2011.

The following is a list of development policies, aid strategies and PFM policies developed by MoFEP:

Development policy and aid strategy

- Government of Southern Sudan Aid Strategy 2006-2011 (November 2007; pre-independence)
- South Sudan Development Plan 2011-2013 (August 2011; post-independence)
- Aid Strategy for the Government of the Republic of South Sudan (November 2011; pre-independence)

PFM policies

- Fiscal challenges and progress in public financial management (April 2008; pre-independence)
- Framework on state public financial management reform (June 2010; pre-independence)

6.2.6 Pooled funding mechanisms

To finance activities in the post-conflict country six pooled funding mechanisms were in operation in 2013. The largest pooled fund named MDTF expired in May 2013. They were established during the pre-independence period except one which was established in the end of 2012. A new pooled fund named the South Sudan Partnership Fund (SSPF) is now under discussion for establishment as of June 2013. The pooled funding mechanism is one of the four types of aid instruments, namely, 1) standalone project support, 2) pooled projects, 3) local services support, and 4) budget support. Among these four instruments the level of alignment with the PFM system increases in the order above. However, local services support and budget support are not implemented in South Sudan. Since the CAMP process is government-driven, CAMP should prefer a higher level of integration, and therefore, the current pooled funding mechanism needs to be revisited to consider, for example, application of budget support and measures to increase accountability of the PFM system.

The following is a list of pooled funding mechanisms:

- Multi-Donor Trust Fund (MDTF) established in 2005 and expired in May 2013
- South Sudan Recovery Fund (SSRF) established in 2008
- Capacity Building Trust Fund (CBTF) established in 2004
- Common Humanitarian Fund (CHF) established in 2005
- Basic Services Fund (BSF) established in 2005
- Health Pooled Fund (HPF) in 2012
- South Sudan Partnership Fund (SSPF) under discussion for establishment as of July 2013.

6.3 Planning and budget procedures

In this section the planning and budget procedures in the pre- and post-independence periods are introduced in order to assess the questions of 1) how the government's PFM mechanism and government-DP coordination arrangements and their evolution can be described, and 2) how the CAMP process will be able to align with the PFM mechanism and coordination arrangements in order to secure allocation of financial resources for an effective and efficient implementation of CAMP.

Prior to independence in 2011 the financial year of the Government of Southern Sudan began on January 1, and ended on December 31 each year. Following the independence of the Republic of South Sudan in 2011, the financial year was shifted to the period beginning July 1 and ending on June 30 the following year. In this section, before discussing the current post-independence budget procedures, the procedures of the pre-independence period will be introduced for comparison. It should be noted that the post-independence

budget procedures have only been followed for one year since independence and under the unusual circumstances of the oil shutdown which forced the government to produce the austerity 2012/13 budget. During the period of January 1 to June 30, 2012 the half-year austerity budget was developed to manage the transition stage between pre-independence and post-independence PFM cycles. Since the half-year austerity budget was an irregular administrative arrangement, it will not be discussed in this report.

6.3.1 Pre-independence budget preparation procedures

To describe the pre-independence budget preparation procedures the 2011 budget preparation was selected for examination. The Government of Southern Sudan (GOSS) commenced the budget planning in June 2010 when MoFEP issued two sets of Budget Sector Plan guidelines. The budget planning lasted for six months until the National Legislative Assembly (NLA) approved an Annual Budget in December of the same year. This six-month budget planning period was divided into two stages: the stage of Budget Sector Plan development, and the stage of Annual Budget development. The Budget Sector Plan was a three-year medium-term plan defining sector priorities and projection of resource allocations for identified Directorate-level activities. The priority activities and their objectives had to be consistent with the relevant sectorial policies. Although Budget Sector Plans were three-year medium-term plans (for DPs' investment), revisions and modifications were done every year prior to the development of an annual Budget which is developed within the framework of Budget Sector Plans.

6.3.2 Budget Sector Plan development

In case of the 2011 budget planning, the Budget Sector Plan development stage commenced in June 2010 when MoFEP issued 1) Guidelines for Drafting Budget Sector Plans 2011-2013 and 2) Development Partner Guidelines for Drafting Budget Sector Plans 2011-2013 to all the Spending Agencies and DPs concerned.

The former Guidelines indicated the NLA approved resource envelopes for all Spending Agencies. As shown in Table 6-2 the stage lasted for two months up until late July 2010. The Budget Sector Planning Process commenced with a Training Week for all Budget Sector Working Groups from May 31 to June 4, 2010. The groups then had six weeks of sessions from June 7 to July 16, 2010 in which the groups drafted their Budget Sector Plans and met once a week. July 16, 2010 was the deadline for completion of the Budget Sector Plans. Each Sector presented its draft plans to MoFEP during a Review Week July 19 to 23, 2010. MoFEP sent final Budget Sector Plans to the Ministry of Labour and Finance Committee of the Southern Sudan Legislative Assembly, and development partners. Finally, MoFEP presented the Plans to the Council of Ministers.

Table 6-2: Schedule for Budget Sector Plan development

Week in 2010	Responsibility of:	To be completed and agreed upon by MoFEP
Training Week: May 31 to June 4	GOSS	• Sector objectives and targets • Major programme areas and main activities
	DPs	• Development Partner reporting begins
Week 1: June 7 to 11	GOSS	• 2010 Half-year Performance Report • Sector overview • Finalize sector targets
Week 2: June 14 to 18	GOSS	• Finalize roles and responsibilities of GoSS and Development Partners • Finalize sector overview

Week in 2010	Responsibility of:	To be completed and agreed upon by MoFEP

Week 3:
June 21 to 25
	GOSS	• Spending Agencies compile:
		  • Overall costing for 2011
		  • Existing contractual obligations
		  • Breakdown of state transfers
		  • Individual institutions' additional top 2 priorities
		  • Revenue collection

	DPs	• The deadline for submission of development partner templates
Week 4: June 28 to July 2	GOSS	• Main activities by Spending Agencies
	DPs	• Draft donor reporting presented by Development Partner Co-Chair and discussed
Week 5: July 6 to 10	GOSS	• Consolidated sector activities
	DPs	• Finalize donor reporting
Week 6: July 12 to 16	GOSS	• Sector reviews of Draft Budget Sector Plan
Review Week: July 19 to 23	GOSS	• Review week and incorporation of clarifications and amendments requested by MoFEP and Ministry of Labor and Public Service.
	GOSS	• MoFEP sends final Budget Sector Plans to Ministry of Labor and Public Service, Ministry of Parliamentary Affairs, Ministry of Cabinet Affairs, the Economy, Development, and Finance Committee of the Southern Sudan Legislative Assembly, and development partners, and they are presented to the Council of Ministers.

Source: MoFEP. June 2010. *Guidelines for Drafting Budget Sector Plans 2011-2013.* Juba. p.15. CAMP Task Team assembled the source information.

DPs were also involved in the process of Budget Sector Plan development due to the large resource contributions committed and planned by DPs. As indicated in Table 6-2 DPs were requested to attend the Training Week where their reporting began; they submitted development partner templates in Week 3; the DP Co-Chair presented the draft donor reporting in Week 4, and finalized the donor reporting in Week 5. While each Budget Sector Working Group met once a week during the six weeks from June 7 to July 16, 2010, they also organized intra-ministerial discussions in their respective Ministries to draft contents of Budget Sector Plans. In the case of MARF the officers of Planning, Statistics and Documentation Directorate attended the Training Week, and then organized intra-ministerial meetings with the Undersecretary and DGs of MARF. At the meetings disaggregation of MARF's resource envelope into envelopes for Directorates and priority areas were discussed in line with the polities of the Ministry. From these discussions, a focal person from each Directorate compiled the budget estimate using these envelopes. Drafts of the half-year Performance Report, sector overview, sector targets, overall costing for 2011, existing contractual obligations, breakdown of state transfers, and MARF's additional top 2 priorities were compiled by the focal persons. The drafts were consolidated by the officers of Planning, Statistics and Documentation Directorate, and presented by the Minister, Undersecretaries, DGs, and officers of the Directorate at the Natural Resources Sector Budget Working Group meetings. The working group finalized the draft of the Natural Resources Sector Budget Sector Plan 2011 which was sent to the Ministry of Public Service (MPS) which verified the budget allocations as to personnel costs. Then, the draft was sent to MoFEP for verification and submission to the NLA for its approval.

6.3.3 Annual budget development[141]

The formulation of the Annual Budget 2011 commenced when MoFEP and the National Ministry of Labour and Public Service (MoLPS) collectively issued the Budget Call Circular for 2011 Budget Preparation in October 2010 to all Spending Agencies. MoFEP revised the resource envelopes of all Spending Agencies based on the 2011 Budget Sector Plans, and informed the Agencies of the NLA approved resource envelopes by the Circular. As shown in Table 6-3 the drafting of the Annual Budget was done within a week in October 2010. Spending Agencies were given a relatively short period of time because the justifications and cost estimates had already been discussed by the Agencies during the period of 2011 Budget Sector Plan formulation. In this way, Budget Sector Planning enhanced the link between planning and budget preparation across GOSS, and provided a foundation for Annual Budget preparation.

An example of 2011 Annual Budget preparation by MARF follows. A ministerial focal officer was assigned by the Director General (DG) of Directorate of Planning, Statistics, and Documentation (DPSD) at the time of 2011 Sector Budget Plan development. The one-day Annual Budget preparation training on October 25, 2010 organized by MoFEP was attended by the focal officer, all DGs expect DG of State Affairs and Special Project Directorate, all professional officers of DPSD and the focal officer of each Directorate. During the training the attendees were provided with the ministerial and directorate resource envelopes stored in an Excel file, and guidelines and formats for budget preparation and execution management. At the workshop MoFEP explained the financial position of the government and budget preparation procedures to be followed by all Spending Agencies.

Following the workshop, the focal officers of MARF called several meetings within MARF to discuss and agree the resource envelopes given each Directorate; each Directorate disaggregated its envelope into cost items under a matrix of activities and expenditure items. The ministerial focal officer consolidated disaggregated budget estimates of all Directorates and compiled MARF's budget within a week as stipulated by MoFEP. This process was followed for government resources which did not include donor contributions.

[141] The budget process is the same in all GRSS ministries.

Table 6-3: Schedule for annual budget 2011 development

Date in 2010	Responsibility of:	Activities
Training Day: October 25	GOSS	• MoFEP and Ministry of Public Service hold a budget preparation workshop for all Spending Agencies • Electronic versions of the forms for budget preparation were given out at the workshop.
October 25-29	GOSS	• To ensure that Spending Agencies include all known expenditure commitments within their budget submissions, and fit within their ceilings, they are requested to adopt the following approach during their budget preparations: • Update the Agency's 2010 performance table, as compiled in their Budget Sector Plan, to indicate the activities which are expected to be completed by the end of December 2010. • Update GOSS salary and allowance obligations for 2011, in line with the Public Service pay scale indicated by the Ministry of Labour and Public Service as a part of the Circular. • Update conditional transfers to states (for salaries, operating and capital). It is expected that Agencies should leave these at the same level as contained in their Budget Sector Plan. • Update planned contractual payments: Agencies set out all their contractual commitments in their Budget Sector Plans. • Allocate the remaining balance to other salary (overtime, incentives, etc.), operating and capital items. It is important to note that no vehicle purchases can be made in 2011. • Update the detailed activity descriptions in line with the final budget allocations. • Calculate Agency estimated revenue collections in 2011 according to each type of revenue to be collected.
October 29	GOSS	• The deadline for submission of budget estimates to MoFEP

Source: MoFEP and Ministry of Labour and Public Service. July 2010. *Budget Call Circular for 2011 budget preparation*. Juba. pp. 10-11 and 19. CAMP Task Team assembled the source information.

6.3.4 Comparison between budget sector plan 2011-2013 and Annual Budget 2011

The Spending Agencies were grouped into four Pillar Working Groups which were further divided into ten Budget Sector Working Groups. The Ministry of Agriculture and Forestry (MAF), Ministry of Cooperatives and Rural Development (MCRD), and Ministry of Animal Resources and Fisheries (MARF) were members of Natural Resources Budget Sector Working Group consisting of the following Spending Agencies:

- Ministry of Agriculture and Forestry
- Ministry of Animal Resources and Fisheries
- Ministry of Co-operatives and Rural Development
- Ministry of Wildlife Conservation and Tourism
- Southern Sudan Land Commission
- Ministry of Environment

Table 6-4: Overview of Natural Resources Sector budget 2011-2013 and Annual Budget 2011

Annual/ Sector Budget	GOSS/ DPs	Central/State Government	No of Staff	Expenditure categories ('000 SSP or '000USD)				
				Wages	Operating	Capital	Total	Total in USD[*1]
2010 Revised Annual Budget	GOSS	National government	6,298	(TBD)	(TBD)	(TBD)	130,235	
		State transfers		(TBD)	(TBD)	(TBD)	106,869	
		Sub-total		144,137	40,261	52,706	237,104	
	DPs						108,319	45,133
	Total						345,423	
2010 Revised Annual Budget Expenditure (provisional)	GOSS	National government	5,014	52,206	29,853	13,544	95,603	
		State transfers		79,381	7,677	2,685	89,743	
		Sub-total		131,587	37,529	16,230	185,346	
		Execution rate		91%	93%	31%	78%	
	DPs						(tbd)	(tbd)
	Total						(tbd)	
2011 Natural Resources (NR) Sector Budget	GOSS	Ceiling					253,367	
		National government	6,327	66,526	31,275	48,608	146,209	
		State transfers	12,651	79,381	9,047	20,441	108,869	
		Sub-total	18,978	145,907	40,321	69,049	255,078	
	DPs						69,234	28,848
	Total						324,312	
	DPs medium-term projections	2012					51,734	21,556
		2013					46,920	19,550
2011 Annual Budget	GOSS	Ceiling					267,454	
		National government	5,143	60,363	49,217	50,288	159,869	
		State transfers	12,651	79,381	6,727	29,770	115,878	
		Sub-total	17,794	139,745	55,944	80,058	275,747	
	DPs						118,006	49,169
	Total						393,753	
	DPs medium-term projections	2012					57,102	23,792
		2013					37,200	15,500
% change from 2011 NR Sector Budget to 2011 Annual Budget	GOSS	Ceiling					6%	
		National government	-19%	-9%	57%	3%	9%	
		State transfers	0%	0%	-26%	46%	6%	
		Sub-total	-6%	-4%	39%	16%	8%	
	DPs						70%	70%
	Total						21%	
	DPs medium-term projections	2012					10%	10%
		2013					-21%	-21%

Note: 1) Exchange rate applied is SSP2.4/USD

Source: 1) GOSS. July 2010. *Natural Resources Sector Budget Sector Plan 2011-2013*. Juba. pp. 46-76. 2) GOSS. March 2011. *Approved Budget 2011*. Juba. pp. 174-252.

6.3.5 Post-independence planning and budget preparation procedures

6.3.5.1 Implementation structure of South Sudan Development Plan 2011-2013

The post-independence planning and budget preparation procedures are characterized by the implementation structure of the South Sudan Development Plan 2011-2013 (SSDP) approved by the NLA in August 2011. The procedures are based on the provisions in the Public Financial Management and Accountability Act 2011 (PFMAA). The overall technical responsibility is vested in the South Sudan Development Plan Technical Working Group (SSDP-TWG) which is chaired by the Undersecretary of MoFEP and supported by the MoFEP Secretariat. Under the SSDP-TWG are four Pillar Working Groups, Context Working Group, and Cross Cutting Working Group. Each Pillar Working Group consists of several Sector Working Groups. As introduced before SWGs are the main vehicles of the development of Budget Sector Plans.

CAMP is a master plan integrating the service deliveries of three ministries: MAFCRD (former Ministry of Agriculture and Forestry and Ministry of Cooperatives and Rural Development), MARF, and MWRI. These ministries belong to two Sector Working Groups. MAFCRD and MARF are members of the Natural Resources Sector Working Group, and MWRI is a member of the Infrastructure Sector Working Group. Both SGWs are members of Economic Development Pillar Working Group which is chaired by the Undersecretary, Forestry, and Co-chaired by the World Bank and African Development Bank.

6.3.5.2 Post-independence budget calendar

Following the independence of the Republic of South Sudan on July 9, 2011 the financial year had shifted from the period January/December of the same calendar year to July 1 of one year to June 30 of the following year. The shift in timing of the financial year has caused a change in the budget calendar. In the case of the pre-independence process, the timings of Budget Sector Plan formulation (end May to end July) and Annual Budget development (October) were clearly separated. However, as shown in Table 6-5, Budget planning (three-year medium-term planning) began in November 2011 and ended May 2012, and annual budgeting began in March 2012 and ended in June the same year. The two processes overlapped in the period March to May 2012. However, if only Budget Sector Plans, which are a subset of the budget planning process, are considered there was no overlap since budget sector plan development was completed by the end of February 2012. The Budget Planning (three-year medium-term planning) process includes the development of the Preliminary National Budget Plan, Budget Sector Plans, and finally the National Budget Plan which consists of consolidated Budget Sector Plans approved by the NLA. Although the new budget calendar includes several new terminologies and different arrangements of timings, the basic procedure of updating medium-term planning followed by Annual Budget preparation remains the same.

The 2012/2013 Annual Budget development was the first annual budget preparation after the independence of the Republic of South Sudan. It is noted that the budget preparation exercise for 2013/2014 should be better organized than the formulation of the 2012/2013 Annual Budget.

Deadlines set out in the 2012/2013 budget calendar were not always met, maybe due to the transition period of pre- and post-independence.

6.3.5.3 Formulation of National Budget Plan 2012/13-2014/15 (three-year medium-term planning)

As shown in Table 6-5, the National Budget Plan 2012/13-2014/15 (i.e. three-year medium-term planning) commenced November 15, 2011 when MoFEP submitted the Preliminary National Budget Plan (Pre-Budget Statement) to the Council of Ministers for its approval.

The Preliminary National Budget Plan included estimates of available resources and revenues consistent with the fiscal and monetary plans for economic and social development. The Plan also included indicative Medium Term resource envelopes. Then on November 23, 2011 MoFEP issued Guidelines for drafting Budget Sector Plans 2012-2015 to all Spending Agencies to commence Budget Sector Plan formulation.

Table 6-5: Budget calendar for 2012/13 budget

Deadline (Month/Day)	Budget Planning (3 year medium-term planning)	Annual Budget preparation	Budget Performance Reporting (Budget execution monitoring)	Administrative procedure for approval (CoM: Council of Ministers) (NLA: National Legislative Assembly) (SAs: Spending Agencies)
2011				
Sep.				
Oct.			Short fiscal outturn reports/BPS reports[*9]	From CoM to NLA and public
Nov. 15	Preliminary National Budget Plan[*1]			From MoFEP to CoM
23	Issuance of Guidelines for drafting Budget Sector Plans 2012-2015			From MoFEP to SAs
Dec.			Semi Annual Budget Performance Report[*10]	From CoM to NLA and public
2012				
Jan. 9-13			Short fiscal outturn reports/BPS reports[*9]	From CoM to NLA and public
	(Annual planning process Phase I)			
	One-week planning and budget planning system training			Organized by MoFEP
20	• Planning Call Circular for Budget Sector Plans			
27	• DPs input aid operation planned allocations in AIMS • Spending Agencies complete budget planning system input • Lead sector DP complete draft Aid Financing Strategy			
Feb. 10	(Annual planning process Phase II)			
13-17	SWGs prepare Budget Sector Plan sector-wide sections 1-4			
24	Review week for Budget Sector Plans			
End	Final Budget Sector Plan[*2] submission			
	Preliminary National Budget Plan[*1]			
	Draft Medium Term Fiscal Framework formed based on BSPs			From CoM to NLA
	Medium Term Expenditure Framework formed based on BSPs			From CoM to NLA
Mar.	Consultations with Special Committee on Economy Development Finance of the Assembly			
Apr.		Draft Annual Budget Plan laid before Council		From MoFEP to SAs
		Annual Budget Call Circular for 2012/13 Budget		
		State budget/PFM consultations		
		Short fiscal outturn reports/BPS reports[*9]		From CoM to NLA and public
May 1	National Budget Plan[*3]			From MoFEP to CoM
1		Draft Budget Book[*4]		From MoFEP to CoM
15	National Budget Plan[*3]			From CoM to NLA and public
15		Draft Budget Book[*4]		From CoM to NLA
15		Donor Book[*5]		From CoM to NLA
		Preparation of Annual Budget Report		
		Citizens Budget (no legal deadline)[*6]		From CoM to public
Jun. By 30		Appropriation Bill/Act[*7]		From CoM to NLA
		Budget speech		
		Publication of the Annual Budget Report		
Jul.		Approved Budget Book[*8] (30 days after NLA		From NLA to public

Deadline (Month/Day)	Budget Planning (3 year medium-term planning)	Annual Budget preparation	Budget Performance Reporting (Budget execution monitoring)	Administrative procedure for approval (CoM: Council of Ministers) (NLA: National Legislative Assembly) (SAs: Spending Agencies)
		approval)		
		Short fiscal outturn reports/BPS reports		From CoM to NLA and public
		Annual Budget Performance Report[*10]		From CoM to NLA and public
Aug.				
Sep.				
Oct.			Short fiscal outturn reports/BPS reports[*9]	From CoM to NLA and public
Nov.				

Note:

1) Preliminary National Budget Plan (Pre-Budget Statement): Preliminary estimates of resources and revenues, consistent with the fiscal and monetary programs and plans for economic and social development, together with indicative Medium Term resource envelopes.
2) Budget Sector Plans: Three year budget plans prepared by Sector Working Groups to achieve SSDP and sectoral Objectives.
4) Draft Budget Book (Budget Proposal): Draft detailed budget estimates for revenue and expenditure.
5) Donor Book (Report on loans and grants): Overview of donor grants and loans; performance of grants and loans vs objectives; and total indebtedness.
6) Citizens Budget (Newspaper Pamphlet): No legal deadline. A simplified presentation of the budget proposal for wide dissemination to the public.
7) Appropriation Bill/Act: The legal basis on which the government raises revenue and spends funds;
8) Approved Budget Book: Approved Detailed Budget Estimates.
9) Short fiscal outturn reports/BPS reports including narrative on performance: Within 30 days of the end of each quarter interim quarterly revenue and expenditure reports are issued to the NLA and public.
10) Annual and semi Annual Budget Performance Reports: The report without legal deadline is a half yearly information on agency budget performance in terms of outputs and expenditure.

Source: CAMP Task Team based on MoFEP. June 2012. National Budget Plan Financial Year 2012/13. Juba. p.4. and MoFEP. November 2011. Guidelines for drafting sector plans 2012-2015. Juba. p.6.

Sector Working Groups (called Budget Sector Working Group in the pre-independence period) began working on their plans. By the end of February 2012, formulation of the Preliminary National Budget Plan and Budget Sector Plans were completed and submitted by the Council of Ministers to the NLA for approval. On May 1, 2012 MoFEP completed the formulation of the National Budget Plan and submitted it to the Council of Ministers for approval. Finally, on May 15, 2012 Council of the Ministers presented the National Budget Plan to the NLA for final approval.

6.3.5.4 Formulation of Annual Budget 2012/13

Prior to the issuance of the Budget Call Circular for 2012/13 Budget in April 2012, one-week budget preparation training (Budget Preparation Training) was held from January 9 to 13; it was attended by officers from all Spending Agencies. The Budget Preparation Training was held at the Government Accountancy Training Centre, Juba. It was particularly organized to introduce and familiarize attendees with the Budget Planning System (BPS) which is a database application program used by national and state governments. BPS allows government officers to handle budget preparation in a simple and coherent manner. For the 2012/13 Annual Budget preparation the resource envelopes were made known in April 2012 by the Budget Call Circular. The Natural Resources (and Rural Development) SWG meeting, chaired by MAFCRD and co-chaired by the EU, was held in the same month. Although the resource envelopes are imposed, an increase in the amount of the envelope can be considered by MoFEP if requested with adequate justification. In this case a Minister level negotiation is arranged to settle the request. MoFEP assessed and consolidated the draft annual budget 2012/13, which is called the "Draft Budget Book," and submitted it to the Council of Ministers on May 1, 2012.

Once the Draft was submitted to the Council of Ministers, Spending Agencies were called in and the Draft was presented and defended by them at Cluster Committees consisting of members of the NLA.

The process of modification of the draft budget was handled by the Spending Agencies and MoFEP. Once consent was given by the Cluster Committees, the draft budget was presented on May 15, 2012 to a full session of the NLA by the Minister of MoFEP. The minister conducted a first reading (line-by-line reading of the draft budget by a Minister) followed by second and third readings to complete presentation and discussion on the Draft Budget. During these readings, concerned DGs and their focal officers were on standby ready to deal with queries and to defend their part of the Draft Budget. DGs can be called to explain the budget in front of the NLA. The NLA approved the Annual Budget 2012/13 in August 2012. The approval which was meant to take place sometime in June 2012 was delayed for two months due to the lengthy process of budget negotiation and approvals at various levels of the administration.

6.3.5.5 Annual Budget 2012/13 is considered an austerity budget

The oil shutdown in July 2012 sent the country into a fiscal emergency, and the government responded by formulating an austerity budget for the three-month period April-June 2012. The budget was submitted to the NLA. The Annual Budget 2012/13 is also considered an austerity budget, and thus, special rules have been applied to budget estimation. They are, for example, 1) no vehicle purchase, 2) no domestic travel expenses (international travel budget was allowed to be estimated), 3) no overtime compensation, 4) no incentives, and 5) no housing allowances. Tight control of budget execution was also implemented by imposing monthly ceilings on expenditures. Since oil revenues consisted of 95% of government revenues in 2011, MoFEP considers that diversification of revenue sources is urgently needed.

6.3.5.6 Annual Budget 2013/14 is also considered an austerity budget

However, Sudan and South Sudan reached agreement to resume the oil flow, H.E. President Salva Kiir stated ‘It is not possible to leave austerity away. We must pay our dues. We have incurred debts to those who kept us afloat and enabled us to keep core services running.’ and ‘our next budget will retain many elements of austerity and we must keep our belts tight until the end of the year’ This is the clear statement that GRSS will continue with an austerity budget for the year 2013/2014 and MoFEP instructed spending agencies accordingly. The same restrictions as in the previous year were imposed.

6.3.6 Planning and budget preparation of MAFCRD and MARF

In the following paragraphs, intra-ministry coordination of planning and budget preparation within MARF and MAFCRD will be described in order to articulate 1) function of the Planning Directorate, and 2) top-down nature of the resource allocation process.

6.3.6.1 Formulation of 2012/13 Annual Budget: MAFCRD

The Deputy Director (DD) of Planning and Statistics Division, MAFCRD is the budget focal person of the Ministry. The role of the DD in the budget preparation is to coordinate among Directorates of MAFCRD and between the Ministry and MoFEP. The DD did not attend the Budget Preparation Training. Offers of the Accounts Department and IT section attended the training. In MAFCRD two computers in the office of the Accounts Department were assigned to run the budget-database system (or BPS). The NLA approved resource envelopes were made known in the Budget Preparation Circular for 2012/13 Annual Budget issued by MoFEP in April 2012. The resource envelope of MAFCRD was discussed at regular DG bimonthly meeting to determine Directorate envelopes. If it was necessary ad-hoc DG meeting were held. Each Directorate selected a focal officer to form a budget working group

in the Ministry. The working group met every two weeks during the period of April-May 2012 to form disaggregated activity and expenditure category based budget estimates within the resource envelopes decided by the DGs' meeting. Budget working group discussions were organized by the Planning and Statistics Division which had the budget to arrange meetings at outside rented venues to avoid interference. These meetings were also held at Cassava Hall of the Ministry. The budget working group is active throughout the fiscal year working on budget preparation, monitoring of budget execution and disbursement, and minor budget adjustment. For the 2012/13 Annual Budget MAFCRD succeeded to obtain an additional budget of SSP 20 million on top of the imposed resource envelope to finance the lending capital of the Agriculture Bank of South Sudan. This Bank is intended to provide soft loans to commercial farmers for their production activities. One of the arguments presented in the NLA by the Ministry was that the lending and interest rate of the additional resources would be assessed by the bank case-by-case; they would use a commercially based appraisal of the agricultural production plan proposed by a potential borrower (i.e. a farmer or a group of farmers). Thus, the resources are likely to be applied for productive and value-added ends. If the Ministry financed subsidies, at the end of the program there would be no resources remaining; in contrast, financing agricultural loans would be a better option for the generation of economic gains. This argument of the Ministry was based on the lessons learned from past experience. For example, a politically motivated program had distributed 200 tractors at a subsidized price, but the government neither received payments from the beneficiaries nor was sure if the tractors had been used productively. It was also noted that to reduce production risks and thus assessed interest rates, the government's technical support to the borrower needed to be considered.

6.3.6.2 Formulation of 2012/13 Annual Budget: MARF

In the case of MARF, one focal officer was assigned by the Director General of Planning, Statistics, and Documentation to handle the formulation of the 2012/2013 Annual Budget. All the DGs of the Ministry, the focal officer, and a BPS operator attended the Budget Preparation Training. BPS requires the Windows 7 operating system which was only available on one computer at the Undersecretary's office. There was consensus in the Ministry that provision of vaccinations and veterinary services were priority areas.

6.3.7 Planning and budget preparation of state ministries

In each state, the state Ministry of Finance and Economic Planning (SMoFEP) plays an important role in planning and budget preparation. The preparation of budget by state ministries is linked to the national budget preparation. After MoFEP informs SMoFEP of the ceilings for their budget, SMoFEP requests each Spending Agency to formulate their annual budget based on the ceilings provided. The NLA approves the national budget in either July or August depending on the schedule of the budget process. The major source for budgets in states is the block grant. The budget for 2012/2013 was delayed and was only approved by the NLA in August 2012. The 2013/2014 budget is also delayed and still has to be approved by the NLA.

Through the field survey conducted by the ID subsector team, it is confirmed that the planning and budgeting procedures at the state level are very similar to the national government procedures. In the following paragraphs two cases of planning and budget preparation procedures, within 2 states, Lakes and Western Equatoria, are described.[142]

[142] The Director of Animal Production, MARF, Upper Nile State, stressed that the budgetary situation of the state was similar to other states. The majority of ministries spend a large proportion of their budget for salaries and wages of officers and workers.

6.3.7.1 *Formulation of 2012/13 Annual Budget: cases in Lakes and Western Equatoria states*

The initial step of budget formulation started in January 2012 when the Annual Budget Planning Session, Phase I started in the GRSS. In February when the Preliminary National Budget Plan was formulated, the DG of SMAF requested the Director of Planning and Administration to nominate two officers as budget planning officers. In case of SMAF, two Deputy Directors (DDs) were selected. The role of the DDs in budget preparation is to coordinate among the Directorates of SMAF and between SMAF and SMoFEP. The DDs did not attend any of the budget preparation training. Their main activities started when the budget preparation circular with the resource ceilings was received from SMoFEP in August 2012[143]; the DDs requested each Directorate to prepare their own budget. After receiving the budget information from each Directorate, the DDs compiled all the information prepared and submitted the draft budget of SMAF to the Director of Planning and Administration, who submitted the draft budget to the DG and later the Minister for his/her approval. The Minister submitted the draft budget to the State Governor for his/her information and the Council of Ministers for discussion and defence. After the approval of the Council of Ministers, the draft budget was submitted to the State Legislative Assembly for final approval. Finally, the State Governor signed the budget.

As shown in Table 6-6, due to the austerity budget, the major spending item is salaries for officers, which accounted for 68% in the 2011/2012 budget and increased to 86% in the 2012/2013 budget. The reason for the significant increase in percentage was the reduction of the total budget, i.e., operating expenditures were cut while salaries were maintained. This resulted in suspending activities in some Directorates. Once this budget is decreased, the activities of counties are automatically suspended which may have a negative impact on crop and animal production. In fact, in Lakes, Upper Nile State and Western Equatoria, austerity budget measures squeeze the implementation of agriculture- and livestock-related projects.

Table 6-6: Budget of Ministry of Agriculture and Forestry (2011/12 and 2012/13), Lakes State

Category	2011/2012 Budget	2012/2013 Budget
Total	**4,036,891 (100%)**	**3,208,654 (100%)**
1. Salary	**2,757,398 (68%)**	**2,757,398 (86%)**
1.1 Wages and Salaries	Unknown	2,356,389
1.2 Incentives and Overtime	Unknown	423
1.3 Pension Contributions	Unknown	400,586
1.4 Social Benefits	Unknown	0
2. Operating	**295,158 (7%)**	**41,319 (1%)**
2.1 Travel	51,427	10,000
2.2 Staff Training	50,000	20,000
2.3 Contracted Services	74,422	0
2.4 Repairs and Maintenance	10,000	5,349
2.5 Utilities and Communications	6,000	0
2.6 Supplies, Tools and materials	78,309	5,970
2.7 Other operating expenses	25,000	0
2.8 Oil production cost	0	0
3. Transfers	**0 (0%)**	**0 (0%)**
3.1 Transfers Conditional Salary	0	0
3.2 Transfers Operating	0	0
3.3 Transfers Capital	0	0

[143] The approval of National Budget Plan was originally scheduled in June 2012. Due to austerity measures and the newly introduced financial year (July-June), the procedure was delayed.

Category	2011/2012 Budget	2012/2013 Budget
3.4 Transfer Other Oil	0	0
3.5 Transfers to International Organizations	0	0
3.6 Transfers to Service Delivery Units	0	0
4. Other	**10,000 (1%)**	**0 (0%)**
4.1 Interest	0	0
4.2 Subsidies	0	0
4.3 Grants and Loans to Businesses	0	0
4.4 Donations	10,000	0
4.5 Social assistance benefits	0	0
5. Capital	**974,335 (24%)**	**409,937 (13%)**
5.1 Infrastructure and land	306,409	0
5.2 Vehicles	428,000	409,937
5.3 Specialized Equipment	239,926	0

Source: Approved Budget 2012/2013, MAF, Lakes State

Table 6-7 shows the budget of the state Ministry of Agriculture, Cooperatives and Environment (SMACE), Western Equatoria State. The austerity budget significantly affected the operating budget which now accounts for only 5% of the total. SMACE is responsible for Agriculture, Forestry, Livestock, Fishery and Irrigation. The needs for those five sectors cannot be met with such a small operating budget.

Table 6-7: Budget of Ministry of Agriculture, Cooperatives and Environment (2012/13), Western Equatoria

Category	2012/2013 Budget
Total	**3,712,168 (100%)**
1. Salary	**3,252,168 (88%)**
1.1 Wages and Salaries	3,244,226
1.2 Incentives and Overtime	7,942
1.3 Pension Contributions	0
1.4 Social Benefits	0
2. Operating	**180,000(5%)**
2.1 Travel	0
2.2 Staff Training	0
2.3 Contracted Services	0
2.4 Repairs and Maintenance	0
2.5 Utilities and Communications	0
2.6 Supplies, Tools and materials	0
2.7 Other operating expenses	0
2.8 Oil production cost	0
3. Transfers	**0**
3.1 Transfers Conditional Salary	0
3.2 Transfers Operating	0
3.3 Transfers Capital	0
3.4 Transfer Other Oil	0
3.5 Transfers to International Organizations	0
3.6 Transfers to Service Delivery Units	0
4. Other	**0**
4.1 Interest	0
4.2 Subsidies	0
4.3 Grants and Loans to Businesses	0
4.4 Donations	0
4.5 Social assistance benefits	0
5. Capital	**280,000 (7%)**

5.1 Infrastructure and land	0
5.2 Vehicles	0
5.3 Specialized Equipment	0

Source: Approved Budget 2012/2013, MACE, Western Equatoria State

6.3.8 Observations regarding Budget Sector Plans and Annual Budget preparation

The budget preparation process adopted by the government seems to be a top-down process where resource envelopes are determined at the national, ministry, directorate, and finally the division level.

These envelopes are decided by referencing, for example, the previous fiscal year's expenditure performances. Activity and expenditure category disaggregation is performed after the division level envelopes are determined. This may be appropriate if resource requirements by each government activity are small. However, in case of a large project, application of bottom-up resource estimation may be required for effective allocation decision-making. Finally, the work of the Project Management Units of DP supported projects and government funded activities should be compared. Information regarding the work and lessons learnt from MDTF operations would be beneficial for the development of CAMP implementation mechanisms.

6.4 Budget execution control and procurement procedures

6.4.1 Budget execution control and monitoring

6.4.1.1 Budget execution control and monitoring by MoFEP

Once a letter of execution is issued by an Undersecretary, if there is no budget allocated to the requested item, the letter is rejected. The current PFM system (a database system) maintained by MoFEP does not allow payment transfer if there is no budget registered in the system. Transfers of budget between items within sector are allowed whereas transfers across sectors (chapters in the annual budget book) are not allowed. If a budget transfer is necessary and can be justified, a Spending Agency submits a Budget Transfer Form to MoFEP for its consideration. The form indicates justification, and amount and timing of the transfer concerned. For the adjustment of estimated monthly expenditure a Spending Agency is required to submit an Expenditure Limit Adjustment Form to MoFEP for its approval.

MoFEP introduced an Integrated Financial Management Information System (IFMIS) with support from the IMF and World Bank in 2012. IFMIS is an Access based database system developed by a Canadian company. IFMIS is able to handle budget preparation and processing, budget execution control, payment transfers, procurement control, revenue management, and asset management. To train government officers on using IFMIS, the World Bank provided a series of training courses in, for example, Kigali, Luanda. It was felt that the introduction of IFMIS made MoFEP more productive and a better performing institution than before when it had always been overspending due to inefficient budget execution monitoring and control.

6.4.1.2 Budget execution control and monitoring in MAFCRD

In the case of MAFRCD, monitoring of budget execution is primarily a responsibility of the Directorate of Planning and Agricultural Economics. However, the monitoring procedures are

under development and no ministry-wide monitoring activities have been organized. There is a monitoring method temporarily adopted by each Directorate where the six-month-work plan is used to monitor activities of each Directorate within the framework of Annual Budget and activities.

6.4.2 Procurement procedures

6.4.2.1 Capacity development of government procurement officers

The government's procurement capacity seems to have developed rapidly due to the priority given to selective investment in the officers involved in procurement. Their capacity has been improved through the implementation of a capacity development program financed by the Multi-Donor Trust Fund (MDTF). For example, a French consultant assisted with on-the-job training of procurement officers and conducted structured training of the officers. MARF's procurement officer attended a two-week seminar/training in Juba, a three-month introductory training course organized by and implemented at the East-South Africa Management Institute (ESAMI) in Dar es Salaam, Tanzania, a two-month intermediate procurement training course in Malawi organized by ESAMI, and a three-month advanced level procurement training course in Swaziland also organized by ESAMI. The World Bank supported capacity development programs in the region, frequently obtaining the training services of ESAMI. MoFEP organized procurement training sessions in Juba in May 2012. The government of Norway financed the sessions and the Crown Agent, a UK based international supplier, provided procurement training.

6.4.2.2 Procurement procedures: an overview

Due to the early stage of private sector development in South Sudan, local competitive bidding (LCB) is offered to suppliers and contractors based in Ethiopia, Kenya, Tanzania, and Uganda in addition to South Sudan. The procurement procedures differ according to funding sources, and two major procedures are the government procedure and the World Bank procedure. The basic steps of both procedures are identical with minor differences. The basic steps conform to international standards.

The World Bank procedure involves obtaining 'no objection' from the Bank between important procurement steps, whereas the government procedure includes scrutiny of a draft contract by the Ministry of Legal Affairs before signing of the contract. Although Interim Public Procurement and Disposal Regulations 2006 are observed for government financed procurement, the World Bank procedure is followed for utilization of MDTF due to the absence of procurement law. Currently, MoFEP is drafting a procurement bill.

6.4.2.3 Internal procedure of budget execution and procurement at national level

Detailed intra-ministerial and inter-ministry procedures for budget execution in the case of MARF are presented below:

Box 6-1: Procurement Procedure of MARF

(1) Undersecretary (or his/her subordinates) prepares a request letter for the execution of a specific budget.

(2) The request letter is sent to Directorate of Planning, Statistics, and Documentation to confirm existence of the proposed budget.

(3) If the budget exists, the request letter is sent back to Undersecretary for his signature.

(4) Then the request letter is sent to Directorate of Administration and Finance to confirm the availability of funds.

(5) Once funds are confirmed DG of Administration and Finance signs the request letter, and sends it to a procurement officer (i.e. Director of Procurement in MARF).

(6) Based on the following criteria the procurement officer decides the method of procurement.

(7) If the planned procurement is more than SSP40,000 competitive bidding is required; the steps followed are similar to the LPO steps given below but more rigorous.

The time required to execute the procurement process within MARF varies significantly. It can be completed within five days. According to an example given of a local purchase order (LPO) for the procurement of goods, it took about four weeks from the issuance of the user request to obtain the approval of the procurement invitation letter by Undersecretary. After the draft contract is submitted to MoFEP, their internal procedure can take up to one year. The legal check by the Ministry of Legal Affairs requires a minimum of two weeks.

Box 6-2: Criteria for procurement

(1) The procurement officer prepares a draft procurement invitation letter. The draft letter is circulated to DG of Administration, Finance, and Human Resources Development Directorate, and Undersecretary for their approval.

(2) The procurement officer issues the invitation letter to shortlisted suppliers. And then the invited suppliers submit their bid proposals to MARF.

(3) The procurement officer calls for an evaluation team meeting attended by one Director, Deputy Director of Procurement, head clerk, and senior inspector of procurement. Quotations are evaluated at the meeting and a supplier is selected for negotiation.

(4) After the selection of the contractor, a draft contract is prepared by the procurement officer and sent to the financial unit for checking.

(5) The draft contract is submitted to MoFEP by the Undersecretary of MARF in order to request a fund transfer from MoFEP to MARF. MoFEP checks the draft to see if the budget item exists or not. If the budget item exists and funds are still remaining, the account officer approves the draft contract according to the guidelines for procurement.

(6) Once the approval of MoFEP is obtained, the draft contract is sent to the Ministry of Legal Affairs for legal check of the draft contract.

(7) Upon completion of the legal check and approval of the draft contract by the Ministry, the financial section of MARF finalizes the contract by obtaining the signature of the supplier. The section executes the budget according to the contract.

(8) Payment is not from petty cash. In the case of payments made against MDTF, payment is made from its account hosted by the World Bank, the custodian of MDTF.

6.4.2.4 Internal procedure of budget execution and procurement at state level

Once a letter of execution is issued by the Director General, if there is no budget allocated to the requested item, the letter is rejected by SMoFEP. The current PFM system maintained by SMoFEP only allows a payment transfer if there is a budget registered and available. If a budget transfer is necessary and can be justified, a Spending Agency submits a Budget Transfer Form to SMoFEP for its approval. The form indicates justification, and amount and timing of the transfer concerned.

Box 6-3: Procurement procedure of SMARF, Upper Nile

(1) The Director General (or his/her subordinates) prepares a request letter for the execution of a specific budget.

(2) The request letter is sent to the Directorate of Planning and Budgeting to confirm existence of the proposed budget.

(3) If the budget is in existence, the request letter is sent back to the Director General for his signature within 2-3 days.

(4) Then the request letter is sent to the Directorate of Administration and Finance to confirm the availability of funds.

(5) Once funds are confirmed, the Director of Administration and Finance signs the request letter, and sends it to a procurement officer.

(6) Based on the following criteria, the procurement officer decides the method of procurement.

Concerning budget allocation to counties and lower levels, other than salaries and wages of county and payam officers, only a few cases of funds being made available were observed. In the case of Juba and Yei River counties, a letter is issued by the assistant commissioner. If there is budget allocated to the requested item, the letter is approved by the executive director of the county. According to interviews by CAMP TT members, the procedure for budget execution is similar at all county offices they visited. However, there are many cases of budget transfers for items which were not in the budget, for example high ranking officers diverting funds to pay for vehicles not in the budget.

Detailed procurement procedures for budget execution in the case of the State Ministry of Animal Resources and Fisheries (SMARF), Upper Nile are presented below:

Box 6-4: Criteria for procurement

(1) The procurement officer obtains three quotations based on the procurement invitation letter. The draft letter is shared with DG, and the Director of Administration and Finance and the Director of Planning and Budgeting for their approval. This is called the Procurement Committee.

(2) The procurement officer issues an invitation letter to shortlisted suppliers. Then the invited suppliers submit their bid proposals to SMARF.

(3) The procurement officer calls for the Committee and quotations are evaluated at the meeting and a supplier is selected for negotiation.

(4) Usually, the price is considered as the most important element and they tend to choose the company offering the second lowest price[144].

(5) After the selection of the contractor, a draft contract is prepared by the procurement officer and sent to the financial unit for checking.

(6) The draft contract is submitted to SMoFEP by the Director General in order to request a fund transfer from SMoFEP to SMARF. SMoFEP checks the draft to see if the budget item exists. If the budget item exists and funds still remain, the account officer approves the draft contract according to the guidelines for procurement.

(7) Once the approval of SMoFEP is obtained, the draft contract is sent to the State Ministry of Legal Affairs for legal check of the draft contract.

(8) Upon completion of the legal check and approval of the draft contract by the Ministry, the financial section of SMARF finalizes the contract by obtaining a signature from the supplier. The section executes the budget according to the contract.

6.4.2.5 Budget distribution to county, payam and boma

Theoretically each state ministry allocates budgets to the counties based on activities at the county level. Similarly the county offices plan activities and budgets for the payams but the county manages the funds on behalf of the payam.

Activities are implemented by the payam whose primary role and responsibility are to supervise the implementation of projects and report on their progress. If there are no projects in a payam, there is no budget.

At the boma level, no specific activities were observed except for seeds and fertilizer distribution in collaboration with the payam. Therefore, no budget is distributed to bomas.

6.4.3 Execution capacity of MAFCRD and MARF

In this section the results of a simple examination of budget execution capacity of MAFCRD and MARF are presented. The Southern Sudan Livelihoods Development Project (SSLDP) was selected as the reference for comparison. Since MAFCRD was created in 2012 by the merger of the Ministry of Agriculture and Forestry (MAF) and the Ministry of Cooperatives and Rural Development (MCRD) the capacity of MAFCRD is represented by those of MAF and MCRD due to very short history of MAFCRD.

The analytical framework employed in this section is simple. Assuming that realization of officers' capacity is constrained due to insufficient budget allocation per staff, an estimate is made of additional financial resources the current government would be able to absorb,

[144] Officers believe that lowest price is like to be the lowest quality. However, there is high possibility of fraud in the selection process if they chose the second cheapest one.

without compromising accountability, effectiveness, and efficiency. In the course of the CAMP development, the Task Team members will have to answer to the question of how much additional financial resources, generated as part of CAMP implementation, can be managed by the current human resources, or will extra human resources be required. To answer to this question, the Team will need to develop methods to determine potential capacity; simple analysis may provide some clue to such discussions. Estimated budget allocation and expenditure per professional staff of the three Ministries is presented in Table 6-8, and the same estimates for SSLDP are shown in Table 6-9. Due to the limited data availability, the number of professional staff in the three Ministries in 2011 was applied to 2010 budget and expenditure data. Because the SSLDP's estimates in Table 6-9 include wages, operating costs, and capital costs, similar Ministry totals are used for comparison (refer to the numbers with bold letters in Table 6-8 and Table 6-9).

Table 6-8: Budget per professional staff in 2010 and 2011 budget, and 2010 expenditure

Budget	Central Government/ State budget	Total no. of Staff	No. of Prof. staff[*1] in 2011	Expenditure categories ('000 SSP)							
				Total budget by expenditure categories				Budget per professional staff			
				Wages	Opera-ting	Capital	Total	Wages	Opera-ting	Capital	Total
Ministry of Agriculture and Forestry											
2010 Revised Budget	National government	668		(tbd)	(tbd)	(tbd)	35,415				**155**
	State transfers			(tbd)	(tbd)	(tbd)	15,095				66
	Total	668		18,919	9,965	21,626	50,510	83	44	95	222
2010 Expenditure (provisional)	National government	650		12,392	5,681	4,797	22,870	54	25	21	**100**
	State transfers			7,265	2,706		9,970	32	12		44
	Total	650		19,657	8,387	4,797	32,841	86	37	21	144
	Execution rate			104%	84%	22%	65%				
2011 Annual Budget	National government	669	**228**	13,860	13,119	20,221	47,200	61	58	89	**207**
	State transfers	676		7,265	2,706	5,124	15,095	32	12	22	66
	Total	1,345		21,125	15,825	25,345	62,295	93	69	111	273
% change of total from 2010 budget				12%	59%	17%	23%				
Ministry of Cooperatives and Rural Development											
2010 Revised Budget	National government	268		(tbd)	(tbd)	(tbd)	8,890				**79**
	State transfers			(tbd)	(tbd)	(tbd)	2,000				18
	Total	268		4,904	2,672	3,313	10,890	43	24	29	96
2010 Expenditure (provisional)	National government	224		4,279	2,319	1,102	7,699	38	21	10	**68**
	State transfers					1,000	1,000			9	9
	Total			4,279	2,319	2,102	8,699	38	21	19	77
	Execution rate	224		87%	87%	63%	80%				
2011 Annual Budget	National government	268	**113**	5,094	3,204	2,092	10,390	45	28	19	**92**
	State transfers					7,000	7,000			62	62
	Total	268		5,094	3,204	9,092	17,390	45	28	80	154
% change of total from 2010 budget				4%	20%	174%	60%				
Ministry of Animal Resources and Fisheries											
2010 Revised Budget	National government	282		(tbd)	(tbd)	(tbd)	16,374				**66**
	State transfers			(tbd)	(tbd)	(tbd)	15,000				60
	Total	282		10,538	6,965	13,871	31,374	42	28	56	127

Budget	Central Government/ State budget	Total no. of Staff	No. of Prof. staff[1] in 2011	Expenditure categories ('000 SSP)							
				Total budget by expenditure categories				Budget per professional staff			
				Wages	Opera-ting	Capital	Total	Wages	Opera-ting	Capital	Total
2010 Expenditure (provisional)	National government	203		5,192	4,423	3,875	13,490	21	18	16	**54**
	State transfers			3,342	2,571	1,024	6,937	13	10	4	28
	Total			8,534	6,994	4,899	20,426	34	28	20	82
	Execution rate	203		81%	100%	35%	65%				
2011 Annual Budget	National government	282	**248**	6,923	9,770	8,130	24,823	28	39	33	**100**
	State transfers	260		3,342	1,621	14,046	19,009	13	7	57	77
	Total	542		10,265	11,391	22,176	43,832	41	46	89	177
% change of total from 2010 budget				-3%	64%	60%	40%				

Note: 1) Staff grade of 1 to 14.
Source: 1) GRSS. July 2010. Natural Resources Sector Budget Sector Plan 2011-2013. Juba. pp. 46-76. 2) GRSS. March 2011. Approved Budget 2011. Juba. pp. 174-252.

Estimates for per professional staff for the 2010 Budget, 2010 Expenditure, and 2011 Budget of MAF (national government) are SSP155,000, SSP100,000, and SSP207,000, respectively. Considering that the staff only executed actual expenditures, SSP100,000 can be selected for the MAF estimate. By the same reasoning, SSP68,000 and SSP54,000 are selected for MCRD and MARF's estimates, respectively. These indicate that expenditure per professional staff, including his/her own salary and benefits, is in the rage of SSP54-100,000 being equivalent to USD23,000-42,000 at the rate of SSP2.4/USD; this should be considered small. The similar professional staff expenditure in SSLDP is SSP343,000 which is equal to USD143,000, about three to six times higher than those of the Ministries. Although these are the results of a simple examination, three to six times higher absorption capacity of the national government can be expected for the CAMP development provided that its accountability, efficiency, and effectiveness are equal to those of the PMU of SSLDP. This approach needs to be further refined and verified and results will be included in the Interim Report.

Table 6-9: SSLDP's per professional annual expenditure for the period of 2011-2012

Category Items	Value	Unit
Number of professional staff		
a) PMU at MAFCRD	5	Staff
b) State Technical Desk Office in three States	9	Staff
c) Total (c = a + b)	14	Staff
Annual average project outturn during 2011-2012		
d) In USD (d = USD4 million/2 years)	2,000	USD ('000)/year
e) In SSP (e = d * 2.4SSP/USD)	4,800	SSP ('000)/year
f) Annual average expenditure per professional staff (f = e/c)	**343**	SSP ('000)/staff

Source: Interviews with South Sudan Livelihood Development Project

6.5 Alignment of aid with GRSS's PFM system

6.5.1 Aid coordination mechanism

In the previous sections, the PFM system of the national government was introduced to consider the mobilization of resources for CAMP implementation through alignment with the Budget Sector Plan and Annual Budget processes. In this section the work of Sector Working Groups (SWGs), particularly that of the Natural Resources Sector Working Group,

is described to facilitate the discussion that the CAMP process should be part of the donor coordination platform in the Natural Resources Sector. The discussion should also be constructed on the recognition that the country's PFM system is and will evolve.

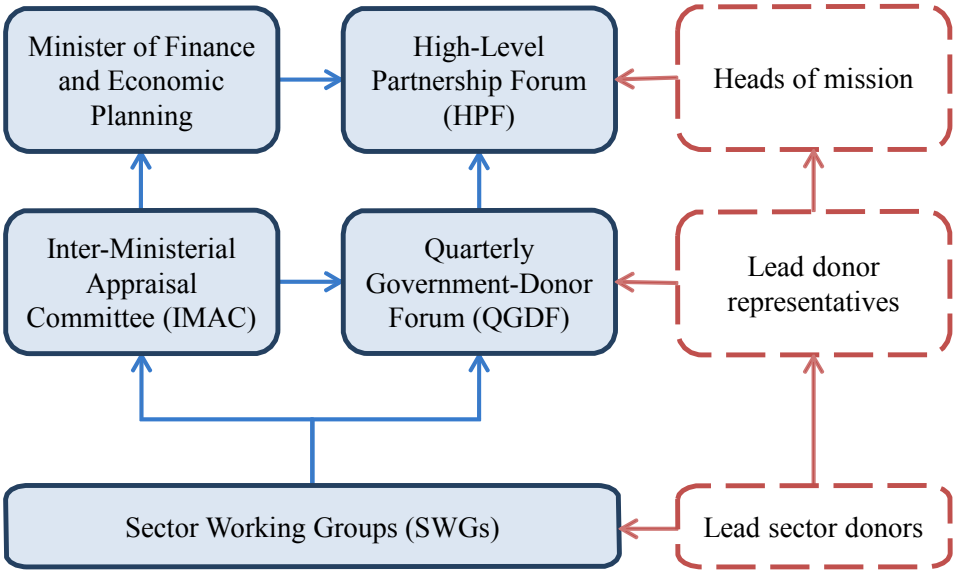
A motto "one dollar-two dollars" had been adopted by the government during the pre-independence period for the financing of DP supported projects and programs. The motto means that when a DP contributes a dollar the government contributes two dollars to finance a project. Although it was said that the principle was followed by the government, as seen in the case of contributions to Multi Donor Trust Fund (MDTF) where the World Bank is the custodian of the Fund, the spirit and practice of mutual responsibility remain valid. The mutual accountability associated with the combined resource mobilization of the government and DPs is also the other most important principle of the alignment of aid to the PFM system. However, the reality is that the capacity to maintain such accountability by the national, state, and county governments is reported to be inadequate; thus, it should be noted that high-level efforts to strengthen the governments' accountability mechanism must be incorporated in CAMP to secure its financing.

6.5.2 Aid coordination structure

Figure 6-1 shows the current aid coordination structure defined in SSDP. The structure consists of 1) the High-level Partnership Forum (HPF) which is to provide an opportunity for senior members of the GRSS and development partners to discuss key strategic policy issues of interest to both groups; 2) the Quarterly Government-donor Forum (QGDF) which will be the central mechanism for coordination and information exchange between the GRSS and development partners; 3) the Inter-Ministerial Appraisal Committee (IMAC) which is to play a more strategic role, reviewing and approving overall donor country strategies, sectoral aid financing strategies and major aid operations (over USD10 million); 4) Sector Working Groups (SWGs) which will be central to aid coordination being enhanced through the introduction of a more strategic Sector-based Approach, with a 'lead donor' for each sector.

In order for CAMP to be an officially recognized master plan, a draft CAMP should be processed through this aid coordination structure prior to submission of the draft to the Council of Ministers by MoFEP; the Council will then send the draft for final approval to the NLA. SSDP envisages that SWGs play the central role of aid coordination. SWGs are the forum where government and DP commitment to project implementation and resource allocation are facilitated and coordinated based on examination of, for example, project rationale, sector and sub-sector priority of project sets, capacity assessment of key implanting agencies particularly those of state and county governments, implementation and monitoring mechanisms, and resource requirements of the sets of projects defined in the draft CAMP document. Therefore, to secure the implementation of CAMP, its process should be managed so as to integrate with the government's SWG mechanism.

Figure 6-1: Aid coordination structure



Source: GOSS, 2011, South Sudan Development Plan 2011-2013, Juba, p.405 (hard copy)

6.5.3 Natural Resources Sector Working Group

The SWG approach is a part of the budget preparation mechanism involving the sector Ministries and DPs supporting the sector; it is organized and managed by the Sectoral Planning Department, MoFEP. Currently, 29 ministries, 10 commissions, and other types of Spending Agencies are classified into 10 Sector Working Groups in order to avoid duplication in segmented public investment and delivery of services. MoFEP envisages that the Sector Working Group (previously the Budget Sector Working Group) concept enables the Group to oversee all public financial management phases, including planning, budget preparation, execution, and evaluation of outcomes and impacts in order to secure effective feedback to the next PFM phase. It is expected that the Sector Working Group approach will enhance the mutual accountability of the government and DPs.

The Natural Resources Sector does not include the Ministry of Water Resources and Irrigation (MWRI), and this arrangement may hinder effective coordination between the Ministries within the Sector and MWRI; this is critical because of the importance of water resources for the Sector. Therefore, it is necessary to consider a broader coordination arrangement inclusive of MWRI.

MoFEP intends to further the integration of the DP coordination mechanism with the PFM system. With the technical support of the EU, MoFEP convened a Natural Resources SWG Meeting on October 10, 2012 to 1) review recent sector performance and 2) explore how to further develop systematic arrangements for the Sector to promote higher levels of public investment integration. Since the pre-independence period the EU has supported the transformation of the Natural Resources Budget SWG into the Natural Resources Sector Working Group. The EU has been the Co-chair of the Working Group and facilitated, for example, the compilation of "Natural Resources Sector: Sector Aid Financing Plan FY2012/13-FY2014/15" which sets out the plans for external aid to the natural resources sector. For the compilation of the document, information on the ongoing and planned contributions of DPs to the sector was gathered and consolidated. The information was also fed into the Aid Information Management System (AIMS) which was eventually used to produce "South Sudan Donor Book" by MoFEP.

6.5.4 Alignment of aid with MARF's PFM system

Primary responsibility for DP coordination to achieve effective allocation of public resources rests on the government, and thus, its effort to improve the coordination capacity through the day-to-day operation of the government is very important. In this section MARF's Directorate of Special Projects is briefly introduced as an example of the government's effort to coordinate DP supported projects for their efficiency and effective implementation. The Directorate of Special Project staffed by the DG are coordinating five projects supported by the EU, one project by GIZ, one project by FAO, and three animal health projects supported by the governments of Germany, Belgium and Switzerland. The projects supported by GIZ and FAO will end soon.

The procedures to initiate coordinated implementation of a DP supported project from the signing of an implementation agreement with a DP are as follows:

- The Undersecretary and DP sign a project implementation agreement once an approval of the assisted project is received from the Minister and Deputy Minister of MARF.
- The agreement is forwarded to DG of the Directorate of Special Projects with all the necessary information.
- The DG facilitates the process of intra-ministerial coordination to assign relevant Directorates responsibility for project implementation.
- At the same time each relevant Directorate appoints project focal officers who are also technical counterparts of the DP.

6.6 PFM instruments for CAMP implementation and the alignment of aid

6.6.1 PFM instruments and government's concern regarding aid flows

In the CAMP process the Task Team will justify, design, and cost sets of sub-sector projects with priorities and timelines. The Team will also examine, in consultation with the national and state governments and DPs, the application of PFM instruments for the implementation the projects. The examination will be carried out with respect to the nature and magnitude of public investment of the project concerned. The PFM instruments include the government's activity-based planning and budget preparation modality and various types of aid instruments. For the Task Team's discussion, four aid instruments are presented in Table 6-10. They are: 1) standalone project support, 2) pooled funding, 3) local services support, and 4) budget support. Although it not in the scope of this study, appropriate choice and management of institutional instruments are also important. The Task Team will examine options of institutional arrangements such as national government's direct operation, decentralized or autonomous operation by state and/or county governments, and semiautonomous or autonomous operation by public or private sector agencies for effective and efficient implementation of CAMP.

Table 6-10: Characteristics and preferred use of aid instruments

Instrument	Characteristics of instruments	Preferred use of instrument
Standalone project support	• Project support is funding which is kept separate from mainstream Government expenditures • Any aid separately identifiable from expenditures in GRSS plans, budgets and reports are considered by GRSS as project support • Project support can use GSS planning, budget preparation, procurement and financial management systems	• The preferred use of project support in support of service delivery is for large-scale public infrastructure projects and humanitarian aid • Project support is also an effective vehicle for the provision of time-bound technical assistance and capacity building, when the Government leads in the process • Where project funding funds the operational costs of service delivery and/or

Instrument	Characteristics of instruments	Preferred use of instrument
Pooled funding	• Pooled funding is a form of project support but is jointly funded by multiple donors, providing a more coordinated implementation mechanism	small-scale infrastructure development • As they are strengthened, projects should use Government procurement and financial management systems and processes • Pooled project support is preferred to standalone projects
Local services support (LSS)	• LSS is where DPs disburse their funds directly to the Government Treasury and uses government PFM system s for planning and implementation • LSS is earmarked for specific conditional state and county transfers • LSS funded expenditures will be separately identifiable in the expenditure budget • LSS may be jointly funded by multiple donors, or by a single donor	• The preferred use of LSS is for state- and county- level service delivery and community development through conditional transfers • Specific and temporary safeguards may be put in place where there are significant weaknesses in GRSS systems, until such a time as those weaknesses are addressed • The objectives of LSS should be linked to the achievement of sectoral outcomes set out in the SSDP and elaborated in Budget Sector Plans. In doing so, it can strengthen sectoral systems for service delivery at both GRSS and state levels
Budget support	• Budget support is where DPs disburse their funds directly to the Treasury and use government PFM systems for planning and implementation • General budget support is un-earmarked and allocated through the Government budget • Sector budget support which is earmarked to specific sectors or sectoral state transfers • Expenditures funded by budget support will not be separately identifiable in the budget	• Budget support is the preferred mechanism for funding overall Government service delivery at GRSS and state level in support of Government expenditure priorities • Provision should be linked to overall achievement of GRSS priorities set out in its development plan and elaborated in BSPs • Budget support also can support improvements in systems for PFM, public service management and decentralized service delivery

Source: GRSS, 2011, South Sudan Development Plan 2011-2013, Juba, pp. 414-415 (hard copy)

MoFEP considers that the rationale for the government's aid coordination effort is to ensure efficient public investment and maximize impacts; it will achieve this by coordinating national and external sources of funds. Involvement of all levels of government in the process of resource-allocation decision-making concerning inflows of external resources should result in better outcomes, provided that appropriate accountability and fiducial risk management mechanisms are in place. The Ministry also considers that direct cash injection to the national economy is better than in-kind contributions to the economy from DPs; thus, the Ministry prefers direct budget support and engagement of local and regional consultants. For example, the Ministry of Information receives DP support amounting to USD six million. A large proportion of the contribution was used for the engagement of advisers and procurement of goods from outside the country. It is perceived that procurement of goods and services in east African countries is beneficial to the regional economy, and that untied assistance rather than tied projects is preferred. The Ministry also recognizes the necessity of institutional capacity development in order to secure an enabling environment for the realization of budget support.

6.6.2 Four aid instruments

Table 6-10 shows the four aid instruments likely to be considered for implementation of CAMP proposed projects. From the point of view of the alignment of aid instruments to the

PFM system, the least aligned is standalone project support, second least is pooled funding, third least is local services support, and the most aligned is budget support.

Standalone project support and pooled funding aid instruments have been adopted in South Sudan. The former is commonly applied for external support to projects in South Sudan where funding for project operation is kept separately from mainstream government expenditures. Although the standalone project support instrument is financially isolated from the government system, it can use GRSS planning, budget preparation, procurement and financial management systems with special arrangements. The pooled funding is a form of project support but is jointly funded by the government and multiple donors, providing a more coordinated implementation mechanism. The pooled funding mechanisms currently in operation in South Sudan are listed in Table 6-11. A well-known example is the Multi-donor Trust Fund (MDTF) hosted by the World Bank. As presented in the next section, the procurement of goods and services finance by MDTF is done through the government procurement mechanism but with international standards, i.e. the World Bank's, followed.

The other two instruments, namely, the local service support instrument and the direct budget support instrument have not yet been adopted in South Sudan. This may be linked with the perceived inadequate PFM capacity of all levels of government and the under-development of DP coordination mechanisms and their alignment to the PFM system. The local services support instrument is characterized by the disbursement of DP earmarked funds directly to the Government Treasury. For the application of the earmarked funds the PFM system is used for planning, budget preparation, and execution. The budget support instrument is where DP un-earmarked funds are disbursed directly to the Treasury and use the PFM system for planning and budget preparation, and execution. The budget support instrument also includes sector budget support which is earmarked to specific sectors or sectoral state transfers.

Since the government of South Sudan intends to achieve a higher level of aid alignment with the PFM system and aid coordination, higher priority should be given to instruments such as pooled funding, local services support, and budget support instruments whenever their adoption is deemed to be appropriate. On the other hand, the usefulness and effectiveness of the standalone project instrument will continue to be recognized and DPs will still opt to employ it given the current PFM capacity of the government. Therefore, management and institutional capacity development components must be incorporated into the CAMP.

6.6.3 Pooled funding aid instrument

Currently, the most advanced form of aid instrument in terms of the alignment to the PFM is pooled funding. Table 6-11 presents seven currently operational pooled funding mechanisms which are worth examining for the designing of the CAMP projects' implementation mechanisms. It is recommended the Task Team carries out an investigation of the mechanism.

Table 6-11: Pooled funding mechanisms (as of 2011)

Name of pooled fund	Description	Supporting sector/projects
The Multi-Donor Trust Fund (MDTF)	• Establishment: 2005 and closed in June 2012. • Total funds managed: USD700m funded by GOSS (USD200m), Netherlands, Norway, UK, Canada, EC, etc. • Host: World Bank as Technical Secretariat.	• All sectors • Infrastructure • Health • Water and sanitation • Accountability
The South Sudan Recovery Fund (SSRF)	• Establishment: 2008 • Total funds managed: USD111.8m funded by UK and the Netherlands • Host: Multi-Partner Trust Fund Office, UNDP	• Short-term emergency aid • Income generation • Stabilization of conflict-affected areas
The Capacity Building Trust Fund (CBTF)	• Establishment: 2004 and to be closed in 2013. • Total funds managed: USD28m by 2011 funded by Canada, Denmark, Netherlands, Norway, Spain, Sweden and the United Kingdom • Host: (to be confirmed)	• Government's capacity development needs
The Common Humanitarian Fund (CHF)	• Establishment: 2005 • Total funds managed: Over USD900 by 2010 • Host: Multi-Partner Trust Fund Office, UNDP	• Humanitarian projects implemented by UN agencies in North and South Sudan
The Basic Services Fund (BSF)	• Establishment: 2005 and to be closed at the end of 2012 • Total funds managed: USD40m by 2011 funded by DFID, Netherlands, Norway, SIDA, and EC • Host: (to be confirmed)	• Primary education, • Primary health, and • Water and sanitation services in the conflict areas
The Health Pooled Fund (HPF)	• Establishment: late 2012 • Total funds managed: £150m for 5 years funded by DFID, SIDA, CIDA, AusAID, and EC • Host: (to be confirmed)	• Primary health services in six states
South Sudan Partnership Fund (SSPF)	• Establishment: under discussion • Host: to be confirmed	• To be confirmed

Source: MoFEP, 2011, South Sudan Donor Book 2011, Juba, pp. 4-5. Modified by CAMP Task Team.

6.7 Planning and budget procedures involving state governments

In this section the involvement of state governments in the Budget Sector Plans and Annual Budget preparation processes of the national government is briefly described. Because a large part of the responsibilities for on-the-ground CAMP implementation is expected to be taken by state and county governments, further discussion on the relationships between national, state, and county governments needs to be carried out. According to the provisions of the Transitional Constitution of the Republic of South Sudan 2011 a wide range of powers is given to the state governments. Therefore, the designing of CAMP implementation across all levels of government will require extensive investigation and analysis of national-state governance.

In the process of budget preparation, a SWG is required to prepare a breakdown of the proposed fund transfers to the states, identifying salaries of state staff, operating expenditure, and capital expenditure of the 10 states. After the approval of the budget by the NLA, fund transfer to the states as conditional block grants is considered as one of the priority actions for the national Ministries. In the case of MARF there are a number of state-level projects to be identified by the Undersecretary and DG of Planning, Statistics, and Documentation. The projects are to be implemented by designated states for the period of 3 years. The project period can be extended based on performance evaluation by MARF. If it is appropriate, the extension and budgets are proposed by MARF at the SWG for discussion. To finance such

projects, budgets for conditional transfer to implementing states have to be estimated and justified.

7. Food Security

7.1 Concept of food security

Food security is a term widely used in South Sudan, but the term is used differently by the various stakeholders. The concept of food security originated in the 1930s. The Health Division of the League of Nations[145] conducted a survey about nutrition and public health. In the report, acute food shortage in low income countries was identified as giving rise to hunger and malnutrition.[146] After the establishment of FAO and WFP, these United Nations organisations made efforts to reduce food shortages worldwide.

Until the 1980s food security was perceived as the availability of an adequate food supply at all times. Thus, an increase in food production would improve food security.[146] During the 1980s, food production increased in many parts of the world through development assistance, etc. but there were still shortfalls of food in different parts of the world. Low purchasing power for food is considered as one cause of food insecurity.[147] Therefore, food security cannot be achieved only by increasing food production, but by considering appropriate distribution mechanisms.

In the World Food Summit organised by FAO in 1996, participants made a commitment to reduce famine and hunger and to improve access to safe and nutritious food as a fundamental right of people. For this situation analysis the definition of food security agreed at the World Food Summit is adopted:

> When all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life.[148]

There are four dimensions to food security: availability, accessibility, utilisation and stability. All four must be fulfilled simultaneously to achieve food security as defined above.[149] Detailed descriptions of these four dimensions are presented in Table 7-1.

Table 7-1: Four dimensions of food security

Dimensions	Descriptions
Physical availability of food	Food availability addresses the "supply side" of food security and is determined by the level of food production, stock levels and net trade.
Economic and physical access to food	An adequate supply of food at the national or international level does not in itself guarantee household level food security. Concerns about insufficient food access have resulted in a greater policy focus on incomes, expenditure, markets and prices in achieving food security objectives.
Food utilisation	Utilisation is commonly understood as the way the body makes the most of various nutrients in the food. Sufficient energy and nutrient intake by individuals is the result of care and feeding practices, food preparation, and diversity of the diet and distribution of food in a household. Combined with good biological utilisation of food consumed, this determines the nutritional status of individuals.

[145] The League of the Nations was an intergovernmental organisation founded as a result of the Paris Peace Conference that ended the First World War. http://en.wikipedia.org/wiki/League_of_Nations

[146] University of Rome Tre, Faculty of Economics, Master in Human Development and Food Security. Food Security: Definition, Four Dimensions, History. Basic readings as an introduction to Food Security for students from IPAD Master, SupAgro, Montpellier attending a joint training programme in Rome from 19th to 24th, March 2012.

[147] Rainer Gross Hans Schoeneberger, Hans Pfeifer, Hans-Joachim A. Preuss: April 2010. *The Four Dimensions of Food and Nutrition Security: Definitions and Concepts.* European Union, FAO.

[148] World Health Organisation. *Trade, foreign policy diplomacy and health:* http://www.who.int/trade/glossary/story028/en/

[149] FAO 2008. *The EC-FAO Food Security Programme. Food Security Information for Action: Practice Guides. An Introduction to the Basic Concepts of Food Security.*

Dimensions	Descriptions
Stability of the other three dimensions over time	If access to food is not stable, the situation is still food insecure. Adverse weather conditions, political instability, or economic factors such as unemployment and rising food prices may have an impact on the food security status.

Source: The EC-FAO Food Security Programme. 2008. Food Security Information for Action: Practice Guides. An Introduction to the Basic Concepts of Food Security.

If any of the four dimensions regarding food security is not satisfied, food security is considered to be unstable. Food insecurity can be categorised into three types: long-term, short-term and seasonal food insecurity.[149] This report calls long-term food insecurity "chronic food insecurity" and short-term food insecurity "transitory food insecurity." Seasonal food insecurity only happens during a specific period of time in a year. Key characteristics of these three types of food insecurity are described in Table 7-2.

Table 7-2: Key characteristics of three types of food insecurity

Type food insecurity	Chronic food insecurity	Transitory food insecurity	Seasonal food insecurity
Character (Duration)	Long term	Short term	Period is limited but can be recurrent
Causes	When people are unable to meet their minimum food requirements over a sustained period of time. It is often the result of extended periods of poverty, lack of assets and inadequate access to productive or financial resources.	When there is a sudden drop in the ability to produce or access enough food to maintain a good nutritional status. It normally causes fluctuations in food availability and food access, including year to year variations in domestic food production, food prices and household incomes.	When people are unable to meet their minimum food requirements in a seasonal pattern primarily due to depletion of food from the previous harvest..
Results	It results in extended periods of poverty, lack of assets and inadequate access to productive or financial resources.	It results in short-term shocks and fluctuations in food availability and food access, food prices and household incomes.	It results in shocks to farmers whose food stocks are depleted. People who face seasonal food security need coping strategies for survival.

Source: FAO 2008. The EC-FAO Food Security Programme. Food Security Information for Action: Practice Guides. An Introduction to the Basic Concepts of Food Security. FAO 2008. *EC-FAO Food Security Information for Action Programme. Distance Learning to Support Capacity Building and Training for National and Local Food Security Information Systems and Networks. Food Security Concepts and Frameworks. Lesson 1. What is Food Security.*

In South Sudan, seasonal food insecurity is very common among farmers and pastoralists; chronic food security and transitory food insecurity also occur.

Regardless of the type of food insecurity, there are four levels of food security: severely food insecure, moderately food insecure, mildly food insecure, and food secure. FAO takes hunger as one of the important indicators to measure levels of food security. They developed 8 questions to categorise hunger into these four levels.[150] This report does not strictly follow these scales but respects them when degrees of food security are described.

Historically nutrition is considered an important element of food security. In 1992, at the International Conference on Nutrition, jointly organised by FAO and WHO, participants declared:

> ……determination to eliminate hunger and to reduce all forms of malnutrition. Hunger and malnutrition are unacceptable in a world that has both the knowledge and the resources to end this human catastrophe.[146]

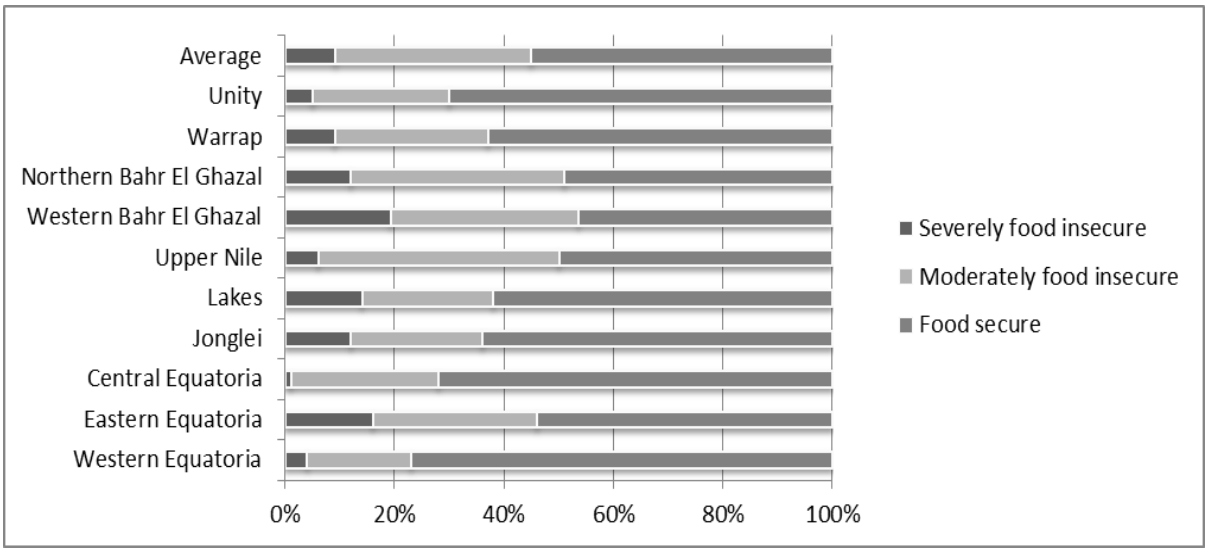
[150] FAO. *New metric to be launched on hunger and food insecurity: FAO in Emergencies. http://www.fao.org/emergencies/fao-in-action/stories/stories-detail/ru/c/171861/*

Since then, access to nutritiously adequate and safe food is acknowledged as an important right for people and has become a more widely known component of food security. Some organisations use the term "food and nutrition security", but in this report, the term "food security" includes the element of nutrition. The scope of the present report focuses on the availability and accessibility dimensions of food security.

7.2 Overview of food security in South Sudan

Sixty per cent of South Sudanese do not consume sufficient, nutritious food. In 2009, the average person consumed 1,318 kilocalories (kcal) per day, which is about 400 kcal lower than FAO's minimum recommended intake per day.[151] In October 2012, about 40% of the population, or about 4,121,000 people, was either severely food insecure or moderately food insecure.[152] In February 2013, about 48% of the population fell into these categories.[153] It can be seen that the proportion of people in these two categories increased between these two dates. Western Bahr El Ghazal State, Northern Bahr El Ghazal State and Upper Nile State have higher ratios of people facing food insecurity to food secure people while Central Equatoria State, Western Equatoria State and Unity State have lower ratios.[153]

Figure 7-1: Food security status by state in 2012 and 2013



Source: WFP. March 2013. *Annual Needs and Livelihood Analysis (ANLA) 2012/2013: South Sudan.* Juba.

The net cereal production in 2012 was estimated at 761,000 tonnes (an increase of 35% from 2011) while the cereal requirement in 2013 is expected to be 1,132,000 tonnes (increased by 9% from 2012). Thus, 371,000 tonnes of food deficit are expected in 2013.[152] Even though production volumes have increased, food availability is still a challenge.

In 2013, refugees from Sudan might increase due to conflicts in Sudan, in South Kordofan and Blue Nile.[154] In Jonglei State, inter- and intra- ethnic conflicts also continue. These two factors could create about 750,000 refugees and internally displaced persons (IDPs),[154]

[151] VAM Food Security Analysis, 2012. *Report on Food Security and Nutrition in South Sudan: how a new country can feed its people.* Juba.
[152] FAO/WFP. February 22, 2013. *Special Report: FAO/WFP Crop and Food Security Assessment Mission to South Sudan.* Juba.
[153] VAM Food Security Analysis. Round 9, February 2013. *South Sudan Food Security Monitoring: A Collaborative Activity of FSTS, RRC, MAF, MoH, FAO, WFP, UNICEF, and UNHCR.* Juba.
[154] FAO and WFP. 22 February 2013. *Special Report. FAO/WFP Crop and Food Security Assessment Mission to South Sudan*. p. 47

even though the numbers of returnees from Sudan have decreased from 449,433 in 2009 to 160,303 in 2012.[155] Other factors causing an increase in returnees and IDPs in 2013 could be floods and inter- and intra-ethnic conflicts in and along the border of South Sudan. The total number of beneficiaries for WFP food assistance in 2013 is expected to be 2,858,000, requiring 224,000 tonnes of food.[152] These factors also weaken availability of food in South Sudan.

7.3 Major causes of food insecurity

In South Sudan, there are several key causes of food insecurity: 1) overall national food deficit, 2) border closure with Sudan, 3) refugees[156], returnees[157] and IDPs[158], 4) conflicts and insecurity, 5) high price of food, and 6) natural hazards.

Sufficient food is not produced to feed the total population of the country leading to a food deficit. In 2012, the cereal deficit was 475,000 metric tonnes.[159] The border between South Sudan and Sudan used to be a major supply route for cereals and other types of food. However, it has only been intermittently open. The northern states, such as Northern Bahr el Ghazal, Western Bahr el Ghazal, Warrap, Unity and Upper Nile, are significantly impacted by the border closure as they lose their major supply routes for food. Currently, food is mainly brought from other parts of South Sudan or from Uganda, Kenya and Ethiopia, which raises the cost of transportation and leads to higher prices for food. This impacts both the availability and accessibility dimensions of food security.

Additionally, numerous refugees and returnees have been re-settling in various parts of South Sudan. Refugees, returnees and IDPs are contributing to the increase in population of the country; they are vulnerable people who need assistance. The total number of refugees, returnees and IDPs in 2012 is shown in Table 7-3.

Table 7-3: Number of refugees, returnees, and IDPs in 2012-2013

	Refugees	Returnees	IDPs
Total Number	221,303	1,867,009	430,000[a]

[a] Total number of IDPs is from 2012. Out of 430,000 IDPs, 170,000 people are affected by cross-border and domestic conflicts. 260,000 IDPs are dislocated due to floods across the country.
Sources: UNHCR. Refugees in South Sudan, Information Sharing Portal, *http://data.unhcr.org/SouthSudan/country.php?id=251.*
International Organisation for Migration (IOM). 2013. *Returnees to South Sudan*. Juba: IOM. (Internal document based on IOM Tracking and Monitoring Database.),
IOM South Sudan 2013. *Annual Report 2012*. p. 5. Juba. FAO and WFP. 22 February 2013.

The number of returnees who came back to South Sudan was 449,433 in 2009 and 160,303 in 2012.[159] However, it is a significant number and they generally returned with minimal possessions and are vulnerable. Hence, the impact of returnees on food security is large.

[155] International Organisation for Migration (IOM). 2013. Returnees to South Sudan. Juba: IOM. (Internal document based on IOM Tracking and Monitoring Database.)
[156] The 1951 Refugee Convention defines a refugee as someone who "owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality, and is unable to, or owing to such fear, is unwilling to avail himself of the protection of that country." United Nations High Commissioner for Refugees (UNHCR), *http://www.unhcr.org/pages/49c3646c125.html.*
[157] A returnee is a South Sudanese national who came back to South Sudan from another country. This includes South Sudanese who returned from Sudan.
[158] According to the United Nations, IDPs are defined as "persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border" Source: Representative of the Secretary-General, Mr. Francis M. Deng. UN Commission on Human Rights. 1998. *Guiding Principles on Internal Displacement.*
[159] WFP, March 2013. *Annual Needs and Livelihood Analysis 2012/2013. South Sudan.* Juba.

Food insecurity caused by refugees, IDPs, and returnees is categorised as transitory (or short term).

Aside from the above mentioned causes, 267 conflict incidents occurred in the country, which were caused mainly by inter- and intra-ethnic/communal conflicts in 2012. Forty four per cent of the conflicts occurred in Jonglei State, the highest percentage in the country. Numbers of conflict incidents (including civilian/civilian clashes, armed forces/civilian clashes, cross-international boundary attacks and other armed incidents) are shown in Table 7-4 for part of 2012. These conflicts caused displacement of people and are causing transitory food insecurity which is serious in South Sudan.

Table 7-4: Numbers of conflict incidents reported in 2012 (January to November 2012)

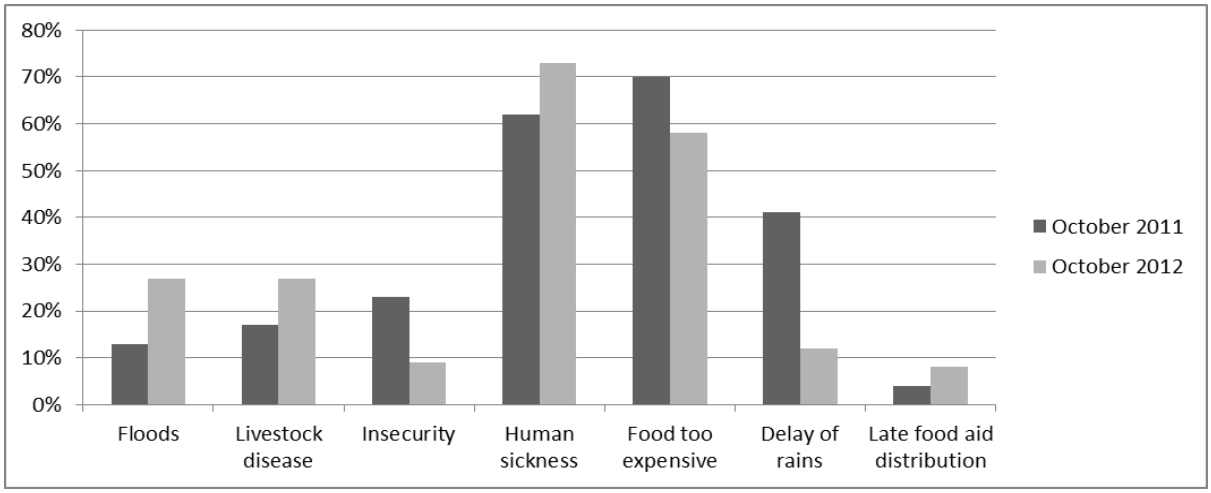
Jonglei	Unity	Lakes	Upper Nile	Warrap	Eastern Equatoria	Northern Bahr el Ghazal	Central Equatoria	Western Bahr el Ghazal	Western Equatoria
118	47	40	22	20	11	6	2	2	0

Source: WFP. March 2013. *Annual Needs and Livelihood Analysis Report 2012/2013 South Sudan*. Juba. p. 41.

Internal conflicts create IDPs which affect farmers and pastoralists negatively. They have to limit or stop their agricultural activities, which significantly affects their area cultivated, yields, output and incomes. This situation leads to unstable food security.

In 2011, high food prices ranked first amongst seven factors for food insecurity as shown in Figure 7-2.

Figure 7-2: Percentages of negative factors impacted on household food security



Source: WFP. March 2013. *Annual Needs and Livelihood Analysis Report 2012/2013 South Sudan*. Juba. p. 18.

In 2012, high food prices were the second most important negative factor influencing household food security. High food prices make food inaccessible. An assumption can be made that there is enough food available in the markets, but that people do not have enough money to buy it. Prices of food at markets are generally high, especially imported agricultural products. Domestic agricultural products are relatively reasonable compared to imported ones, but still not very low. Many agricultural producers have low incomes. This means that accessibility to food is restricted due to high food prices. Lower prices would lead to improved accessibility. Production volumes, production functions and conditions of the market are analysed in details in the section on production and marketing and trading in each subsector chapter.

7.4 Categories of food insecure people

People facing food insecurity are categorised into groups shown in Table 7-5.

Table 7-5: Types of Food Insecure People and their Conditions

	Type of people	Assistance they receive and life after receiving assistance	Conditions and potential needs for support
1	Refugee	At a refugee camp, refugees are provided shelter, food, shelter materials, transportation, and water sanitation and hygiene facilities. They receive assistance for up to 360 days[160], but if necessary, they could extend the period until they find out the next step to take.[161]	Refugees are supported by humanitarian agencies until they change their status by relocating to other countries. Rehabilitation support is necessary only when they decide to stay in South Sudan and find a place to resettle because they have limited livelihoods including land and houses. Degrees of their food security range from severe to mild because long term refugees may be well-established.
2	Returnee	Shelter, food[162], non-food package[163], shelter materials, transportation and water sanitation and hygiene facilities. SSRRC finds a host community for returnees. After that period, the returnees have to be independent and make their living by some means such as farming or employment regardless the places they settle in.[164]	When they arrive in South Sudan, their belongings and assets are very limited. During the period of humanitarian aid assistance, it is difficult to improve their skills and means to be self-sufficient. In the reintegration process, returnees need support in the areas of housing, skills for employment, means of transportation, land, tools for and skills and knowledge of agricultural production and some funds to survive with until the harvest period in the first year. Degrees of their food security range from severe to moderate.
3	IDP	IDPs are provided shelter, food, shelter materials, transportation and water sanitation and hygiene facilities. When natural hazards and conflicts cease, they have to return to their hometowns and villages. Then, they are responsible for making their normal livelihood without assistance.	In their hometown and villages, they own houses, lands and other livelihoods including means for agricultural production. However, if their areas are badly damaged by floods, they may need technical support to rehabilitate the areas or prevent further natural hazards. Also, if conflicts in their areas happen repeatedly, peace building activities may be necessary. Degrees of their food security range from severe to moderate.
4	People affected by natural hazards and insecurity	These people do not need to move to other places such as IDPs, but are still affected by drought and flood damage to their livelihood. They sometimes receive assistance by aid organisations, but normally, they have to survive without any external support.	These people face constraints on agricultural activities,[165] reduction of yields and limitation of areas to raise their livestock. They have basic means of making their living such as houses, land, livestock and tools for agricultural activities, but their production levels are low, considering the required amount of food for the household. Their knowledge and skills related to production and marketing are often limited for improvement of their status. Often these people reside in disadvantaged locations. Degrees of their food security range from severe to mild, because it depends on how serious was the natural hazard affecting them.

[160] FAO and WFP. 22 February 2013. *Special Report. FAO/WFP Crop and Food Security Assessment Mission to South Sudan*. Rome: FAO and WFP.

[161] The next step could be a return to their home country or transfer to a third country for re-settlement, or transfer to a different place in South Sudan for re-settlement.

[162] 3 month food package includes 500 grams of cereals per day/person, 50 grams of pulses per day/person, 30 grams of oil per day/person, and 5 grams of salt per day/person. World Vision, interviewed by CAMP task team, Juba, 5 July 2013, CAMP Situation Analysis.

[163] It includes plastic sheets, blankets, mats, utensils, mosquito nets, etc. UNOCHA, interviewed by CAMP task team, Juba, June 2013, CAMP Situation Analysis.

[164] Some returnees move to semi-urban or urban areas by themselves after the three month re-integration period. World Vision, interviewed by CAMP task team, Juba, 5 July 2013, CAMP Situation Analysis.

[165] As examples, there are armed groups which are harmful for farmers and pastoralists' activities in Upper Nile State and Jonglei State. State government office, Crop Subsector questionnaire, Upper Nile State. 28 May 2013. CAMP Situation analysis. World Vision, interviewed by CAMP task team, Malakal, 1 July 2013, CAMP Situation Analysis.

	Type of people	Assistance they receive and life after receiving assistance	Conditions and potential needs for support
5	Low-income people	Normally, these people do not receive any assistance from either the government or humanitarian aid agencies. However, sometimes, some of them receive support by NGOs and DPs through implementation of development projects.	For most of those who are involved in agriculture, the size of their lands, numbers of livestock and amount of yields and knowledge of effective agricultural practices are limited. Due to their low income, they suffer from food shortage during the period of seasonal food insecurity; they have several types of coping strategies such as reduction of eating volume, engaging in non-agricultural income generating activities, and hunting and collecting wild animals, fish and fruits. Degrees of their food security range from moderate to mild.
6	Socially vulnerable people	These are disabled people, widows, orphans, children under five years old, elderly people, school children and HIV/AIDS patients. They receive food and other types of assistances from NGOs and DPs.	These people lack ability to produce agricultural products or earn money to obtain food by themselves. Since these people are not core players in the national economy, they tend to be marginalized from society and have disadvantage in getting access to food. They obtain food assistance through various projects of WFP and NGOs.[166] Degrees of their food security range from moderate to mild.

Sources: Farmers, WFP, FAO, UNOCHA, and World Vision, interviewed by CAMP task team, ten states, April to June 2013, CAMP Situation Analysis.

7.5 Farmer's food insecurity situation

The CAMP Task Team attempted to identify the food security situation of ordinary subsistence farmers, who would seem to be either moderately or mildly food insecure. However, information regarding the detailed food security situation of these of farmers is not available. Therefore, in the situation analysis, the CAMP crop subsector team conducted 37 focus group discussions (FGDs), targeting subsistence farmers at various locations, both near and far from the main market(s) of a town, to understand the food security situation in the ten states.[167] Between four and ten farmers participated in each FGD; participants discussed key questions concerning food security.

The team found that, for subsistence farmers in all of South Sudan, seasonal food insecurity is common and that it is the most frequent type of food insecurity. Seasonal food insecurity occurs when stocks of produce from the previous harvest are depleted causing a potential food shortage. Households have to find alternative sources of food using coping mechanisms (or strategies). The types of food insecurity previously described are long term and caused by extended periods of poverty, lack of assets, natural disasters, conflicts and inadequate access to productive or financial resources. On the other hand, seasonal food insecurity is a normal occurrence that is part of the farming calendar. It can occur regardless of the distance from the main markets. Seasonal food insecurity is more severe, and more common, in the northern states.

There are six coping strategies used during the period of seasonal food insecurity as shown in Box 7-1.

[166] World Vision South Sudan provides food assistance under the project titled "General Food Distribution Program," "Targeted Supplementary Feeding Program", "Blanket Supplementary Feeding Program, "Food for Asset" and School Feeding programs in Upper Nile state, Unity State, Northern Bahr el Ghazal State, Western Bahr el Ghazal State, Warrap State, and Central Equatoria State. World Vision, interviewed by CAMP task team, Juba, 5 July 2013, CAMP Situation Analysis.

[167] Two to five FGDs were conducted in each state, in different payams or counties. Male and female participants were included.

Box 7-1: Types of Coping Strategies

1. Reduction of volume and number of meals in a day
2. Selling agricultural related products at the market to buy food
3. Engaging in non-agricultural income generating activities
4. Hunting and collection of wild animals, fish and fruits
5. Use of mutual support systems among families, relatives and community members
6. Others (e.g., food assistance)

Source: Groups of farmers, interviewed by CAMP crops subsector team, ten states, April to June 2013, CAMP Situation Analysis.

Examples of characteristics of subsistence farmers' food security and their common coping strategies during a period of seasonal food insecurity are described in Table 7-6.[168]

Farmers typically sell livestock and vegetables to make money. They will sell goats and chickens to buy food, but not cattle since the number of cattle a man owns defines his social status, especially in the northern parts of the country. Examples of income generating activities are grass cutting, charcoal making, and alcohol making, etc. Mutual support systems include sharing labour amongst neighbouring farmers and supporting vulnerable groups in the community. "Other" strategies are receiving food assistance or other types of assistance from NGOs and donors. These strategies were commonly identified through the FGDs, but not necessarily all of them were used in each state; the first three coping strategies described in Box 7-1 were commonly applied in all ten states.

Commonly, seasonal food insecurity occurs from June to July, but in Lakes, Northern Bahr el Ghazal, Warrap and Unity States it lasts longer. Coping strategies are very similar in all ten states, and selling agricultural products is an effective approach to coping with food shortage. Livestock and vegetables are key for farmers to survive seasonal food insecurity; water points such as rivers, streams, ponds and boreholes are crucial to practice these coping strategies. Hunting is another common method to obtain food. It is found that fish is an important protein source across the country. Selling charcoal and firewood is currently common across the country, but overexploitation of forestry resources may diminish the future usefulness of this coping strategy.

Table 7-6: Characteristics of Subsistence Farmers' Food Security Situation in Each State

State	Period	Common food consumed	Common coping strategies	
			Category	Descriptions
Western Equatoria	June to July	Cassava tubers, maize, finger millet, groundnuts, rice, beans, meat, fish, bananas, papayas, mangoes, honey, white ants, sugar canes, pumpkins, sweet potatoes, yam, abu kamira (wild fruit), joko	Meals	- Reduce number of meals in a day - Eat the food stored from the previous season
			Sell agricultural products	- Catch fish to sell - Sell cassava leaves - Collect firewood and make charcoal to sell
			Off farm activities	- Brew beer to sell - Make bricks, mats, and tea to sell - Bake cakes to sell
			Hunting and gathering	- Hunt wild animals (deer, buffalo, bush rats) - Collect wild fruits, wild yams, and wild honey
			Support	- Provide labour to each other and community supports vulnerable groups

[168] Information collected from the crop subsector team of CAMP TT members is used as one of the examples of food security of this county.

State	Period	Common food consumed	Common coping strategies	
			Category	Descriptions
		(wild yams), sesame, bush meat (deer, buffalo, bush rats)		
Eastern Equatoria	June to July[169]	Maize, sorghum, cassava, sweet potatoes, sesame, groundnuts, okra, cabbage, tomatoes, pumpkins, eggplant, amaranths, beans, cowpeas, meat, fish, mangoes, guavas	Meals	- Reduce number and volume of meals in a day - Reduce amount of seed to store
			Sell Agricultural products	- Sell livestock such as goats and chickens - Collect firewood and make charcoal to sell
			Off farm activities	- Cut grasses to make money - Engage in construction work to earn money in the city during the dry season - Cut trees to make poles - Brew beer and local alcohol to sell - Organise traditional festivals during the dry season
			Hunting and gathering	- Hunt wild animals and catch fish
			Support	- Support each other among families, relatives, and community - Wife stays at her parents' house during a food shortage period
Central Equatoria	June to July	Maize, sorghum, cassava, millet, pigeon peas, tomatoes, onions, eggplant, cabbage, okra, amaranths, jew's mallow, green peppers, pumpkin, sweet potatoes, meat, and fish	Meals	- Reduce number of meals and volume in a day
			Sell agricultural products	- Grow vegetables in dry season along the river and sell them - Grow fruits such as mango to eat and sell - Sell charcoals and bamboos - Sell some livestock such as goats and chicken to buy some food
			Off farm activities	- Have a side business to make money
			Support	- Support other farmers by providing labour for each other
Jonglei	June to July	Sorghum, groundnuts, sesame, pumpkin, tomato, okra, cowpeas, pigeon peas, fish, milk, meat, jew's mallow, moringa leaves, honey	Meals	- Reduce number and volume of meals in a day
			Sell agricultural products	- Sell cattle such as goat, sheep, and cows - Make charcoal and collect firewood to sell - Sell milk
			Off farm activities	- Sell sorghum straw and cut grasses to make money
			Hunting and gathering	- Collect edible wild plants and wild fruits - Catch fish - Eat white ants
			Support	- Support each other among families, relatives and community
			Other	- Wait for food assistance
Lakes	May to July[170]	Sorghum, maize, pumpkin, millet, okra, ground nuts, green grasses,	Meals	- Reduce number of meals and volume in a day
			Sell agricultural products	- Grow vegetables at water points (e.g. boreholes) in the dry season - Sell or exchanges chickens and goats to obtain

[169] In some areas such as Obbo Payam, food shortage does not commonly occur. Farmers mentioned that the amount of rainfall is enough to grow sufficient crops to survive throughout the year.

[170] In the north western part of the state, food shortage starts in February and ends in July according to the farmer interviewed. Source: Group of farmers, Crop Subsector questionnaire, Lakes State. May, 2013. CAMP Situation Analysis.

State	Period	Common food consumed	Common coping strategies	
			Category	Descriptions
		sesame, jew's mallow, pumpkins, beans, cow milk, meat, and fish		some food
			Off farm activities	- Make local beer and tea to sell
			Hunting and gathering	- Fishing for their own consumption during the dry season[171] - Collect wild fruits, wild vegetables, and honey
			Support	- Support each other through providing labours for farming[172]
Upper Nile	June to July	Sorghum, maize, jew's mallow, sesame, tomato, beans, groundnuts, okra, milk, meat, eggs, fish, cowpeas, watermelon, peer millet, wild fruits, wild green leaves	Meals	- Reduce number of meals in a day
			Sell agricultural products	- Sell cattle such as goats and sheep - Sell crop products at a market - Make charcoal and collect firewood to sell
			Off farm activities	- Sell grasses for house thatching - Cut grasses and clean farms to make money
			Hunting and gathering	- Collect wild fruits and wild leaves
			Support	- Community supports vulnerable people
Western Bahr el Ghazal	July to Sept.	Sorghum, maize, cassava, okra, cassava leaves, pumpkin, groundnuts, sesame, beans, onion, meat, fish, fruits such as mango and guava	Meals	- Reduce number and volume of meals in a day - Prioritize children to eat food while adults eat less or skip meals
			Sell agricultural products	- Make and sell charcoal to make money
			Off farm activities	- Cut grasses to make money
			Other	- Seek an opportunity for food assistance
Northern Bahr el Ghazal	July to Sept.	Sorghum, groundnuts, beans, cowpeas, sesame, jew's mallow, okra, rice, wild green leaves, meat, fruits	Meals	- Reduce number of meals in a day - Reduce volume of meal in a day
			Sell agricultural products	- Sell cattle such as cow - Make firewood to sell - Make charcoal to sell
			Off farm activities	- Cut grasses
			Hunting and gathering	- Catch fish to sell
			Other	- Receive food aid from WFP and FAO
Warrap	July to Sept.	Sorghum, meat, milk, fish, some vegetables	Meals	- Reduce volume of meals
			Sell agricultural products	- Make and sell charcoal - Catch fish to sell - Sell goats and cows to buy food - Grow vegetables during the dry season
			Off farm activities	- Cut grasses to make money - Sell assets and home properties to buy food
			Support	- Support each other among families and farmers in case of emergency
Unity	May to part of August	Sorghum, maize, pumpkin, cowpeas, okra,	Meals	- Reduce the number and volume of meals in a day - Eat pumpkins

[171] In some areas, fishing is not a common coping strategy for food deficiency.
[172] Some farmers mentioned that they do not support each other since they do not have extra energy and resources to provide labour for each other. Source: Groups of farmers, Crop Subsector questionnaire, May 2013, CAMP Situation Analysis.

State	Period	Common food consumed	Common coping strategies	
			Category	Descriptions
		tomatoes, cucumber, beans, groundnuts, cow milk, meat, and fish		- Take cow blood to drink and use it for cooking
			Sell agricultural products	- Collect firewood to sell - Sell livestock to buy foods
			Off farm activities	- Earn some money through grass cutting and charcoal making - Brew local beer to sell
			Hunting and gathering	- Collect wild vegetables such as jew's mallow and potatoes - Catch fish - Collect wild honey and wild fruits to eat

Source: Groups of farmers, interviewed by CAMP crops subsector team, ten states, April to June 2013, CAMP Situation Analysis.

In some states, especially in the northern parts of the country, food choices are limited. Even though farmers grow vegetables during the dry season in many parts of the country, it does not necessarily mean that everyone can eat vegetables throughout the year. Based on the results of FGDs and observations made during the CAMP situation analysis, more vegetables are available in the southern parts of the country than in the northern parts.

All coping strategies are either substituting another edible food for a staple food or generating income to purchase food. Strengthening subsistence farmers' capacity for crop production and/or increasing their incomes are effective approaches to improving their food security.

7.6 Food security and the market economy

Almost all the farmers, who were interviewed or participated in FGDs during the CAMP situation analysis, said that they engage in income generating activities, including selling their agricultural products and engaging in off farm activities to generate income, regardless of their farm size. This means that farmers have access to markets to engage in commercial activities to supplement their income. They do this primarily during periods of seasonal food insecurity but also to generate income to pay for expenses such as school fees for their children.

The FGDs showed that when they face seasonal food insecurity, many subsistence farmers consider coping strategies such as hunting wild animals, reducing the number and volume of meals, and engaging in income generating activities such as providing their labour. They do this in preference to selling their agricultural products and/or livestock. Farmers may have access to a market, but they try to cope with food insecurity without engaging in economic activities at a market. Farmers may not have enough surpluses to sell their agricultural products at market due to the limited size of their cultivated land; most of their harvest is for home consumption not for generating income. For pastoralists', livestock is considered as an asset. Inadequate means for marketing and poor road conditions could affect farmers' decisions to increase production as well as their selection of coping strategies.

In the FGDs and interviews, it was found that most subsistence farmers did not receive food aid from donors. As explained in Section 6.4, it is refugees, IDPs and returnees who receive food aid. However, food aid does affect food security and markets.

Food aid is provided to vulnerable groups such as refugees, returnees, and IDPs. The volume of food aid (or rations) is determined based on required calorie intake and nutritional balance for adults and children. However, some refugees engage in agriculture, growing

food. Land is provided by the host community, and farming tools by the government and NGOs. This means they have surplus food which can be sold at a market or to a middleman. They can sell either rations or harvested food, whichever is more advantageous.

For example, one retailer in Central Equatoria State mentioned that she buys lentils from a refugee through a middleman at a nearby refugee camp and then sells them at a market in Yei town.[173] The same situation is identified in Maban County in Upper Nile State.[174]

As rations are free to refugees, they can make more profit than other farmers or merchants; rations can be sold at a lower price than food grown locally or imported from foreign countries. It is understandable that surplus food is sold at a market, but this distortion of the market should be carefully examined; subsistence farmers are at a disadvantage.

Nevertheless, markets should be an instrument to improve food security. However, the current situation does not fully utilise markets as instruments to improve food security. Subsistence farmers have started to enter the market economy but need to be encouraged to participate further. Markets should provide a place and an opportunity for farmers to sell their surplus. For that purpose, the following issues need to be addressed: increasing farmers' production volumes, improvement of access to markets, creation of more opportunities for marketing of farmers' products especially in rural areas, minimize market distortions created by food aid.

7.7 Roles of government organisations and development partners

The Ministry of Humanitarian Affairs and Disaster Management (MoHADM) is the main ministry responsible for resettlement of refugees and returnees and internally displaced persons (IDPs) and food distribution to vulnerable people.

MoHADM coordinates relief repatriation, rehabilitation, resettlement and reintegration activities in collaboration with UN agencies at the national level. The South Sudan Relief and Rehabilitation Commission (SSRRC) is another governmental entity which coordinates relief activities in collaboration with UN agencies at the state level.[175] SSRRC has a network at county and payam levels to identify food insecure people and/or vulnerable groups who need assistance.[176]

The South Sudan Food Security Council (SSFSC)[177] is a government body responsible for coordinating resources, supervising, planning and conducting monitoring and evaluation of activities regarding food security. However, as of June 2013, SSFSC was not established and had yet to start its activities. Its function will be to coordinate the activities planned by different ministries to improve the food security situation. MAFTARFCRD is responsible for supporting people engaged in agriculture to improve the food security situation of these people plus the country as a whole.

There are a large number of DPs and NGOs involved in food security issues. Some key DPs engaging in food security are introduced in Table 7-7.

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[173] Retailers, interviewed by CAMP crop subsector team, Yei, April 2013, CAMP Situation Analysis

[174] Better off households surprisingly also sell a proportion of their rations. Solidarities International, The Food Economy Group. 2013. *Livelihood Baseline Profile: Refugee CAMPS, Maban County Upper Nile State, South Sudan, 2013. Household Economy Approach.* Paris.

[175] South Sudan Relief and Rehabilitation Commission (SSRRC), *http://www.goss-online.org/magnoliaPublic/en/Independant-Commissions-and-Chambers/Relief-Rehabilitation.html*

[176] World Vision Malakal Office, crop subsector questionnaire, Malakal, 1 June 2013, CAMP Situation Analysis.

[177] It is a council directly under the President of South Sudan. The Ministers of MAFCRD, MARF, Health, Minister of Cabinet Affairs, Finance and Economic Planning, the Office of the President and Wildlife Conservation and Tourism are members of the council. The Republic of South Sudan *Food Security Council: Establishment, mandate and composition, John Ogoto Kanisio. Secretary General, RSSFSC.* Unpublished.

Table 7-7: DPs involved in food security issues in South Sudan

Organisation	Roles	Main activities
International Organisation for Migration (IOM)	- Facilitate peace-building and conflict mitigation - Coordinate hosting refugees and manage a camp and a way station for returnees and IDPs - Strengthen functions of border management	- Identify numbers of returnees and IDPs to register - Secure transportation for returnees and IDPs - Provide water sanitation and hygiene promotion support to returnees and refugees - Provide emergency shelter to returnees and IDPs - Provide household supplies and shelter materials to returnees and IDPs
United Nations Office for the Coordination of Humanitarian Affairs (OCHA)	Coordinate all the aspects of humanitarian affairs to be implemented including management of the Common Humanitarian Fund (CHF)[178]	- Identify needs for humanitarian aid - Coordinate and assist all the areas of humanitarian aid planning and implementation of activities - Provide updated information to humanitarian aid organisations and the public - Manage CHF for effective humanitarian aid
World Food Programme (WFP)	Manage food provision to people in food insecure	- Identify needs of food distribution (volume and locations) - Coordinate food distribution processes including subcontracting and monitoring and evaluation of food distribution, Food for Assets (FFA)[179], Purchase for Progress (P4P)[179] programmes and School Feeding programme. - Assess, monitor, and report food security issues and updates of food distribution status
Food and Agriculture Organisation of the United Nations (FAO)	Provide support to people who are related to agriculture	- Implement projects to provide seeds and agricultural tools to farmers - Implement projects to provide fishing gear to farmers and fishers - Coordinate and subcontract NGOs to implement projects related to food security

Source: IOM South Sudan 2013. *Annual Report 2012.* Juba, WFP, FAO, and World Vision interviewed by CAMP task team, Juba, April to July 2013, CAMP Situation Analysis, Common Humanitarian Fund South Sudan. 2013. *2012 Annual Report*. Juba.

The Food Security and Livelihood Cluster (FSLC) is a network of DPs and NGOs, whose main objective is to share information about food security and discuss issues. The FSLC was created by the government and any organisation interested in food security can attend its monthly meetings to exchange information and discuss selected issues. There are also state level FSLCs which hold meetings.

WFP is moving from direct food aid to rehabilitation and long-term economic development through food assistance. This shift in strategy has been ongoing for the past fifteen years. Food provided should be used as a tool for broader and more effective humanitarian food assistance. A main reason for this shift is the recognition of the importance of local agricultural production to improve food security.[180] WFP has implemented a variety of programmes reflecting this shift of strategy. For example, under the Food for Asset (FFA) programme, WFP distributes food to farmers who provide labour. Labour can be for their own farming purposes or communal labour.[181] The Purchase for Progress (P4P) programme

[178] The fund was established in 2012 and seven donors contributed funds totalling over USD 118 million. Common Humanitarian Fund South Sudan. 2012. *2012 Annual Report*. Juba.

[179] WFP and World Vision interviewed by CAMP task team, Juba, June to July 2013, CAMP Situation Analysis.

[180] Harvey, Paul, Karen, Proudlock, Edward Clay, Barry Riley and Susanne Jaspers. 2010. *Food aid and food assistance in emergency and transitional contexts: a review of current thinking.* London: Humanitrian Policy Group, Overseas Development Institute.

[181] As a criterion, the target household should have someone who is able to provide physical labour and be over 18 years old. Communities receiving assistance from FFA must include vulnerable people such as widow, disabled person, elderly person, or orphans.

is designed to purchase domestic food in bulk to encourage agricultural production in the country. WFP has constructed food storage facilities to match traders and farmers in several areas of the three Greater Equatoria states. It is still in a pilot stage and is only implemented in these three states. Attempts such as FFA and P4P could be more common among DPs to support farmers to be self-sufficient.

FAO is also trying to shift its activities from distribution of seeds and tools to more economic development oriented activities.

Although some DPs have actively provided food security assistance to vulnerable groups, the impact of their activities is not clear, partially because there has been no impact assessment of food distribution neither by DPs nor GRSS. How food assistance has impacted vulnerable people and market are not closely monitored and evaluated. For example, refugees sell some of their rations to a broker, who sells it to a retailer at a market. As explained in Section 6.6, rations distributed to refugees were identified in a public market in Yei during the CAMP situation analysis. The same situation was reported by another study in Maban County, Upper Nile State.[182] However, these facts are neither examined nor written in reports on food security.

Numerous NGOs implement projects to support people engaging in agriculture in different states, which improve food security. More information about their activities is presented in the subsector chapters of this report.

[182] Solidarities International, The Food Economy Group, 2013. *Livelihood Baseline Profile: Refugee CAMPS, Maban County Upper Nile State, South Sudan, 2013. Household Economy Approach.* Paris.

8. Rural Society and Livelihood

8.1 Population, Communities and Households

The population of South Sudan was projected to be more than 10 million in 2013 (Table 8-1). This projected population is an increase of 25.5% compared with the 2008 census data. The number of returnees influenced this growth. For example, in Unity State, the increase is 49% because of the large number of returnees. The projected population density, which is 15.7 people /km^2, is relatively low for East African countries.[183,184]

Since only 0.1% of the land in South Sudan is urban, [185] real population density would be higher than 15.7 people /km^2 in urban areas. Villages are thinly spread across the country making rural and agricultural development more difficult. In the rainy season, access to rural areas becomes more difficult.

The percentage of rural population (83%) has not been updated since the 2008 census. Although urbanization is occurring in the major cities such as Juba and Wau, the 2008 rates were applied for calculating the rural population in 2013; it was 8,592,706. Jonglei State contains 18% of South Sudan's rural population and Warrap State 13%. These are two states where conflicts frequently occur and that have the first and third largest populations. This means that large numbers of the rural population are living in conflict areas.

Table 8-1: Population related data of South Sudan

State	Population 2008 [a]	Population 2013 [b] (Projection Including returnees)[1]	5 years growth rate (2008-2013)	2013 Projected population Density (ppl./km^2)[c]	Rural population rate [a]	Rural population [b]	Proportion of rural population
Upper Nile	964,353	1,160,458	20.3%	14.8	75%	870,344	10%
Jonglei	1,358,602	1,659,070	22.1%	13.4	90%	1,501,013	18%
Unity	585,801	872,734	49.0%	23.0	79%	692,780	8%
Warrap	972,928	1,193,365	22.7%	26.8	91%	1,089,245	13%
NBG	720,898	971,243	34.7%	32.6	92%	896,607	10%
WBG	333,431	446,123	33.8%	4.3	57%	254,866	3%
Lakes	695,730	879,012	26.3%	19.9	91%	796,847	9%
WES	619,029	731,098	18.1%	9.2	84%	612,954	7%
CES	1,103,557	1,395,905	26.5%	31.8	65%	912,250	11%
EES	906,161	1,059,862	17.0%	14.3	91%	965,801	11%
Total	8,260,490	10,368,871	25.5%	15.7	83%	8,592,706	100%

[a] Data from Sudan Centre for Census, Statistics and Evaluation (SSCCSE). 2010. *Southern Sudan counts: Tables from the 5th Sudan population and housing census*. Juba: SSCCSE.

[B] Data from World Food Programme of the United Nations (WFP). 2013. *Annual Needs and Livelihood Analysis (ANLA) 2012/2013. South Sudan*. Juba: WFP.

[C] Land scale data applied from Food and Agriculture Organization of the United Nations (FAO). 2011. *Land Cover Attars of the Republic of South Sudan*. Juba: FAO

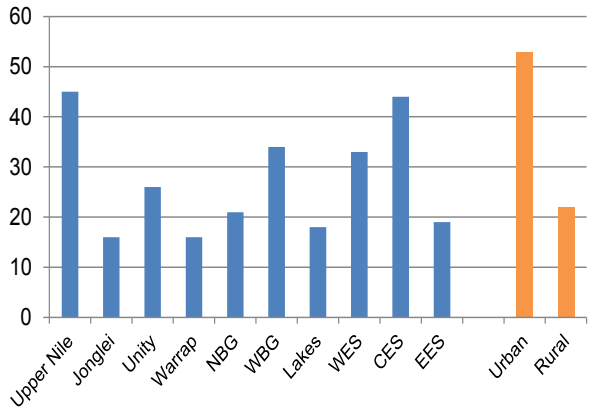
[183] Kenya has 66 people /km^2 see Kenya National Bureau of Statistics (KNBS). 2009. *Kenya 2009 Population and Housing Census Highlight.* Nairobi: KNBS.

[184] Uganda 141 people /km^2 see Uganda Bureau of Statistics (UBOS). 2012. *Statistical Abstract.* Kampala: UBOS.

[185] World Bank. 2011. *Strategic Choices for Realizing South Sudan's Agricultural Potential*. Juba: World Bank

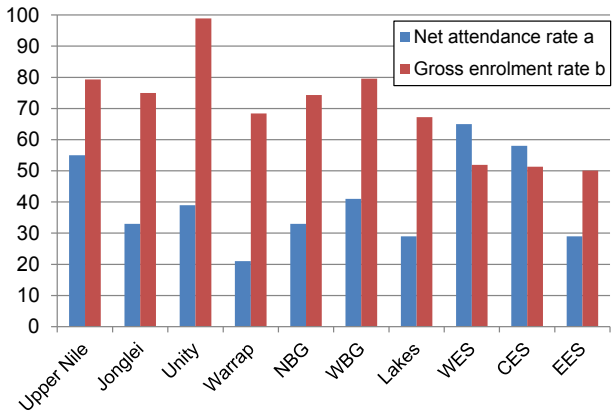
The literacy rate in South Sudan is one of the lowest in the world [186] due to low investment in education during the civil war. [187] During the war, most education was given by non-governmental organisations. In contrast, there was little public education. Figure 8-1 shows literacy rates by state and urban and rural areas. The rate is only 22% in rural areas, which has a large influence on the effectiveness and efficiency of rural and agricultural development. Distributing information by written materials is not effective; audio and visual distribution is a better approach. The literacy rate varies amongst the states. The rates in Upper Nile and Central Equatoria States are 45% and 44%; whereas, those of Jonglei, Warrap, Lakes and Eastern Equatoria States are 16%, 16%, 18% and 19%. There is a similar gap in net attendance rates in primary education, although gross enrolment rates in primary education do not show the same gap (Figure 8-2). Net attendance rate could be influenced by insecurity, the poverty resulting from this insecurity and the harsh natural environment. There are a number of pupils who enrolled but do not attend schools. Basic education is one of the important factors for economic development. Along with low literacy, low numeric ability negatively affects agricultural production; for example, when farmers are required to apply fertilizer to farmlands and to keep account books.

Figure 8-1: Literacy rate (above 15 years old) by state and location (%)



Source:
National Bureau of Statistics (NBS). 2012. *National Baseline Household Survey 2009*. Juba: NBS.

Figure 8-2: Net attendance rate and Gross enrolment rate in primary education by state (%)



Source
[a] NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.
[b] Ministry of Education (MoE). 2010. *Education Management Information System (EMIS)*. Juba. MoE.

A boma is the lowest level of local government and can be considered as a grouping of villages normally with a total population of 2-10,000 people. When South Sudanese refer to a community they normally mean a boma or village. The head of a boma is a boma chief. Generally, a payam consists of three or four bomas and is headed by a head chief. Three to four payams normally make up a county, headed by a paramount chief. There were 2,111 bomas in South Sudan in 2009. [188] There is not a more recent official count; bomas are often merged and/or created by the government.

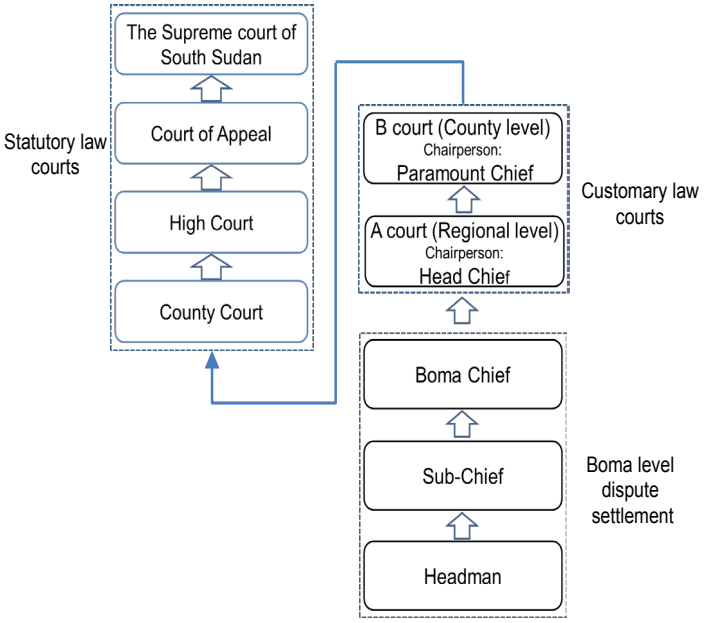
[186] Central Intelligent Agency (CIA). 2013. *The World Fact Book*. https://www.cia.gov/library/publications/the-world-factbook/ (accessed on 9 June 2013)
[187] World Bank. 2012. *Education in the Republic of South Sudan: Status and Challenges for a New System*. http://documents.worldbank.org/curated/en/2012/01/16439140/education-republic-south-sudan-status-challenges-new-system (accessed on 9 June 2013)
[188] NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

The chiefs are the traditional leaders. They work as chairpersons and/or members of customary law courts at county and payam level, and resolve issues arising in the community (Figure 8-3). It is said that the civil war has weakened the power and status of traditional leaders. The degree of their influence varies among communities; however, they still have an influential and pivotal position in some communities. [189]

The boma chief is normally elected by the older community members (usually older than 35 years old) from amongst their members; the head chief for a payam is elected from the boma chiefs in the payam: and the paramount chief is elected from the head chiefs. According to the Local Government Act (2009), there should be customary law courts at the boma level. At present, due to financial and capacity issues, there are no customary law courts in the bomas. Instead, headmen (heads of clan), sub-chiefs and boma chiefs deal with disputes in the bomas.

In South Sudan, it is expected that 90% of criminal and civil cases will be dealt with by the chiefs based on customary laws. [190] Customary law-based dispute resolution by the chiefs does not always function well especially when there is a tendency to solve issues by force, such as guns. When a serious case such as homicide occurs, statutory laws are applied; however, customary laws are still applied to such cases in some rural areas. There are a number of precedents for homicide cases based on customary laws.

Figure 8-3: Judicial system and community level dispute settlement system



Source:
Juba local government office, interviewed by CAMP Task Team. June 2013, Camp Situation Analysis.
GOSS. 2009. *The Local Government Act*. Juba: GOSS.

[189] Norwegian Refugee Council (NRC). 2012. *Customary law and land rights in South Sudan*. Juba: NRC.

[190] World Vision International. 2004. *A study of customary law in contemporary Southern Sudan*. Juba: World Vision International.

A household is defined as a person or group of people, related or unrelated, who live together in the same dwelling unit or separate dwelling but share same food or income source. [188] It was assessed that the farming households occupied 75% of the total household number in 2012. [191] They are mainly subsistence farmers and household members carry out the farming activities in most cases. The household size in rural areas is 6.4 people which is smaller than that in urban areas. [192] The number of farming households as of the middle of 2012 was 1,210,001.

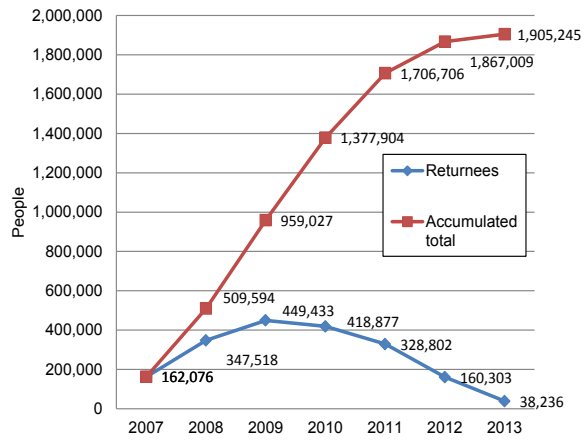
8.2 Reintegration of Returnees and Internally Displaced Persons into Rural Communities

Responsibility for the returning and reintegration process of returnees and Internally Displaced Persons (IDPs) lies with two government entities: at the state and county level, the South Sudan Relief and Rehabilitation Commission (SSRRC); and at the national level, the Ministry of Humanitarian Affairs and Disaster Management (MoHADM). They coordinate their activities and work with DPs to assist returnees and IDPs.

8.2.1 Returnees

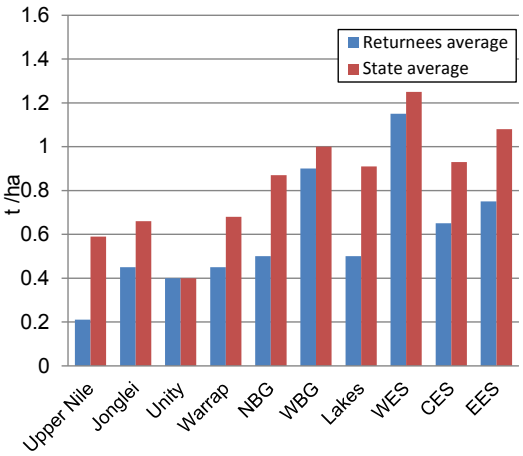
The civil war and insecurity in South Sudan caused the displacement of a large number of people from their homes. After the Comprehensive Peace Agreement (CPA), there was a large influx of returnees and their return still continues. After the independence of South Sudan in 2011, the number of returnees from the north (hereafter referred to as the North) of the previous country of Sudan increased; the government of the new country of Sudan obliged all South Sudanese to return to South Sudan. As of May 2013, the accumulated number of returnees is 1,905,245 (Figure 8-4). This is 18% of the 2013 projected population. The majority of the returnees had no means of livelihood [193] when they arrived in South Sudan to restart their lives in a new environment.

Figure 8-4: Cumulative number of the returnees (2007- May 2013)



Source:
International Organisation for Migration (IOM).2013. *Returnees to South Sudan*. Juba: IOM. (Internal document based on IOM Tracking and Monitoring Database)

Figure 8-5: Returnees and State average cereal yield (t/ha)



Source:
FAO and WFP. 2013. CFSAM. Juba: FAO and WFP.

[191] FAO and WFP. 2013. *Crop and food security assessment mission (CFSAM)*. Juba: FAO and WFP.

[192] Average 6.5 people/household, 6.4 people /household in rural area, and 7.1people /household in urban area. Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

[193] United Nations Office for the Coordination of Humanitarian Affairs (OCHA). *Mid-Year Review of the Consolidated Appeal for South Sudan 2012*. Juba: OCHA

On their return from the North, returnees can stay several days or months at one or more facilities called “transit sites” and “way stations” in South Sudan, before finally returning to their home community (boma or village) from where they originally came. In the case of returnees that do not have a home community, DPs and the government organisations, such as the SSRRC, find host communities for them to move to.

On arrival in the community, IOM provides three months food support and a non-food package including plastic sheets, blankets, mats, utensils, mosquito nets, etc. The returnees are considered as residents after 3 months. At this stage further support is dependent on their location since further support is not mandatory. Only if there is a humanitarian aid agency or programme in the area will returnees get further support. As a result, most returnees remain vulnerable. Figure 8-5 shows average cereal yield for returnees and states. Except for Unity State, the average yield for returnees is approximately 30 to 64% lower than the state average. These results indicate the disadvantages that returnees face in agricultural production.

In the reintegration process, there are several issues. Returnees who settle in their home communities will be allocated land as they are from the community. However, the returnees who go to a host community often face problems with land access. Although the community agreed to host them, sometimes they refuse to allocate land to the returnees. In some cases, the communities ask for monetary compensation from the government. Although the Land Act 2009[194] specifies the importance of reintegration for returnees and IDPs, there is no clear procedure for allocating land to these people. The average area of cereal cultivated by the returnee households in 10 states is from 13 to 56% smaller than the state average.

The majority of returnees later move to urban and sub-urban areas from their home or host communities because they have no agricultural experience. Many of them worked in non-agricultural jobs in Khartoum. The influx of returnees to these areas causes a deterioration in both public and food security. Some live with their relatives; meanwhile, others live on illegally occupied land. The urban areas cannot provide enough jobs. Some returnees from the North face a language barrier since their first language is Arabic which further decreases their employment opportunities. In contrast, most returnees from East Africa do not have this language problem and tend to have more capital.

8.2.2 Internally Displaced Persons (IDPs)

There are two types of IDPs: one is internally displaced due to the civil war and the other is displaced due to insecurity and natural disasters. At present, most IDPs are of the latter type. In 2012 there were over 430,000 IDPs.[195] Since the number of IDPs is affected by conflict, the majority of IDPs are from Jonglei State where inter- and intra-communal conflicts frequently occur. When a conflict or natural disaster occurs, DPs and the SSRRC assess the situation and relief goods are provided.

The period of evacuation for IDPs tends to be short; they go back to their homes when the situation improves. They can re-settle in other communities if the insecurity continues. Although some IDPs are accepted by host communities and allocated farm land by the chiefs or by consensus among community members, the settlement process tends to be more difficult than for returnees. Communities can refuse to allocate land to IDPs as they are not community members. In addition, if the IDPs are pastoralists attempting to settle in an area of sedentary farming, there can be tension between the two parties. There are also IDPs who move to urban areas where there are better opportunities. If they want to cultivate

[194] GOSS. 2009. *The Land Act*. Juba: GOSS.

[195] IOM. 2012. *South Sudan Annual Report*. 2012. Juba: IOM. Approximately, over 260,000 people are displaced due to floods; over 170,000 are also displaced due to either cross-border or internal conflicts. .

in nearby rural areas, usually they are required to pay rent and will commute between the urban and rural areas.

8.3 Gender Issues

The percentage of women in the population is 48%. The Transitional Constitution of Southern Sudan assures women of equal rights[196]; however, there still remain gender disparities as shown in Table 8-2. The gross enrolment rate (GER) of primary education, net attendance rate of primary education and literacy rate show that there are fewer educational opportunities for women in South Sudan. Women's net attendance rate is 28% lower than that of men; the female literacy rate (above 15 years old) is less than half of men's. The maternal mortality rate is one of the highest *rates* in the world due to insufficient medical and health services.

Table 8-2: Key indicators on gender disparity

Indicator	Women	Men	Total
Gross enrolment rate (GER) of primary education in 2010[a]	54.5%	81.4%	68.8%
Net attendance rate of primary education in 2009[b]	36%	64%	40%
Literacy rate (15-24 years) in 2009[b]	28%	55%	40%
Literacy rate (above15 years old) in 2009[b]	16%	40%	27%
Maternal mortality rate (per 100,000 live births)[c]	2,054	-	-

[a] MoE. 2010. EMIS. Juba. MoE.

[b] Data from NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

[c] Data from Ministry of Health (MoH). 2006. *Sudan Household Health Survey I*. Khartoum: MOH.

In addition, it is estimated that women rarely have ownership of land, dwellings or livestock. 197 The issue of women's land ownership is pointed out as a high-priority challenge in an African Union report.198 Land is an important means of livelihood in rural areas. Regarding households living under the poverty line,[199] the percentage headed by females (57%) was 9% higher than the percentage headed by males (48%). This result indicates that households headed by females have less food than male headed households. The issue of female headed households is also addressed in the South Sudan Development Plan 2011-2013 (SSDP) as a vulnerable group living under poor conditions. [200]

In the National Baseline Household Survey 2009, there were no significant differences by gender in tenure status or type of dwelling or in access to health care facilities. However, other results indicate that female headed households have fewer assets such as transport items (e.g. vehicle, motorcycle and bicycle) and mosquito nets in comparison with male headed households. In addition, the female headed households spend less money on food per month; their toilet facilities are poorer. These results may be partly influenced by household size. The average female headed household size was 6.0 people while that of a male headed household was 6.8 people. This could represent less male workforce in these households. Meanwhile, the survey indicates that female headed households have more access to improved drinking water.

[196] GRSS. 2011. *The Transitional Constitution of Southern Sudan*. Juba: GRSS.

[197] Ministry of Gender, Child and Social Welfare (MoGC&SW). 2012. *Comprehensive Country Gender Assessment*. Juba: MoGC&SW.

[198] African Union (AU). Economic Commission for Africa (ECA) and African Development Bank (AfDB). 2010. *Framework and guidelines on land policy in Africa*. Addis Abeba: AU, ECA and AfDB.

[199] The poverty line is calculated using 2400 calories per person per day as the daily energy intake threshold, in addition to a minimal nonfood component. The poverty line was calculated to be 73 SDG per person per month. NBS. 2012. *National baseline household survey 2009*. Juba: NBS.(p. 59)

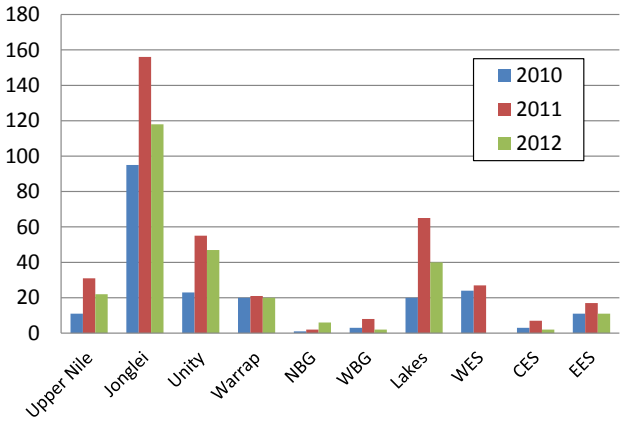
[200] GRSS. 2011. *South Sudan Development Plan (SSDP) 2011-2013*. Juba: GRSS.

The status and situation of women in South Sudan vary amongst the communities; gender disparity does not always show up in the mean values of the survey. In some villages, the right of women to speak is observed and they have influence in their villages' decision making; they also have more access to assets. The majority of women engage in agricultural activities. Approximately 75% of households headed by females engage in either crop farming or animal husbandry, which is almost the same as male headed households.

8.4 Security and Conflicts

South Sudan achieved independence in 2011 after a long civil war that was fought mostly in South Sudan; however there are still security issues. Figure 8-6 shows the number of conflicts that happened in the last 3 years which includes both internal conflicts, such as inter- and intra-communal conflicts, and cross-border conflicts. Since the recording periods in 2010, 2011 and 2012 are different, it is difficult to compare years. The data, however, show that more conflicts occur in Jonglei, Lakes and Unity States.

Figure 8-6: Cumulative numbers of conflicts



Source
OCHA. 2010. *Cumulative figure of conflict incidents reported in 2010* (As of 30th Oct.). Juba: OCHA
OCHA. 2011. *Cumulative figure of conflict incidents reported in 2011* (As of 31st Jul.). Juba: OCHA
OCHA. 2012. *Cumulative figure of conflict incidents reported in 2012* (As of 30th Nov.). Juba: OCHA

According to the United Nations Department of Safety and Security in South Sudan, approximately 460 conflicts occurred between January 2009 and June 2011. The types of conflict were: cattle raiding (44%), armed skirmishes involving rebel militia groups (25%), attacks by the Lord's Resistance Army (16%) and tribal fighting (15%).

Attacks by the Lord's Resistance Army have displaced people but have decreased over this period. Other conflicts are mainly about competition for natural resources, especially when natural resources become scarce in the dry season. Pastoralists move looking for water and pasture, and conflicts arise between other pastoralists and sedentary agriculturalists. In 2012, 63% of the conflicts happened between January and May. [201] Conflicts in this period decrease agricultural production as land preparation and planting are interrupted.

Cultural traditions also cause and prolong conflicts. When cows are stolen by pastoralists in a cattle raid, the original owners take back their cows in another cattle raid, plus extra cows

[201] WFP. 2013. *ANLA 2012/2013*. South Sudan. Juba: WFP.

as payment for the period they were without their cows. For some tribes, cattle raiding has a ritual meaning: it demonstrates a boy's transition from adolescent to adult. [202]

These conflicts become more serious because small arms are carried by the pastoralists. This issue is prioritised in the SSDP. The National Demobilisation, Disarmament, and Reintegration Commission (NDDRC) attempts to disarm civilians with DP support, but with limited success. People still want firearms to protect their property and themselves; therefore, new firearms have been supplied from outside. Exceptionally, in Northern Bahr el Ghazal State, cattle are looked after by children and women using only sticks after successful disarmament.

8.5 Land Tenure and Access to Land

Land in South Sudan is classified as public, community or private land[194.] Public land is owned by the national, state or local government. Public land includes roads, railways and airports as specified by laws; it also includes rivers, lakes, canals, wetlands and other areas of water where ownership cannot be identified. Moreover, all forest and wildlife areas which are officially gazetted as national reserves or parks are public land. If there is no private or customary ownership, the land can be considered public land. Community land is the land held by communities (boma or village) which includes most rural areas. It includes residential areas, community forests, farmland and grazing areas. Finally, private land is land formally registered and held under leasehold or freehold tenure.

The concept of ownership of community land must be understood. It involves the right to use a piece of land in a community (boma or village) which is given or revoked by the boma chief or community consensus. The land can be inherited by the owner's children but the owner can neither sell nor lease it. Land can be leased to outsiders by the community. If a farmer clears community land, he is considered to own the land.

Most private land is in urban areas, especially in gazetted areas. For private land, a land survey and registration are required for acquiring land tenure which are dealt with by the appropriate State Ministry and five Land Registry Offices (part of the Judiciary) in Unity (Bentiu), Upper Nile (Malakal and Renk), WBG (Wau), and Central Equatoria (Juba) States. In the other six states, the appropriate State Ministry is in charge of both land survey and registration. Once a piece of land is registered, the leasehold deed is issued and given to the owner. Since the renewal process of leasehold tenure is not fully established, the tenure could be thought as freehold, i.e. as an indefinite lease. Private land can be inherited and sold or sub-leased.

Table 8-3 shows the types of farmland tenure and acquisition of farmland. Farmland is presumed to be community land. More than 90% of farmers own their land in both urban and rural areas but in the sense that they own community land. The majority of land is inherited; 15% of the farmers in urban areas and 21 % of the farmers in rural area acquire their land by clearing it. Nearly 90% of farmers in rural areas obtain their land either by inheritance or clearing land. In urban areas 7% of land is purchased. Land acquisition is becoming more complicated due to urbanisation and the increased value of land values in urban areas.[189]

[202] T. Richardson. 2011. *Pastoral Violence in Jonglei*. www1.american.edu/ted/ICE/jonglei.html (accessed on 1 July 2013)

Table 8-3: Type of farmland tenure and acquisition of farmland

	Type	Urban	Rural
Type of farmland tenure (%)	Owned	91	93
	Rented	3	0
	Partially owned	4	2
	Communal	2	6
Type of acquisition of farmland (%)	Inherited	61	68
	Cleared	15	21
	Purchased	7	1
	User rights from local leader	11	7
	Received from de-collectivisation	2	1
	Other	3	2

Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS

For private land in urban areas, multiple land allocation, illegal land occupation and land boundary issues with sub-urban communities are major issues. Land issues can negatively influence agricultural activities. For example, residential areas can expand and cattle routes can be blocked due to insufficient consultation with the nearby pastoralists. Normally, state governments negotiate with communities around urban areas when allocating new residential areas.

For community land, there are other land issues including 1) unequal land access, 2) large-scale land acquisition, and 3) land boundary issues among pastoralists and between pastoralists and sedentary agriculturalists.

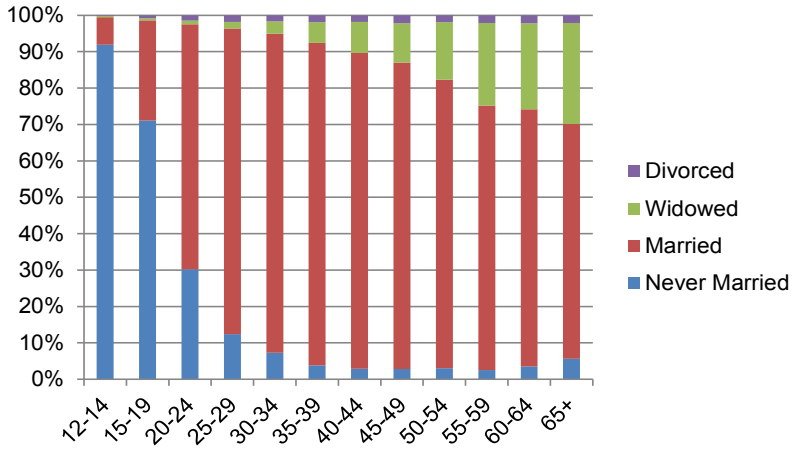
8.5.1 Unequal land access

As previously mentioned, returnees, IDPs and women tend to have less access to land. The Land Act 2009 states that women have the right to own and inherit land together with any other heir of the deceased; nevertheless, women's land rights are still insecure at present. The Land Act also clearly specifies that the returnees' and IDPs' reintegration process should be assisted to improve their livelihoods. Assuring access to land is often addressed in agriculture policy papers as a priority, e.g., Agriculture Sector Policy Framework (ASPF).[203]

At present, efforts to ensure equitable access to land are not very successful. The CAMP field surveys found that widows' land rights are often not respected. Widows, especially those who do not have adult male children, often lose their land to other relatives, losing their means of livelihood. In order to show the number of widows, female marital status by age group is shown in Figure 8-7. The civil war widowed many women; the proportion of widows exceeds 10% in the above 45 years old age group. Based on the 2008 Census data, the population of widows from 15 to 49 years old was calculated as approximately 64,000. There are no clear figures to identify widows facing land access problems but the number is probably not negligible.

[203] Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD). 2012. *Agriculture Sector Framework (ASPF)*. Juba: MAFCRD.

Figure 8-7: Female marital status by age group



Source: SSCCSE. 2010. *Southern Sudan counts: Tables from the 5th Sudan population and housing census*. Juba: SSCCSE.

8.5.2 Large-scale land acquisition

Large-scale land acquisition can be a problem. In order to prevent such acquisition, the Investment Promotion Act 2009 [204] sets out the lease period for agricultural and forest land. The Land Act 2009 also specifies the maximum lease period for land as 99 years and requires the community to report to the state government through the local government when more than 250 feddans of community land is allocated for commercial or agricultural purposes to a person or company, national or foreign.

The state is also required to consult with community members. Next, the investors must negotiate with the community and submit the leasehold contract with the community to the state government. Finally, the decision made by the community will be approved by the state government.

The consultation process is not clearly described in the two Acts and there are no penalties for violation; it is possible that a number of large-scale land lease agreements might be made without sufficient consultation with community members. As a result, community members perceive that their lands were grabbed; land grabbing is a South Sudanese term used to describe the illegal acquisition of community or private land generally by well-connected people. Between 2007 and 2010, total 26,400km^2 of land was either acquired or planned to be acquired, mainly by foreign companies.[205]

8.5.3 Land boundary issues

There is tension among pastoralists and between sedentary agriculturalists and pastoralists. Among pastoralists, tensions arise when pastoralists compete for scarce natural resources such as pasture and water points in communal areas or when cattle enter other pastoralists' territory.

Within a community, in the rainy season, cattle move to highland to avoid humidity and dangerous creatures such as crocodiles and poisonous snakes. Then, in the dry season, the

[204] GOSS. 2009. *The Investment Promotion Act*. Juba: GOSS.

[205] Norwegian People's Aid. 2011. *The New Frontier: A baseline survey of large-scale land-based investment in Southern Sudan*. Oslo: Norwegian People's Aid.

cattle move to lower land and eat the pasture that grew during the rainy season. This kind of migration involves short distances and generally does not lead to problems.

In the dry season, or to escape conflict, some pastoralists migrate longer distances to areas where there is more water and pasture. This migration causes tension between pastoralists and sedentary agriculturalists. The pastoralists pass through agricultural villages and damage crops. In some areas, the chiefs mediate; they estimate the amount of damage and the pastoralists compensate the agriculturalists. In other cases, the pastoralists resort to force. In order to minimise conflict, the government and DPs try to define migration routes for effective land use. Some communities erect fencing around their farmland as a self-defence measure.

Land boundary issues in sedentary farming areas are not confirmed but are probably less. Livestock are carefully looked after to avoid damaging crops. Along with urbanisation, in urban and sub-urban areas, land survey and registration have been conducted. This will prevent land boundary conflicts in the future. In some states, there are charges for land survey and registration; farmers in urban and sub-urban areas are subsistence farmers and sometimes cannot afford to pay these charges.

Apart from large-scale land acquisition, customary law plays an important role in resolving land issues. Customary law, however, faces challenges from many directions especially statutory law. Since customary law is undocumented, it can be interpreted differently by different chiefs. Therefore, the Draft Land Policy 2013[206] proposes to enact the Community Land Act which will document customary law, improve land tenure and ensure equal land rights for every community member. The policy also addresses land grabbing and land boundary issues. One of the big challenges will be capacity development of government staff involved in land administration, including practical rules for land management.

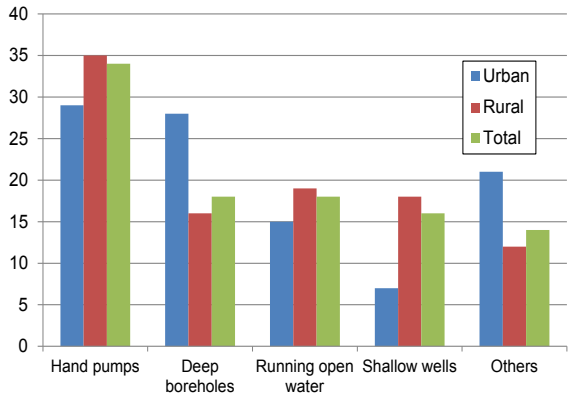
8.6 Access to Basic Services

For basic services analysis, water, education, energy and health related data are used as indicators.
The majority of the population, approximately 55%, have access to improved water (Figure 8-8). In rural areas, the percentage is much lower than urban areas. The sources are mainly hand pumps, boreholes and shallow wells. These are mainly installed with DPs' support. Others in rural areas are taking water from running open water sources such as rivers. This can negatively influence the health of these people. Additionally, fetching water is done by women increasing their workload.

The gross attendance rate for primary education is 98% in urban areas; the rate is 59% in rural areas (Figure 8-9). The gross attendance rate is higher than the net attendance rate in Figure 8-2 because it includes children of all ages attending primary school. The gap is wider in secondary education. In South Sudan, even in public primary schools, the pupils are required to pay school fees. This will reduce the attendance rate especially in rural areas, where the majority of subsistence farmers live.

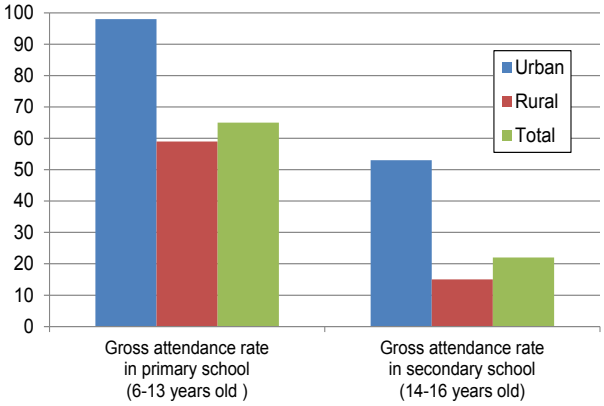
[206] South Sudan Land Commission (SSLC). 2013. *Draft Land Policy*. Juba: SSLC.

Figure 8-8: Main source of drinking water (%)



Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

Figure 8-9: Gross attendance rates in primary and sedoncary school (%)



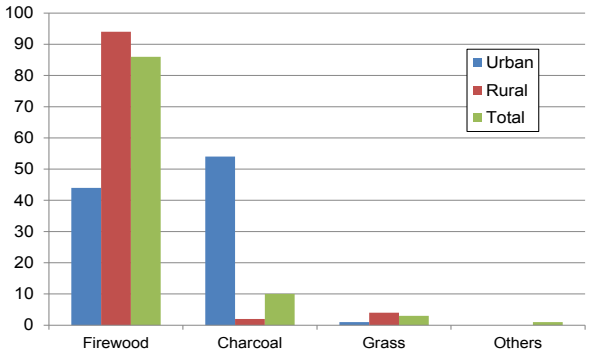
Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

There is almost no public energy supply such as electricity and gas. Electricity is provided individually mainly by generators and occasionally by solar panels. For cooking, firewood is used especially in rural areas where 94% use firewood (Figure 8-10). Firewood collection is done by women, which is time consuming for women in rural areas. Much charcoal is made in rural areas especially as land is cleared; however, it is not fully utilized due to high transport costs.
Some charcoal is transported to markets in urban areas where many people use it for cooking.

There are mainly three types of health care facilities; primary health care units, primary health care centres and public hospitals. In total, 70% of the population have access to health care facilities; however, the quality of the services delivered is different between urban and rural areas (Figure 8-11). Primary health care units have only health trained personnel, there are no doctors or nurses.

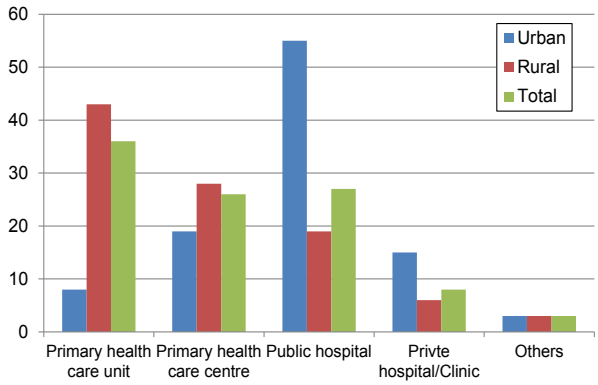
In primary healthcare centres, there are a number of doctors and nurses or assistant doctors with or without a nurse. In rural areas, 43% of the people use primary health care units, followed by primary health care centres and public hospitals. This order is reversed in urban areas; 55% use public hospitals, while primary health care units are used by only 8%. The low availability of health care in rural areas could result in health issues and reduction of agricultural production. There are no toilet facilities for 80% of the population and the percentage is higher in rural areas.[188]

Figure 8-10: Main source of energy for cooking (%)



Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

Figure 8-11: Health care facility most visit (%)



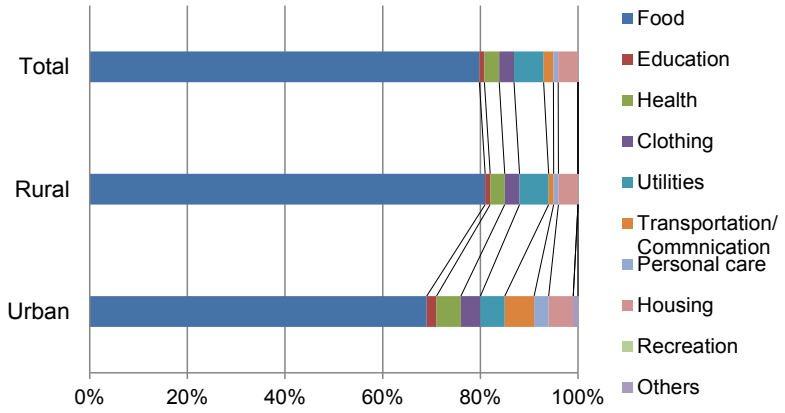
Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

8.7 Livelihoods

Most of the population of South Sudan engage in agricultural activities. About three quarters of the population rely on crop farming or animal husbandry as their main source of livelihood.[188] Their faming style is largely subsistence. They sell extra agricultural produce to obtain cash which is used for buying food items. Sometimes they have to buy staple foods such as maize and sorghum during the period of seasonal food insecurity. Breakdown of household expenditures is shown in Figure 8-12. Most income is spent on food reaching 81% in rural areas. Utilities expenditure (water, waste, energy for lighting and cooking) is 6%, housing 4%, health 3% and clothing 3%. People in rural areas have very little spare money.

In rural areas, breakfast tends to be light. Lunch and dinner consist of a staple food (e.g., sorghum, maize, and cassava) and a sauce made of vegetables, beans, meat or fish. Food variety and intake vary between the livelihood zones. The natural environment (e.g., rainfall, vegetation and natural food resources) heavily influence daily diet. The Greenbelt and Hills and Mountains zones have greater food intake and variety due to higher rainfall and a more favourable growing environment. Honey and fruits are more available. Milk consumption is not high since most people do not keep cattle.

Figure 8-12: Proportion of monthly expenditure



Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

People's livelihoods are harder in the northern zones. Due to low rainfall and poor vegetation (e.g., semi-arid zone), agricultural production is low and natural resources scarce. Subsistence farmers in the Western Flood Plains and Nile-Sobat Rivers eat twice a day; however, the volume and quality are poorer than in the Greenbelt and Hills and Mountains zones. Sometimes they eat only sorghum and milk, especially in the dry season, when vegetables are not available.

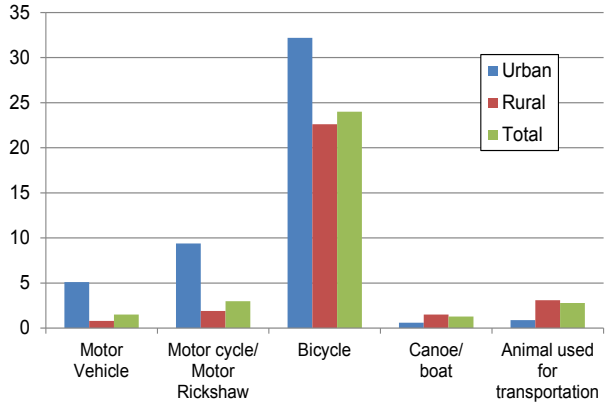
Fish is an important source of protein in most areas especially in the rainy season. Chickens, goats and sheep are eaten occasionally and kept for periods of food shortage and for unexpected expenses. Selling cattle is the last resort for farmers. Farmers rarely slaughter cattle but will eat cattle that die of natural causes; when they eat beef, they usually buy it from the market. With the expansion of a cash economy, the value farmers place on cattle is changing, especially in urban areas. People are not so reluctant to sell them as before. Hunting of wild animals is prohibited by the national government; however, rural people occasionally hunt especially during the period of seasonal food insecurity.

8.8 Assets

For assets owned by households, transportation, dwelling, ownership of selected items and livestock are used as indicators. Bicycles are the most popular transportation (Figure 8-13). More than 20% of households in rural areas own bicycles meaning that the bicycle is the most common means of transport in rural areas. In Western Equatoria and Western Bahr Ghazal States, transportation of agricultural produce by bicycle is common. Farmers and purchasers of produce use bicycles even for comparatively long distances. The ownership of motorcycles and motor vehicles is low in rural areas due to people's lack of funds. Canoes and boats are owned by only 2% of the people, mainly in Upper Nile, Jonglei, and Unity States which have rivers and flood plains. [188]

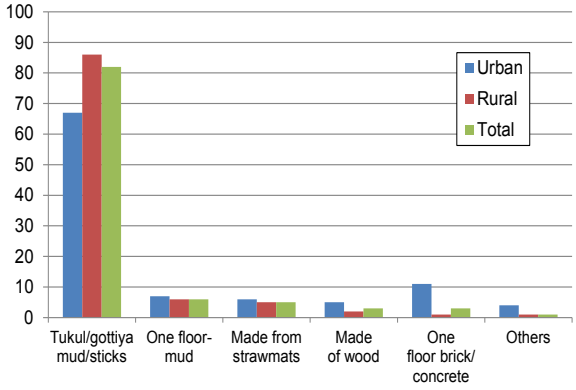
The majority of the population (82%) live in traditional dwellings called tukuls which are grass thatched houses with walls of mud and/or sticks (Figure 8-14); in rural areas 86% live in tukuls. Although the quality of the dwellings was not part of the survey, it can be assumed that the quality in rural areas is fair, since building materials are easily available. Rural people spend much time building and maintaining their houses in the dry season. Tukuls have poor ventilation due to limited holes for ventilation in the mud walls. Normally there is one door and some small windows. If the walls are made of sticks, there are no ventilation problems but the houses are often attacked by termites, especially in the dry season.

Figure 8-13: Type of transportation owned (%)



Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

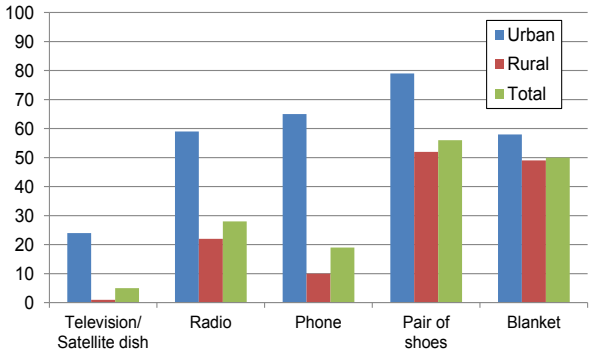
Figure 8-14: Type of dwelling (%)



Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

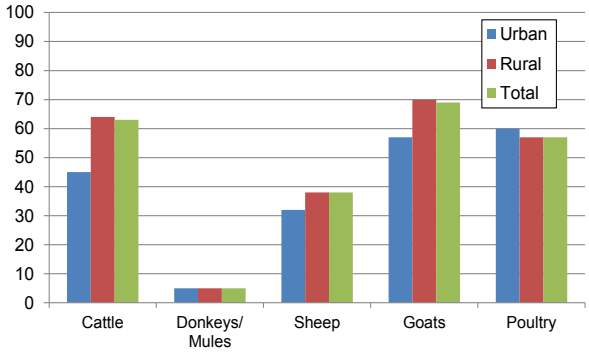
Shoes are most commonly owned item, but ownership is only 56% (Figure 8-15). Sandals are the most common footwear. Mobile phones are a widespread communication tool; ownership was 65% in urban areas and 10% in rural areas in 2009. The rate may have increased since then. The gap in phone ownership shows both the income gap between urban and rural areas, and the lack of service and electricity in rural areas. The gap in ownership of a radio could be for the same reasons. Mobile phones and radios are not affordable for some subsistence farmers. Despite the low ownership rates of mobile phones and radios, these communication tools are important for rural and agricultural development as they are used to exchange agricultural and market information.

Figure 8-15: Type of items owned (%)



Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

Figure 8-16: Type of animal owned (%)



Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

Animals are important assets for farmers. Goats (69% of households), cattle (63%), poultry (57%) and sheep (38%) are owned by households (Figure 8-16). Donkeys are commonly used for carrying water and goods in towns, but ownership is low at 5%.

The ownership rates by state are shown in Table 8-4. The states where sedentary agriculturalists are dominant such as Western Equatoria and Western Bahr Ghazal States

have the highest ownership of poultry at 83% and 82%. In contrast, their ownership of cattle was the lowest among the 10 states. Since cattle can enter farmland and damage crops, these farmers tend not to integrate livestock into their farming.

Table 8-4: Proportion households owning specific animals by State (%)

State	Cattle	Donkeys/ Mules	Sheep	Goats	Poultry
Upper Nile	57	3	36	57	50
Jonglei	84	0	36	67	29
Unity	93	1	35	57	39
Warrap	79	2	49	73	64
NBG	47	5	32	65	80
WBG	24	3	27	53	82
Lakes	74	1	40	78	56
WES	12	0	12	52	83
CES	25	0	27	82	70
EES	74	24	54	78	55

Source: NBS. 2012. *National Baseline Household Survey 2009*. Juba: NBS.

In the other 8 states, there are not such clear patterns of ownership. Probably agriculturalists, pastoralists and agro-pastoralists coexist together. A large proportion of households own livestock, which are eaten by household members or sold for cash for unexpected expenditures or to purchase food in times of shortage.

8.9 Observations

More support for returnees and IDPs is required. Their cereal yield and areas of cereal cultivated are considerably smaller than those of other farmers. Support to returnees and IDPs will contribute to national economic growth. Their land rights need to be assured especially in rural areas. Training on farming techniques, provision of farming tools, vocational training etc. could facilitate their reintegration and develop their farming ability.

The improvement of women's lives is essential for agricultural development in South Sudan. Issues include equal land rights, educational opportunities, access to health care services etc. Equal land rights could be ensured by ensuring land laws are implemented by trained governmental officials. More support to female headed households is required.

Disarmament could significantly reduce conflicts and contribute to agricultural development. Efforts by NDDRC and DPs have potential.

Procedures for land tenure, urban planning, land survey and registration etc. are not clearly formulated nor fully implemented. These procedures need to be transparent and accountable. Additionally, since customary law is not documented, equal land rights are not available to all community members.

Natural vegetation and climate affects the livelihoods of the people of South Sudan. In dry areas, their daily diet is restricted and sometimes does not meet their nutritional needs. Livestock, which can be used as food or sold, could have an important role as they are more drought resilient than crops. However, there would need to be a change in the value placed on cattle. The preferences of pastoralists and agriculturalists, which are different, would need to be considered in selecting livestock when agricultural development plans are formulated.

8.10 Infrastructure

Infrastructure is the foundation of agricultural development and economic activities. Infrastructure development fosters economic growth. For agriculture, infrastructure could be roads; facilities for storage, drying, processing, marketing and irrigation; slaughter houses, ports, etc. Subsector specific infrastructure is described in the chapters for each subsector, while this chapter focuses on road infrastructure.

Adequate roads are critical for: transporting agricultural products; and enhancing farmers' access year round to local and regional markets plus agriculture related services such as extension and veterinary health.[207] Improvement of roads helps facilitate the flow of agricultural inputs and outputs between farmers and markets.[208] There are about 15,764 kilometres of roads in South Sudan and most of them are in poor condition. Moreover, about 65% of these roads are located in areas with high agricultural potential.[209]

According to the South Sudan Development Plan (SSDP), the objective of the infrastructure sector is to maintain, rehabilitate, provide and operate infrastructure to enhance poverty reduction, economic growth and service delivery in a sustainable manner. Roads and road transport development is one of the key priorities for the infrastructure sector.[207] However, road infrastructure in South Sudan is extremely underdeveloped because roads were largely destroyed or left in disrepair during the civil war.[208] Current poor road conditions impede agricultural development and economic growth.

There are several categories of road: trunk (interstate) roads connect the major towns and regions. Feeder roads connect small towns and villages with medium sized towns. Collector roads ensure the connectivity of the priority feeder roads to trunk roads. Less than 2 per cent of the primary road network was paved when research was conducted in 2011.[210] Due to poor road conditions, transportation is time consuming and so becomes more costly. This means transport and trade services are not competitive so that the volume of marketed products is small. Improved roads will reduce transport and marketing costs significantly in the short-term.[208] Agricultural economy activities are constrained by the limited availability of paved, rehabilitated, or all season roads.

Seasonality also affects the effectiveness of transportation. During the rainy season, many unpaved feeder roads become inaccessible; even the condition of some trunk roads becomes poor. As an example, the lack of a well-constructed road between Juba and Malakal affects the volume of products sent from Juba to Malakal. This road becomes difficult to pass during the rainy season. Then, traders use boats to bring smaller volumes, especially in the rainy season. While transport by boat is one way to transport products, it would be beneficial to have an all season road network to provide more options for efficient transportation. Many trunk roads and feeder roads need to be constructed or rehabilitated.

The Ministry of Transport, Roads, and Bridges (MTRB) has tried to improve the current situation, but its resources are limited. DPs are supporting MTRB to construct, rehabilitate, and maintain roads in different parts of the country. The Southern Sudan Roads Authority (SSRA) was established in January 2011. SSRA is an autonomous corporate body responsible for planning, construction, rehabilitation and maintenance of all inter-state and international trunk roads.[210]

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[207] Government of the Republic of South Sudan. August 2011. *South Sudan Development Plan 2011-2013 Realizing freedom, equality, justice, peace and prosperity for all.* Juba.

[208] African Development Bank Group. Temporary Relocation Agency. 2013. *South Sudan: An Infrastructure Action Plan. A Program for Sustained Strong Economic Growth.* Tunisia.

[209] World Bank. May 23, 2013. *Agricultural Potential, Rural Roads, and Farm Competitiveness in South Sudan.* Report No. 68399-SS. Washington D.C.

One of the recommendations of the Joint Assessment Mission (JAM) in 2005 was that South Sudan focus on road construction and rehabilitation. The MTRB developed a Transport Sector Policy and Road Sector Strategy Plan in October 2006. These were approved by the Southern Sudan Legislative Assembly (SSLA) and adopted as framework for the sector development programme.[210]

Since CPA in 2005, various road projects were implemented. Significant construction and rehabilitation projects were implemented such as the Emergency Road Repair Program and Emergency Transport Infrastructure Development Project, which linked major towns and regions.[208] The aim of these road projects was to deliver aid products and services to vulnerable people.

Details of key road projects funded or implemented by major DPs follow.

The Multi-Donor Trust Fund (MDTF) is a major fund supported by 24 international donors and administered by the World Bank. The MDTF has funded several major road and bridge projects (Table 8-5) through WFP and MTRB.[211] These projects focus mainly on the rehabilitation and maintenance of major trunk roads

Table 8-5: Major road projects funded by MDTF

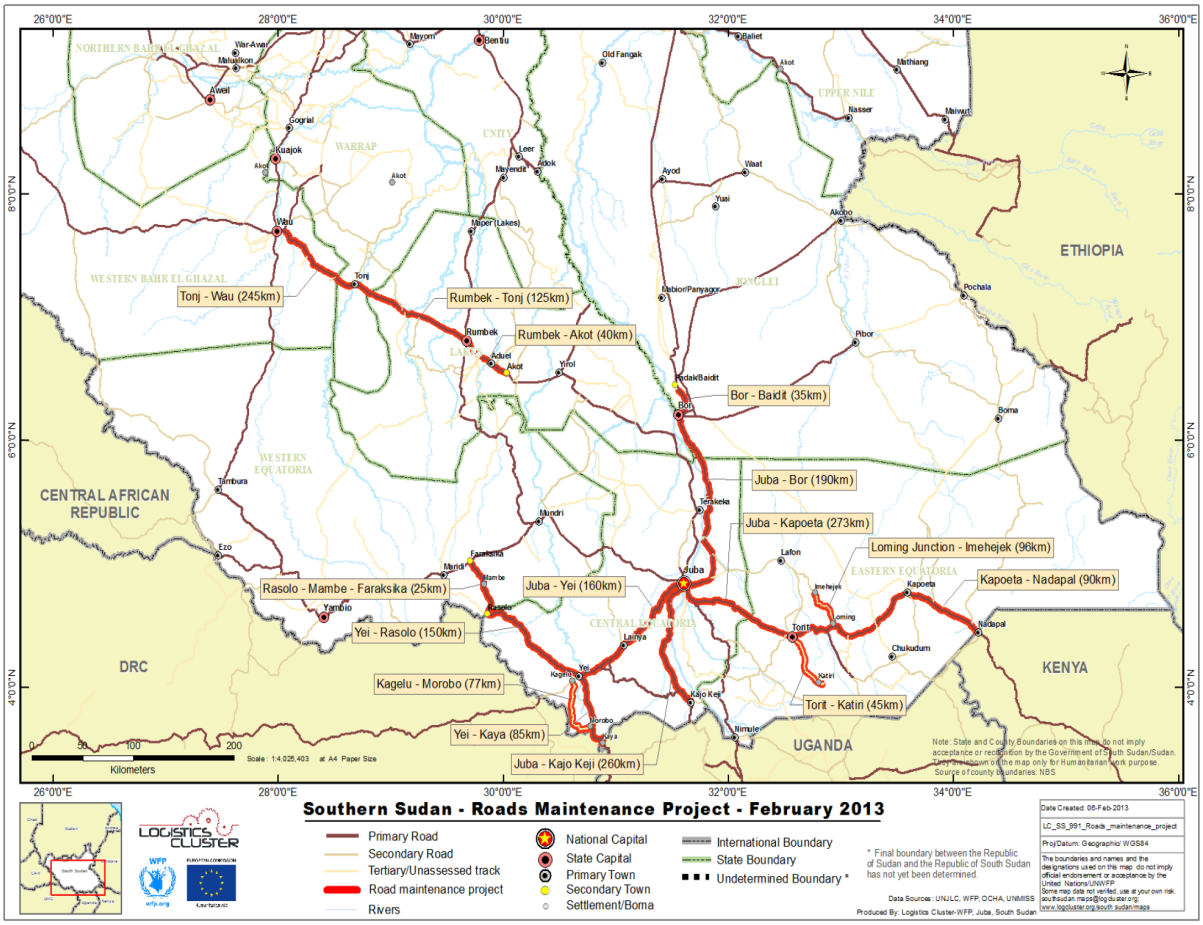
Project names	Implemented periods	Major achievements and characteristics
Emergency Transport and Infrastructure Development Project	2005 to 2012	Project reopened 1,030 kilometres of key interstate and regional roads.
Juba Rapid Impact Emergency Project	2007 to 2012	Project's main objective was to provide basic pharmaceutical stocks and learning materials. One of the components was road and bridge construction of critical government infrastructure at national and state level.
Southern Sudan Road Maintenance Project	2010 to 2012	Project aimed to improve the quality of targeted roads and strengthen the capacity for strategic and project planning for construction and maintenance of roads.
South Sudan Rural Roads Project (SSRRP)	2012-Current	Objective of the project is to enhance all season road connectivity to agricultural services for rural communities in high agricultural potential areas.

Source: Japan International Cooperation Agency. September 30, 2013. *Supporting Document for the Project for Capacity Development on Sustainable Road Maintenance and Management in Juba.* Unpublished.,
Rupa Ranganathan, Cecilia M. Briceno-Garmendia. September 2011. *Policy Research Working Paper 5814. South Sudan's Infrastructure: A Continental Perspective.* The World Bank. Washington D.C.

Major achievements of the Southern Sudan Road Maintenance Project (Figure 8-17) were improvements of the major trunk roads in the south and west of the country, including roads to Uganda and Kenya, and the road between Wau and Rumbek

[210] Rupa Ranganathan, Cecilia M. Briceno-Garmendia. September 2011. *Policy Research Working Paper 5814. South Sudan's Infrastructure: A Continental Perspective.* The World Bank. Washington D.C.
[211] Japan International Cooperation Agency. September 30, 2013. *Supporting Document for the Project for Capacity Development on Sustainable Road Maintenance and Management in Juba.* Unpublished.

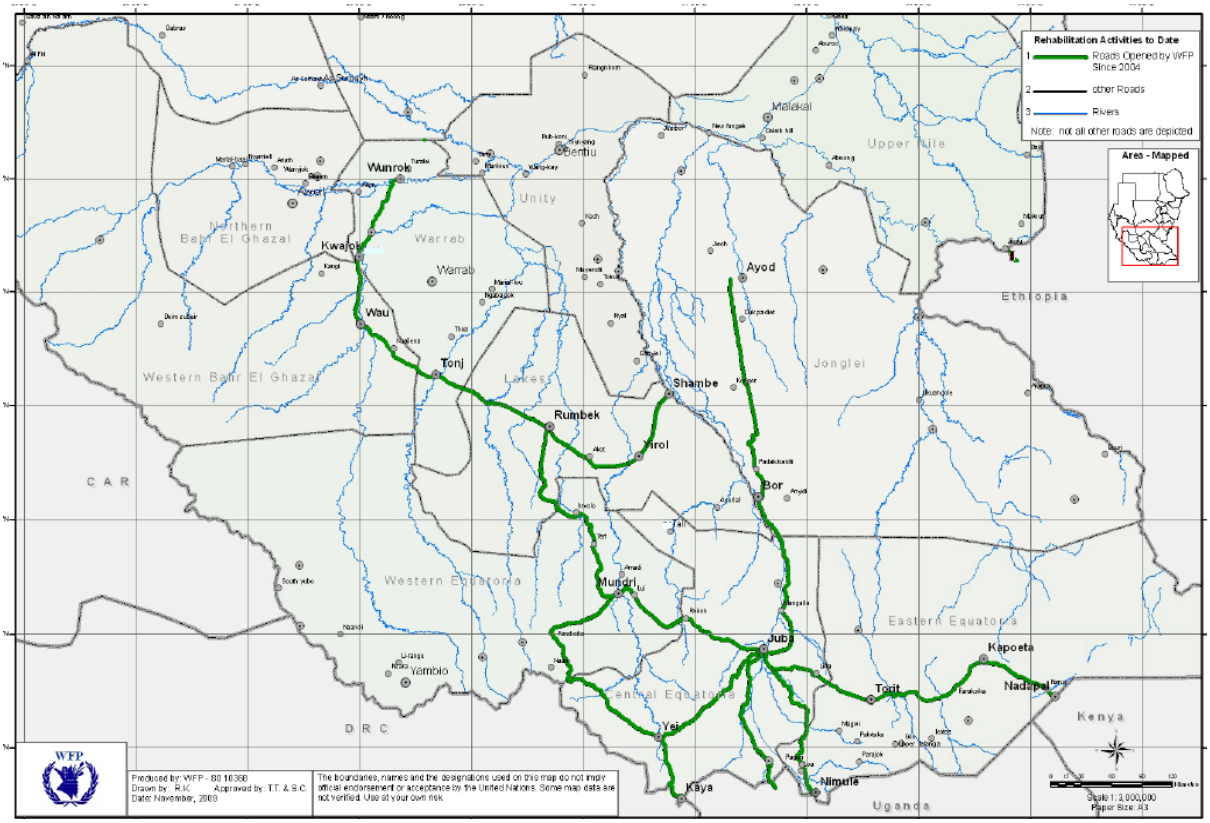
Figure 8-17: Roads maintained by the Southern Sudan Roads Maintenance Project



Source: The World Bank. February 15, 2013. *Implementation Completion and Results Report on a Multi Donor Trust Fund-South Sudan (MDTF-SS) Grant in the Amount of US $40 Million to the Republic of South Sudan for a Southern Sudan Roads Maintenance Project.* Report No: ICR2564.

WFP has been one of the major road project implementing agencies since 2004 (Figure 8-18). They have repaired 2,600 kilometres of trunk roads. WFP has implemented road projects on behalf of the Government of Republic of South Sudan (GRSS). Initially, WFP targeted trunk roads connecting state capitals. After this, they went on to construct and rehabilitate feeder roads. Both these activities were to enable the distribution of relief goods and humanitarian services.. An on-going project implemented by WFP involves construction of 500 kilometres of feeder roads.[211]

Figure 8-18: Roads opened by the WFP since 2004 in South Sudan



Source: Japan International Cooperation Agency. September 30, 2013. *Supporting Document for the Project for Capacity Development on Sustainable Road Maintenance and Management in Juba.* Unpublished.

UNOPS has partnered with MDTF, UNDP, USAID and the Japanese Government to implement several road projects in remote areas and conflictive areas such as Jonglei, Warrap and Eastern Equatoria states. UNOPS initiated the repair and construction of important trunk and feeder roads to allow more efficient delivery of humanitarian supplies. So far, they have constructed, rehabilitated or repaired 475 kilometres of roads in 25 road projects in ten states.[211]

The World Bank (WB) has implemented many road projects through the MDTF. They also prioritized rehabilitating and maintaining national and rural roads that would improve delivery of relief goods and peace-keeping operations. Currently, the WB has 14 road projects. The South Sudan Rural Roads Project (SSRRP) is one of the current projects. Its main objective is to provide all season roads which could transport agricultural products to and from rural communities in areas with high agricultural potential, so improving access to markets. It includes components for improving feeder roads and collector roads, which are connected to critical interstate trunk roads. Additionally, SSRRP has a component to enhance the capacity of state and national governments to manage their rural infrastructure.[211]

USAID has engaged in infrastructure projects in South Sudan since 2003. Construction of roads and bridges, and capacity building for infrastructure are major components. The Sudan Infrastructure Capacity Building Program (SICBP), Rehabilitation, Reconstruction and New Construction of Roads and Bridges, and Response Assistance for Priority Infrastructure Development (RAPID) Program are major transport projects funded or implemented by USAID. In the RAPID Program, road maintenance, road rehabilitation, and construction of feeder roads are undertaken.

The Japanese government funded road maintenance between Yei, Central Equatoria State and Farasika, Western Equatoria State and road construction between Farasika and Rumbek, Lakes State. JICA funds UNOPS to rehabilitate roads between Meilut and Buni in Upper Nile state which are described in Figure 8-19. The Japanese Self-Defence Force is also rehabilitating a part of the trunk road between Yei and Juba.

Completed and on-going, or planned road projects by all DPs in South Sudan are listed in Table 8-6.

Table 8-6: List of Road Projects based on Road Section in South Sudan

No.	Road Section	Duration	Length (km)	Amount	Status	Funding agency	Implementing agency
1	Yei-Juba (rehabilitation)	2005-2006	160	Opening of the main roads corridor was funded by donors mainly USAID, UK, Norway, and others which is totalled of US $ 285 million.	Completed	MDTF	WFP
2	Juba-Nimule (rehabilitation)	2005-2007	192		Completed	MDTF	WFP
3	Nedapal-Torit-Nesitu (rehabilitation)	2004-2007	337		Completed	MDTF	WFP
4	Kaya-Yei-Rumbek (rehabilitation)	2004-2005	567		Completed	MDTF	WFP
5	Rumbek-Yirol-Shambe (maintenance)	2005-2008	177		Completed	MDTF	MTRB
6	Juba-Bor (rehabilitation)	2006-2008	190		Completed	MDTF	WFP
7	Rumbek-Tonj-Wau (rehabilitation)	2006-2008	230		Completed	MDTF	WFP
8	Wau-Gorgial-Abyei (rehabilitation)	2006-2008	140		Completed	MDTF	WFP
9	Juba-Mundri	2007-2009	186		Completed	GRSS	MTRB
10	Torit-Kapoeta	2010-2011	150	No data	Completed	MDTF	WFP
11	Akobo-Pochala		85	No data	On-going	UNDP	UNOPS
12	Pagak-Mathium		100	No data	On-going	USAID	UNOPS
13	Baraf-Massharaf		100	No data	On-going	UNDP	UNOPS
14	Dabio-Exo (emergency repair)	2011	75	No data	Completed	USAID	UNOPS
15	Yambio-Dabio (rehabilitation)	2009-2010	80	No data	Completed	USAID	UNOPS
16	Yei-Farasika (maintenance)	2009-2010	165	No data	Completed	GoJ	WFP
17	Farasika-Rumbek	2009-2010	200	No data	Completed	GoJ	WFP
18	Dabio-Tambura	2009-2010	105	No data	Completed	USAID	UNOPS
19	Kaya-Yei	2010-2011	85	SSP 9,222,499	Completed	MDTF	MDTF
20	Yei-Ras Olo	2010-2011	150	SSP 5981,184	Completed	MDTF	MDTF
21	Karich-Amok Piny		114	No data	On-going	WFP	WFP/GIZ
22	Aluakaluak-Akuoc Cok		114	No data	On-going	WFP	WFP/GIZ
23	Juba-KajoKeji-Keriwa (rehabilitation)	2008-2011	240	US $ 6.69 million	Completed	MDTF/GRSS	WFP
24	Loming Junction-Imehejeck (rehabilitation)	2010-2011	85	US $ 1.3 million	On-going	MDTF	WFP/GIZ
25	Kayila-Ikwotos-Tseretenya	2008-2010	100	SSP 18 million	Completed	GRSS	MTRB
26	Juba-Lebank-Moli (construction)	2008-2011	138	SSP 44,059,310	Completed	GRSS	MTRB
27	Lainya-Jumbo	2008-2010	110	SSP 24,964,209	Suspended	GRSS	MTRB
28	Mvolo-Aluakluak (construction)	2008-2010	65	SSP 14 million	Suspended	GRSS	MTRB
29	Wau-Warrap (construction)	2008-2010	90	SSP 43 million	Completed	GRSS	MTRB
30	Thiet-Luonyaker & Tonj Internal road	2008-2012	11	SSP 39 million	On-going	GRSS	MTRB
31	Ayod-Waat-Akobo	2009-2011	215	US $ 22 million	Suspended	GRSS	MTRB
32	Faraksika-Maridi-Yambio	2008-	176	US $ 21 million	Completed	MDTF	UNOPS

No.	Road Section	Duration	Length (km)	Amount	Status	Funding agency	Implementing agency
	(rehabilitation)	2010					
33	Yambio-Tambura	2008-2010	151	US $ 17 million	Completed	USAID	UNOPS
34	Meriam-Wanjok-Aweil	2006-2007	167.93	US $ 288 million	Completed	GRSS	MTRB
35	Marol-Deing		16.7				
36	Mayan-Waddweil		11.5				
37	Madol-Ameth		21				
38	Aweil Ring Road		7.35				
39	Wanjok-Mayn-Aryat-Gokmachar-Kiir		145.5				
40	Wanjok-Akon-Tiaraliat-Mallek alel-Kom		135				
41	Aweil-Waddweil-Nyamlail-Marial Bai		84				
42	Nyamlail-Adol		12				
43	Aweil-Wau	2008	136.2	SSP 80 million	Completed	GRSS	MTRB
44	Ameth-Abyei	2008	88.8	SSP 108 million	Completed		
45	Mayan Abon-Wun Rock	2008	26		Completed		
46	Gorgial-Akon	2008	45		Completed		
47	Wau-Deium Zubeir-Raja (rehabilitation)	2008	320	SSP 387 million	280 km completed	GRSS	MTRB
48	Wau-Luonyaker Lietnhom (construction)	2008	145	SSP 122 million	132 km completed		
49	Tonj-Thiet-Mauac-Aguer-Maper	2008	180	SSP 90 million	115 km completed		
50	Rumbek-Maper-Mayendit	2008	160	SSP 204 million	Completed		
51	Wau-Tambura	2008	275	SSP 271 million	200 km completed		
52	Juba-Terekeka-Yirol-Leer (construction)	2008	512	SSP 469 million	350 km completed		
53	Malakal-Nssir-Jekou	2008	250	SSP 311 million	On-going		
54	Malakl-Renk	2010-2014	345	US $ 222 million	Suspended	GONU	MTRB
55	Terekeka-Tindilo-Tali-Kamande & Tindilo-Rokon	2012	285	US $ 33 million	On-going	GRSS	MTRB
56	Buni-Paloich-Meilot, Upper Nile (rehabilitation)	2013-2014	No data	US $ 6.5 million	On-going	Japan	UNOPS
57	Refugee camp site in Maban County (Gedrassa, Doro, Jamman, Yusuf Batil camps), Upper Nile	2012-2013	No data	US $ 1.5 million	On-going	OCHA	UNOPS
58	Morobo-Kajokeji	2012-2013	No data	US $ 1.3 million	On-going	USAID	UNOPS
59	Yambio-Sakure	2012-2013	No data	US $ 0.86 million	On-going	USAID	UNOPS
60	Nzara-Sakure		No data	US $ 0.45 million	On-going	USAID	UNOPS
61	Yambio-Nabiabai		No data	US $ 2.6 million	On-going	USAID	UNOPS
62	Yei-Morobo trunk road (rehabilitation)	2012-2013	No data	US $ 2.3 million	On-going	USAID	UNOPS
63	Juba-Nimule road (routine maintenance)	2012-2013	192	US $ 3.09 million	On-going	USAID	UNOPS
64	Yei-Morobo road (rehabilitation)	2012-2014	No data	No data	On-going	USAID	UNOPS
65	Pagak-Ulen road	2012-2014	No data	No data	On-going	USAID	UNOPS
66	Magwi-Labone road (via Parajok)	2013-2015	89	No data	On-going	WB	MTRB
67	Amadi-Tali road	2014-2015	65	No data	On-going	WB	MTRB
68	Tali-Yirlo (Awerial)	2014-2015	55	No data	On-going	WB	MTRB
69	Yei-New Lasu road	2011-2013	45	No data	On-going	WB	MTRB
70	Ras Olo-Maridi road	2012-2013	71	No data	On-going	WB	MTRB
71	Maridi-Kozi road	2013-2013	60	No data	On-going	WB	MTRB
72	Morobo-Panyume	2013-2014	25	No data	On-going	WB	MTRB
73	Panyume-Yaribe	2013-	25	No data	On-going	WB	MTRB

No.	Road Section	Duration	Length (km)	Amount	Status	Funding agency	Implementing agency
		2014					
74	Yaribe-Gimunu	2013-2014	30	No data	On-going	WB	MTRB
75	Panyume-Kanchu-Limbe	2013-2015	30	No data	On-going	WB	MTRB
76	Narus-Boma	2012-2013	240	No data	On-going	GRSS	MTRB
77	Warrap-Kuacjok-Luonyaker	2012-2013	No data	No data	On-going	EU	WFP
78	Kangi-Kuacjok-Luonyaker	2012-2013	No data	No data	On-going	EU	WFP
79	Aluakluak-Mapourdit	2012-2013	No data	No data	On-going	EU	WFP
80	Pageri-Magwi	2012-2013	No data	No data	On-going	Netherlands	WFP
81	Mundri-Bangolo	2012-2013	No data	No data	On-going	Netherlands	WFP
82	Yei-Kegulu-Morobo	2012-2013	No data	No data	On-going	USAID	UNOPS

Source: Japan International Cooperation Agency. September 30, 2013. *Supporting Document for the Project for Capacity Development on Sustainable Road Maintenance and Management in Juba.* Unpublished.

As shown in Figure 8-19, construction and rehabilitation for many trunk roads are completed in 7 states, excluding Upper Nile, Jonglei, and Unity States. Transportation among major towns in these seven states has become better. Although some projects are suspended, mainly due to security issues, 46 road projects are on-going in all of South Sudan (Table 8-6). These on-going road projects include road construction and rehabilitation in areas which had not been targeted before, i.e., in Jonglei and Upper Nile, and in parts of Cental Equatoria, Eastern Equatoria and Warrap states.

Until recently, the main objectives of road construction projects were to improve trunk roads connecting major towns and regions and to better deliver relief products and services. Such improvements may contribute to reducing the costs of transportation and the prices of products. However, completion of all interstate trunk roads will only provide road access to 18% of the population and 7% of the crop land in areas of high agricultural potential. Hence, the impact on rural connectivity is limited.[209]

More recently, some road projects have started focusing on the improvement of feeder roads to enhance accessibility of farmers and agricultural products to markets. Currently, the available rural road network is about 6,123 kilometres.[208] As of May 2012, the WB estimated that the Rural Accessibility Index (RAI)[212] would be improved to 39%, if all the trunk and major feeder roads were fully rehabilitated, while the RAI would be 18% if rehabilitation was limited to interstate trunk roads.[209] Improvement of feeder roads is imperative to improve accessibility of farmers and agricultural products to markets. 39% of RAI does not sound a high figure, but infrastructure development takes time and is costly. Continuation of road infrastructure improvement is necessary to achieve an RAI of 39% or higher.

Within GRSS there is the Feeder Road Technical Committee (FRTC), whose role is to identify feeder road standards and specifications, develop and prioritize criteria for selecting feeder roads to be constructed / rehabilitated, apply these criteria, and develop initial cost

[212] The Rural Access Index (RAI), a key transport headline indicator, has been established to focus on the critical role of access and mobility in the reduction of poverty in developing countries. The RAI estimates the proportion of the rural population with adequate access to the transport system. Measurement of RAI is based on household survey data to estimate the number of people who live within 2 kilometres (or about 25 minutes walking time) of the nearest all-weather road. The World Bank. Rural Transport, Rural Access Index (RAI). http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTTRANSPORT/EXTRURALT/0,,contentMDK:22590482~menuPK:2997966~pagePK:210058~piPK:210062~theSitePK:515370~isCURL:Y,00.html. Accessed in November 20, 2013.

estimates for priority feeder roads.[213] After FRTC identifies priority feeder roads to be constructed, they are integrated into the on-going road projects. On-going road projects are depicted in Table 8-6 and Figure 8-20.

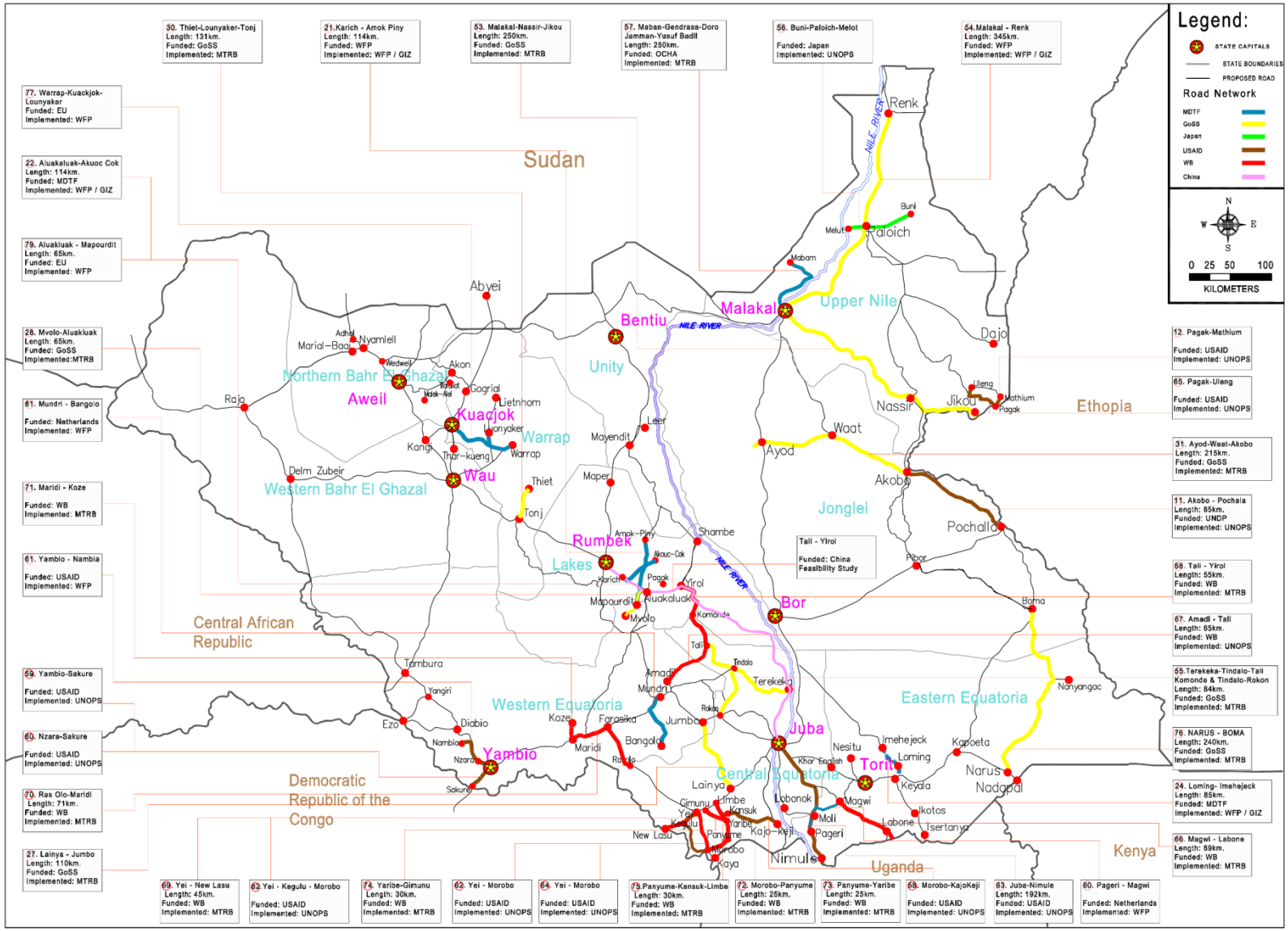
Road improvements are also necessary for roads in urban areas. In the medium term, implementation of road projects in urban areas such as Juba, Malakal, Wau, Aweil, Rumbek, Yei, etc will be important as the urban population is expected to increase to 23% in 2015 and 26% in 2020.[208] They will be needed to facilitate economic activities in urban areas. In addition, maintenance of the existing road network will require a large amount of funds. Overall, road infrastructure projects will need to be planned and implemented based on priorities that consider rural and urban demands and impacts.

[213] Screening criteria of feeder road are as follows: road length, connectivity, requirements of demining, requirements of full environmental impact assessment, population density, impact of food production and food security, cost of road rehabilitation/construction, security situation. Source: *Feeder Road Screening Results.* August 19, 2011., Prepared by the Feeder Roads Technical Committee., GRSS.

Figure 8-19: Completed Road Projects

Source: Japan International Cooperation Agency. September 30, 2013. *Supporting Document for the Project for Capacity Development on Sustainable Road Maintenance and Management in Juba.* Unpublished.

Figure 8-20: On-going Road Projects (as of October 1, 2013)



Source: Japan International Cooperation Agency. September 30, 2013. *Supporting Document for the Project for Capacity Development on Sustainable Road Maintenance and Management in Juba.* Unpublished.

9. Lessons learned from previous investments

The CAMP Task Team conducted a survey on past and on-going development assistance projects in South Sudan's agricultural sector. The objective was to draw lessons for the formulation and implementation of CAMP out of the experiences of such interventions. The survey focused on the projects that were launched after the signing of the Comprehensive Peace Agreement (CPA) in 2005 in order to be relevant to the current situation.

Through a literature survey, the CAMP Task Team identified agricultural development assistance projects. Due to time constraints, 27 projects were selected; EU funded projects are more than half of the total. It should be recognised that these projects may not be a representative sample. A questionnaire was prepared focussing on effectiveness/efficiency and long term sustainability and it was completed for each project. The information collected was analysed to learn lessons for CAMP formulation and implementation, with respect to improving CAMP's effectiveness/efficiency and long term sustainability.

9.1 Cooperation with the government

Most projects studied work or worked with the central and/or local governments of South Sudan, although the levels of interaction varied. All of them found challenges in the process of cooperation with the government. This sometimes resulted in a low degree of government involvement in projects and programmes, as reflected in the statement by IDA and IFC: "Rather than using aid provision to build government capacity and legitimacy, donors have worked mainly in a humanitarian mode employing NGOs and Project Implementation Units to deliver assistance directly to beneficiary communities".[214]

However, cooperation with the government is indispensable in order to have a significant and long-lasting impact on target institutions/communities/areas. In fact, one of the interviewees recognized that engagement of the respective Ministries in the initial process was significant for the effectiveness of an exit strategy and for sustainability of an intervention. Inadequate involvement of the government resulted in insufficient capacity and commitment of the government and hindered effective/efficient implementation of development projects/programmes and sustainability of such efforts.

The following lessons are drawn from several projects concerning cooperation with the government.

- The state authorities need to be engaged throughout the process to ensure that they own and prioritize implementation of projects in their work plan. The same is true of central government.
- It is important to sign a Memorandum of Understanding with relevant state institutions at project inception, clearly detailing exit strategies to be integrated into the project during the implementation period.
- Transparency and accountability of the project will motivate the government agencies and other stakeholders to be fully involved in the project planning, implementation and monitoring and evaluation.
- Active involvement of and cooperation with community leaders help the project gain commitment and support by the government.
- The importance of having long-term visions and incorporating the private sector needs to be discussed and agreed upon with government staff, especially senior members.

[214] International Development Association and International Finance Corporation. 2013. Interim Strategy Note (FY2013-2014) for the Republic of South Sudan. Washington D.C.: World Bank. p. 12.

- The limited security of the country, particularly in rural areas, such as conflicts over land and water resources, may hinder implementation of development projects. In order to avoid conflicts over productive assets developed by projects, such as a water reservoir, local governments and communities need to be involved in the selection and identification of areas, projects and activities to be developed.

9.2 Coordination with DPs

Implementation of CAMP will require involvement of multiple donors, because the geographical areas and sectors covered are so large that it cannot be funded by a single donor. Some projects drew lessons on coordinating donors and/or involving new stakeholders into a project.

- Coordination with other implementing agencies and donors will build synergies and ensure non-duplication of activities. This promotes effectiveness and efficiency of the project, which increases the chance of success in a limited amount of time and resources.
- Also, common strategies should be developed with other agencies implementing similar projects in order to devise a functional uniform methodology.
- However, funding agencies and implementing/supporting agencies need to be careful when they invite new stakeholders into projects because of a possible increase of coordination costs.

9.3 Partnership with the private sector

Sustainability becomes an important issue especially when private entities are established or trained in a project. Some projects identified that the private entities they launched and/or trained, such as community health groups, did not function after project completion. This was because the funds provided by the NGOs ceased at project completion. In order to ensure sustainability, the following suggestions were made on how to involve private entities in a project.

- The private entities need to be linked to other organizations in order to operate on a cost recovery basis and to access loans. Private entities need to be able to generate income sustainably.
- Also, the government and NGOs' intervention should be kept at the minimum level. It seems better to reduce financial support to these groups as they grow financially. The target entity's knowledge of asset building and management, and banking can be an indicator to control the level of intervention.
- The size of private enterprises and their relationships are should be taken into consideration. Group-owned/run businesses are not always better than individually-run business. One of the projects studied identified a conflict of interests in the former case. When businesses are run by groups, the division of roles and responsibilities need to be clearly defined in order to avoid such conflicts.
- Agriculture is basically a private sector activity. In order to promote sustainable operation of the agricultural sector, the government's role needs to be clear and restricted to activities that government should do. These might include creating a supportive environment for agricultural activities such as development of regulations and provision of support services.
- Additionally, the risk of failure of a business can be reduced by supporting already existing business to grow, rather than starting and growing new ones.

9.4 Participation of farmers

Farmers in South Sudan have limited capacity and inputs to realise the high potential of the fertile lands of South Sudan, due to decades of civil war. Effective/efficient and sustainable

capacity building of farmers and provision of inputs are essential to improve agricultural productivity. The following lessons were learnt from the various experiences of agricultural projects/programmes.

- Famers need to be trained in cost effective ways. For instance, it is not always best to diversify products; it can be more cost effective to focus on increasing productivity of an existing product. Also, the project needs to be careful not to have too many trainees so that each trainee receives enough inputs; instead it should focus on increasing productivity.
- It is risky to rely heavily on agricultural inputs such as seeds, fertilizer, and cattle from outside the project site for success of the project, due to poor infrastructure, unreliable transportation and insecurity in South Sudan. For instance, one of the projects studied identified theft of cattle being transported as a major issue.
- Adoption of new technologies and practices requires time due to the conservative nature of rural households. A project team needs to spend sufficient time on creating mutual understanding, trust and friendship with the community leaders as well as the community at large. For instance, the needs and rationale that underlie farmers' risk-averse approaches to farming should be understood in order to gain their understanding and support of new technologies and practices, which will make the project effective and sustainable in the long run.
- Partnering with local NGOs and community-based organizations provides many advantages such as local knowledge and community acceptance. It will also increase sustainability after project completion and withdrawal of the international organization from the project site.

PART II

10. Crop

10.1 Overview

Over 95% of the territory of South Sudan is considered as suitable for agriculture and 50% of it is prime agricultural land for various crops. However, only 3.8% of land is utilised as cropland, while 62.6% of it is covered by trees.[215] So far, only limited areas are utilised for crop production. Almost all farming areas are rain-fed, thus agricultural production is heavily influenced by rainfall. Precipitation generally increases from north-east to south-west and rainfall patterns tend to be erratic nowadays. Based on the precipitation, water availability and livelihood patterns, the country is categorised into seven livelihood zones (i.e., Greenbelt, Hills and Mountains, Ironstone Plateau, Eastern Flood Plain, Western Flood Plain, Nile-Sobat Rivers and Pastoral). In each zone, different types of agriculture are practiced.

Approximately 78% of households in the county are engaged in agriculture[216] and the average area farmed per household is about 1.12ha.[217] The majority are subsistence farmers who cultivate crops for home consumption. They utilise very simple manual tools, such as hoe, maloda,[218] panga and axe, for farming activities. In some areas farmers use ox ploughs but in most areas ploughing is done manually. Weeding is one the most labour intensive activities during the farming season since farmers practice mixed cropping and weed manually by using simple tools or by hand. Harvesting is also labour intensive.

Most farmers do not use chemical fertilisers and many of them use traditional varieties of seeds which are obtained from their own harvest of the previous season whose quality is variable since they are a mixture of unknown varieties and liable to damage by insects. Use of high yielding varieties is not very common in rural areas since it is difficult for rural farmers to access them. Pesticides and herbicides are not used at all except by a limited number of progressive farmers and in large scale mechanised schemes.

Main crops cultivated are sorghum, maize, cassava, groundnuts, sesame, pearl and finger millets, beans, peas, sweet potato and rice. Sorghum is a main staple food, which is widely grown in the whole country. Usually sorghum is grown with some other crops (e.g., groundnuts, sesame, cowpeas, beans and pumpkins). A large volume of maize is mainly grown in the Greater Equatoria Region, especially in the Greenbelt zone. Farmers in the northern part of the country also began to grow maize recently since sorghum is usually severely damaged by birds; farmers choose maize because it is has less damaged by birds. Cassava is mainly grown in the Greater Equatoria Region, especially in Western Equatoria State. Groundnuts are a very important crop for famers as both food and cash crops. It is widely grown.

Even though vast arable land is available, farmers cannot exploit it fully due to their insufficient knowledge, skills, experience and use of simple hand tools, plus underdevelopment of mechanised farming and limited irrigation facilities. Total net cereal production in 2012 was 761,378 tons and total cereal requirement for 2013 was 1,132,368 tons.[219] The estimated cereal deficit in 2013 is 370,991 tons. This number is much better

[215] World Bank. *Agricultural Potential, Rural Roads, and Farm Competitiveness in South Sudan*. p. 5.

[216] NBS. 2012. *National Baseline Household Survey 2009.* p. 53.

[217] FAO / WFP. 2013. *Crop and Food security Assessment Mission to South Sudan*. p. 14.

[218] Maloda is a traditional hoe. There are various kinds of malodas, such as anchor shaped blade and another with a small trapezoidal blade.

[219] Net cereal production is 80% of gross cereal production, taking into account postharvest loss and seeds for the next season. FAO / WFP. 2013. *Crop and Food security Assessment Mission to South Sudan*. pp. 21-22.

than that of 2012 but the country still cannot achieve cereal self-sufficiency. This food gap could be filled by emergency food aid and imports from neighbouring countries.

Vegetables are produced near homes mainly for home consumption. Most of the fresh vegetables in markets are coming from Uganda, Kenya and Sudan, and some green leafy vegetables (e.g., amaranthus and Jew's mallow) and okra are supplied to markets from peri-urban areas of the country. Peas and beans (e.g., cowpeas, kidney beans, green gram and pigeon peas) are grown near homes, again mainly for home consumption. Fruit is also grown throughout the country. Especially in the Greenbelt and Hills and Mountains zones, various kinds of fruit are grown. Pineapple, mango, avocado, citrus, papaya, passion fruit, jack fruit and guava are produced and mainly consumed locally. A small volume is also sold in urban markets while a large volume, including watermelon and banana, is imported mainly from Uganda. Coffee and Tea are also grown in both zones but production volume seems to be limited. As mentioned, many vegetables and fruit are imported from neighbouring countries although South Sudan has great potential for vegetable and fruit production with substantial water resources and highly fertile soil.

10.2 Key issues and challenges

Key issues and challenges identified during the situation analysis are as follows:

(1) Low agricultural production

- The gross cereal yield has stagnated at a low level since 2009, approximately from 0.8 t/ha to less than 1.0 t/ha due to rain-fed farming, use of traditional varieties, low quality seeds, low inputs (e.g., fertiliser and agro-chemical) and damage by pests and diseases. Likewise, cereal area harvested per capita has been at a low level, about 0.1 ha, since 2009 because land reclamation, ploughing, seeding, weeding, harvesting and postharvest handling are mainly done manually by family or communal labour.
- These two aspects (i.e. yield and area harvested per capita) are causes of serious food insecurity in 2013. Estimated cereal deficit in 2013 is approximately 370 thousand tons. This amount could be filled by food aid and cereal imports. Even the rural population, the majority of whom live in farming households, face food insecurity, particularly during the period of seasonal food insecurity.[220]
- Due to favourable rainfall, temperature and soil conditions, some areas are suitable for cash crops (e.g., vegetables, fruit, tea, coffee and oil seeds); however, the potential is not fully exploited as of now.

(2) High costs

- Compared to neighbouring countries, labour costs are relatively high due to the strong South Sudanese currency influenced by oil exports.
- Prices of agricultural inputs are relatively high since all are imported from foreign countries. South Sudan is a landlocked country so import costs tend to be higher.
- Domestic transport costs are increased up due to poor road conditions and high fuel prices.
- Higher production costs reduce agricultural competitiveness in international markets. A large volume of agricultural products is imported from neighbouring countries such as Uganda, Kenya, Ethiopia and Sudan.

(3) Poor infrastructure

- Interstate and primary road networks are not well maintained so some are not passable during the rainy season. This makes transportation costs higher. Since the

[220] Seasonal food insecurity occurs when stocks of produce from the previous harvest may be depleted and households may have to find alternative sources of food using coping mechanisms (or strategies).

condition of feeder roads is extremely poor, collection of products from production areas is difficult and costs for collection become very high.
- Only a limited number of farmers own irrigation facilities although a large part of the country is endowed with substantial water resources.
- Large and medium scale warehouses for storing and shipping cereals and drying yards for postharvest activities are not yet developed.
- Public electric services are provided in very limited areas, so most business entities are utilising generators for electricity, which makes electricity very expensive.

(4) Insecurity
- Due to insecurity some farmers fail to cultivate crops. When farmers escape from inter-communal or tribal conflicts and become Internally Displaced Persons (IDPs), they tend to lose opportunities to cultivate crops. This situation causes serious food insecurity in rural areas.
- Livestock coming from other areas with armed pastoralists often destroys farmers' crops. Fencing is one of the effective prevention measures but it requires a high investment. Usually farmers cannot afford to construct a fence.

(5) Weak service delivery to farmers
- Both national and state governments can deliver very limited services to farmers. At payam level, a limited number of Agricultural Extension Officers (AEOs) are deployed, so farmers rarely get access to improved technical knowledge and skills for agriculture. NGOs provide some technical services (e.g., training and extension), but the number of beneficiaries is quite limited.
- Basic research for crop production is rarely done by government institutions. Thus, new technologies for crop production are not developed. Similarly, information and technology dissemination for extension officers and farmers is limited.
- Even though some farmers in the northern-eastern part of the country face serious crop damage by birds, governments cannot carry out proper pest control measures. Likewise, prevention measures for cassava mosaic and brown streak diseases are not carried out appropriately.
- Rural financial services are also limited, although farmers often need some capital to expand farming operations.
- Limited tractor services provided by national and state government institutions and the private sector restrict the expansion of the area farmed by farmers.

(6) Poorly organised farmers
- Farmers lack the capacity to gather their harvest into a large volume to sell, so wholesalers and traders who need large volumes tend to purchase products in bulk in foreign countries.
- The number of active farmer organisations, such as cooperatives and Farmer Based Organisations (FBOs), is very limited.

(7) Unfavourable environment for investments
- Land acquisition processes are often influenced by local politics and traditional arrangements. High uncertainty of land acquisition becomes a serious factor that affects foreign investors' decisions to invest in the agricultural sector.
- Legal and illegal multiple taxation hinders active investments. Illegal taxes (i.e., bribes) make transaction costs high. In addition, rates of taxes are often changed without notice.
- Basic infrastructure (roads, electricity, irrigation, potable water, ports, etc.) is not well developed.
- The relatively high costs of inputs and labour and insecurity are also unfavourable factors for investments.

10.3 Policy framework

After the Comprehensive Peace Agreement (CPA), the Southern Sudan autonomous region was restored and the autonomous Government of Southern Sudan (GOSS) was established. The former GOSS Ministry of Agriculture and Forestry (MAF) developed the Food and Agriculture Policy Framework 2007-2011 (FAPF) in 2006, which was the first policy framework in the sector for Southern Sudan. The National Agriculture and Livestock Extension Policy (NALEP) was also developed. After independence in July 2011, MAF started preparing a new policy framework for the new country as well as eight subsector policies (Table 10-2).

Table 10-1: Summary of Agriculture Sector Policy Framework 2012-2017

Vision	Food security for all the people of the Republic of South Sudan, enjoying improved quality of life and environment
Mission	To create an enabling environment for the transformation of agriculture from a subsistence system into a modern, socially and economically sustainable system through science-based, market-oriented, competitive and profitable farming while maintaining the integrity of the natural resource base for the benefit of future generations of South Sudanese people.
Goal	Increased agricultural productivity to improve food security and contribute to economic growth and enviromental sustainability
Targets by 2017	▪ Cropland will increase from 3.8% (2.7 m ha) to 14.3 % (9.2 m ha) of total land area in the next five years ▪ Per capita cropland increases from 0.32 ha to 0.99 ha in 5 years assuming 2.5% population growth ▪ Average annual increase of more than 20 per cent for roots and tubers, more than 30 per cent for cereals and more than 25 per cent for horticultural crops. ▪ Increase average yield of crops from 0.9 tons per ha to 3 tons per ha ▪ Contribute to reduction of rural poverty by 50 per cent from the baseline levels of 55.4% in 2010; and reduce the number of people living below poverty line by half come 2017.
Key Policy Choices and Objectives	1. Accelerate food and agricultural production while ensuring that the growth is pro-poor, sustainable and contribute to food and nutrition security • Smallholder and Commercial Agriculture • Expansion and Intensification • Mechanization and employment generation • Foreign direct investment (FDI) in agriculture 2. Improve agricultural markets and trade through investing in market infrastructure and institutions, and developing value chains • Local, regional and international markets • Agribusinesses and value addition • Production, marketing and price risks 3. Develop and enhance human and institutional capacity • Human and institutional capacity of all stakeholders • The role of government versus private sector • Pursue agricultural growth with social development
Guiding Principles	▪ Decentralization and empowerment ▪ Pluralistic extension approach driven by communities ▪ Promotion of public-private partnership ▪ Government as a facilitator to stimulating rural development ▪ Cooperatives and farmer groups ▪ Promoting value addition and agro-processing ▪ Strengthening of rural infrastructure for roads, electricity and water ▪ Macro-economic stability ▪ Conducive marketing policies ▪ Sustainable development management
Subsector Policy Guidelines	ASPF indicates policy guidelines on the following subsectors. ▪ Crop ▪ Agricultural production support services ▪ Agricultural markets, value chain development and finance

	▪ Food security and nutrition ▪ Forestry development and management ▪ Role of agriculture and forestry in socio-economic change ▪ Sustainable agriculture, environment and climate change ▪ Social justice ▪ Coordination with other sectors

Source: GRSS. 2012. *Agriculture Sector Policy Framework 2012-2017*. pp. 9-12. Juba: GRSS.

In September 2011, MAF and the Ministry of Cooperative and Rural Development were merged into one ministry, the Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD); the new policy framework for the agriculture sector had to incorporate cooperative and rural development aspects.

In this context, the Agriculture Sector Policy Framework 2012-2017 (ASPF) was drafted and passed by the National Legislative Assembly (NLA) - South Sudan's parliament - in December 2012 and is now ready for dissemination. This is a comprehensive policy document for MAFCRD and contains subsector policy guidelines (e.g., crop, agricultural support services, agricultural marketing, food security and nutrition, and forestry). This policy document has stipulated national targets by 2017 regarding crop land expansion, increase of crop production and yield, and poverty reduction. A summary of ASPF is shown in Table 10-1.

In addition to the eight key subsectors policies mentioned above, MAFCRD has been formulating four more subsector policies (i.e., rural development, rural finance, agricultural marketing and food security). The draft policies have been prepared and some are in the legislative process. The present status of subsector policies is shown in Table 10-2.

Table 10-2: Subsector policies as of July 2013

	Subsector	Present Status As of July 2013
1	Plant Protection	• Approved by the Council of Ministers on 15 March 2013 • Presented to National Legislative Assembly
2	Horticulture	• Approved by the Council of Ministers on 15 March 2013 • Presented to National Legislative Assembly
3	Agriculture Mechanisation	• Approved by the Council of Ministers on 8th February 2013 • Presented to National Legislative Assembly
4	Soil Health and Conservation (Fertiliser Policy)	• Approved by the Council of Ministers on 15th March 2013 • Presented to National Legislative Assembly
5	Seed	• Being discussed in MAFCRD
6	Research	• Being discussed in MAFCRD
7	Training and Capacity Development	• Passed by the economic cluster with amendment • Preparing amendment for re-submission to the Council of Ministers
8	Rural Development	• Approved by the Council of Ministers on 7 June 2013 • To be submitted to National Legislative Assembly
9	Rural Finance	• A stakeholders consultative forum held in June 2013 • For submission to the Council of Ministers
10	Agricultural Marketing	• A stakeholders consultative forum held in June 2013 • For submission to the Council of Ministers
11	Food Security	• A stakeholders consultative forum held in June 2013 • To be submitted to the Council of Ministers

Source: GRSS, MAFCRD and the FARM project, interviewed by the CAMP Task Team, Juba, June 2013, CAMP Situation Analysis

10.4 Institutions

10.4.1 Ministry of Agriculture, Forestry, Cooperatives and Rural Development [221]

10.4.1.1 Mandate of the national ministry

MAFCRD was established in September 2011 through amalgamation of two ministries. The new mandate of the ministry was set out in the ASPF as follows:[222]

- Develop and implement policies, objectives and strategies for development of agricultural sector in the areas of Food Security, Agriculture, Forestry, Rural Development and Cooperatives in South Sudan.
- Promote productivity of agriculture and forestry for economic growth and development of South Sudan
- Promote and enhance the formation of cooperative societies and community-based organizations as vehicles of community empowerment and poverty eradication
- Coordinate and promote rural transformation and development

The functions and duties of the ministry are also stated:

- Formulate legislation, policies, standards, and plans for the development of agriculture, forestry, cooperatives and rural development in South Sudan
- Prevention of environment degradation through tree planting, soil and water conservation and proper utilization of agricultural land
- Promotion of sustainable use of natural resources for agricultural and forestry production including non-timber forest products
- Promote the development and adaptation of appropriate technology in the field of agriculture and forestry
- Create a national food policy to ensure adequate food availability
- Promote and where necessary regulate the efficient production and marketing of agriculture and forest products
- Promote community-based forestry conservation, management and utilization to ensure sustainable forestry production
- Promote, undertake demand-driven agricultural and forestry research
- Establish and supervise an agricultural microfinance and credit banking scheme
- Control and regulate the use of agricultural chemicals and phytosanitary regulations and seed quality standards and licensing
- Rehabilitating and expanding training institutions and research institutions
- Provide technical assistance and training to State governments and other local governments to build their capacity to assume their responsibilities for agriculture and forestry matters as defined in the Constitution and RSS policy
- Formulate and implement Cooperative Society legislation and policy
- Promote the formation of cooperative societies and community-based organizations as vehicles of community empowerment and poverty eradication
- Develop policy on Cooperative Savings and Banking services and facilitate their establishment throughout South Sudan

[221] MAFCRD was merged with other ministries (i.e., the Ministry of Animal Resources and Fisheries and the Tourism Directorate under the Ministry of Wildlife Conservation and Tourism) in August 2013 and becomes the Ministry of Agriculture, Forestry, Tourism, Animal Resources and Fisheries. A formal name the new ministry is not decided yet as of August 2013.

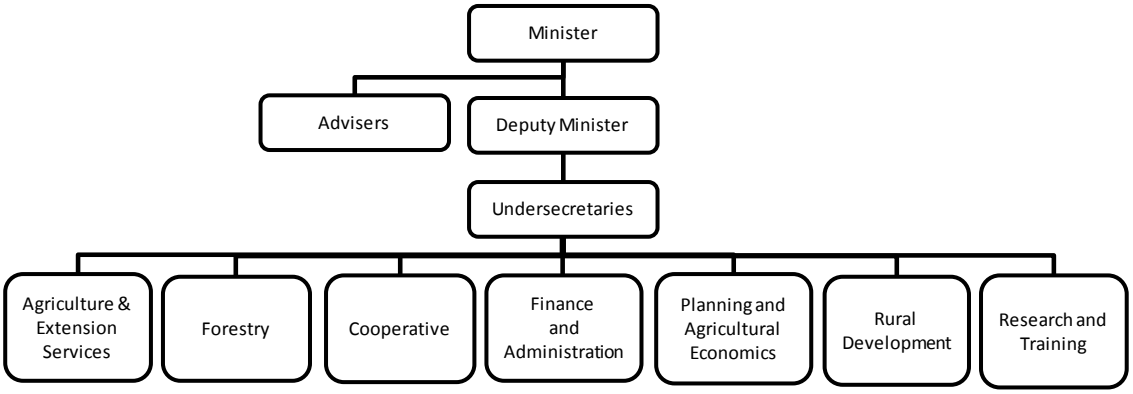
[222] GRSS, MAFCRD. 2012. *Agriculture Sector Policy Framework (ASPF): 2012-2017*. p. 9. and GRSS, MAFCRD. 2013. *Strategic Plan 2013-18*. p. 2.

- To provide training to upgrade the management and performance of community based programmes
- Support the Amadi Institute of Community Development
- Develop, in conjunction with other relevant ministries, state and local governments, policies, and strategies for the development of rural areas
- Provide technical assistance to State governments to build their capacity to support cooperative societies and undertake rural development planning and manage the implementation of rural development plans
- Coordinate Planning and implementation of programs with the State Ministries of Agriculture, Forestry, Cooperatives and Rural Development

10.4.1.2 Organisational structure

MAFCRD consists of seven directorates (Figure 10-1) including two technical directorates, which are related to crop production (i.e., Agriculture and Extension Services and Research and Training). Table 10-3 shows the departments in these two directorates.

Figure 10-1: Organogram of MAFCRD



Source: MAFCRD. 2012. Agriculture Sector Policy Framework (ASPF): 2012-2017. p. 10

Table 10-3: Crop related directorates and departments

Directorate	Department
Agriculture and Extension Services	Crop production, plant protection, horticulture, postharvest and home economics, mechanisation, and extension services
Research and Training	Research and training

Source: Staff of the national government, interviewed by CAMP crops subsector team, Juba, July 2013, CAMP Situation Analysis.

Actual operations of the ministry are being executed under the above mentioned organogram, but this is still not approved by the Ministry of Labour, Public Service and Human Resources. Thus, budget requests in 2012/13 were made based on the previous organogram, which includes two crop related technical directorates, namely Agriculture and Production, and Research, Training and Extension.

10.4.1.3 Budget

Table 10-4 shows the budget of MAFCRD and crop production related directorates. Due to the austerity measures for the 2012/13 budget, the national budget was drastically reduced. MAFCRD, however, was allocated a more budget compared to the 2011/12 expenditures

since there is a strong desire in the government to develop the agriculture sector to improve food security immediately. The former Directorate of Agriculture and Production secured more than ten times the budget compared to 2011/2012 expenditures. A main increment is capital expenditure, which was SSP 150,000 in the 2011/12 expenditures but is SSP 26,911,818 in the 2012/13 approved budget.

Although approximately SSP 26 million for capital expenditure in 2012/13 was approved, actual capital expenditures related to agricultural development were small due to austerity measures. Allowances and necessary operating costs (e.g., fuel for cars and airtime for communications) for staff were cut and sometimes payment of salaries was delayed for two months. This situation negatively affects the morale and performance of government staff.

Table 10-4: Budget of MAFCRD and crop related directorates (SSP)

Ministry/Directorate	2011/12 Approved	Budget 2011/12 Expenditures	2012/13 Approved
MAFCRD	**140,295,003**	**95,235,857**	**104,665,749**
Agriculture and Production	**-**	**2,971,064**	**31,899,044**
Wage and Salaries	-	2,076,290	2,750,759
Use of Goods and Services	-	744,774	2,236,467
Capital Expenditure	-	150,000	26,911,818
Research, Training & Extension	**-**	**4,202,608**	**5,636,518**
Wage and Salaries	-	2,169,155	4,285,975
Use of Goods and Services	-	2,033,453	1,350,543
Capital Expenditure	-	0	0

Source: Republic of South Sudan Approved Budget 2012/13. pp. 222-224.

10.4.2 State government

10.4.2.1 Vision, Mission, Values and Mandate of the state ministry

Each state ministry created its own vision, mission values and mandate in line with the national government's vision. Table 10-5 shows the case of the Ministry of Agriculture and Forestry (MAF), Jonglei State.

Table 10-5: Vision, Mission, Values and Mandate of the Ministry of Agriculture and Forestry, Jonglei State

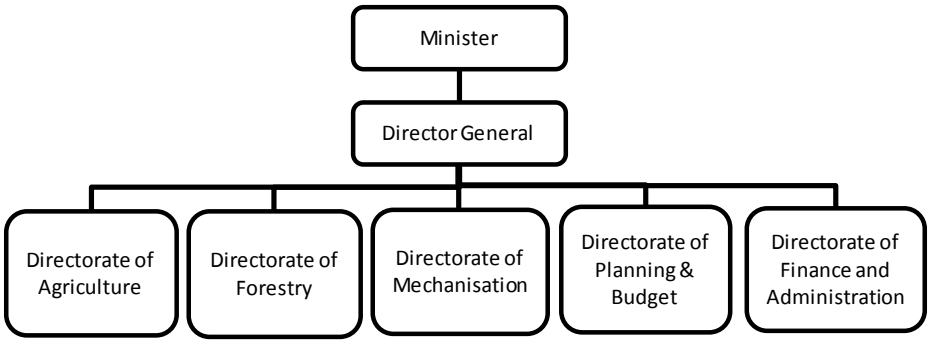
Vision	A prosperous, growing, innovative, and demand driven rural economy that generates more jobs by adopting agro-forestry technologies appropriate to Jonglei that advance commercial producer groups, small and large scale farmers and forest industries so to yield food and income security with environmentally sustainable growth.
Mission	To facilitate and promote the transformation of agriculture and forestry in Jonglei from subsistence farming with few productive trees so to advance into a science based, agro-forest sector with a sustainable market-driven system of rural economic growth
Values	Based upon the national and state government's values, where the ministry values promoting excellence in extension and food support work, accountability, transparency, integrity, inclusivity and mainstreaming gender and environmental concerns
Mandate	To achieve 100% food security by supporting crop and forest producers to produce more than enough to cover food security needs, so to create market opportunities for trade, investment, business growth, and employment.

Source: Agriculture and Forestry Strategic Development Plan for 2012 to 2017

10.4.2.2 Organisational structure

MAFCRD stated in ASPF that the state ministries would basically consist of five departments (i.e., agriculture, forestry, cooperatives and rural development, planning, and administration and finance). [223] State governments, however, are able to establish their own unique organisational structures. Thus, organisational structures of agriculture related ministries vary according to the needs and arrangements of the states. Figure 10-2 describes the organogram of the Ministry of Agriculture and Forestry, Lakes State. It has three technical directorates including mechanisation, instead of cooperatives and rural development, which is recommended by the national government. [224] Cooperative and rural development activities are under the jurisdiction of the Directorate of Agriculture.

Figure 10-2: Organogram of the Ministry of Agriculture and Forestry, Lakes State



Source: Staff of the Lake state government, interviewed by CAMP crops subsector team, Rumbek Centre, May 2013, CAMP Situation Analysis.

10.4.2.3 Budget and operation

States have their own ability to collect taxes but the most of their budget comes from the national government. As an example, Table 10-6 indicates the estimated revenue and expenditures 2013/14 of Western Bahr el Ghazal State. Budget transfers from the national government (i.e., block transfer, conditional transfer, counties development grant and counties block transfer) reach 70% which is almost equivalent to expenditures on personnel salaries. In 2012/2013 expenditures on salaries were 82% of the total; operating costs were only 12%.[225]

The state government sets a budget ceiling for each state ministry based on the revenues it expects to receive as shown in Table 10-6. The Ministry of Agriculture and Forestry was allocated SSP 4,343,407 as the 2013/14 budget and salaries are about 69% of the total budget (Table 10-7).

Table 10-6: Estimated revenue and expenditures 2013/14 of Western Bahr el Ghazal State (SSP)

Source of Revenue			Expenditures		
	SSP	%		SSP	%
Block transfer	40,564,775	20	Personnel salary	144,021,638	72
Conditional transfer	92,714,191	46	Operating costs	44,850,556	22
Counties development grant	5,862,439	3	Capital costs	12,606,195	6

[223] GRSS, Agriculture Sector Policy Framework 2012-2017. p. 9.

[224] Under the minister, the highest public servant is usually named Director General.

[225] Documents collected from the Ministry of Agriculture and Forestry, Western Bahr el Ghazal State.

Counties block transfer	1,951,734	1			
State agricultural sale tax	11,104,214	6			
State local revenue	49,281,036	24			
Total	201,478,389	100	Total	201,478,389	100

Source: Documents collected from Ministry of Agriculture and Forestry in Western Bahr el Ghazal

During the situation analysis, interviews with state and county officials were conducted and almost all of them mentioned that there were serious constraints on the operating budget for activities on the ground. They have only a little or no budget for fuel, so many of the extension workers use their own money for purchasing fuel to visit fields, or do not conduct any activities. Some officers at county level mentioned that they did not obtain any operating budget and this situation had started even before the austerity measures. They only receive their salaries. Thus, service delivery to farmer beneficiaries on the ground by the government is limited (see Section 10.8 Services). Some officers also mentioned weak political will to support the agricultural sector.

Table 10-7: Estimated budget 2013/14 of Ministry of Agriculture and Forestry, Western Bahr el Ghazal State (SSP)

Salaries	Operating	Capital	Total
2,989,056 (69%)	944,414 (22%)	409,937 (9%)	4,343,407 (100%)

Source: Documents collected from the Ministry of Agriculture and Forestry, Western Bahr el Ghazal State.

Many state government staff pointed out the problems with reporting to the national government. A state ministry prepares monthly and annual reports and submits them to its minister. After receiving these reports, the minister presents them to the state council of ministers and then the governor's office compiles all the reports from the state ministries to report to the President by the governor. In this regular reporting system, there is no direct reporting channel between the national and state ministries. The national ministry receives only minimal information on agriculture activities at the state level and sends very limited feedback to the state ministries.

10.4.3 Land Commission

The Interim Constitution of Southern Sudan states that the Southern Sudan Land Commission (SSLC) is to be established to deal with land issues in Southern Sudan. As a result, the SSLC was founded in 2006. Its functions are to (a) develop land laws and policies, (b) conduct research on land matters, (c) arbitrate on land disputes and (d) advise various levels of government on land issues.[226]

The SSLC attempted to prepare the Land Policy to create the principle of land administration, but it was not completed due to time constraints. Instead, as provisional rules, the Land Act was drafted and submitted to the NLA who passed it in 2009. Subsequently, in 2013, the draft Land Policy was approved by the Council of Ministers. Currently, the draft policy is waiting for the approval of the NLA. After approval, the SSLC plans to revise the Land Act to make it consistent with the policy for effective and efficient land administration.

As of 2013, there are five state level Land Commissions in Central Equatoria, Western Equatoria, Jonglei, Unity, and Lakes States. The state Land Commissions were established to deal with land administration. The SSLC is expected to coordinate and give advice to the

[226] GOSS. 2013. *South Sudan Land Commission*. http://www.goss-online.org/magnoliaPublic/en/Independant-Commissions-and-Chambers/Land-Commision.html (accessed on 13 July ,2013)

state Land Commissions; however, there is an institutional capacity issue. The annual budget of the SSLC is approximately SSP 1.8 million. The number of staff is 10, including the chairperson. Most staff perform management and administrative work. There are few technocrats who give technical advice. The position that deals with conflict resolution is vacant at present and there is no section which deals with legal issues. In addition, the SSLC does not have any legal power to sort out land issues. After the Policy approval, the SSLC is required to play an important role in the Policy implementation. However, the SSLC would face budget and human resource issues.

10.4.4 Development Partners

Development partners have played vital roles to improve the situation of agriculture in South Sudan. Before and after the CPA, numbers of relief projects, including food distribution, were conducted, but from 2012 to early 2013, many food security projects which focused on food distribution were completed. Currently, the nature of many assistance projects are geared more towards development of sustainable livelihoods and capacity building of farmers and government officers.

10.4.4.1 Donors

There are various donors who support the crop subsector. Some of the on-going projects funded by donors are shown in Table 10-8.

Table 10-8: Donor support to crop subsector

Name	Major projects/institutions funded	Objective or major activities	Geographical coverage/Target
CIDA	▪ Food Security Through Community-Based Livelihood Development and Water Harvesting	Help farmers and herders secure their access to water resources and increase food production and incomes	• Jonglei and Upper Nile States
	▪ Building Community Resilience	Increase the resilience of Sudan's poorest communities, and enhance livelihood and improve capacity of community volunteers	▪ Eastern Equatoria State (EE)
	▪ Comprehensive Agricultural Development Master Plan (CAMP)	Dispatch an expert in the area of institutional capacity development	▪ Entire nation
DFID	African Enterprise Challenge Fund	• Identify, select, support and monitor projects to ensure improvements in market system • Demonstrate innovative business models • Support commercially viable projects • Support projects that have high development impacts	Entire nation
EU	Introduction and Dissemination of Innovative Food Security Practices	• Improve food security of vulnerable populations through increasing farmers' income, knowledge and farming techniques • Strengthen capacity of government officials • Distribute tools to farmers, and link producers and wholesalers	Yei and Lainya Counties of Central Equatoria State (CE)
GIZ	Livelihood improvement	Distribution of farming tools and seeds	3 counties, Western Equatoria State (WE)

Name	Major projects/institutions funded	Objective or major activities	Geographical coverage/Target
	Improvement of market access	Develop markets for agricultural products through promoting value chain of agricultural products	Greenbelt
IFAD	Southern Sudan Livelihoods Development Project	Increase production and productivity to improve food security and increase farmers' income	2 payams in Jonglei State
Irish govern-ment	Food Security and Livelihood project	Improve food security through providing food, seeds, and tools to farmers as well as providing training	Upper Nile State, northern Jonglei State
JICA	CAMP	Dispatch experts for formulation of CAMP	Entire nation
	National Effort for Agricultural Transformation (NEAT)	Develop an implementation plan for NEAT	Entire nation
	Rice project	Dispatch a rice expert to CTC Yei to improve training curriculum and to Yei Agricultural Research Centre (YARC) to implement rice research project	CE, Yei
Dutch govern-ment	CTC Yei, Marial Lou Livestock Training Centre (MLLTC), Amadi Rural Development Institute (Amadi RDI)	Develop curriculum for 9 month training course	CTC Yei, MLLTC, Amadi RDI
	CTC Yei	Improve teaching quality	CTC Yei
USAID	Food, Agribusiness, and Rural Markets (FARM) Project	Ensure a sustainable domestic food supply and reduce needs for imports, improve food security and increase income of rural farmers through improvement of farmers' agricultural production, productivity, and trade through activities as follows; provision of tools, seeds, knowledge on farming skills, marketing opportunities, and behaviour change, and development of a platform for business	CE, WE, EE
WFP	Food for Asset (FFA)	Provide low income and vulnerable farmers food, tools, and financial supports to enhance their capacity for farming	All ten states, but focusing on 5 states [a]
	Purchase for Progress (P4P)	Increase capacity of smallholders and low income farmers to enable them to produce and sell surplus crops both to WFP and to markets.	21 counties in CE and WE

[a] These five states are Northern Bahr El Ghazal, Western Bahr El Ghazal, Warrap, Upper Nile, and Lakes.
Source: CAMP Task Team. December 2012. *Compilation of Development Assistance Project Profiles in South Sudan's Agricultural Sector.* December 2012. Unpublished. Donors, *interviewed by CAMP crop subsector team*, Juba, Yei, Malakal, 22 April to June. 2013. CAMP Situation Analysis, *The Food, Agribusiness and Rural Markets (FARM) Project. Annual Work Plan October 2012 – September 2013.* Maryland. 25 May 2013. CAMP Situation Analysis. World Vision, *interviewed by CAMP crop subsector team,* Malakal, 1 June 2013. CAMP Situation Analysis.

10.4.4.2 Non-governmental organizations (NGOs)

There are international NGOs and domestic NGOs which assist farmers across the nation. NGOs have different specialities and geographic coverage. NGOs are normally funded by donors and are project implementing bodies. Since it is difficult to identify and describe all the NGOs' activities in the country, some of the names, activities and target states of major NGOs working in areas related to crop production are introduced in Table 10-9.

Table 10-9: Major NGOs assisting in the areas related to crop production

Name	Major Objectives/Main Activities	Target Areas/States
ACROSS	Provide government staff and farmer groups with training on ox ploughs as well as providing seedlings of fruit trees	Rumbek East and Centre Counties in Lakes
Agency for Technical Cooperation and Development (ACTED)	Provide technical support related to storing quality seeds, compost making, and pest management to refugees	Western Bahr el Ghazal (WBG)
Bangladesh Rural Advancement Committee (BRAC)	Provide training to farmers about better farming skills and supply bulls and ox ploughs as well as providing food and farming tools	Yambio and Maridi Counties in WE
Church and Development	Promote community farming through identifying groups to improve ploughing and fencing skills, and distribute seeds and tools	Bor County in Jonglei
Norwegian People's Aid	Provide fund for part of running cost and staff salary of Yei Agricultural Training Centre (YATC)	Trainees are from all over the country
Rural Action Against Hunger (RAAH)	Support farmers through providing agricultural tools and seeds with technical support to them, and provide food at subsidized prices	Entire state of WE
United Methodist Committee on Relief (UMCOR)	Promote fish farming, bee keeping, and poultry, improve cassava and vegetable production, and enhance capacity of farmers, community based extension workers, and government officers	Yei and Lainya Counties, CE
World Vision	Distribute food, seeds, and tools including fishing gears, Provide seedlings of fruit trees, train farmers how to use tools properly	Upper Nile State and northern Jonglei State

Source: NGOs. April to June 2013. *Interviewed by CAMP crop subsector team*, Wau, Yei, Yambio, Maridi, Bor, Malakal, Rumbek and Juba. CAMP Situation Analysis.

Several NGOs such as ACROSS, ACTED, BRAC, World Vision, and Church and Development have provided technical assistance to farmers and other vulnerable groups to help them become more self-sufficient while the majority of NGOs are still focusing on food distribution. Creation of a market and/or linking traders and farmers are new perspectives for an agricultural project. To implement more such projects, a medium- to long-term perspective is essential. One challenge is that NGOs tend to implement their projects in limited geographical areas in limited period of times. Coordination of NGOs' activities, facilitated by the government and DPs, is important to provide effective and efficient services to needy people.

10.4.5 Cooperatives

The history of cooperatives of South Sudan extends back to 1953 when a Department of Cooperatives was established in Juba to promote and develop cooperative societies.[227] Cooperatives were established in several areas such as Juba, Wau, Malakal and Renk. Further development of cooperatives was hampered by the first civil war (1955-1972) and the second civil war (1983-2005).

Cooperative development was resumed after the CPA with efforts by the Ministry of Cooperatives and Rural Development (merged with the Ministry of Agriculture and Forestry in 2011). As of 2013, 566 cooperatives are registered by national and state ministries (Table 10-10); 38% are agricultural cooperatives. There are also fisheries and bee keeping

[227] GOSS. 2012. *National Strategy for Cooperative Development 2012-2015*. Juba.

cooperatives in the agricultural sector. The ministry is obliged to supervise non-agricultural cooperatives, such as general purpose and consumers' cooperatives.

Table 10-10: Type of cooperative societies

Type	Number	%
Agriculture	212	38.0
General Purpose	64	11.3
Multi Purpose	46	8.1
Consumers	41	7.2
Fisheries	26	4.6
Women	24	4.2
Youth	22	3.9
Others	131	23.1
Total	**566**	**100.0**

Source: Directorate of Cooperative Development/ MAFCRD. 2013. *Type of Cooperative in the Republic of South Sudan* (Unpublished). Juba.

The Cooperative Society Act 2011 defines the principles of registered cooperatives as (a) voluntary and open membership, (b) democratic control by members, (c) economic participation by members, (d) autonomy and independence, (e) education, training and information, (f) co-operation among cooperatives, (g) concern for the community in general and (h) protection and preservation of the environment.[228]

Based on these principles, cooperatives are formed with the assistance of cooperative inspectors at the payam level. Next, the Assistant Commissioner at the county office prepares the documents necessary to register a cooperative. Each group is required to prepare a membership list (minimum 20 members), executive board member list (minimum 5 board members), and a by-law which defines rules such as constitution of the cooperative, general meetings, and shares to be bought and held by the members. Finally, the documents are submitted to the state ministry and the cooperative officially registered.

One of the advantages for registered cooperatives is that they are able to open bank accounts with their registration certificates issued by the state ministry. They also get recommendation letters from the ministry in support of opening bank accounts. In the near future, the Cooperative Bank will be established which would provide more support to cooperatives who, now, have difficulty accessing financial services.

After registration, the treasurer is required to do bookkeeping and produce financial statements at general meetings. National and state ministries focus on establishing cooperatives but are unable to improve the financial management capacities of cooperatives due to limited institutional and human capacity. Currently, the national ministry plans to establish a college which would provide training for cooperative officers to improve their skills.

The cooperatives are expected to have a nationwide structure (Table 10-11). Primary cooperative societies (cooperatives) at the payam level are expected to subscribe to a county cooperative union, although this union is established only in some counties at present. State cooperative federations are also expected to be established in all states. Then, finally, a national cooperative alliance will be established as an apex body of all cooperatives with representation from the state cooperative federations.

[228] GOSS. 2012. *Co-operative Societies Act*. Juba: GOSS.

Table 10-11: Nationwide cooperative structure (proposed)

Level	Body	Situation
National	National cooperative alliance	To be established
State	State cooperative federation	To be established
County	County cooperative union	Established in some counties
Payam	Primary cooperative society (so-called cooperative)	566 registerd cooeratives (as of 2013)

Source: Directorate of Cooperative Development/MAFCRD, intervened by CAMP Crop subsector team, July 2013, CAMP Situation Analysis

10.4.6 Private sector

In South Sudan, activities by the private sector in agriculture are very limited, especially, agro dealers. There are several agro dealers in Juba and some in Central Equatoria (CE), Western Equatoria (WE) and Jonglei States. In other areas, very few agro dealers were found. Even though the role of agro dealers is important for all states, agro dealers are concentrated in southern parts of the country and total numbers of agro dealers across South Sudan are limited. Table 10-12 shows a list of agro dealers, who are providing agricultural inputs in major towns.[229] The range of years in business is from one to thirteen years so the number is increasing. Local farmers are the main customers for all agro dealers, but sometimes NGOs purchase seeds from them.[230] In other major towns such as Malakal, Wau and Rumbek, there are no agro dealers even though there are hardware stores which also sell a few kinds of cereal and vegetable seeds.

The most popular seed products for cereal are maize, sorghum and rice; for vegetables onion, cabbage, tomato, okra and eggplant. Ten out of eleven agro dealers sell vegetable seeds but only six sell pesticides or herbicides. This shows that the demand for seeds of certain vegetables is high, while the demand for pesticides and herbicides is lower. Moreover, only two out of eleven agro dealers sell fertilisers implying that demand for fertiliser is lower than for vegetable seeds. All agro dealers mentioned that they understood the effectiveness of their products through feedback from their customers and thought it was important to know the opinions of their customers.

Table 10-12: Agro dealers in South Sudan

Names	Locations	Main products sold	Origins of major products
Agro Life	Juba, CE	Agricultural tools (greenhouse kit, gardening tools), vegetable seeds	Kenya
Laisi General Stores	Juba, CE	Cereal seeds, vegetable seeds and tools	Uganda
Seed Corn	Juba, CE (Branch Nimule)	Cereal seeds, vegetable seeds, fertiliser, pesticides, herbicides and tools	Uganda
BA Juba International	Juba, CE	Fertilizer, pesticides, herbicides and tools	Tanzania
Century Seeds	Yei, CE	Cereal seeds, vegetable seeds, fertiliser, pesticides, herbicides and tools	Uganda, China through Kenya
Greenbelt Seeds	Yei, CE	Cereal seeds, vegetable seeds and tools	Uganda and Kenya

[229] Agro dealers in Juba shown in Table 10-12 are the major ones. Many other agro dealers might operate in Juba. Further surveys in Juba will be conducted.

[230] Century Seeds mentioned that 60% of their sales in 2011 were generated by NGOs, but currently, 70% of their sales are made to local farmers.

Kaboji's Chain and Son's Memorial Enterprise	Kajokeji, CE	Cereal seeds, vegetable seeds, fertiliser, pesticides, herbicides and tools	Uganda
Zawa Trading Company	Yambio, WE	Cereal seeds, vegetable seeds, fertiliser and tools	Uganda
Eastern Equatoria Store	Torit, EE	Vegetable seeds, maize seeds, pesticides, herbicides and tools	Kenya
Fight hunger seeds & Agro chemist	Torit, EE	Vegetable seeds, maize seeds, fertiliser and tools	Kenya and Uganda
Peace Pharmacy	Bor, Jonglei State	Vegetable seeds	Kenya
Libo Centre	Aweil, Northern Bahr El Ghazal	Vegetable seeds, pesticides, herbicides, and tools	Kenya

Source: Agro dealers, interviewed by CAMP crops subsector team, April to June, CAMP Situation Analysis.

A few more enterprising agro dealers, such as Century Seeds and Greenbelt Seeds in Yei, either hire their own extension workers or hold radio extension programmes. These extension workers follow up with their customers to provide appropriate knowledge about farming with their products. They also visit communities to promote seeds of improved varieties and/or hybrid varieties for both cereals and vegetables. These efforts, including radio programmes, have improved their business and, also, agricultural production in the targeted areas.

The common challenges are high cost of transportation and taxes, farmers' limited knowledge about agricultural inputs, lack of storage facilities, limited packing technology, lack of capital and high interest rate for loans, and fluctuations in exchange rates between South Sudanese pounds (SSP) and foreign currencies. These challenges limit their business opportunities. Some agro dealers mentioned that their profits were limited due to the high costs of operation. At the same time, high retail prices of seeds minimize the numbers of farmers who can purchase seeds.[231]

If the number of agro dealers continues to be limited across South Sudan, opportunities for farmers to improve agricultural productivity will remain limited.

10.4.7 Traditional institutions

The boma was created by the SPLM as the lowest level of government in order to enhance the administrative efficiency of the then Southern Sudan. Traditionally, a village was an administrative unit formed by a clan organised by blood-related members. A boma consists of several villages. In a village, traditional leaders include the Headman (clan leader), elders and spiritual leaders (e.g. rain maker), plus clan members who together are in charge of communal work such as cultivation, hunting and defence. They also deal with disputes which arise in the village. In some areas, a spiritual leader looks after two villages.

The chief system (boma level and up) has been incorporated into the public administration system; however, traditional institutions still play an important role at village and boma levels due to insufficient public institutional capacities.

10.5 Food crop production

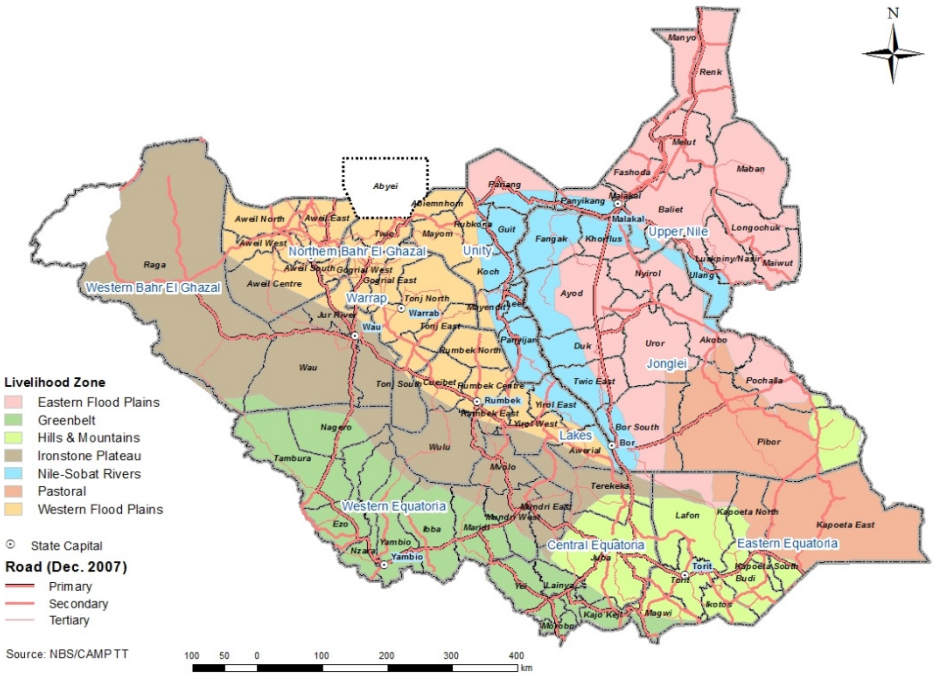
10.5.1 Livelihood Zones

South Sudan's territory is categorised into seven livelihood zones mainly based on rainfall, water availability and livelihood patterns in the areas (Figure 10-3). In general, rainfall in South Sudan gradually increases southward to the Congolese border from approximately 300 mm to 1,700 mm (Figure 10-4). Areas adjacent to the borders with Sudan and Kenya

[231] For example, the retail price of maize seeds is SSP 7-16 per kilogram.

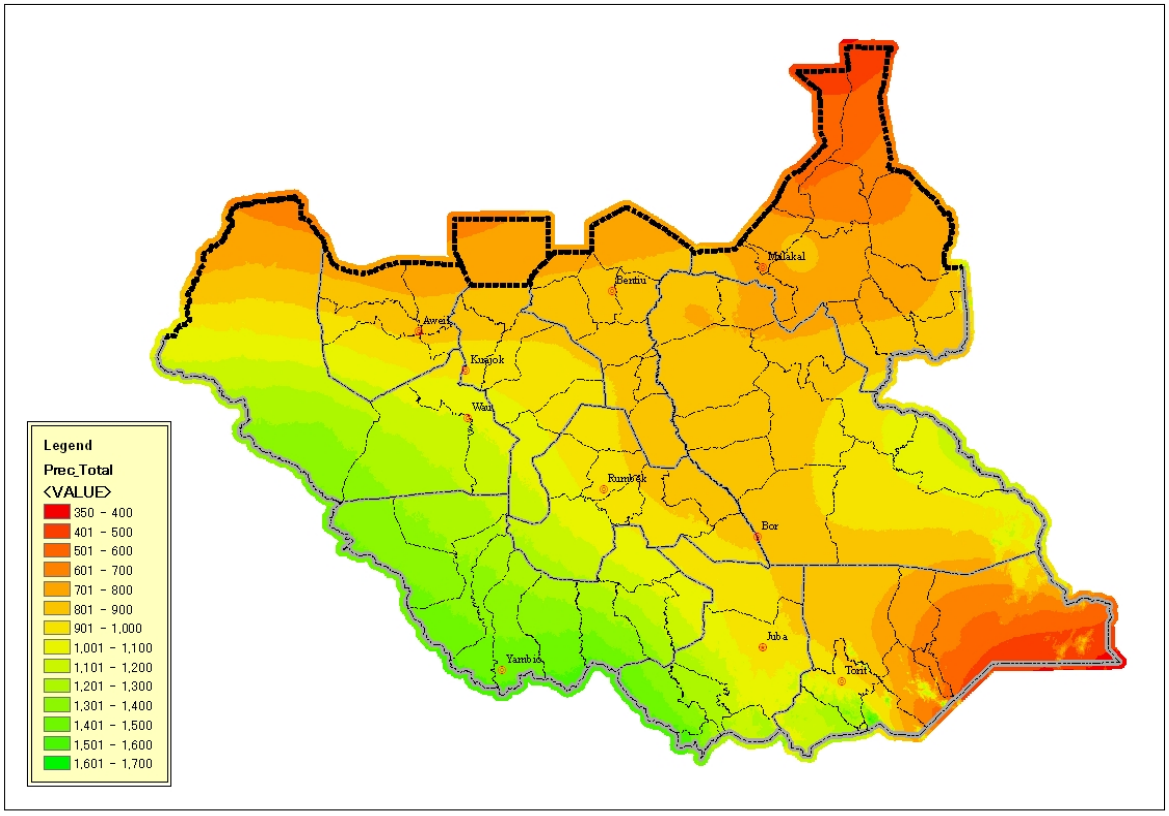
have less precipitation and are frequently affected by drought. The White Nile River flows from south to north in the eastern part of the country and is accompanied by vast marshlands.

Figure 10-3: Livelihood zones in South Sudan



Source: Data from the NBS National Baseline Household Survey 2009. Prepared by NBS / CAMP Task Team.

Figure 10-4: Annual precipitation of South Sudan



Source: Data from WorldClim. Prepared by NBS / CAMP Task Team.

Table 10-13: Livelihood zones and characteristics

Livelihood Zones	States	Characteristics
Eastern Flood Plains	• Upper Nile • Jonglei • Unity • Eastern Equatoria	• Main crops grown are sorghum and groundnuts. Sesame, bulrush millet and cowpeas are also cultivated. • The Renk scheme is a mechanised irrigated farming scheme whose command areas (command area = area benefitting from irrigation) are 654,000 ha in total.[232] Fourteen irrigation pumps for the national schemes are not operational as of June 2013. • Livestock also plays an important role in sustaining livelihoods. If there is food shortage due to seasonal food insecurity, farmers can sell or barter livestock to obtain staple foods. • Conflicts between farmers and pastoralists and among pastoralists seriously affect insecurity. • Frequent flooding occurs from August to November and this affects crop production negatively. • Fish becomes an important protein source in the flooding season.
Greenbelt	• Eastern Equatoria • Central Equatoria • Western Equatoria	• Double cropping is possible and many farmers could produce surplus to sell to markets. • Maize, sorghum, cassava, upland rice, beans and varieties of vegetables and fruit are cultivated. Coffee and tea are also high potential products. • Postharvest losses of the first season are remarkably large due

[232] GRSS. MWRI. 2010. *Assessment, Design, Installation of Irrigation Pumps and Rehabilitation of Water Control Infrastructures, Inception Phase, Preliminary Assessment Works on Renk Project, Final Report*. p.8. Juba: MWRI

Livelihood Zones	States	Characteristics
	• Western Bahr el Ghazal	to high moisture and inadequate storage facilities.
Hills and Mountains	• Jonglei • Eastern Equatoria • Central Equatoria	• Maize, sorghum, cassava, rice, wheat, beans and various vegetables and fruit are cultivated. • In higher altitude areas, production of vegetables and crops grown in cooler temperatures has high potential because these areas have the only temperate climate in the country. These areas also have high potential for perennial cash crop production such as coffee and tea. • Peri-urban vegetable production has a big potential, especially in suburbs of Juba, due to high fresh vegetable demand. • Livestock is also important for farmers to obtain cash income.
Ironstone Plateau	• Eastern Equatoria • Central Equatoria • Western Equatoria • Lakes • Warrap • Northern Bahr el Ghazal • Western Bahr el Ghazal	• Main crops grown are sorghum and groundnuts. Sesame, bulrush millet, finger millet, beans and cowpeas are also important crops in the areas. • Livestock also plays an important role for livelihood, especially for obtaining cash income if there is food shortage due to seasonal food insecurity.. • Conflicts between farmers and pastoralists and among pastoralists greatly affect insecurity and productivity. • Erratic rain seriously affects agricultural production.
Nile-Sobat Rivers	• Jonglei • Lakes • Unity • Upper Nile	• Farmers grow crops and vegetables beside the wetlands. • Wild animals in wetlands, such as elephants, hippopotamuses and baboons, damage crops frequently. • This zone is suitable for fisheries.
Pastoral	• Eastern Equatoria • Jonglei	• The zone is purely for pastoralism since vegetation cover is grass and shrubs. Insecurity issues are serious since tribal and inter-communal conflicts frequently occur in the areas.
Western Flood Plains	• Unity • Lakes • Warrap • Northern Bahr el Ghazal	• Situation is quite similar to the Eastern Flood Plains zone. • Main crops grown are sorghum and groundnuts. Sesame, bulrush millet and cowpeas are also cultivated. Lowland (or paddy rice) grows in the Aweil Irrigation Scheme. • Livestock also plays an important role for livelihood. If there is food shortage due to seasonal food insecurity, farmers can sell or barter livestock to obtain staple foods. • Conflicts between farmers and pastoralists and among pastoralists greatly affect insecurity. • Frequent flooding occurs from August to November and this affects crop production negatively. • Fish becomes an important protein source in flooding season.

Source: State and county officials, and farmers, interviewed by CAMP crops subsector team, April to June 2013, CAMP Situation Analysis.

The highest potential livelihood zone is the Greenbelt situated in the Southern part of the country. The area has a bi-modal rainfall pattern with a rainy season of approximately 8 to 9 months, allowing double cropping. Various kinds of crops (e.g. maize, cassava, upland rice and beans) and vegetables can grow in this zone. The Hills and Mountains zone is also a high potential area for crop and vegetable production. Mountainous areas in this zone are suitable for crops needing cooler weather such as wheat, white or Irish potato (solanum tuberosum), cabbage, tea and coffee. The Nile-Sobat zone holds an enormous marsh land, called the “Sudd”, which is conserved under the Ramsar Convention on Wetlands. This area has a great potential for fisheries. East and west of the Nile-Sobat zone are the Eastern and Western Flood Plains zones. These areas are mainly flat fields and are affected by frequent flooding from August to November. The Ironstone Plateau zone is situated north of the

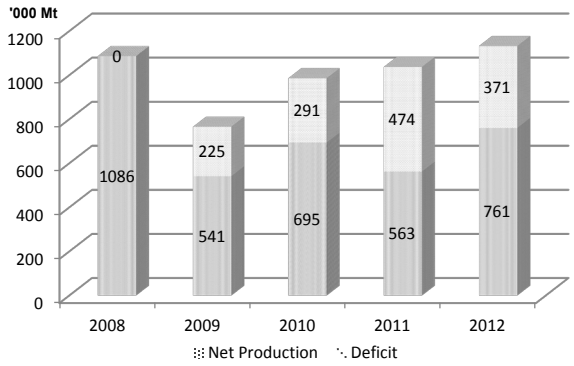
Greenbelt zone and is suitable for crops with drought resistance such as sorghum and groundnuts. Erratic rainfall severely affects crop production in this area. The Pastoral zone is suitable for pastures since the vegetation cover is grass and shrubs, due to less precipitation. The detailed characteristics of the livelihood zones are described in Table 10-13.

10.5.2 Trend of food crop production

Figure 10-5 shows the trend of cereal production and deficit in the recent five years. Net cereal production, (the amount available for consumption) was calculated as 80% of gross cereal production since estimates of postharvest losses and seeds for the next season account for 20% of gross production. Cereal demand per capita is 109 kg, which is estimated from the data of the National Baseline Household Survey 2009. Based on these estimates, South Sudan achieved cereal self-sufficiency in 2008. However, the country has not achieved that again. Production in 2009 and 2011 was relatively low mainly due to late and sporadic rainfalls and a longer dry spell respectively. Production in 2010 and 2012 was slightly better due to fair rainfall but the country was not able to produce enough cereal for domestic consumption.

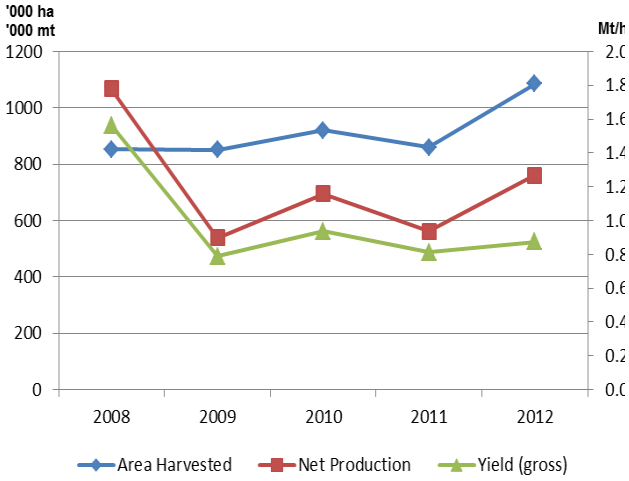
The total cereal area harvested has gradually increased since 2008 from 853,000 ha in 2008 to 1,085,000 ha in 2012 (Figure 10-6). The area harvested per capita, however, has been at the same level throughout this period since the population growth rate was almost the same as the expansion rate of cereal area harvested (Table 10-14). Cereal area harvested per capita has been about 0.1 ha. The net cereal yield has remained at a low level since 2009, ranging from 0.8 t/ha to less than 1.0 t/ha (Figure 10-6). In order to increase cereal production to achieve food self-sufficiency, both productivity per hectare (intensification) and farm expansion (extensification) need to be addressed.

Figure 10-5: Cereal net production and deficit



Source: FAO/WFP. 2013. *Crop and Food Security Assessment Mission (CFSAM) to South Sudan*. p. 25. Rome: FAO/WFP

Figure 10-6: Cereal area harvested, net yield and net production



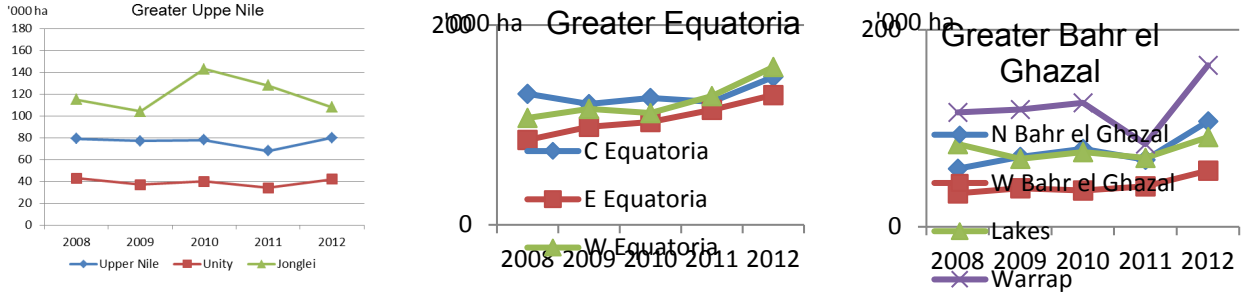
Source: FAO/WFP. 2013. *CFSAM to South Sudan*. p. 25.Rome:FAO/WFP

Table 10-14: Cereal area harvested, population and cereal area harvested by capita in South Sudan

	2008	2009	2010	2011	2012
Cereal area harvested ('000 ha) [a]	853	851	921	860	1,085
Population estimated ('000) [b]	8,473	8,941	9,415	9,897	10,386
Cereal area harvested per capita (ha) [c]	0.101	0.095	0.098	0.087	0.104
Cereal area harvested per capita (feddan) [c]	0.240	0.227	0.233	0.207	0.249

Sources:
[a] FAO Stat http://faostat.fao.org/ (accessed on 6 July 2013)
[b] NBS Statistical Year Book 2011
[c] Calculated by the CAMP Task Team, 1 feddan (70m x 60m =4,200m^2) = 0.42 ha

Figure 10-7: Trend of area harvested for cereal



Source: FAO/WFP. 2013. *CFSAM to South Sudan*. p. 25. Rome: FAO/WFP

Figure 10-7 describes the trend of cereal area harvested from 2008 to 2012. The area harvested in the three states of the Greater Upper Nile Region has not changed much. Upper Nile and Unity States have maintained almost the same area harvested for five years. In the Greater Equatoria Region, the area harvested in each state has steadily expanded. In the Greenbelt and Hills and Mountains zones, this tendency was confirmed through farmer interviews during the CAMP Situation Analysis. Some progressive farmers are rapidly expanding their area farmed. Subsistence farmers would cultivate larger areas if they had access to markets to sell their produce. In the Greater Bahr el Ghazal Region, the area farmed for cereal production has slightly increased except for Warrap State which had a large increase in 2012.

Table 10-15 shows the yields of main staple crops (i.e., cereal, sorghum and maize) in South Sudan and its neighbouring countries. Since disaggregated cereal yield data for South Sudan are not available, cereal aggregated data are utilised for South Sudan. 68% and 44% of agricultural households grow sorghum and maize respectively in South Sudan,[233] thus, it can be assumed that cereal yield is mainly composed of sorghum and maize. For this reason, yields of sorghum and maize in neighbouring countries (i.e., Sudan, Kenya, Uganda, Ethiopia and Tanzania) are compared to cereal yield in South Sudan with the aim of clarifying levels of productivity.

Aggregated cereal yield in South Sudan is relatively low compared to sorghum yields in Uganda and Ethiopia, but is similar to yields in Kenya and Tanzania. Sorghum yield in Sudan is extremely low compared to other countries although Sudan produces the largest volume of sorghum among these countries.[234] Maize yields in Uganda and Ethiopia are 2.34

[233] Definition of agricultural households is households where one or more members own or use agricultural, forest or pasture land. GRSS. NBS. 2012. *National Baseline Household Survey 2009.* p. 54. Juba: GRSS.
[234] In 2009, sorghum production in Sudan, Kenya, Uganda, Ethiopia and Tanzania was 4,192; 99; 374; 2,804; and 709 thousand tons. Data from FAO Stat. (http://faostat.fao.org/) (accessed on 6 July 2013)

and 2.49 t/ha in 2011 respectively; yields in Kenya and Tanzania have not reached 2 t/ha since 2008. Even though maize yields in Kenya and Tanzania are relatively low, they are much higher than the aggregated cereal yield of South Sudan.

Table 10-15: Yields (t/ha) of selected cereals

Country	Crop	2008	2009	2010	2011
South Sudan[a]	Cereal	1.56	0.79	0.94	0.81
Sudan (former)[b]	Sorghum	0.58	0.63	0.47	-
Kenya[b]	Maize	1.39	1.29	1.73	1.58
	Sorghum	0.52	0.57	0.73	0.63
Uganda[b]	Maize	1.47	2.5	2.3	2.34
	Sorghum	1.49	1.1	1.1	1.2
Ethiopia[b]	Maize	2.14	2.22	2.12	2.49
	Sorghum	1.51	1.74	1.84	1.84
Tanzania[b]	Maize	1.37	1.12	1.55	1.32
	Sorghum	0.92	0.81	1.29	0.99

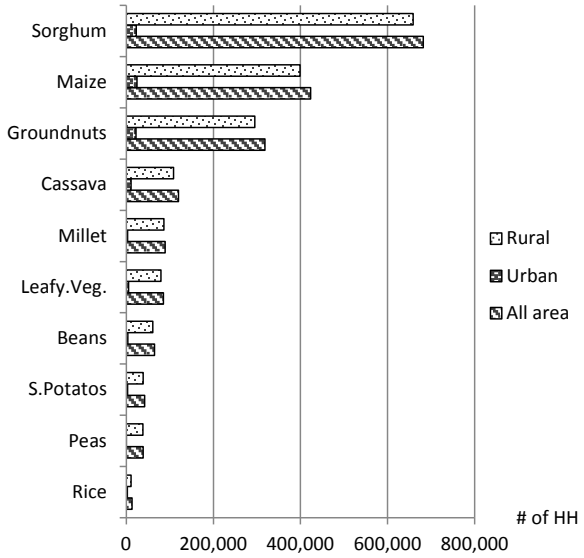
Source: [a] Gross yield calculated from FAO, CFSAM 2009 – 2012 Data
[b] Data from FAO Stat. (http://faostat.fao.org/) (accessed on 6 July 2013)

Through the situation analysis, the CAMP Task Team discovered factors that resulted in low yields of sorghum. The first is the use of traditional (or unimproved) varieties of seeds, which take longer to mature and are low yielding; some farmers cannot get access to improved high yielding seeds. In addition, rural people prefer the taste of traditional sorghum varieties which also suffer less damage from birds due to the later timing of their milk and ripening stages. Secondly, sorghum usually grows in areas of less precipitation where rainfall has tended to be erratic recently. Farmers are cultivating sorghum without irrigation which makes sorghum yields low.

10.5.3 Food crop production areas and agricultural practices

Staple crops in South Sudan are sorghum, maize, cassava, millet, sweet potatoes and rice (Figure 10-8). Among them sorghum is the most important staple crop. Table 10-16 indicates that sorghum is cultivated by more than half of the total households in South Sudan. Approximately 80% of the households in Northern Bahr el Ghazal State grow sorghum. Sorghum is also cultivated by 79%, 73% and 67% of the households in Eastern Equatoria, Lakes and Jonglei States respectively.

Figure 10-8: Number of households harvesting crops (Top 10) in 2008/2009



Source: Data from the National Baseline Household Survey 2009. Prepared by NBS / CAMP Task Team

Table 10-16: Number of households producing major staple crops by state in 2009

State	U/R	total HH		Sorghum		Maize		Cassava		Rice		Millet	
Whole Nation	Total	1,310,316	100.0%	681,819	52.0%	423,401	32.3%	120,053	9.2%	13,839	1.1%	89,703	6.8%
	Urban	199,740	15.2%	23,236	1.8%	24,680	1.9%	11,526	0.9%	2,763	0.2%	3,160	0.2%
	Rural	1,110,576	84.8%	658,584	50.3%	398,720	30.4%	108,526	8.3%	11,076	0.8%	86,543	6.6%
Upper Nile	Total	142,438	100.0%	26,713	18.8%	67,979	47.7%	-	0.0%	151	0.1%	715	0.5%
	Urban	33,613	23.6%	2,713	1.9%	3,015	2.1%	-	0.0%	151	0.1%	301	0.2%
	Rural	108,825	76.4%	23,999	16.8%	64,964	45.6%	-	0.0%	-	0.0%	414	0.3%
Jonglei	Total	192,424	100.0%	129,220	67.2%	83,061	43.2%	4,327	2.2%	632	0.3%	1,082	0.6%
	Urban	15,565	8.1%	4,824	2.5%	4,096	2.1%	-	0.0%	91	0.0%	-	0.0%
	Rural	176,859	91.9%	124,396	64.6%	78,965	41.0%	4,327	2.2%	541	0.3%	1,082	0.6%
Unity	Total	72,114	100.0%	12,556	17.4%	37,949	52.6%	366	0.5%	67	0.1%	732	1.0%
	Urban	12,120	16.8%	1,398	1.9%	3,196	4.4%	-	0.0%	67	0.1%	-	0.0%
	Rural	59,994	83.2%	11,157	15.5%	34,753	48.2%	366	0.5%	-	0.0%	732	1.0%
Warrap	Total	169,505	100.0%	88,464	52.2%	58,261	34.4%	1,255	0.7%	951	0.6%	9,013	5.3%
	Urban	13,070	7.7%	3,554	2.1%	1,376	0.8%	-	0.0%	115	0.1%	229	0.1%
	Rural	156,435	92.3%	84,910	50.1%	56,885	33.6%	1,255	0.7%	837	0.5%	8,784	5.2%
Northern Bahr El Ghazal	Total	133,563	100.0%	106,628	79.8%	5,154	3.9%	-	0.0%	144	0.1%	966	0.7%
	Urban	8,255	6.2%	1,292	1.0%	-	0.0%	-	0.0%	144	0.1%	-	0.0%
	Rural	125,308	93.8%	105,336	78.9%	5,154	3.9%	-	0.0%	-	0.0%	966	0.7%
Western Bahr El Ghazal	Total	58,691	100.0%	26,566	45.3%	7,352	12.5%	7,567	12.9%	-	0.0%	332	0.6%
	Urban	25,932	44.2%	4,239	7.2%	1,496	2.5%	3,906	6.7%	-	0.0%	332	0.6%
	Rural	32,759	55.8%	22,327	38.0%	5,856	10.0%	3,660	6.2%	-	0.0%	-	0.0%
Lakes	Total	92,323	100.0%	67,569	73.2%	15,562	16.9%	9,281	10.1%	-	0.0%	22,987	24.9%
	Urban	6,476	7.0%	747	0.8%	249	0.3%	-	0.0%	-	0.0%	249	0.3%
	Rural	85,847	93.0%	66,821	72.4%	15,313	16.6%	9,281	10.1%	-	0.0%	22,738	24.6%
Western Equatoria	Total	116,336	100.0%	35,292	30.3%	57,513	49.4%	58,586	50.4%	11,383	9.8%	28,783	24.7%
	Urban	15,280	13.1%	2,101	1.8%	8,022	6.9%	5,539	4.8%	2,197	1.9%	1,815	1.6%
	Rural	101,056	86.9%	33,191	28.5%	49,491	42.5%	53,047	45.6%	9,187	7.9%	26,968	23.2%
Central Equatoria	Total	179,071	100.0%	67,634	37.8%	54,994	30.7%	31,286	17.5%	511	0.3%	6,369	3.6%
	Urban	56,357	31.5%	1,164	0.7%	2,329	1.3%	1,630	0.9%	-	0.0%	233	0.1%
	Rural	122,714	68.5%	66,470	37.1%	52,665	29.4%	29,656	16.6%	511	0.3%	6,136	3.4%
Eastern Equatoria	Total	153,851	100.0%	121,176	78.8%	35,576	23.1%	7,386	4.8%	-	0.0%	18,724	12.2%
	Urban	13,072	8.5%	1,202	0.8%	902	0.6%	451	0.3%	-	0.0%	-	0.0%
	Rural	140,779	91.5%	119,974	78.0%	34,675	22.5%	6,935	4.5%	-	0.0%	18,724	12.2%

Source: Data from the National Baseline Household Survey 2009. Prepared by NBS / CAMP Task Team

The second staple crop is maize. About 32% of the households cultivate maize. Maize is grown not only in the Greater Equatoria Region but also the Greater Upper Nile Region (i.e., Unity, Upper Nile and Jonglei States). Farmers in the Greater Equatoria Region produce

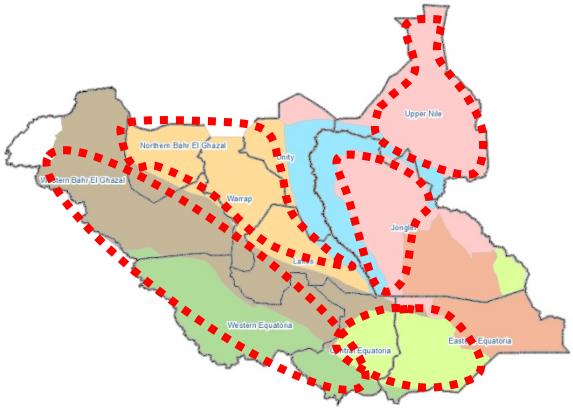
maize and process it into flour to consume as a staple food such as *posho* and *kisira*. Meanwhile, in the Greater Upper Nile Region, farmers usually cultivate maize in small patches to consume fresh as a supplementary food.

Cassava is the third important crop, cultivated mainly in the Greater Equatoria Region. Upland rice (non-irrigated) is mainly grown in Western Equatoria State and lowland rice in northern flooding areas. Millet is grown mainly in Western Equatoria and Lakes States.

10.5.3.1 Sorghum

Sorghum is grown throughout most of South Sudan. Main production areas are the Ironstone Plateau, Greenbelt, Hills and Mountains and Flood Plains zones (Figure 10-9). Cultivars are mainly traditional varieties, which take almost eight months to mature but some modern varieties, which are high yielding and early maturing with a three-month growing period, are also cultivated. Names of modern varieties are Serena, Go'do, Gadam el hamam, Kavi matama and Wad Ahmed. Usually sorghum is cultivated by mixed cropping (growing multiple crops on the same piece of land) with groundnuts, beans, cowpeas and pumpkins. Usually, seeds are broadcast (or scattered) at planting time making weeding difficult. Since farmers weed manually with simple tools, weeding is very labour intensive during the growing period. Birds (e.g., quelea quelea) are the most serious pest and cause serious damage to sorghum especially in the milk stage. During the situation analysis, some farmers interviewed in Renk County mentioned that many farmers could harvest less than 1 sack (about 100 kg) per feddan in 2012, which is equivalent to a yield of 0.24 t/ha, due to damage from quelea quelea. Locusts are also a serious pest damaging the plants by eating leaves.

Figure 10-9: Main areas of sorghum production



Source:Prepared by CAMP Task Team

Table 10-17: Consumption of sorghum in 2009

State	Urban/ Rural	Annual consumption (% to the total)					Total (ton/year)	Population (person)	Per person consumption (kg/year/person)
		From purchased	From own stock	From own production	From gift and other sources	Total			
Upper Nile	Urban	42%	39%	19%	0%	100%	14,648	243,938	60 kg/year
	Rural	63%	17%	14%	7%	100%	62,723	720,415	87 kg/year
Jonglei	Urban	76%	10%	11%	3%	100%	20,951	129,341	162 kg/year
	Rural	53%	10%	34%	3%	100%	156,435	1,229,261	127 kg/year
Unity	Urban	76%	17%	5%	2%	100%	9,002	120,992	74 kg/year
	Rural	78%	8%	10%	3%	100%	30,145	465,966	65 kg/year
Warrap	Urban	72%	12%	13%	3%	100%	8,672	84,887	102 kg/year
	Rural	55%	18%	25%	2%	100%	136,433	888,041	154 kg/year
Northern Bahr el Ghazel	Urban	87%	7%	2%	3%	100%	6,584	55,398	119 kg/year
	Rural	62%	11%	23%	4%	100%	105,317	665,500	158 kg/year
Western Bahr el Ghazel	Urban	-	-	-	-	-	-	-	- kg/year
	Rural	-	-	-	-	-	-	-	- kg/year
Lakes	Urban	63%	10%	24%	3%	100%	8,494	65,033	131 kg/year
	Rural	52%	14%	30%	4%	100%	166,570	630,697	264 kg/year
Western Equtoria	Urban	75%	12%	11%	2%	100%	3,445	100,034	34 kg/year
	Rural	47%	8%	41%	5%	100%	27,421	518,995	53 kg/year
Central Equatoria	Urban	91%	2%	3%	4%	100%	11,323	382,362	30 kg/year
	Rural	74%	6%	18%	2%	100%	41,940	721,230	58 kg/year
Eastern Equatoria	Urban	62%	3%	35%	0%	100%	4,633	80,420	58 kg/year
	Rural	29%	24%	44%	3%	100%	98,359	825,706	119 kg/year
	Urban average	71%	14%	13%	2%	100%	87,751	1,262,405	70 kg/year
	Rural average	54%	14%	28%	4%	100%	825,343	6,665,811	124 kg/year
	National average	56%	14%	27%	3%	100%	913,094	7,928,216	115 kg/year

Note: Data of Western Bahr el Ghazal is not available.
Source: Data from the National Baseline Household Survey 2009. Prepared by NBS / CAMP Task Team

Table 10-17 shows consumption of sorghum in 2009. Although the data for Western Bahr el Ghazal are not available, the data describe a general tendency. More than half of sorghum consumed in rural areas was purchased and more than 40% was self-produced. Thus, sorghum markets seem to be actively functioning even in rural areas. A large volume of sorghum was imported from Sudan before the closure of the border in 2011. This imported sorghum was mainly consumed in the northern part of the country.[235] Rural people in Jonglei, Warrap, Northern Bahr el Ghazal and Eastern Equatoria States consume more than 100kg/year; in Lakes, rural people consume 264 kg/year.

10.5.3.2 Maize

Maize is grown mainly in the Greenbelt and Hills and Mountain zones (Figure 10-10). In the northern part of the country, farmers grow maize in small patches near their homes as supplementary food. Maize is the second staple food for the South Sudanese. Cultivars are mainly open pollinated varieties[236] but some progressive and large-scale farmers have started using hybrid varieties imported from Kenya and Uganda. Both types take almost five months to mature. Names of varieties are Longe 4, 5, 8 and 9, and Yei 2.[237]

Maize seeds are sown in rows since a maize seed is much larger than a sorghum seed, which is usually broadcast. Farmers can sow larger seeds in rows. Between rows of planted maize, other crops such as groundnuts, beans, cowpeas and pumpkin are cultivated.

Post-harvest losses of the first cropping season (May-September) in the Greenbelt zone are extremely high due to high humidity and poor storage facilities. Wild animals (e.g., monkeys, baboons and squirrels) or livestock can cause serious damage to maize plants. Insect pests (e.g., locust, termite and stem bore) are another large factor for decreasing productivity.

[235] Even after the border with Sudan was closed, some informal trade continued. During the CAMP Situation Analysis it was confirmed that in the northern areas, such as Upper Nile, Warrap, Northern and Western Bahr el Ghazal states, sorghum, wheat flour and some vegetables were imported from Sudan.

[236] Many farmers use their own seeds obtained from harvest in the previous season.

[237] 2011. *Seed System Security Assessment South Sudan November-December 2010*, p. 51.

Figure 10-10: Main areas of maize production

Source:Prepared by CAMP Task Team

10.5.3.3 Cassava

Cassava is grown mainly in the Greenbelt and Hills and Mountain zones. 13% of agricultural households[238] and 25% of rural households cultivated cassava in Western Equatoria State, which is a growing centre for cassava (see Table 10-16). TME 14, Nase 1 and 2, and Oreste are varieties preferred by farmers;[239] TME 14 and Oreste are cassava mosaic virus tolerance varieties. Cassava takes more than one year to mature. Farmers can harvest tubers at any time when necessity arises, so cassava is an important food to cope with food shortages during the period of seasonal food insecurity. Leaves of cassava are also utilised as a green vegetable.

Cassava stocks are planted in rows and usually farmers do not practice mixed cropping. Cassava mosaic virus and brown streak virus diseases could become a serious threat for cassava growers in the Greater Equatoria Region. Cassava brown streak virus disease comes from Uganda and Kenya and could cause substantial losses if proper disease control is not carried out.[240] However, effective disease control and quarantine systems do not exist. If these diseases spread rapidly in the production areas, it would be a major cause of food insecurity.

[238] GRSS. NBS 2012. *National Baseline household Survey 2009*. Juba. GRSS. p54. Juba: NBS

[239] Footnote 22 (Seed System Security Assessment South Sudan November-December 2010, p 51)

[240] The New Nation. June 23- July 7 2013. *S. Sudan hit by cassava diseases*. p20. Juba.

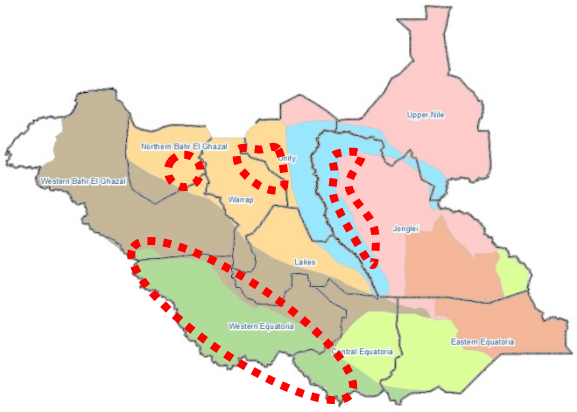
Figure 10-11: Main areas of cassava production

Source:Prepared by CAMP Task Team

10.5.3.4 Rice

The main areas of rice production are shown in Figure 10-12. Currently, the volume of rice production is not significant but rice could substantially contribute to enhancing food security at both household and national levels since rice imports have been increasing in recent years.[241] There are some large areas with potential for rice production. Upland rice grows mainly in the Greenbelt zones. Cultivars of upland rice (NERICA 1, 4 and 10) are cultivated and are newly introduced from Uganda.

Figure 10-12: Main areas of rice production



Source:Prepared by CAMP Task Team

Lowland rice (or paddy rice) could grow in the areas that flood in the Eastern and Western Flood Plains and Nile Sobat zones; however, this is not fully exploited so far. Lowland rice is also cultivated in the Aweil Irrigation Rice Scheme (AIRS) in Northern Bahr el Ghazal State. AIRS is a national irrigation scheme and about 2,700 feddans of farmland are operational in 2013, although 11,000 feddans were intended to be irrigated. Cultivars in the scheme are BR 4 and BG 400-1, and yield level is about 1 to 1.5 t/ha.

[241] Net weight rice exports of Uganda to Sudan (primarily South Sudan) more than doubled from 5,072,413 tons in 2010 to 11,590,109 tons 2011. COMSTAT. http://comstat.comesa.int/DataQuery.aspx (accessed on 18 July 2013)

10.5.4 Types of farmers

10.5.4.1 Overview of farm households

The dataset of the National Baseline Household Survey 2009 shows that among households that harvested crops in the season 2008/2009,[242] 47% harvested only one crop and 30% two crops (Table 10-18). These figures show that diversification of cultivated crops per household was very limited as 77% of households harvested only one or two crops. Especially in rural areas, farmers tend to concentrate on growing one or two types of crops.

Table 10-18: Number of crop(s) harvested by households

# of crops cultivated	All areas		Urban		Rural	
	#	%	#	%	#	%
1	402,280	*47.0*	16,696	*28.5*	385,585	*48.3*
2	257,955	*30.1*	17,044	*29.1*	240,911	*30.2*
3	90,842	*10.6*	10,031	*17.2*	80,810	*10.1*
4	56,025	*6.5*	9,567	*16.4*	46,458	*5.8*
5	21,950	*2.6*	799	*1.4*	21,151	*2.7*
6	16,833	*2.0*	2,931	*5.0*	13,902	*1.7*
7	5,372	*0.6*	739	*1.3*	4,633	*0.6*
8	3,896	*0.5*	411	*0.7*	3,485	*0.4*
9	1,191	*0.1*	262	*0.4*	930	*0.1*
total	856,344	*100.0*	58,480	*100.0*	797,864	*100.0*

Source: Data from the National Baseline Household Survey 2009. Prepared by NBS / CAMP Task Team

Table 10-19: Number of plots cultivated by household

# of plots cultivated	All areas		Urban		Rural	
	#	%	#	%	#	%
1	842,783	*84.1*	40,419	*85.2*	802,364	*84.1*
2	114,981	*11.5*	4,755	*10.0*	110,226	*11.5*
3	33,219	*3.3*	1,209	*2.5*	32,010	*3.4*
4	8,461	*0.8*	1,083	*2.3*	7,378	*0.8*
5	975	*0.1*	-	*0.0*	975	*0.1*
6	1,441	*0.1*	-	*0.0*	1,441	*0.2*
total	1,001,860	*100.0*	47,467	*100.0*	954,394	*100.0*

Source: Data from the National Baseline Household Survey 2009. Prepared by NBS / CAMP Task Team

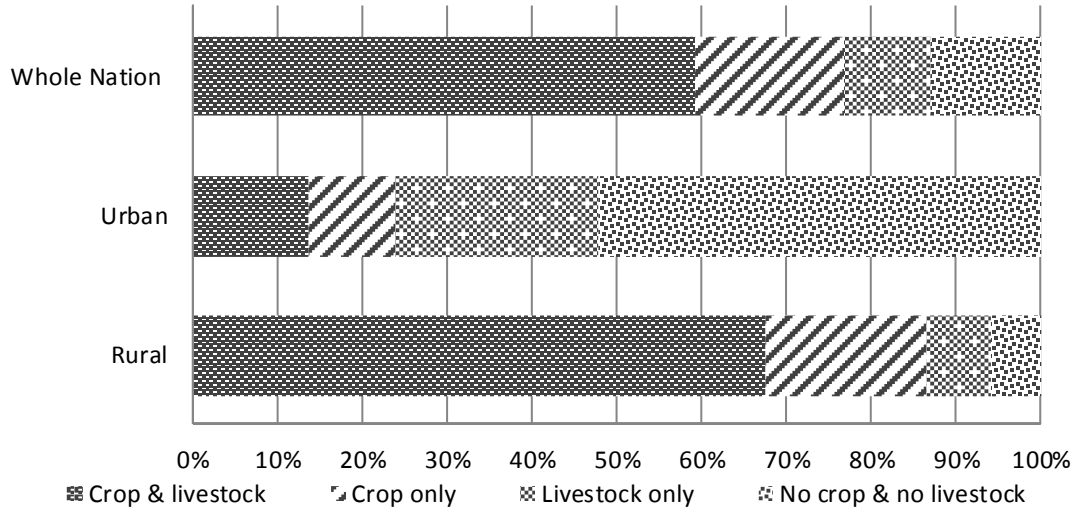
Among the households which cultivated any crops in the season 2008/2009,[243] about 84% cultivated only one plot (farmland) and 12% two (Table 10-19). Approximately 96% of households, which cultivated any crops, used only one or two plots. This is almost the same in both urban and rural areas.

[242] Based on the NBS dataset, the total number of households is about 1,310,000 in 2009, and about 856,000 households harvested at least one crop in the season of 2008/2009.

[243] Based on the NBS dataset, the total number of households is about 1,310,000 in 2009, and about 1,002,000 households cultivated farm(s) in the season of 2008/2009.

Figure 10-13: Proportion of households by status of owning agricultural land and livestock

in 2009



Source: Data from the National Baseline Household Survey 2009. Prepared by NBS / CAMP Task Team

Approximately 60% of households owned land for both crop production and livestock while 18% owned land only for crop production (Figure 10-13). The detailed breakdown by state is shown in Table 10-20. In Jonglei, Lakes, Warrap and Unity States, agro-pastoralism was very common. In Western Equatoria State, slightly less than half of households concentrated on crop production. In Unity, Upper Nile and Warrap States, the number of households concentrating on livestock was relatively large compared to other states.

The estimated average area growing crops per household was 1.12 ha, which is equivalent to 2.7 feddans, in 2012.[244] These general figures show that the majority of households are engaged in farming relatively small areas with only a few types of crops. They are also keeping livestock.

For the CAMP Situation Analysis, the CAMP Task Team defined three types of farmers: 1) subsistence farmers who cultivate small areas (1 to 4 feddans) and grow crops mainly for their own consumption; 2) progressive farmers who produce a surplus for selling (transforming to commercial farming); and 3) large-scale farmers who cultivate more than 100 feddan. When the team selected farmers to interview, they took into account the distance between the farmers' homes and major markets since it is probable that distance to market might affect their production patterns.

[244] FAO/WFP. 2013. *CFSAM to South Sudan*. p. 14. Rome: FAO/WFP

Table 10-20: Proportion of households by status of owning agricultural land and livestock by state in 2009

State	U/R	total # of HH	Crop production & Livestock		Crop production only		Livestock only		No crop production & no livestock	
			#	%	#	%	#	%	#	%
Whole Nation	Total	1,310,316	775,646	59.2	231,702	17.7	133,941	10.2	169,026	12.9
	Urban	199,740	27,156	2.1	20,406	1.6	47,929	3.7	104,249	8.0
	Rural	1,110,576	748,491	57.1	211,296	16.1	86,012	6.6	64,777	4.9
Upper Nile	Total	142,438	80,132	56.3	12,077	8.5	21,877	15.4	28,353	19.9
	Urban	33,613	4,823	3.4	904	0.6	12,360	8.7	15,525	10.9
	Rural	108,825	75,309	52.9	11,172	7.8	9,517	6.7	12,827	9.0
Jonglei	Total	192,424	137,505	71.5	27,059	14.1	22,511	11.7	5,349	2.8
	Urban	15,565	3,914	2.0	1,638	0.9	6,827	3.5	3,186	1.7
	Rural	176,859	133,591	69.4	25,420	13.2	15,685	8.2	2,163	1.1
Unity	Total	72,114	45,149	62.6	4,973	6.9	13,956	19.4	8,036	11.1
	Urban	12,120	3,263	26.9	1,132	1.6	4,262	5.9	3,463	4.8
	Rural	59,994	41,886	69.8	3,841	5.3	9,694	13.4	4,573	6.3
Warrap	Total	169,505	116,758	68.9	18,107	10.7	25,769	15.2	8,871	5.2
	Urban	13,070	4,242	2.5	1,376	0.8	5,274	3.1	2,178	1.3
	Rural	156,435	112,516	66.4	16,731	9.9	20,495	12.1	6,692	3.9
Northern Bahr El Ghazal	Total	133,563	78,673	58.9	35,114	26.3	7,915	5.9	11,861	8.9
	Urban	8,255	718	8.7	646	0.5	1,795	1.3	5,097	3.8
	Rural	125,308	77,955	62.2	34,468	25.8	6,120	4.6	6,765	5.1
Western Bahr El Ghazal	Total	58,691	16,935	28.9	15,451	26.3	4,058	6.9	22,246	37.9
	Urban	25,932	1,745	3.0	5,569	9.5	1,496	2.5	17,122	29.2
	Rural	32,759	15,190	25.9	9,883	16.8	2,562	4.4	5,124	8.7
Lakes	Total	92,323	71,592	77.5	9,779	10.6	6,311	6.8	4,641	5.0
	Urban	6,476	1,059	1.1	498	0.5	2,366	2.6	2,553	2.8
	Rural	85,847	70,534	76.4	9,281	10.1	3,944	4.3	2,088	2.3
Western Equatoria	Total	116,336	41,351	35.5	56,281	48.4	4,692	4.0	14,011	12.0
	Urban	15,280	4,011	3.4	6,494	5.6	1,433	1.2	3,343	2.9
	Rural	101,056	37,340	32.1	49,787	42.8	3,260	2.8	10,669	9.2
Central Equatoria	Total	179,071	80,048	44.7	26,451	14.8	20,240	11.3	52,332	29.2
	Urban	56,357	2,329	1.3	1,397	0.8	10,014	5.6	42,617	23.8
	Rural	122,714	77,719	43.4	25,054	14.0	10,226	5.7	9,715	5.4
Eastern Equatoria	Total	153,851	107,503	69.9	26,410	17.2	6,611	4.3	13,326	8.7
	Urban	13,072	1,052	8.0	751	0.5	2,104	1.4	9,165	6.0
	Rural	140,779	106,451	75.6	25,659	16.7	4,508	2.9	4,161	2.7

Source: Data from the National Baseline Household Survey 2009. Prepared by NBS / CAMP Task Team

10.5.4.2 Subsistence farmers

In view of the sector policy objectives of MAFCRD, the main focuses of CAMP will be food security and poverty reduction in addition to economic development. Therefore, it is crucial to understand the situation of subsistence farmers who are the majority of the rural population in order to formulate effective programmes and projects for them.

In this context, the CAMP Task Team conducted interviews with 113 farmers in ten states (Table 10-21) during the situation analysis. The team selected a larger number of subsistence farmers to interview to accurately know their situation. 96 out of the 113 farmers interviewed were subsistence farmers. Their typical characteristics and situation revealed through the interviews are as follows:

- Subsistence farmers mainly use family and communal labour for farming activities (e.g., ploughing, sowing, weeding and harvesting). They usually do not have enough

funds to hire labourers. Ploughing, weeding and harvesting are labour intensive work, so it is difficult for them to expand the area cultivated using only family labour.

- Some of the subsistence farmers try to hire labourers, but the cost of labour is extremely high and the supply of labourers is limited. Thus, they sometimes give up trying to expand their cultivated area. There is a tendency for young people not to want to farm, so scarcity of labour for farming is becoming a serious issue.
- Subsistence farmers use hand tools for farming, e.g., hoes, pangas, malodas (traditional hoes), knives, sickles and axes. Even though they try to open and clear new areas for farming, they can only prepare a few feddans using manual labour and hand tools.
- Subsistence farmers cannot afford to use agricultural inputs because of limited funds and unavailability of inputs. They use traditional varieties of seeds which are obtained from their own harvest of the previous season and are a mixture of unknown varieties which do not give high yields. Since they are practicing rain-fed, low input farming, yields are usually quite low and production is sometimes not enough to feed household members throughout the year.
- Subsistence farmers in the Greenbelt zone are suffering from large postharvest losses in the first season.[245] They generally use traditional storage facilities for grains and dried cassava, which sometimes do not perform well due to high humidity. Storage capacity is also limited.
- A relatively large number of subsistence farmers are keeping small ruminants (e.g. goats and sheep) and chickens. If there is food shortage due to seasonal food insecurity, they sell these to obtain cash for purchasing food.
- Insecurity is severely affecting the livelihoods of subsistence farmers. Due to intercommunal or tribal conflicts, some farmers leave their homes and become Internally Displaced Persons (IDPs). If this happens at an early stage of the rainy season, they are unable to plough their land and sow seeds and might face serious food insecurity.

Table 10-21: Number of farmer interviewees for situation analysis

State	Subsistence		Progressive		Large Scale		Total
	Near [a]	Far [b]	Near	Far	Near	Far	
Eastern Equatoria State	9	17	0	0	2	1	29
Central Equatoria State	7	6	1	0	0	0	14
Western Equatoria State	0	8	0	0	0	0	8
Jonglei	1	7	0	0	0	0	8
Unity	3	4	1	0	0	0	8
Upper Nile	1	2	1	2	0	2	8
Northern Bahr el Ghazal	6	5	0	0	0	0	11
Western Bahr el Ghazal	4	4	0	0	1	0	9
Warrap	2	5	0	0	0	0	7
Lakes	2	3	4	1	1	0	11
Sub-total	**35**	**61**	**7**	**3**	**4**	**3**	**113**

Note: [a] Farmers live near county capitals (markets), within about 10km radius.
[b] Farmers live far from county capitals (markets), outside of 10km radius.
Source: CAMP Situation Analysis from April to June 2013

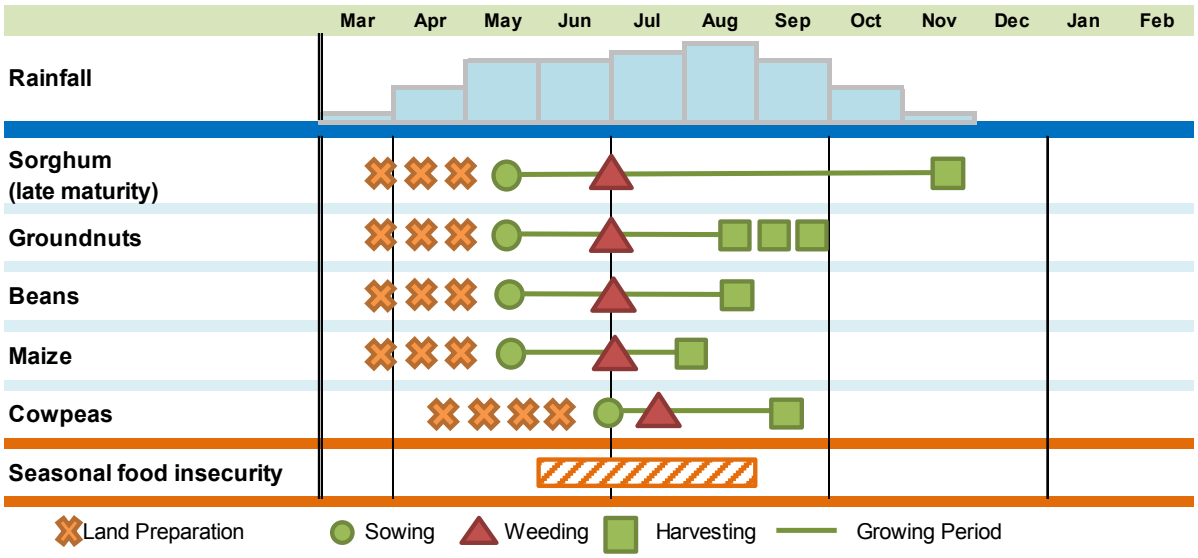
Through interviews with subsistence farmers, the CAMP Task Team could confirm their cropping patterns as illustrated in the following figures. They mainly cultivate a few staple cereal crops, such as sorghum and maize, and also grow other crops like groundnuts, tubers (e.g., cassava and sweet potato), beans, sesame and some green leafy vegetables. Family

[245] There are two crop seasons in the Greenbelt.

members consume most of the produce; some farmers have to purchase additional food from markets.

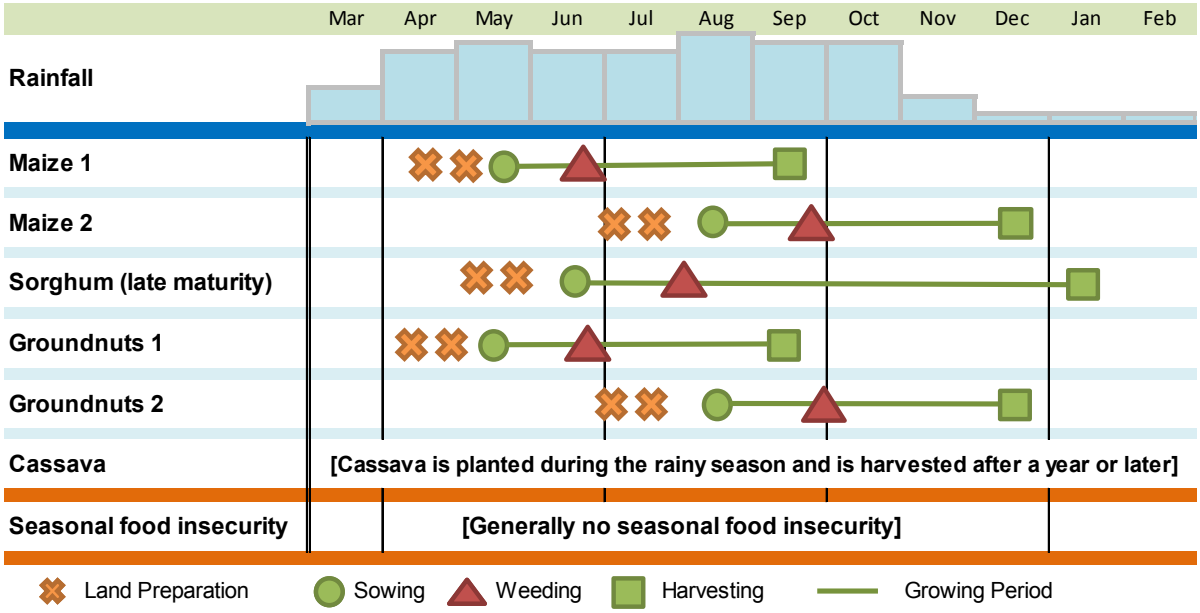
In Rumbek, Unity State in the Ironstone Plateau zone, the majority of subsistence farmers cultivate sorghum and groundnuts mixed cropping (Figure 10-14). Since the soil type is sandy loam, groundnuts, which prefer well drained soil, grow well and are harvested easily due to less soil stickiness. Some farmers can produce surplus groundnuts but the sorghum harvest is sometimes not sufficient for home consumption. Many farmers use ox ploughs since NGOs are promoting this new technology; also, sandy soil is suitable for ox ploughs. The period of seasonal food insecurity in this area is from June to August. If farmers face food shortages, they sell their small ruminants such as goats and sheep or ask relatives for support.

Figure 10-14: Crop calendar of subsistence farmers in Rumbek, Lakes State (Ironstone Plateau zone)



Source: Farmers, interviewed by CAMP crops subsector team, May 2013, CAMP Situation Analysis

Figure 10-15: Crop calendar of subsistence farmers in Yambio, Western Equatoria State (Greenbelt zone)



Source: Farmers, interviewed by CAMP crops subsector team, April 2013, CAMP Situation Analysis

In Yambio, Western Equatoria State in the Greenbelt zone, the majority of subsistence farmers cultivate maize and/or sorghum with groundnuts mixed cropping (Figure 10-15). They also cultivate cassava for tubers, leaves and stalk. Cassava leaves are a very important green vegetable for farming households in this area and palatability of leaves is one of the key criteria for selecting cultivars. Stalks are used as firewood. The rainfall pattern is bi-modal so farmers are able to cultivate two crops in a year. Due to heavily forested land, it is difficult for farmers to open up new areas for farming manually. Many large tree stumps remain in the ground and this can hinder the use of tractors. Many farmers can produce surplus maize to sell in Yambio market. Seasonal food insecurity is not a major problem in this area since farmers can produce enough agricultural products year round. Western Equatoria State was the only state to produce a cereal surplus in the 2012/13 season.[246]

Two typical cases of subsistence farmers in Northern Bahr el Ghazal and Central Equatoria States are shown in Box 10-1.

Box 10-1: Cases of subsistence farmers

[Case 1] In Northern Bahr el Ghazal State

This farmer is cultivating two mogomat (area of 30m by 20m, which is equivalent to 1/7 feddan); one mogomat for sorghum and a half each for sesame and groundnuts. He also owns twenty cattle and ten goats. Sorghum planted was a late maturing variety (traditional one), which needs eight months to mature. He was using traditional manual tools for land preparation, weeding and harvesting.

He harvested 3 bags (100kg/bag) of sorghum, 1.5 bags (100kg/bag) of sesame and 5 bags (50kg/bag) of groundnuts in 2012. He bartered 1 bag of sorghum and 2 bags of groundnuts for cattle. However, he mentions that he would have to purchase sorghum from the market during the period of seasonal food insecurity from July to August. He is very keen on livestock and is eager to increase the number although he feels there is not enough food for

[246] FAO/WFP. 2013. *CFSAM to South Sudan*. p. 24. Rome: FAO/WFP

them. It seems that social aspects heavily influence agricultural practices in this area.

[Case 2] In Central Equatoria State

This farmer is cultivating two feddans; one feddan for maize and a half each for sorghum and cassava. He also owns six cattle, seven goats and ten chickens. He plants maize in rows using a rope to ensure straight rows and to set equal planting distances following the recommendation of an Agricultural Extension Officer (AEO). He uses his own maize seed and improved ones purchased from a market, which costs 14SSP for 2kg. He used traditional manual tools (e.g. hoe, axe, rake, fork hoe and panga) for land preparation, weeding and harvesting.

He harvested 12 bags (100kg/bag) of maize through 2 crop seasons in 2012/13, and 6 bags of sorghum and 17 bags of dried cassava[247] in 2012. Damage by monkeys and birds was very serious, so he thinks 65% of produce was lost. He, however, could maintain relatively good yield levels, since he was following instructions provided by the AEO. He could sell 3 bags of maize, 4 bags of sorghum and 9 bags of cassava to a market and his neighbours, especially from May to June, which is the highest price season of this produce. His son carries the produce to markets by his bicycle to sell to a trader but road conditions are very poor. He collects market information from neighbours and the boma headquarters.

Source: Farmer, interviewed by CAMP crops subsector team, Yei River, 23 May 2013, CAMP Situation Analysis.

Table 10-22: Issues of subsistence farmers

Items	Issues
Land preparation	▪ Tractor services are not available in many places, so the farmers cannot cultivate larger areas. Tractor hire cost is usually high even when tractor services are available. ▪ Ox ploughs are used in limited areas (e.g., Lakes and Warrap States) due to limited support services, unavailability of tools and unfavourable soil types (sandy loam is suitable for animal traction). ▪ Family manual labour is limited. Utilisation of hired labour is also difficult due to high cost and limited availability.
Inputs	▪ Quality seeds are sometimes not available in markets since there are no agro-dealers in some areas. The majority of farmers use their own seeds from the last harvest, which tend to be low quality and mixed with different varieties. ▪ Chemical fertiliser is not available in almost the entire country except for some agro-dealers supported by Development Partners (DPs).
Cultivation	▪ Since weeding is very labour intensive; this hinders expansion of the area farmed. Mixed cropping makes weeding difficult so many farmers weed by hand and/or with special small hoes. ▪ The farmers try row planting for maize, groundnuts and beans but broadcast sorghum and sesame. Weeding becomes very hard if they broadcast.
Pest and diseases	▪ Pesticides and herbicides are rarely available in rural areas. ▪ Quelea quelea (birds) seriously damage sorghum in the northern part of the country (especially in Renk County and other sorghum production areas). ▪ Other animal pests, such as monkeys, baboons and squirrels, and livestock also cause serious damage to crops. Fencing is one of the measures to prevent damage but many farmers do not have the funds to do this.
Post-harvest activities	▪ First season crops in the Greenbelt zone are frequently damaged by fungus due to high humidity. ▪ Stored grains are damaged by weevils and rats since farmers lack modern storage facilities.

[247] Usually, bitter cassava is soaked in water to remove toxic substances and then it is dried.

Items	Issues
Marketing	▪ Many of the farmers cannot obtain timely market price information. Even if they can get market information, it is difficult for them to send products to markets because of lack of transport and bad road conditions. ▪ There are a limited number of traders who buy products from subsistence farmers.
External support/services	▪ Extension services provided by the government are limited. Some NGOs are providing extension services to a limited number of farmers. ▪ Financial services are very limited. Only about 3% of rural households could borrow money for agricultural activities.[248]
Infrastructure	▪ Feeder road conditions are extremely bad in most areas. This is a big obstacle for access to markets. Also main roads are not paved and not well maintained, so transport costs between large cities are very high. ▪ Large and medium scale warehouses for grains and facilities for collection points are not developed. ▪ Only a very limited number of farmers have irrigation facilities.
Others	▪ Livestock of pastoralists coming from other areas destroys farmers' crops. Fencing is one of the effective prevention measures but it requires high investment. Usually farmers cannot afford to construct a fence. ▪ Erratic rainfall patterns seriously affect crop production in semi-arid areas in the northern part of the country. Frequent flooding also affects it in the Flood Plains zones. ▪ Insecurity is also a serious issue for crop production. Some farmers fail to cultivate crops when they escape from conflicts and lose opportunities to plough land and sow seeds. ▪ Some farmers who face food insecurity frequently receive food aid from NGOs and DPs. This may accelerate food aid dependency and reduce farmers' motivation to farm.

Source: Farmers, interviewed by CAMP crops subsector team, April to June 2013, CAMP Situation Analysis

During the interviews with subsistence farmers, the team ascertained their major issues. Many of the farmers cannot get access to support services such as agricultural extension services and rural credit facilities. They are also suffering from low productivity because of erratic rains, low input agriculture, pest and diseases, and limited access to modern agricultural techniques. They want to expand their farmlands but they do not have enough financial and human capacity to do so. The detailed issues they are facing are shown in Table 10-22.

10.5.4.3 Progressive farmers

Although the majority of farmers are at a subsistence level, the CAMP Task Team could identify some progressive farmers and conducted interviews with them. They are cultivating relatively large farmlands and are engaged in commercial farming. Many of the progressive farmers have access to tractor services for ploughing, agricultural inputs (e.g., quality seeds, pesticides), hired labourers, market information and traders for selling produce. Many of the progressive farmers started commercial farming recently and it seems that their number is increasing rapidly, especially in the Greenbelt zone. The characteristics of the progressive farmers are as follows:

- Progressive farmers have financial capacities to hire tractor services and labourers for land preparation. Some of them are shop owners and government officers, so they have other income sources besides agriculture.
- Their educational levels are relatively high and are eager to accept and apply new technologies. They sometimes have precise records of their farm operations and can calculate their profit and loss easily.

[248] Data from the NBS Dataset of the National Baseline Household Survey 2009 and calculated by NBS / the CAMP Task Team, this figure is further explained in "9.8 Services."

- Many of them have connections with middlemen and traders. They know the season of the highest prices of their produce and, as they own storage facilities, wait for the best time to sell.
- They have a clear vision of how to develop a farming operation over a few years. They recognise the business potential of agriculture.

Although the number of progressive farmers is still limited, the CAMP Task Team found some farmers who have already transformed their operations from subsistence farming into commercial and others who are new to commercial farming. They are looking for financial institutions that will provide credit for further expansion of their operations. The following box describes the case of one progressive farmer in Eastern Equatoria State.

Box 10-2: Case of progressive farmer in Eastern Equatoria State

This farmer is a member of the state council in Juba. He has a total of 100 feddan planted with sorghum and groundnuts, and a piece of land with vegetables along a river. He believes that agriculture will become a profitable business although he could only make a small profit from farming last year due to the large initial investment.

He employs 25 workers who get regular income from work on his farm. He spends a lot of money for land reclamation, removing trees and other obstacles. He has a tractor and implements for all field operations. On some occasions, when the tractor is not fully engaged, he rents his tractor to other local smallholder farmers for income generation. He hires some labourers for seeding, weeding and harvesting. He notes that labour costs are very expensive. While labourers are paid wages, he also needs to provide them with food, otherwise most of them would leave work.

He is planning to expand his farm to 200 feddans and to put a fence around the farm to prevent intruders (e.g., cow, goats, wild animals and thieves). He wants to introduce an irrigation system so that he could supply his products to markets in Torit throughout the year. He plans to ask the Agricultural Development Bank or Cooperative Bank of South Sudan for a loan to meet the extra charges for the expansion of his farm.

Source: Farmer, interviewed by CAMP crops subsector team, Torit, 13 April 2013, CAMP Situation Analysis.

10.5.4.4 Large scale farmers

In Renk County, Upper Nile State in the Eastern Flood Plains zone, the Renk Irrigation Scheme was operated by the Sudanese government before the independence of South Sudan. There are 23 sub-schemes in the scheme and now 9 sub-schemes are operated by the government and the rest by private farmers.[249] There is no operational irrigation sub-scheme in the scheme due to breakage of pumps and insufficient funds for operation provided by the government. However, many private farmers are engaged in rain-fed mechanised large-scale farming in and outside the scheme.

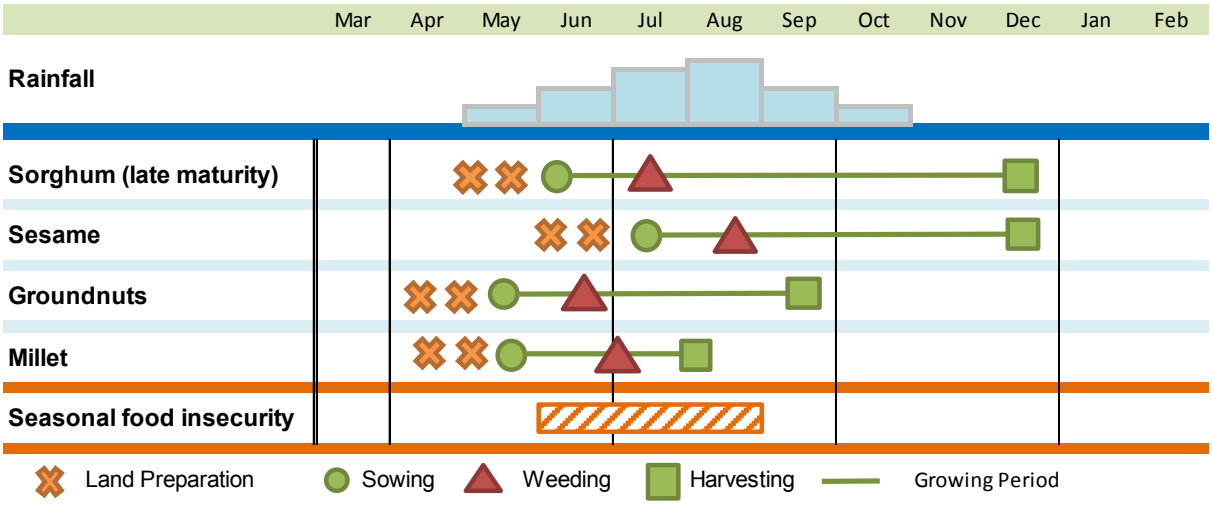
These farmers mainly grow sorghum, sesame, millet and groundnuts (Figure 10-16). Their farm sizes are very large compared to farms in other areas of the country. One of the interviewed farmers operates hundreds of feddans and another owns more than one thousand feddans. Land preparation on large farms is done by tractors and sowing is also done by mechanised broadcasters. Meanwhile, weeding and harvesting are done manually.

This area has a semi-arid climate with total annual precipitation of about 500 mm. Farmers have no irrigation facilities, thus rainfall is the most crucial determinant of yield. Moreover,

[249] GRSS. MWRI. 2010. *Assessment, Design, Installation of Irrigation Pumps and Rehabilitation of Water Control Infrastructures, Inception Phase, Preliminary Assessment Works on Renk Project, Final Report*. p. 8.

damage from pests is very serious, particularly by birds, and additional numbers may migrate from Sudan.[250] Although pest control is carried out in Sudan by aerial spraying, in South Sudan pest control measures are not taken at all. Some farmers mentioned that they cultivated 220 feddans of sorghum in 2012 but they only harvested 5 bags (100kg/bag) due to damage from birds. One farmer tried to use smoke to chase away birds but unsuccessfully. He believed that only aerial spraying was effective in preventing bird damage.

Figure 10-16: Crop calendar of large-scale farmers in Renk, Upper Nile State (Flood Plains zone)



Source: Farmers, interviewed by CAMP crops subsector team,, June 2013, CAMP Situation Analysis

The CAMP Task Team identified other large-scale farmers during the situation analysis, apart from those in mechanised rain-fed farming schemes such as the Renk scheme. One of these cases is described in the following box.

Box 10-3: Case of a large scale farmer in Lakes State

He used to be a police officer in this area and after retirement in 2008, he started farming in Rumbek Central County. He cultivated sorghum and groundnuts in two areas last year; one is about 400 feddans, which he plans to expand to 1,000 feddans this year, and another is 60 feddans. He also started cultivating 200 feddans in Wulu County this year. He owns 72 cattle, 22 sheep, 9 goats and 40 chickens. He practices mixed cropping with sorghum and groundnuts, sorghum seeds are broadcast and groundnuts are planted in holes prepared with an equal space between them. The soil is still productive because it is newly opened land. Animal pests, especially monkeys, squirrels and porcupines, and neighbours' livestock, such as cows and goats, cause serious damage to his produce; he is planning to establish fences around his farms.

He tries to hire labourers to open and plough his farmland since tractor services are very limited in this area. He faces many difficulties because labour costs are extremely high and hiring many labourers at one time is difficult during a busy farming season. Therefore, he chooses to open up a new area in a remote part of Wulu County where labourers are available due to limited job opportunities in the area and labour costs are more reasonable. He would like to buy a generator to operate an irrigation pump for vegetable production. He thinks demand for vegetables in the dry season is very high in Rumbek Town, and

[250] FAO/WFP. 2013. *Crop and Food Security Assessment Mission (CFSAM) to South Sudan*. p. 20. Rome: FAO/WFP

vegetable prices are also remarkably high. He would like to obtain a daily cash income by supplying vegetables to markets, while cereal crop production would provide a large amount of cash income several times a year.

Source: Farmer, interviewed by CAMP crops subsector team, Rumbek Central, 23 May, CAMP Situation Analysis.

10.6 Cash crop production

10.6.1 Overview

South Sudan has great potential for the production of various cash crops such as vegetables, fruit, coffee, tea, sugarcane, sesame, groundnuts, sunflower, oil palm and cotton, all of which are for domestic consumption and export. In particular, the Greenbelt and Hills and Mountains zones are high potential areas due to favourable rainfall and fertile soil. However, this potential is not fully exploited.

Vegetables are a high potential cash crop for domestic consumption. However, domestic production does not meet demand and a large volume of vegetables is imported from Uganda, Kenya, Ethiopia and Sudan. During the situation analysis, the CAMP Task Team collected market information on vegetables and other crops. At markets in state capitals, many imported vegetables and tuber crops are sold. Table 10-23 shows the origin and prices of three selected cash crops at major markets. In markets located in the southern part of the country, such as Torit, Juba and Rumbek, these items mainly come from Uganda and Kenya. Ugandan and Kenyan wholesalers and transporters import vegetables from their own countries. South Sudanese are rarely involved in this business.[251]

Meanwhile, in markets located in the northern part of the country, such as Bentiu, Malakal, Aweil, Wau and Kwajok, the same items are coming from Sudan and Ethiopia, or are produced locally around the state capitals. Local tomatoes are sold in the northern markets, since tomatoes are not commonly produced in Sudan and it is difficult to bring them from Uganda due to poor road conditions, high transport costs and high perishability. Seemingly, if markets are isolated from large production areas in foreign countries, local products are more competitive. This situation encourages farmers to produce vegetables for sale. Production of green leafy vegetables in peri-urban areas is a typical success story. Farmers grow Jew's mallow and amaranths in small patches near urban areas, since demand for green leafy vegetables is very high and they are not imported from neighbouring countries due to high perishability.

Table 10-23: Origins and prices of selected crops at major markets (April-June, 2013)

Market	Tomato		Onion		Potato	
	Origin	Price	Origin	Price	Origin	Price
Torit	Uganda	SSP 600/ box	Kenya	SSP 6/kg	Kenya	SSP 3/kg
Juba	Uganda	SSP 2/ 4 large pieces SSP 1/ 3 small pieces	Uganda	SSP 5/ 4 large pieces SSP 2/ 4 medium pieces	-	-
Yei	South Sudan	SSP 170/ box	Uganda	SSP 5/kg	South Sudan	SSP 4/kg
Rumbek	Uganda	SSP 17/kg	Uganda	SSP 10/kg	Uganda	-
Bentiu	Sudan	SSP 2/ 3 small pieces	Sudan	SSP 6/kg	-	-
Malakal	South Sudan	SSP 5-10/ 4 pieces	Sudan	SSP 5-10/ 4 pieces	Ethiopia	SSP 25/kg
Aweil	Sudan	SSP 500/ box	Sudan	SSP 5/kg	Sudan	SSP 8/kg

[251] The detailed information is shown in the section 10.7 Marketing and trade.

Market	Tomato		Onion		Potato	
	Origin	Price	Origin	Price	Origin	Price
Wau	South Sudan	SSP 5/ 4 pieces	-	-	-	-
Kwajok	South Sudan	SSP 5/ 6 pieces	-	-	-	-

Source: Wholesaler and Retailers, interviewed by CAMP crops subsector team, April to June 2013, CAMP Situation Analysis.

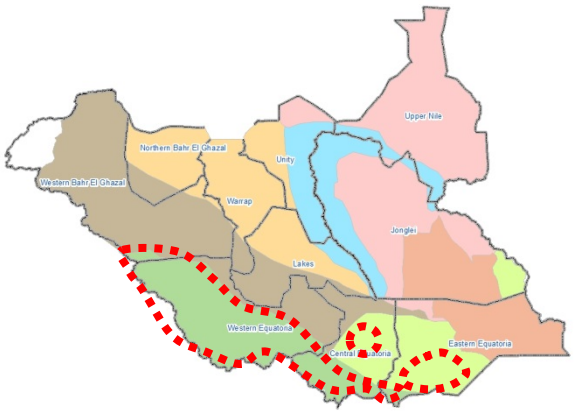
Fruit is another high potential cash crop but only a small amount is produced for commercial purposes. In the Greenbelt zone, various kinds of fruit, such as pineapple, mango, banana, citrus, papaya, watermelon, passion fruit and avocado, are grown. Likewise, small quantities of coffee and tea are grown and consumed locally, although they are high value and have high potential. Groundnuts and sesame are commonly grown in the whole country and are very important crops for farmers for home consumption. These two crops also have high potential for the production of vegetable oil, most of which is currently imported from neighbouring countries.

10.6.2 Production areas and agricultural practices

10.6.2.1 Vegetables

Through the situation analysis, three major potential areas for vegetable production are identified. Two potential areas for large volume production are the Greenbelt and Hills and Mountain zones (Figure 10-17). The third potential area is the suburbs of major towns since vegetable demand there is high.

Figure 10-17: High potential vegetable Production Areas



Source:Prepared by CAMP Task Team

In Yei and Morobo in the Greenbelt zone, various kinds of vegetables are cultivated for commercial purposes. During the situation analysis, agro-dealers in Yei mentioned that vegetable production in Yei and Morobo had grown in the last two years. Many kinds of vegetables, such as tomatoes, cabbages, cucumbers, bell peppers and onions, came from Uganda before but now some[252] are produced locally. This is confirmed by the fact that sales of quality vegetable seeds have increased substantially due to the increase in the number of vegetable growers. Some of the farmers in the areas are returnees from Uganda who had farming experiences in Uganda growing vegetables.

[252] According to the agro-dealers, it seems that almost 80% of vegetables at markets in Yei are local. Some retailers, however, sell local vegetables as imported from Uganda, since they can get a higher price for imported vegetables.

Many interviewees in this area pointed out the difficulties of market access. Although, many of them know how to access local market information (e.g., through radio and neighbours), they cannot easily transport their products to local markets in Yei, due to inadequate feeder roads and lack of transportation. In addition, even though there is a large demand for fresh vegetables in Juba, vegetables from Yei and Morobo are not common in Juba markets. The reasons for this are as follows:

- The Juba-Yei road is not paved and its condition is poor especially in the rainy season. The distance between Juba and Yei is 157km, but it sometimes takes more than 8 hours by truck during the rainy season.
- It is difficult for local traders to collect a large volume of vegetables since vegetables are produced by small scale farmers who are not well organised to consolidate their products.
- Traders at markets in Juba tend to prefer Ugandan products due to their high quality and the ease of obtaining a large volume. In addition, many of the vegetable wholesalers are Ugandans who have good connections with vegetable buyers and producers in Uganda.

Budi, Ikotos and Talanga in Eastern Equatoria State, the Hills and Mountains zone, are situated in high altitude areas suitable for vegetable production due to favourable rainfall and cool temperatures. However, vegetable production is not actively practiced by local farmers. In the Torit market, the nearest major market, most vegetables, e.g., tomato, onion, cucumber, carrot, cabbage and potato, come from Kenya and Uganda and only some vegetables (e.g., okra and green leafy vegetable) are locally produced near the market. Through interviews with state and county officials, and some retailers in the market, the following reasons hindering vegetable production were confirmed:

- Road conditions are very poor especially during the rainy season, which is the main season for vegetable production, so it is not easy for vegetable producers to transport their products from farms to markets. Large trucks cannot use the roads, so small trucks are used to carry relatively small amounts, which makes prices higher.
- Security conditions in some areas are not good; some farmers and traders hesitate to bring products to markets.
- Due to poor roads, insecurity and less traders/middlemen, local farmers have little incentive to produce vegetables for sale. In addition, local farmers are not well organised to consolidate their products, due to less demand from traders/middlemen.

The abovementioned challenges in promoting vegetable production in higher elevation areas in the Hills and Mountains zone are similar to those in the Greenbelt zone. Potential areas in the Hills and Mountains zone are less developed for commercial vegetable production compared to Yei and Morobo. It seems that road conditions in these areas are much poorer, and Juba, the biggest market in the country, is much farther from the production areas. In addition, insecurity and low population density might affect the development of vegetable production.

Peri-urban vegetable production is also common. Since fresh green leafy vegetables are commonly eaten as side dishes with local meals, demand is very high especially in urban areas. Some farmers, inside and around cities and towns, grow these vegetables on a small scale. Prices are much higher in the dry season than the rainy season, so some farmers near water sources (e.g., rivers, small streams, shallow wells and boreholes) try to grow them throughout the year. Mainly female farmers do this. During the situation analysis, the CAMP Task Team found that NGOs supported women's groups in small scale vegetable production with simple irrigation facilities. Success in this activity is for the following reasons:

- Demand for green leafy vegetables, such as Jew's mallow, amaranths and sukuma wiki (local kale), is very high in towns, so farmers can find markets easily.

- Since the harvesting cycles of these vegetables are relatively short, farmers can grow them several times in a year. If a farmer manages his farm well, he can harvest and send to market almost every day. Such farmers can obtain a daily cash income, which is important for household management. Farmers can obtain a relatively larger income from major crop production a few times a year, while peri-urban vegetable production provides frequent income which might fulfil the daily cash needs of households.
- This is very intensive and profitable farming, thus, the impact of irrigation is high. If NGOs, financial service providers or governments support the initial costs for developing small irrigation facilities, operation and maintenance costs might be met by the frequent cash income. Some NGOs already support this type of activity.
- For vegetable production, it is not necessary to have a large farm which makes it suitable for female farmers. In addition, women tend to manage daily cash income properly since they are used to managing daily household expenses.

10.6.2.2 Perennial cash crops

Due to favourable precipitation patterns, temperatures and soil conditions, some areas of South Sudan have high potential for perennial cash crop production, such as fruit, coffee, tea and oil palm. However, commercial farming of these crops is rarely found.

Regarding fruit, mangos are grown in many places in the country which are sold in local markets but their quality is not of an international level due to the fibrous nature of the fruit. Citrus fruit (e.g. lemons and oranges), guavas, papayas, passion fruit, avocados, jackfruit and bananas are grown in the Greenbelt zone and part of the Hills and Mountains zone. These are mainly grown for home consumption and only a small quantity is sold in markets, although a large volume is imported from Uganda.

Coffee is grown in the Greenbelt and Hills and Mountains zones on a small scale. According to an officer of the Horticultural Department of the national ministry, commercial coffee production began about 30 years ago. Although arabica coffee has higher values due to its taste and aroma, most of the coffee producers grow robusta coffee, since arabica coffee is more susceptible to diseases such as coffee berry disease and leaf rust disease. However, the officer believes that arabica coffee varieties with disease resistance could grow in the areas where robusta coffee grows. Some private companies from foreign countries are interested in coffee production in South Sudan.[253]

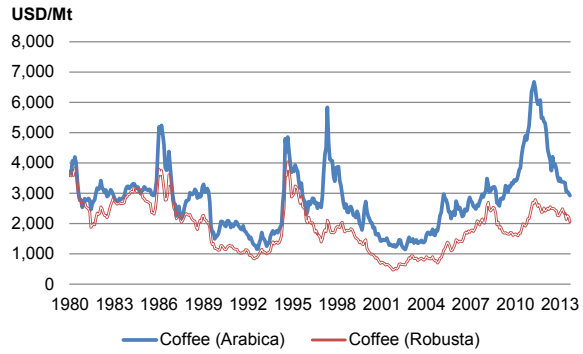
In the international market the price of coffee beans has fluctuated, but has remained at a relatively high level. In October 2013, the price of arabica coffee was more than 40% higher than robusta coffee. Neighbouring countries, such as Ethiopia and Uganda, are rapidly expanding their production, while the production of Kenya and Tanzania has stagnated. The producer's price for green coffee beans was USD 5,011 per ton in Kenya and USD1,372 per ton in Rwanda.[254] During the CAMP situation analysis, a 50kg bag of green coffee beans, probably robusta coffee, was sold for SSP500 at a shop (retail price), which is equivalent to USD3,436 per ton.[255] It seems that the price of South Sudanese coffee is more competitive than Kenyan. However, coffee price is greatly affected by quality, varieties and brands, so competitiveness and the potential of coffee production should be examined considering these factors.

[253] Sudan Tribune. 21 July 2013. *Swiss firm eyes South Sudan for coffee production*. http://www.sudantribune.com/spip.php?article47343 (accessed on 5 August 2013)

[254] Sources: FAO Stat http://faostat.fao.org/ (accessed on 6 October 2013)

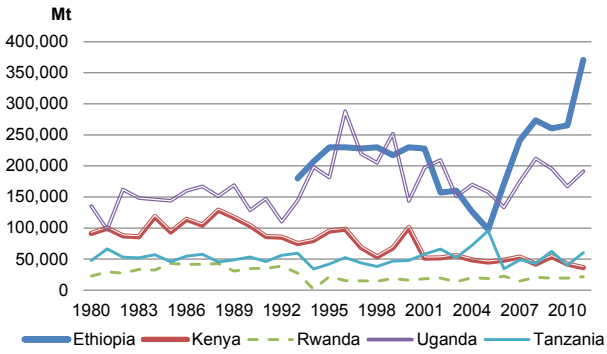
[255] Exchange rate is USD1 = SSP2.91 (JICA exchange rate as of August 2013)

Figure 10-18: Price trend of coffee in the international market



Note: data converted from US cents/pound to USD/Mt
Source: International Monetary Fund (IMF). http://www.imf.org/external/np/res/commod/index.aspx (accessed on 7 October)

Figure 10-19: Production of coffee beans (green) by country



Sources: FAO Stat http://faostat.fao.org/ (accessed on 6 October 2013)

Tea production in the Greenbelt and Hills and Mountains zones also has potential. In 1983 the EU started a tea production project in Upper Talanga, Eastern Equatoria State, the Hills and Mountain zone, but it stopped due to the second civil war. Tea plants from the project period are still growing which implies that the weather and soil are suitable for tea production. Some farmers around the tea plantation harvest tea for home consumption.

Large scale sugar cane production was planned in Mongala, Central Equatoria State in 2011. A private company was willing to provide SSP 270,000 for an initial investigation on the potential of a sugar cane plantation and sugar factory. However the investigation did not happen due to land and political issues which highlights that land acquisition is a crucial factor for large scale agricultural developments such as plantations. To promote foreign investment for such developments, a favourable environment, including clear land acquisition processes, must be created.

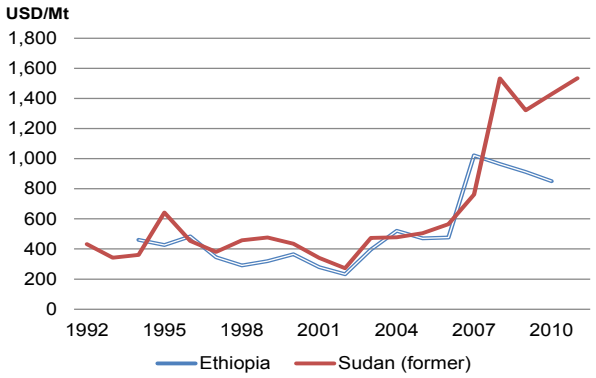
Oil palm in Western Equatoria State and some nuts (e.g., cashew and shea nuts) in the Greenbelt and Ironstone Plateau zones might have high potential, although only limited information on these crops is available.

In general, perennial cash crop development requires relatively large scale investments and strong international market linkages. More detailed investigation needs to be done to understand suitability of weather and soil types for target crops; international market price trends; potential for processing and required quality; possible international markets; and means and cost of transport.

10.6.2.3 Other cash crops

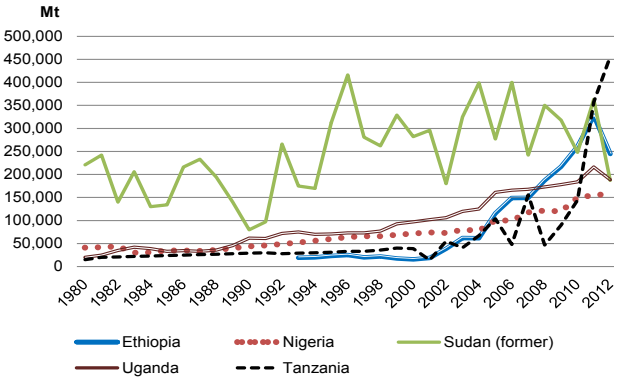
Not only perennial cash crops but also annual cash crops, such as sesame, groundnuts, sunflower, cotton and some fruit (e.g., pineapple and watermelon) are potential agricultural products. Sesame is a potential crop for export. Recently, the producer's price for sesame seeds in Ethiopia and Sudan is comparatively high (Figure 10-20) because international prices are high. Before independence, the former Sudan was one of the largest exporters of sesame in the world. Figure 10-21 shows the sesame production trends of the large producers in Africa. The former Sudan was the top producer of sesame in Africa until 2009. Tanzania and Ethiopia rapidly increased sesame produce in the last decade and, in 2012, their output exceeded that of Sudan. Sudan became the fourth largest producer in Africa.

Figure 10-20: Producer price trend of sesame seed by country



Sources: FAO Stat http://faostat.fao.org/ (accessed on 6 October 2013)

Figure 10-21: Production of sesame seed by country

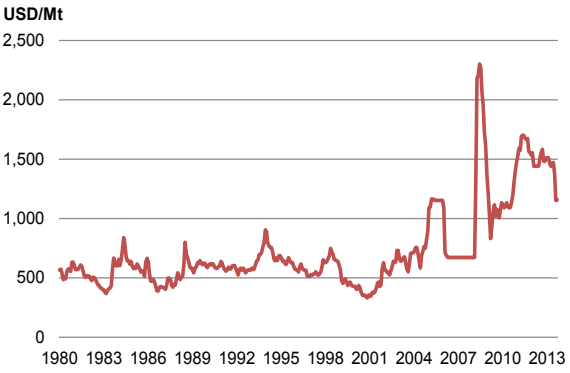


Sources: FAO Stat http://faostat.fao.org/ (accessed on 6 October 2013)

Some other oil seeds, such as sunflower and groundnuts, also have potential for export. The international price of sunflower oil has increased since 2008. In Tanzania the production of sunflower seeds has increased rapidly and Tanzania is now the twelfth largest producer in the world.[256] Previously, sunflower were cultivated in large mechanised schemes in the north-eastern part of the country, especially in Renk County, under the supervision of the Sudanese government. Irrigated cotton was also grown in these schemes. Both cotton and sunflower seeds might be alternative cash crops to sorghum which is seriously damaged by birds (Quelea quelea); however, competitiveness of price and quality in international markets need to be examined carefully.

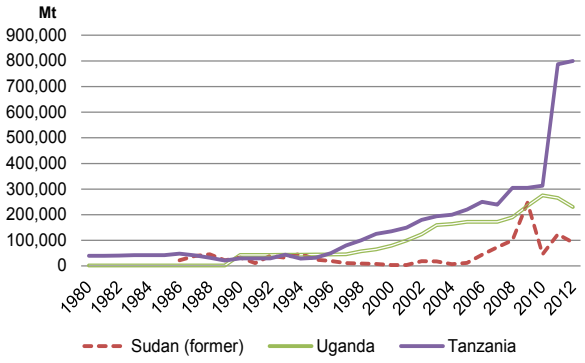
Oil seeds might also be suitable as raw materials for vegetable oil production for domestic consumption; a large volume of vegetable oil is imported from neighbouring countries. This may be possible with relatively small investment and residues of vegetable oil production could be utilised as feeds for livestock, but production costs should be examined carefully for comparison with imported vegetable oil.

Figure 10-22: Price trend of sunflower oil in the international market



Source: International Monetary Fund (IMF). http://www.imf.org/external/np/res/commod/index.aspx (accessed on 7 October)

Figure 10-23: Production of sunflower seeds by country



Sources: FAO Stat http://faostat.fao.org/ (accessed on 6 October 2013)

[256] Sources: FAO Stat http://faostat.fao.org/ (accessed on 6 October 2013)

Some annual fruit crops, such as pineapples and watermelons, are grown in the Greenbelt zone. Demand is high but most are imported, so there are opportunities to replace imported with domestic.

10.6.3 Economic considerations for cash crop production

10.6.3.1 Potential

As mentioned above, there is great potential for cash crop production in South Sudan due to favourable natural resources (e.g., rainfall, temperature and soil types). Two types of opportunity are identified: 1) Replace imported agricultural products with domestic products for domestic consumption, such as vegetables, some fruit and oil seeds for vegetable oil production. Substituting local agricultural products for imported would reduce import expenditures. 2) Export for international markets. Coffee, tea, sesame, cotton, nuts and oil palm are potential products for export, which might contribute to sustainable economic growth.

10.6.3.2 Constraints

Major constraints are high labour costs, limited service delivery by the government, poor basic infrastructure and an unfavourable environment for investment. Table 10-24 shows details of these constrains. A detailed explanation is made in the following sections (mainly in 10.7 Marketing and trade and 10.8 Services).

Table 10-24: Constraints for cash crop production

Constraint	Details
High labour costs	• Compared to neighbouring countries, labour costs are high due to the strong South Sudan currency. Other possible causes of high labour costs are (1) high prices of domestic products, including labour costs, caused by oil exports and (2) insufficient labour for farming in rural areas due to low population density and unpopularity of farming work with young people. • High labour costs cause higher production costs which reduce competitiveness in international markets.
Limited service delivery	• Both national and state governments deliver very limited services to farmers. Farmers rarely get access to technical knowledge and skills for cash crop production. • Basic research for annual and perennial cash crops is seldom done. Thus, new technologies for cash crop production are not developed for farmer beneficiaries. • Rural financial services are also limited, though farmers often need seed capital to start cash crop production.
Limited agricultural inputs	• It is difficult for farmers to get access to improved seeds, fertilisers, agro-chemicals and other agricultural materials because of the very limited number of agro-dealers. • Prices of these inputs are high since all are imported.
Poor basic infrastructure	• Interstate and other primary road networks are not well maintained; some are not passable during the rainy season which makes transport costs higher. • Since the condition of feeder roads is extremely poor, collection of products from production areas is difficult and costs become very high. • Public electricity services are very limited, most is produced using private generators, which makes electricity very expensive. Processing factories for cash crops might face the same situation.
Land acquisition	• Land acquisition processes are often influenced by local politics and traditional arrangements. The high uncertainty of land acquisition is a serious factor that makes foreign investors hesitate to make large scale investments.
Multiple taxation	• Legal and illegal multiple taxation is one of the causes of higher commodity prices. In addition, transaction costs become high due to frequent application. • Rates of taxes are often changed without notice.

Constraint	Details
Foreign merchants	• Many foreign merchants work in major markets in South Sudan. They have very strong connections with people in their home country and can easily make arrangements for collection, transport and import of agricultural products. It is difficult for South Sudanese merchants to have this kind of linkage with foreign producers.

Source: Interviewed by CAMP crops subsector team, April to June 2013, CAMP Situation Analysis

10.7 Marketing and trade

10.7.1 Characteristics of markets

In South Sudan, there are major markets available in the capital town of each state and sometimes, there are several large markets in major towns. Local markets are also available in rural towns and villages. Normally, markets are structured with both permanent and temporary stores. Wholesalers tend to operate in permanent stores, while retailers tend to operate in temporary stores. In each large town, there is a main market which operates throughout the year. In some large towns such as Juba, Yei, and Aweil, there are more than two markets. These markets function as local markets but also as waypoints to bring products to other areas. A variety of products are available, but many of them are imported. Not many locally processed foods are present except maize flour, cassava flour and wheat flour. Characteristics of some major markets in each state are presented in Table 10-25 based on the survey results of the CAMP Situation Analysis.

Table 10-25: Characteristics of major markets in each state

State	Markets surveyed	Majority of merchants at market(s)	Number of merchants/size of markets
Central Equatoria State (CE)	Konyokonyo, and Jebel Markets in Juba, and Main markets in -Yei, -Morobo, -Lainya, -Kajokeji, Counties	- The majority of merchants at Konyokonyo market are Sudanese. - The majority of merchants at main markets in Kajokeji, Yei, and Lainya Counties are South Sudanese retailers. - Majority of merchants engaged in Morobo County main market are South Sudanese traders.	Information not available
Western Equatoria State (WE)	Main markets in -Yambio, -Nzara, -Maridi Counties	- The majority of merchants at Yambio and Maridi Central Market are South Sudanese retailers.	- Total number of wholesalers and retailers at Yambio Central Market is about 425. - The markets in Yambio and Maridi are larger than the one in Nzara.[257]
Eastern Equatoria State (EE)	Main markets in -Magwi, -Torit Counties	- The majority of merchants at Torit Main Market are Ugandans and Kenyans.	Information not available
Western Bahr el Ghazal State (WBG)	Main markets in Wau County - Jou market - Hajer market - Wau market	- More than 90 % of merchants are wholesalers. - Majority of the traders, wholesalers, and retailers are Sudanese.	- Estimated total number of merchants is about 2,000.
Northern	Main markets	- Majority of merchants are Sudanese	- Estimated total number of

[257] WFP/VAM, March 2013. Western Equatoria State, *Rapid Market Assessment Report in Western Equatoria State*. Juba.

State	Markets surveyed	Majority of merchants at market(s)	Number of merchants/size of markets
Bahr el Ghazal State (NBG)	in -Aweil Centre, -Aweil East Counties	wholesalers at Aweil main market. - Majority of merchants are South Sudanese domestic traders and retailers at market in Aweil East.	merchants in Aweil main market is about 3,000. - Estimated total number of merchants at main market in Aweil East is about 1,200.
Warrap	Main market in -Kwajok	- Majority of merchants are Sudanese at main market in Kwajok.	- Estimated total number of merchants is 200.
Lakes	Main market in -Rumbek Centre	- Majority of merchants at Rumbek and Rumbek East Markets are Ugandan retailers. - There are also large proportions of Kenyan and Sudanese merchants at the markets.	Information not available
Unity	-Bentiu main market and -Rubkona Market	- Majority of merchants at the market in Bentiu Main and Rubkona Market are South Sudanese retailers. - Substantial numbers of Sudanese merchants exist at both markets.	Information not available
Jonglei	Main market in -Bor	- Majority of merchants at the main market in Bor are Sudanese retailers. However, there are significant proportions of foreign retailers such as Ugandan, Ethiopians, Kenyans, and Eritrean retailers.	Information not available
Upper Nile	Main market in -Malakal -Renk	- Majority of merchants of Malakal Main market and a main market in Renk are Sudanese retailers.	Information not available

Sources: Farmers, market authority, wholesaler/retailer, trader, crop subsector questionnaires, ten states, April to June 2013, CAMP Situation Analysis.

Different actors play different roles in a market. They are traders, middlemen, wholesalers, retailers, and market authority. Collectively traders, middlemen, wholesalers and retailers are referred to as merchants. Characteristics of each player are explained in Table 10-26.

Table 10-26: Key players in market and their roles

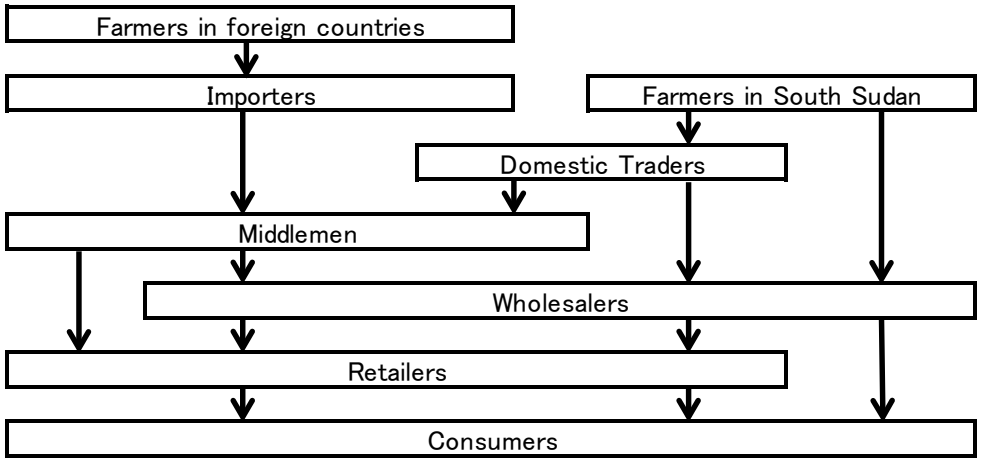
Players	Descriptions of their Roles
Traders (Importers)	They normally bring agricultural products from outside of a market. They may bring products from foreign countries or other states in South Sudan. Traders are also commonly called importers. Traders are either South Sudanese or foreigners such as Ugandan, Sudanese, Kenyans, etc.
Middlemen	They buy agricultural products from traders and sell them to a wholesaler or a retailer at a market. Middlemen do not own stores at a market but own a storage facility. They purchase large volumes of agricultural products from traders and stay at a market. This is one example of middleman. There might be a different type of middleman who visits farms and purchases products by themselves to sell them to wholesalers and retailers.
Wholesalers	They own a store in or close to a market and sell products in bulk to retailers and to other wholesalers. They tend to deal in cereal products because these products are non-perishable and can be stored for a longer time. Some wholesalers cross the border of South Sudan to purchase agricultural products in bulk and bring them back themselves.

Players	Descriptions of their Roles
Retailers	They buy products either from wholesalers, middlemen, or traders directly. They rent a small space at a market and pay a small amount of market fees on a daily basis. When farmers bring their products to markets, normally, they either sell their products to middlemen or retailers directly. It depends on their relationships.
Market authority	They control usage of a market space and collect fees from merchants at the market. They are also responsible for maintaining security and a hygienic environment at the market. Often, the market authority is operated by the payam government office, but sometimes, the chamber of commerce plays the role of market authority. The arrangement of a market authority is different by area.

Source: Farmers, market authority, wholesaler/retailer, trader, crop subsector questionnaires, ten states, April to June 2013, CAMP Situation Analysis.

The types and numbers of merchants at the surveyed markets are presented in Table 10-25. A typical relationship of key players and flow of products is described in Figure 10-24.

Figure 10-24: Key players and relationships



Source: Trader and wholesaler/retailer, crop subsector questionnaires, Yei, Yambio, Maridi, Bor, Torit, Wau, Kwajok, Aweil, Malakal, Renk, Guit, April to June, 2013, CAMP Situation Analysis.

The above figure demonstrates a typical flow. However, some wholesalers cross the border to bring agricultural products back to their home town to sell to customers or retailers. Importers may sell agricultural products directly to wholesalers or retailers.

In many major markets in different states, foreign merchants are found. They know farmers, brokers, associations, wholesalers and traders in their own countries and so have an advantage.

Across the country, substantial numbers of agricultural products are imported from other countries, but more products are grown locally and sold at nearby markets. For example, beans, onions, tomatoes, green peppers, potatoes and cabbage are brought from local areas and from nearby counties to Yei River County. According to an agro dealer in Yei, in the last three years, more agricultural products are grown locally and sold in local markets.[258] A market authority at the Yei Main market mentioned that about 50% of cassava, maize and groundnuts are locally grown.[259]

[258] Agro Dealer, interviewed by CAMP crops subsector team, Yei, 13 April 2013, CAMP Situation Analysis.
[259] Trader, questionnaire, Yei, 11 April, 2013, CAMP Situation Analysis.

Vegetables are in high demand and normally sell at higher prices than cereal crops. More farmers have realised this and started to grow them. Farmers, who bring their products to market, know the prices of agricultural products through radio programmes and their friends. Some farmers try to sell their products when the price is high but it is difficult to time the harvest.

There are several issues commonly identified through the situation analysis. Safety at markets is a challenge. Theft is common. In addition, most buildings at markets are fire hazards. These factors negatively influence the viability of a market.

10.7.2 Domestic distribution chain

In South Sudan, a variety of agricultural products is sold at market and most of them are brought from areas surrounding the markets. Very limited quantities are brought from other states. This characteristic is stronger in the northern parts of the country. Thus, domestic agricultural products tend to be consumed locally whereas the majority of imported products are distributed nationally. Exceptions are identified in some cases such as groundnuts grown in Lakes State and brought to Juba, CE and Wau, NBG. Characteristics of available products and distribution chains are different by state. Identified local products sold at markets and major distribution chains of the ten states are described in Table 10-27.

Farmers living close to a market bring their products to the market to sell directly to retailers and wholesalers, so avoiding middlemen. Farmers obtain price information about their products and try to sell when prices rise. Trade and distribution routes are basically the same throughout the year, but in some areas such as Upper Nile State, supply routes change between the dry season and the rainy season. In the dry season, many traders bring agricultural products from Sudan and Ethiopia by road. In the rainy season, some traders use a boat to bring agricultural products from Juba. The frequency of supply decreases in the dry season and cost of delivery becomes higher in the rainy season.

Table 10-27: Identified local products and major distribution chains for ten states

State	Identified local crops	Origin(s) and distribution chains of products sold in the state
CE	-maize, -sorghum, -cassava, -tomato, -okra, -green pepper, -onion, -amaranthus, -Jew's mallow, -beans, -groundnuts, -cowpeas, -potato	- Maize, raw cassava, sorghum, groundnuts, and beans are grown in Yei, Lainya, and Morobo Counties and sold at markets in all of these counties. - Dry cassava is made in Kajokeji County and sold at surrounding markets. - Cassava is brought from Morobo and Yei to Juba. - Some beans and vegetables such as onions are brought from Morobo and Yei to Lainya Counties.
WE	-maize, -sorghum, -cassava, -rice, -groundnuts, -sesame, -finger millet, -okra, -sweet potato -pineapple	- Groundnuts are supplied from Rumbek to market in Maridi. - Sorghum is brought from Maridi to Juba, Yei, and Rumbek[a] - Maize is grown in many parts of the state and brought to the same towns as mentioned above.
EE	-maize, -sorghum, -cassava, -sesame, -cowpeas, -Jew's mallow, -eggplant, -okra, -amaranthus	- Many products such as maize, cassava, groundnuts and sesame are brought from Magwi County - Cassava, Jew's mallow, eggplant, cowpeas, okra and amaranthus are grown and sold inside of the state.
WBG	-sorghum, -wheat, -groundnuts, -eggplant, -okra,	- Maize is brought from Ezo in WE. - Groundnuts, eggplants, okra, and tomatoes are grown in

State	Identified local crops	Origin(s) and distribution chains of products sold in the state
	-tomato, -onions, -lentil, -cowpeas	Wau County and brought to market.
NBG	-sorghum, -groundnuts, sesame, -rice[b], -eggplant, -green pepper, -okra	- Dried okra and groundnuts are brought from Meram and Warawar in NBG.
Warrap	-sorghum, - sesame, -Jew's mallow, -okra, - groundnuts, -tomato	- Sorghum, okra, Jew's mallow, and tomato are grown in Kwajok and sold at nearby markets.
Lakes	-sorghum, -millet, -groundnuts, -Jew's mallow, -tamaliga	- Sorghum is grown in Rumbek East and sold at the Main Market in Rumbek. - Groundnuts, Jew's mallow, tamaliga are grown in Cuebit County and Rumbek North County. These are sold at market in Rumbek. - Groundnuts are supplied to markets in Juba (CE) and Wau (WBG).
Unity	-sorghum, - maize -cowpea, -pumpkin, -Jew's mallow, -okra	- Farmers grow some varieties of products. They do not bring them from outside of the state. - Many farmers grow pumpkin, but these are for home consumption.
Jonglei	-sorghum, groundnuts, -cowpeas, -maize, -sesame, -okra, -pumpkin, -onion, -rocket	- - Most of agricultural products are grown locally and brought to local markets. - Some agricultural products are brought from other parts of the country.
Upper Nile	-sorghum, -finger millet -maize, -sesame, -onion, -tomato, -okra, -cotton, -rocket, -Jew's mallow	- Many agricultural products are grown and brought to local markets.

[a] FEWSNET. 2012. *Production and market flow maps: South Sudan First Season. Sorghum.* Juba. FEWSNET. 2011. *Production and market flow maps: South Sudan First Season. Maize.* Juba.

[b] There is the Aweil rice scheme in Northern Bahr el Ghazal, and 22 varieties of rice are grown.

Sources: Farmers, market authority, wholesaler/retailer, trader, crop subsector questionnaires, ten states, April to June 2013, CAMP Situation Analysis.

10.7.3 Imported agricultural products

Large amounts of agricultural products are imported. In the southern parts of the country such as the Equatoria states, they come from Uganda, Kenya and the Democratic Republic of the Congo (DRC). In the north western part, main sources are Sudan and Uganda. In the north eastern part, Sudan, Ethiopia and Juba are main sources. In Table 10-28, identified origins of imported products at markets in each state are described.

Table 10-28: Origins of imported agricultural products by state

State	Origin(s) of Imported Products
CE	- Cabbage, tomatoes and potatoes are from Uganda. - Substantial amounts of cereals are from Uganda such as maize, sorghum and wheat.
WE	- Rice, maize flour, red yellow beans come from outside the country, e.g. Uganda.
EE	- Many agricultural products are from Uganda. (e.g. sorghum, maize, beans, onions, cassava)

State	Origin(s) of Imported Products
	- Kenya is another source of agricultural products such as onions and potatoes.
WBG	- Cabbage, tomatoes and potatoes are from Uganda. - Substantial amounts of cereals are from Uganda such as maize and sorghum. - Wheat is from Sudan.
NBG	- Many products are from Sudan. (e.g. tomato, onion, and potato)
Warrap	- Maize, maize flour and sorghum are from Uganda.
Lakes	- Major imported agricultural products such as maize, onion, tomato, green peppers, carrot, and cabbages are brought from Uganda. Remaining imported products come from Kenya and Sudan. - Many agricultural products such as onion and sorghum come from Sudan, but many cereals are also brought from Uganda.
Unity	- Many agricultural products such as sorghum, wheat flour and onion are from Sudan.
Jonglei	- Most agricultural products come from Sudan and Uganda through Malakal and Juba. - In the eastern part of the state, food products are supplied from Ethiopia.
Upper Nile	- Sudan and Ethiopia are the main sources of agricultural products, especially in dry season. - During rainy season, the road conditions become bad and more products are brought from Juba using boats.

Sources: Farmers, market authority, wholesaler/retailer, trader crop subsector questionnaires, ten states, April to June 2013, CAMP Situation Analysis., FEWS NET. July 2013. South Sudan Price Bulletin. Juba.

Uganda is a major supplier of imported products but in the northern part of South Sudan, Sudan and Ethiopia are the main sources.

In Central Equatoria, Kaya-Morobo-Yei-Juba is one major route, and Nimule-Juba is another, used to transport products from Uganda to Juba. After arriving in Kaya, some products are brought to Maridi and Yambio. In Western Equatoria, imported products are brought to Yambio and Ezo, where they can be transported further to either Wau or Juba. In Eastern Equatoria, the road to Torit is the major route for imported products. After arriving in Torit, products continue to Juba or other towns in Eastern Equatoria.

In the north western part of South Sudan, the main route from Sudan goes to Warawar. Imported products continue to Aweil or Kwajok. After Aweil, some continue further to Wau and even to Rumbek.

In the north eastern part of South Sudan, products are imported from Sudan through Renk to Malakal or from Ethiopia to Malakal. Products are also brought from Sudan to Bentiu. After arriving in Malakal, imported products can continue to Rumbek, Bor and other towns.

Products imported into Juba are not transported to towns in Central and Western Equatoria. It is assumed that there are enough products (local and imported) available in these areas. Major flows of imported agricultural products are demonstrated in Figure 10-25.

Figure 10-25: Major flows of imported agricultural products in South Sudan

Source:http://www.google.co.jp/search?q=South+Sudan+road+map&tbm=isch&tbo=u&source=univ&sa=X&ei=OqQBUuDVDZHbkgXr0oDQAg&ved=0CCkQsAQ&biw=1143&bih=542#facrc=_&imgdii=_&imgrc=ubgxKYnbyRvJUM%3A%3BMys3I95uKZS1M%3Bhttp%253A%252F%252Fmapsof.net,
FEWSNET, Production and Market Flow Maps: South Sudan First and Second Season Sorghum, First and Second Season of Maize, Trader and wholesaler/retailer, crop subsector questionnaires, Yei, Yambio, Maridi, Bor, Torit, Wau, Kwajok, Aweil, Malakal, Renk, Guit, April to June, 2013, CAMP Situation Analysis.

10.7.4 Product price and cost

Generally, the origin of products is one of the major factors which affect prices. One case observed in Western Bahr el Ghazal (WBG) State demonstrates that prices of imported products are higher than locally grown products. Table 10-29 shows the difference in prices of local and imported maize. The reasons for the higher prices of imported products will be explained later.

Table 10-29: Selling prices of locally grown and imported maize in Wau, Western Bahr el Ghazal State

Type of Products		Local Products		Imported Products	
Items		**High**	**Low**	**High**	**Low**
Maize	Price	SSP 3/kg	SSP 2/kg	SSP 4/kg	SSP 3/kg
	Season	August 2012	February 2013	May-Aug. 2012	Feb.-May 2013

Sources: Trader, crop subsector questionnaires, Wau, May 2013, CAMP Situation Analysis.

Price gaps are identified not only between local and imported products but also between different seasons. The above table shows that there is a clear price gap between the high season and low season. During the period before the harvest (May-August), prices tend to

be high; after the harvest (February-March), prices become lower. Prices are affected by the availability of products.

Geographical differences contribute to the price gaps. In the northern parts of the country, prices of agricultural products tend to be higher than those in the souths; prices in rural areas are generally higher than urban areas. Major costs for wholesalers and retailers are transportation costs, taxes, labour costs for on-loading and off-loading. These costs affect the price of agricultural products. High costs for all these items are found in all states.

Table 10-30: Market fees at major markets

Market	Market fees
Yei Main market (CE)	Permanent stores at the market need to pay SSP 300 per month. Retailer needs to pay SSP 25-50 for inside shelter per month to the market. Retailer needs to pay SSP 1.0 for open floor per day to the market.
Yambio Central market and Mundri West market (WE)	Wholesaler needs to pay from SSP 500 to SSP 1,500 to the Market Authority depending on size and location of store. Retailers need to pay SSP 2.0 per sack and/or SSP 20 monthly to the town council.
Torit Main market (EE)	Retailers pay SSP 500 per month as a market fee.
Wau Main market (WBG)	Permanent merchants need to pay SSP 3,000 per month, semi-permanent merchants need to pay SSP 1,000 to the market authority.
Aweil Centre market (NBG)	Permanent merchants need to pay SSP 400 to 1,500 monthly to a market authority. Merchants need to pay SSP 2,000-2,500 monthly to a market authority.
Kwajok market (Warrap)	Permanent merchants at main market need to pay SSP 500-1,700 monthly, and semi-permanent merchants need to pay SSP 300-600 monthly to a market authority.
Rumbek Main market (Lakes)	Merchants need to pay SSP 30-200 as a monthly market fee.
Guit market (Unity)	Merchants need to pay SSP100-310 monthly to the market, depends on size they occupy.
Bo Central market (Jonglei)	Merchants on the main market roads need to pay SSP 600 monthly to the shop owner and those inside the market pay SSP 300 per month. Amount changes depending on location of shop.
Malakal Main market (Upper Nile)	Merchants need to pay from SSP 220 to SSP 1,000 monthly depending on size of place they rent.

Sources: Farmers, market authority, wholesaler/retailer, trader, crop subsector questionnaires, ten states, April to June 2013, CAMP Situation Analysis.

As shown in Table 10-30, market fees paid to the market authority vary by market. Permanent merchants and wholesalers pay more to market authorities than retailers. Some market authorities charge a fee for each sack that traders and wholesalers bring into the market. These costs are a major burden to merchants. In addition to market fees, there are other costs such as transportation, labour, taxes, etc. How all these costs add up and how they may influence business needs to be examined more. One example of a wholesaler's cost for the domestic trade of maize between Morobo and Yei is presented in Table 10-31.

Table 10-31: List of costs for domestic trade from Morobo to Yei River County, CES

Cost items	Charges (SSP per bag)	Remarks
Transportation	25	• 1 bag is 100 kg.
Labour (on and off loading)	5	• The wholesaler buys about 10 bags per week from farmers and
County tax in Morobo	2	• Cooperatives in Morobo County.
County tax in Yei	5	• Amount of county tax differs by type of crop.
Intermediate cost (fee for a middleman)	10	
Market fee	5	
Total	52	

Source: Wholesaler/retailer, crop subsector questionnaire, Yei, 13 April 2013, CAMP Situation Analysis.

According to the wholesaler interviewed, there are other costs such as the rental fees for the store and storage, salaries for employees, and other bills including electricity and water; profit per bag of maize is about SSP 25 so net profit is not much. Transportation costs can be assumed to be higher for longer distances, so domestic products tend to be traded over short distances.

The costs for imports can be even higher. The prices of agricultural products in Uganda and Juba are significantly different. One set of data indicates that the price of maize in Juba is three times higher than that at three Ugandan transport hub cities, Arua, Odramachaku and Mbarara. Beans are twice as expensive in Juba as in these three cities.[260] After crossing the border into South Sudan, the unit cost for transportation is roughly 1.4 times higher.[260] The main reason for the higher cost in South Sudan is considered poor infrastructure.

Transportation costs are a major cost for traders. An example is introduced to estimate the influence of transportation costs on prices. As shown in Table 10-32, if the transport cost in South Sudan declines from USD 0.65 per ton/kilometre to USD 0.33 per ton/kilometre, maize prices in Juba and Rumbek are expected to fall by 9% to 20%. Sorghum prices in major markets are expected to fall by 30%.

Table 10-32: Simulated impact of lower transport prices on maize and sorghum prices in South Sudan (USD/ton)

Product	Maize		Sorghum	
Name of towns	Juba	Rumbek	Juba	Aweil
Derived cost (at transport cost of USD 0.65 per ton/kilometre)	689	964	1,285	992
Derived cost (at transport cost of USD 0.33 per ton/kilometre)	628	768	829	680
Simulated price reduction rate	-9%	-20%	-36%	-31%

Source: World Bank, 23 May, 2012. Agriculture and Rural Development Unit, Sustainable Development Department, *Country Department AFCE4, Africa Region, Report No. 68399-SS,* Washington D.C.

Identifying the impact of improving infrastructure requires further and thorough analysis, but the above simulation shows the relationship between transportation costs and the price of agricultural products.

10.7.5 Taxation

There are several types of taxes in South Sudan. Taxes need to be paid to Customs at the South Sudan border and to states and counties in the process of transporting agricultural

[260] Yutaka Yoshino, Grace Ngungi and Ephrem Asebe, June 2011, Africa Trade Policy Notes, Notes #21. *Enhancing the Recent Growth of Cross-Border Trade between South Sudan and Uganda.*

products to a destination (market). Profit tax needs to be paid periodically. Types of taxes are shown in Table 10-33.

In Table 10-33, a wholesaler moving products from Morobo County to Yei River County pays county tax twice; once at the Morobo County border and again at the Yei County border. Wholesalers and retailers in Eastern Equatoria pay about SSP 500-700 per year as profit tax to the government. In the case of a retailer/ wholesaler in Western Equatoria, he pays SSP 10,000 per truck as a tax and custom fee every time he crosses the border with agricultural products. These taxes and fees are charged formally (legal) and informally (illegal or bribes). Formal and informal payments during the transit after crossing the border to Juba and to other destinations need to be made. Some examples of total payments between Kaya-Juba and Nimule-Juba are shown in Table 10-34.

Table 10-33: Type of taxes that merchants need to pay

Type of tax	Person who pay	Place to pay	Frequency/timing to pay
Custom	Trader/Wholesaler	Border of South Sudan	Every trip
State tax	Trader/Wholesaler	State border	Every trip
County tax	Trader/Wholesaler	County border	Every trip
Market use fee	Trader/Wholesaler/ Retailer	Market authority	Monthly
Profit tax[a]	Trader/Wholesaler	Government office at a market	Monthly or periodically[b]
License fee	Trader	Government office at a market	Annually
Police service	Trader/Wholesaler	Market police	Monthly

[a] It is called development tax or revenue tax in some areas.

[b] Payment period is variable. It can be paid from monthly to annually.

Source: Trader and wholesaler/retailer, crop subsector questionnaires, Yei, Yambio, Maridi, Bor, Torit, Wau, Kwajok, Aweil, Malakal, Renk, Guit, April to June, 2013, CAMP Situation Analysis.

Table 10-34: Formal and informal payments during transit between border and Juba

Route	Distance	Total Amount (SSP)	No. of Payments	Average Amount per Payment (SSP)
Kaya-Juba	233 km	285	11	25.91
		205	8	25.63
		165	9	18.33
		200	7	28.57
Nimule-Juba	193 km	145	8	18.13
		205	6	34.17
		135	5	27.00
		285	10	28.50

Source: Yoshino, Yutaka, Grace Ngungi and Ephrem Asebe. June 2011. Africa Trade Policy Notes, Notes #21. Enhancing the Recent Growth of Cross-Border Trade between South Sudan and Uganda. Washington D.C.: World Bank.

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The figures in the above table show that the amounts and numbers of payment are different for the same route. A reason for the different numbers of payment could be that there are many informal payments after the border. In some cases, more payments were made for shorter distances. This indicates that there were no strict rules about where and how much traders need to pay as of June 2011. In 2012, the number of collection points in the Nimule-Juba route was reduced to three after the road was paved. However, the Kaya-Juba route has not improved and this unclear taxation system may confuse traders as to how much they should prepare as payments for taxes and bribes after the border. With the data in Table 10-34, the size of a load for each trip is not given, but all traders paid over SSP 100 per trip and 5 of them paid more than SSP 200.

Table 10-34 shows that traders paid formal and informal payments 8-10 times on the Nimule-Juba route and 7-11 times on the Kaya-Juba route. This example clearly shows the multiple payments required for traders after the border of South Sudan. These multiple payments increase prices of products at markets. Through interviews with some merchants, bribes are requested by police officers at various places on the way to deliver products to market.

10.7.6 Collection and marketing capacity

One of the reasons for the large volume of foreign agricultural products in markets across the country is that local farmers lack the capacity to consolidate their harvest with other farmers to sell to a trader or a wholesaler. Consequently, wholesalers and traders tend to purchase products in bulk in foreign countries where cheaper products in bulk are available. This is a challenge for local farmers, traders and wholesalers to find new business opportunities and to make domestic products more competitive. Currently, there is no method where farmers, traders and wholesalers could meet, consolidate and negotiate among themselves to trade in larger quantities. Consolidation depends entirely on an individual trader's personal relationships.

WFP has tried to create collection points for farmers' agricultural products and places where traders, wholesalers and farmers can meet to develop innovative purchasing solutions.[261] These places also store farmers' products. WFP also purchases domestic farmers' products when certain criteria are met. These attempts are made with a programme titled Purchase for Progress (P4P). The Food, Agribusiness and Rural Markets (FARM) Project, supported by USAID, promotes marketing for farmers in the three Equatoria states. The project tries to create relationships between farmers and traders through providing them with appropriate product information. The project also tries to initiate business relationships between farmers and traders. These projects are good practices which support different players to create and strengthen their relationships to enhance business for agricultural products.

10.8 Services

10.8.1 Research

The principles of the Research Directorate of MAFCRD are to increase the quantity, quality and availability of technologies for the improvement of efficiency and profitability of agriculture in the country. The goal of agricultural research activities is to improve the food security of the country. Therefore, the Directorate focuses on testing and multiplying seeds of maize, sorghum, rice, cassava and tuber crops which are staple crops in South Sudan.

The Research Directorate has several research partners overseas such as the Association for strengthening Agricultural Research in Eastern and Central Africa (ASARECA), Alliance for a Green Revolution in Africa (AGRA), International Institute of Tropical Agriculture (IITA), and International Crops Research Institute of Semi-Arid Tropics (ICRIST). Most of the agricultural research activities are requested and/or funded by these international research institutes or DPs.

Under the supervision of the Research Directorate, there are currently two functioning research centres, the Yei Agricultural Research Centre (YARC) and the Palataka Agricultural Research Centre (PARC). Another is under rehabilitation which is the Halima Agricultural

[261] WFP. Purchase for Progress (P4P) in South Sudan, Juba.

Research Centre[262]. YARC is the largest functioning research centre in South Sudan. Basic information about YARC is presented in Table 10-35.

YARC tries to select research topics based on farmers' needs plus they follow policies and prioritize research topics. However, funding is a critical factor; although YARC and PARC are government research centres, they only receive staff salaries from MAFCRD. Research activities are almost entirely reliant on foreign research institutes' or donors' support or requests. Their research equipment is limited which constrains the range of research. There is no research activity conducted in the forestry subsector. Dissemination methods of their research findings can be improved. Currently, YARC creates manuals, brochures and posters to share research findings with the public, but many farmers are illiterate.

The Research Directorate wants to strengthen research functions in agriculture, responding to needs in different livelihood zones. They plan to establish research centres and/or research stations in different livelihood zones. They propose to establish or rehabilitate research centres/stations in Yambio, Halima, Renk, Bor, Upper Talanga and Kapoeta. Their first priority is to rehabilitate the Yambio Agricultural Research Centre. Another reason to add more research centres is that existing research centres do not have enough land for experimental plots.

Table 10-35: Profile of YARC

History	YARC was established in 2006 by the Government of Southern Sudan. It was a part of the South Sudan Agricultural Revitalization Program supported by USAID.
Location	Yei, CES
Basic objective and goals	• To increase the quantity and availability of technologies, methods and policy advice for the efficiency and profitability of agriculture while improving the food security, equity and natural resource sustainability • Ensure seed quality control for various crops including maize, rice, sorghum, groundnuts, cassava, millet, cowpeas and sesame • Disseminate best practices and technologies for improved varieties and production systems to enhance food security, poverty reduction and economic growth
Major activities	1) Conduct basic and adaptive research, 2) establish a rice breeding programme, 3) provide training to extension workers, seed producers and technicians.
Staff breakdown	37 staff in total, 1 director, 1 plant breeder, 2 research assistants, 1 farm manager, 1 accountant, 1 store keeper, 1 tractor driver, 1 secretary, 1 administrator, 3 drivers/mechanics, 10 support staff and 14 casual workers
Available Facilities	1 office building, 1 seed laboratory, 24 feddans of experimental plots, 1 rice processing hut, 1 workshop to repair car and tractors, 2 greenhouses (under construction), 6 self-contained guest rooms and 1 generator hut
Supporting donors/ project	World Bank/Multi-Donor Trust Fund, FAO, USAID/AGRA, International Fertilizer Development Center (IFDC)/Seed for Development (S4D) project, JICA, and ASARICA

Sources: YARC, crop subsector questionnaire, Yei, 10 April 2013, CAMP Situation Analysis. MAFCRD Research Unit, Agricultural Research Centre, April 2013, *Root/Tuber and Horticultural Crops Research Program 04.09.2013.* Yei. Unpublished.

Recently, the Research Directorate recruited about thirty experienced South Sudanese researchers from Sudan to be deployed at existing research centres and new research centres/stations. Their specialities are listed in Table 10-37.

[262] Currently, a seed laboratory is being constructed with FAO's support. The soil laboratory is temporarily relocated to the state ministry office, and currently no research activities are conducted.

PARC and YARC are very similar. Target commodities are also almost the same. PARC is currently focusing on maize, sorghum, rice, cassava and groundnuts. They also conduct research on seed multiplication of bananas. However, PARC is much smaller than YARC.[263] The number of supporting donors and projects at PARC are also smaller.

Major achievements and current research activities of YARC are listed in Table 10-36.

Table 10-36: Major achievements and current research activities of YARC

Target crops	Achievements, Varieties where seed multiplication succeeded and Current Situation of Research Activities
Cassava	TME14 which is sweet and early maturing was introduced to the public. It is palatable and resistant to cassava related diseases such as cassava brown strip.
Maize	Recommended varieties named longerpo and longepike which are early maturing. These varieties contain better quality protein. KDB 4 is another recommended variety which responds well to fertilizer. Longe 4 and 5 are also early maturing which are released to the public. YARC wants to market hybrid varieties such as Longe 6H and Longe 10H.
Upland rice	Training on NERICA's post-harvest and marketing skills has been conducted. YATC adopts a method called Innovation Platform Technology Adoption (IPTA).[a] Baseline survey was conducted on rice in Wotogo and Mugo payams in Yei.[b] It was found that Morobo is an appropriate place to grow rice. YARC tested several varieties of rice three times in collaboration with PARC. They want to release 4 varieties called NERICA 1, 4, 10 and DKAP 27.
Sorghum	MACIA and KARL MTAMA are popular early maturing varieties which tolerate drought well. MALISO and GRINKAN perform well in West Africa. Tests on all of these varieties are continuing.
Mushrooms	Trials have been carried out to produce edible and medicinal mushrooms. Different types of substrates were tested to see the most suitable materials for mushrooms to grow.
Sweet potatoes	Multiplication of 6 best varieties in Uganda has been conducted. Sources of sweet potatoes are the National Crops Resources Research Institute in Uganda. The main objective of the multiplication is to evaluate diseases and pest resistance, high yield and farmer preference.
Groundnuts	Some varieties are tested at YARC. SERENA is one variety that was tested.

[a] People who have common interests and goals such as traders, millers and NGOs discuss and identify rice value chains

[b] 200 farmers were interviewed through the baseline survey.

Sources: YARC, crop subsector questionnaire, Yei, April 10 2013, CAMP Situation Analysis. MAFCRD Research Unit, Agricultural Research Centre, April 2013, *Root/Tuber and Horticultural Crops Research Program 04.09.2013.* Yei. Unpublished. Yei Agriculture Research Centre, Jan-March 2013. Yei, *Progress Report on the Mushroom Production Trial Research Project: Narrative Progress report covering the period of Jan-March 2013.* Yei. Unpublished.

Table 10-37: Specialities of researchers recently recruited by MAFCRD

Category	Types of Researchers
Breeding	Rice breeder, maize breeder, sorghum breeder
Plant Health	Plant protectionist, plant health care specialist, plant pathologist, entomologist, crop physiologist
Agronomy and Soil	Agronomist, soil scientist,
Economy	Economist

[263] Two researchers are stationed in PARC as of July 2013.

Category	Types of Researchers
Mechanization	Mechanization specialist
Forestry	Forestry specialist

Source: Directorate of Agricultural Research, MAFCRD, Interviewed by CAMP task team, Juba, 28 June 2013, CAMP Situation Analysis.

10.8.2 Training

See Section 5.5 Education and Training

10.8.3 Extension services

10.8.3.1 Agricultural extension services

An Agricultural Extension Officer (AEO) is a government extension officer working at state or county level. They are responsible for disseminating appropriate agricultural knowledge and techniques to farmers as well as distributing seeds and tools. Their target groups are mainly crop farmers. AEOs are responsible for supervising and supporting Community Based Extension Workers (CBEWs). If there is no AEO available in a certain area, another AEO or CBEW who works in a nearby payam would cover.

An AEO is deployed in a state or county office in all the states to provide extension services. The National Agriculture and Livestock Extension Policy (NALEP) stipulates that one each AEO is to be stationed in county and payam offices.[264] However, not enough AEOs are deployed in county offices. In Upper Nile State, there are three AEOs working at the state office, but no AEOs hired or deployed in county offices. It is difficult to recruit new AEOs because they do not want to work in small towns or rural areas. It is similar in other states. At the payam level, AEOs were deployed in each payam in Yei River County, Morobo County, and Lainya County in Central Equatoria State, but in other states, no AEO was found by the CAMP situation analysis. Even though the number of AEOs is smaller in Western Equatoria State (WES), Western Bahr el Ghazal State (WBG) and Upper Nile State, the total number of AEOs in each state is sufficient to cover county offices. However, the number of AEOs who provide extension services on a regular basis seems limited. Total number of AEOs and their deployment situation are shown in Table 10-38.

Table 10-38: Total numbers of AEOs and their deployment situation (as of June 2013)

State	Total number	Deployment and other situations of AEOs
Central Equatoria	27	There are 5 AEOs in Juba, Yei, Lainya,[a] and Kajokeji Counties. 4 AEOs are in Morobo and 3 AEOs are in Terekeka County.
Western Equatoria	10	No AEOs are deployed to county offices. 5 out of 10 AEOs are seconded to NGOs or DPs as extension officers.[b]
Eastern Equatoria	38	Deployment situation is not confirmed yet. 3 out of 38 AEOs are seconded to NGOs and a DP.[c]
Western Bahr El Ghazal	7	3 AEOs are deployed to Jur River County and 4 AEOs are working at the state office in Wau.
Northern Bahr El Ghazal	15	3 AEOs are deployed at 5 counties. No AEO is deployed at payam level.
Warrap	51	30 AEOs out of 51 are deployed at 6 counties.
Lakes	56	16 AEOs are deployed at 8 county offices (2 for each). The remaining AEOs are working in the state office.

[264] Government of South Sudan, Ministry of Agriculture and Forestry (MAF), Ministry of Animal Resources and Fisheries (MARF), November 2010. *Final Draft National Agriculture and Livestock Extension Policy (NALEP).* Juba. Unpublished.

State	Total number	Deployment and other situations of AEOs
Unity	23	2 AEOs are deployed at 9 counties[d]. 5 AEOs are stationed at the state office of agriculture. No AEO is deployed at payam offices. Most of the AEOs work full-time, but as volunteer workers. One AEO needs to cover four to eight payams.
Jonglei	55	Deployment of AEOs at county offices is not carried out at all due to insecurity and lack of budget. The State Ministry of Agriculture tries to recruit new AEOs but has not been successful due to insecurity.
Upper Nile	3 at state office	No AEO is deployed at county offices. 6 staff from the state and county ministry offices were seconded to FAO as extension agents.[e] They were trained and provided with motorcycles. 6 of them are deployed at 3 counties to work for a FAO project.
Grand total	285	

[a] Except for the AEO in Lainya Payam, four other AEOs in payam offices do not receive salaries and work voluntarily. A similar situation was found in Morobo County as well. AEO, crop subsector questionnaire, Lainya and Morobo Counties, April 2013, CAMP Situation Analysis.

[b]The FARM Project, Red Crescent, SPCRP, CAFD, and World Vision accept one government AEO for each organization. The Project for Livelihood Improvement in and around Juba for Sustainable Peace and Development, Ten States of South Sudan, July 2011, *Survey on the Situation of Rural Development and Agricultural Extension in Ten States of South Sudan. ANNEX 4 Livelihood Profile of 10 States.* Juba. p. 104.

[c] CRS and UNHCR accepted one AEO each. Another AEO is seconded to a different NGO. The Project for Livelihood Improvement in and around Juba for Sustainable Peace and Development, Ten States of South Sudan, July 2011, *Survey on the Situation of Rural Development and Agricultural Extension in Ten States of South Sudan. ANNEX 4 Livelihood Profile of 10 States.* Juba. p. 121.

[d] Some AEOs work only part-time such as six hours in three days a week.

[e] Another 6 government staff was seconded from the state MARF and county offices to work as FAO's extension agents. Thus, in total 12 government staff is seconded as extension agents to work at county level. Source: FAO crop subsector questionnaires, Malakal, 1 June 2013, CAMP Situation Analysis.

Sources: AEOs, crop subsector questionnaires, Yei, Morobo, Lainya, Kajokeji, and Malakal, April to June 2013, CAMP Situation Analysis., The Project for Livelihood Improvement in and around Juba for Sustainable Peace and Development, Ten States of South Sudan, July 2011, *Survey on the Situation of Rural Development and Agricultural Extension in Ten States of South Sudan. ANNEX 4 Livelihood Profile of 10 States.* Juba. pp.38-39, p.47, p.57, p. 68, p. 76, p.82, pp.90-91, p. 96, p.104, pp. 112-113, pp. 120-121.

AEOs support farmers by providing information and knowledge. They sometimes provide seeds and tools. Since their means of transportation are limited, they sometimes join workshops and field activities of NGO extension workers. General extension approaches they apply are demonstration farms, Farmer Field School (FFS) and exchange visits[265]. All of these approaches have been successful for farmers to learn better farming practices and exchange information and opinions among farmers. Very few AEOs collaborate with Community Development Officers (CDOs) and Cooperative Officers (COs), but some CDOs support AEOs when they need to work with communities. AEOs support CDOs in agriculture related activities. When AEOs provide extension services, they do it independently or with NGO extension workers.

Limited means of transportation is a major challenge. For example, the AEO in Yei River County has only a bicycle to visit farmers which limits the areas of his activities. As for the few AEOs in payams, they have no transportation. Some AEOs walk to a community they need to visit. Some AEOs obtain motorcycles from NGOs to implement their extension activities. The AEOs' office environment is often not good; there are no desks and office equipment. This situation is due to a lack of budget. Similarly, there is no budget to implement activities. In many counties, no extension activities are organised by AEOs. However, a few AEOs feel that they should still provide extension services and spend their

[265] These approaches are not used in some states, but they are widely applied across the country.

own money to implement extension activities. Overall, this situation lowers the motivation of AEOs to provide extension services.

Almost all AEOs are secondary school certificate holders, not graduated from a university. Most received one month of training about extension at a training centre before they were deployed. Subsequently, they have no training opportunities to update their knowledge of extension methods and subjects. They often have limited knowledge of creative and advanced extension approaches and skills, as well as of new technologies (e.g., seed varieties, tools, pest control, storage, marketing, etc.). In addition, insecurity constrains their activities. For example, in Rumbek East of Lakes State, due to a conflict situation, the AEO cannot easily provide extension services.

10.8.3.2 Rural development extension services

Community Development Officers (CDOs) work in the Department of Community Development which is a state department facilitating community development. CDOs support communities to identify problems, embark on self-help projects and build communal facilities. Raising awareness of areas such as health and sanitation and road construction is included in their responsibilities. Capacity building related to agriculture may be a part of their work, but extension work purely for an agricultural purpose is not a CDO's responsibilities. It is a part of the reason that very few cases of collaboration have been identified between CDOs and AEOs, even though there is room for them to support each other more closely. Total numbers of CDOs are shown in Table 10-39. Numbers vary considerably between states. Central Equatoria State has the largest number and the Unity State has the smallest. In 2011, 54% of CDOs were deployed at county levels.[266]

Table 10-39: Total numbers of CDOs by State

Upper Nile	Jonglei	Unity	Warrap	NBG	WBG	Lakes	WES	CES	EES	Total
48	12	3	29	8	13	14	11	84	30	252

Sources: Department of Community Development, crop subsector questionnaires, Yei and Malakal, April to June 2013, CAMP Situation Analysis. The Project for Livelihood Improvement in and around Juba for Sustainable Peace and Development, Ten States of South Sudan, July 2011, *Survey on the Situation of Rural Development and Agricultural Extension in Ten States of South Sudan.* Juba.

The CAMP situation analysis found out that community development offices own very limited or no transportation at state and county levels. This means that, even if CDOs are deployed at county offices, they cannot implement activities. CDOs have a stronger relationship with NGOs than AEOs. NGO staff, including extension workers, has better transportation and a budget for their activities. If CDOs collaborate with NGOs, they implement their activities more often and more effectively than working with AEOs. Limited budgets for transportation and implementation of activities is a serious challenge.

10.8.3.3 Cooperative development extension services

Cooperative Officers (COs) also work in the Department of Community Development. There is an office in each state which covers the entire state to support cooperatives. Main responsibilities of a CO are promoting the cooperative movement by supporting people who wish to establish, register, audit and supervise management of a cooperative. The target group is not limited to farmers but extends to any type of cooperative. Therefore, a CO performs outreach activities, but extension work for agricultural purposes is not part of his responsibilities. Normally, there is no collaboration between AEOs and COs, but some COs

[266] The Project for Livelihood Improvement in and around Juba for Sustainable Peace and Development, Ten States of South Sudan, July 2011, *Survey on the Situation of Rural Development and Agricultural Extension in Ten States of South Sudan.* Juba. p. 54.

coordinate with NGO agricultural extension workers. Total numbers of COs in each state are shown in Table 10-40.

Table 10-40: Number of COs by state

Upper Nile	Jonglei	Unity	Warrap	NBG	WBG	Lakes	WES	CES	EES	Total
30	29	4	30	24	15	25	17	55	26	255

Source: The Project for Livelihood Improvement in and around Juba for Sustainable Peace and Development, Ten States of South Sudan, July 2011, *Survey on the Situation of Rural Development and Agricultural Extension in Ten States of South Sudan.* Juba. p. 7.

The total numbers of COs vary from state by state. Only 28% of COs are deployed at county offices.[266] Part of the reason is that COs need to support cooperative development and management in urban areas as well. However, limited budgets are another reason for this low rate.

Limited budgets for operation and implementation of activities, as well as transportation, are major challenges for COs. Some cooperative offices have support from NGOs or DPs to improve the situation. For example, in Upper Nile State, the Cooperative Office was granted a fund from NPA to train 61 farmers on cooperative development and management. The office also trained 16 fishermen to develop cooperatives with support from NPA. NPA provided one vehicle for COs to implement their activities. This type of support is not common so normally, COs have limitations.

10.8.3.4 NGO extension services

Agricultural extension services are also provided by NGO extension workers. Some large NGOs hire extension workers to implement their own activities effectively; these kinds of NGOs exist across the country. Generally, NGO extension workers have better transportation and budgets for their activities. Their knowledge levels in farm practices and extension are higher than AEOs and CBEWs. NGO extension workers have better opportunities for capacity development.

In Upper Nile State, several DPs and NGOs, such as UNDP, FAO, NPA, World Vision, VSF German and Oxfam, employ extension workers to provide extension services. The USAID-funded Food, Agribusiness and Rural Markets (FARM) Project employs extension workers to implement extension activities in Central Equatoria, Western Equatoria and Eastern Equatoria states. Smaller NGOs, such as the United Methodist Committee on Relief (UMCOR) in Yei, have some extension workers.

Normally, AEOs and NGO extension workers have a fair relationship. NGOs periodically report their activities to the state or county government offices and ask AEOs to join some of their field activities, workshops and training. Levels of knowledge are different. NGO extension workers normally have a university degree or diploma in agricultural extension, but AEOs have a secondary school certificate and only received one month of training about extension.[267] Collaboration between NGO extension workers and AEOs is important to include government opinions into extension activities by NGOs.

As an example of NGO extension workers, key information about extension workers of the FARM Project is provided in Table 10-41.

[267] UMCOR, Interviewed by CAMP task team, Yei, 15 April 2013, CAMP Situation Analysis.

Table 10-41: Key information about extension workers of the FARM Project in CES

Number of extension workers	Target counties	Means of transportation	Their main activities
9 extension workers and 1 senior extension worker	Yei River, Morobo and Kajokeji	A motorcycle is provided to each extension worker.	- Provide 3-4 day training on basic agricultural skills and knowledge to farmers - Train farmers about development of farmer-based organizations such as cooperatives - Distribute seeds, fertilizers and tools - Set up demonstration farms and support their operation as well as exchange visits - Assess yield and technology adoption rates and pest and disease impacts on farmers

Source: The FARM Project, crop subsector questionnaire, Yei, 11 April and 12 April 2013, CAMP Situation Analysis.

Three extension workers are assigned to one county and one senior extension worker oversees all of them. In Central Equatoria State, the FARM Project selected 145 motivated farmers in 2011. These farmers were trained and each of them is responsible to teach twenty other farmers new skills and knowledge. To these 145 farmers, bicycles were given. Last year, over 2,000 demonstration farms were created in the three counties to compare agricultural methods. Through extension activity, knowledge of appropriate spacing, line planting, right timing of planting and weeding, disease control, etc. is disseminated to the farmers. The adoption rate of technology was 20-23% among target farmers in 2012, and in 2013, the adoption rate increased to 40-47%. FARM considers the improvement is due to the efforts of the motivational farmers.[268]

Extension workers of the FARM Project get two training courses: 1) skills in the participatory mobilization of communities, and 2) basic agricultural skills and knowledge with best agronomic practices such as spacing, pest identification and control using integrated methods. Both courses are 7-10 days and paid by the FARM Project.

Even though NGO extension workers have better conditions for implementing their activities, there are still some challenges and constraints. Often, coverage areas are extensive and the range of activities wide. Numbers of target farmers are large[269] with a limited budget. The wide coverage in terms of areas and farmers, means NGO extension workers have to deal with language barriers.

10.8.3.5 Farmer based extension services

CBEWs are farmer based extension workers who are responsible for providing extension services to farmers at the boma level. They work under the supervision of AEOs and have to report to AEOs, but are not government officers. Therefore, they work without receiving any salary or financial incentives from the government. They are nominated from local farmers by the AEOs and trained by county or state offices. The GRSS wants to assign CBEWs to every boma office. However, their deployment varies by area. For example, no CBEWs were identified in Lakes and Jonglei states. However, in Upper Nile State, 31 CBEWs were trained and deployed in five counties by an NPA project.[270]

[268] The FARM Project, crop subsector questionnaire, Yei, 12 April 2013, CAMP Situation Analysis.
[269] Each extension officer is in charge of 400 to 500 farmers in Central Equatoria State.
[270] Panyikang, Bailet, Fashoda, Renk and Maiwut Counties. The Project for Livelihood Improvement in and around Juba for Sustainable Peace and Development, Ten States of South Sudan, July 2011, *Survey on the Situation of Rural Development and Agricultural Extension in Ten States of South Sudan. ANNEX 4 Results of State Survey.* Juba. p. 38.

As a successful case in Yei River County, one CBEW visits Ronyi boma office two days a week to provide extension services to 20 leading farmers. He receives no salary or support from the government or NGOs, except the initial three month training. However, he has commuted to the boma office using his own bicycle to provide extension services since 2006. He has created a small demonstration farm at the boma office and uses it for extension activities. He has also introduced line planting and appropriate timings of different types of crops. Leading farmers supported by the CBEW have 15-20% higher yields and are earning more income. He is appreciated by the leading farmers who share his information with other farmers in their communities.[271] This is one of the success stories. CBEWs have the potential to improve extension activities, if they are properly supported by GRSS and NGOs.

Farmer volunteers called "promoters" are supposed to be trained and assigned by the AEOs. The responsibilities of promoters are to support CBEWs to provide extension services at the community level. However, no active promoters were identified; the concept of volunteer promoters has not been well practiced.

Sometimes, the AEOs visit boma offices to meet with CBEWs, but the AEOs' transportation and budget are limited. So opportunities for AEOs to supervise CBEWs are limited. Transportation for CBEWs is also limited; many of them use their own bicycles or walk to communities. Insufficient opportunities for refresher training limit CBEWs' knowledge of extension and farming skills. Insufficient numbers of CBEWs is another challenge.

10.8.4 Rural financial services

Through the situation analysis, the CAMP Task Team clarified that only a few institutions are providing financial services to farmers. Most of the farmers interviewed are not able to get access to financial services, since there is no rural financial service provider in their area.[272] There are several financial institutions in Yei, which provide services for rural farmers, most farmers interviewed in Yei have never utilised such credit services. Some of them are eager to access financial services, but do not know how to apply nor what the requirements are. According to the interviews with some financial service providers in Yei, they have already started lending money to eligible farmers who are salaried workers of governments or NGOs or who have enough collateral as they want to avoid a default on the loan. Seemingly, the targets of the financial service providers are not subsistence farmers but progressive or large scale farmers with income from other sources or assets.

The NBS Dataset of the National Baseline Household Survey 2009 shows that 17.4% of total households in South Sudan and 15.4% of rural households borrowed money last 12 months in 2009 (Table 10-42).

Table 10-42: Number of household borrowed money last 12 months in 2009

Area	Total number of households	Households that borrowed money	
		Number	Percentage
Urban	199,740	57,605	28.8%
Rural	1,110,576	170,879	15.4%
Total	1,310,316	228,484	17.4%

Source: Data from the National Baseline Household Survey 2009. Prepared by NBS / CAMP Task Team

The top reason for borrowing money is for household consumption needs (e.g. purchase of food and daily necessities), see Table 10-43. Meanwhile, the number of households that borrowed money for agricultural purposes is small. For example, only 3.2% of rural

[271] CBEW, crop subsector questionnaire, Yei, 16 April 2013, CAMP Situation Analysis.

[272] More information on financial institutions in South Sudan is provided in Section 5.3.4 Financial institutions.

households borrowed money for farm inputs. Likewise, only 3.6% of rural households borrowed money for buying other equipment for farming. The data shows that rural households rarely borrow money for agricultural purposes.

Table 10-43: Percentage (%) of households that borrowed money last 12 months by the main reason for borrowing money in 2009

	Reasons for borrowing money	Whole Nation	Urban	Rural
I	Agriculture			
	Farm Inputs	2.9	2.7	3.2
	Buy heavy equipment	1.0	1.2	0.8
	Buy other equipment	5.8	8.0	3.6
	Buy animal	2.8	1.2	4.4
	Buy agricultural land	0.8	0.8	0.8
	Other agricultural costs	4.6	2.4	6.7
II	Non-farm business			
	Working capital & purchase	3.8	4.9	2.6
	Land and/or building equipment	3.1	2.4	3.8
	Other business expenses	5.4	6.7	4.0
III	Personal use			
	Consumption needs	64.9	61.6	68.1
	Purchase/improvement dwelling	9.9	11.2	8.7
IV	Other purposes			
	Religious, wedding, burial	3.3	2.0	4.6
	Consumer durables	2.4	2.2	2.6
	On-lending	1.1	0.8	1.4
	Other	9.2	9.6	8.9

Note: Reasons are multiple choices which are not weighted.
Source: Data from the National Baseline Household Survey 2009.
Prepared by NBS / CAMP Task Team

Table 10-44: Percentage (%) of households with main reasons for not borrowing money in 2009

Reasons	Whole Nation	Urban	Rural
No Need	23.8	25.9	22.9
Believed I would be refused	21.1	16.2	23.2
Too expensive	12.3	15.1	11.1
Inadequate collateral	6.7	5.7	7.2
Do not like to be in debt	25.2	31.9	22.2
Do not know any lender	17.1	11.8	19.5
Attempted to borrow but was refused	11.7	11.1	12.0
Because in debt	1.5	1.2	1.6
Other	9.5	6.2	11.0

Note: Reasons are multiple choices which are not weighted.
Source: Data from the National Baseline Household Survey 2009.
Prepared by NBS / CAMP Task Team

Table 10-44 shows the main reasons for not borrowing money. About 23% of rural households do not need credit which implies that approximately three quarters of rural households might have some need for rural financial services, but only limited formal

financial services are provided for rural farmers. During the CAMP situation analysis, a few interviewees mentioned mutual financing arrangements among relatives. These kinds of informal arrangements, however, are not so common in rural areas.

10.8.5 Mechanisation

Mechanisation is one of the key factors to promote large-scale commercial farming. However, there are very limited numbers of operational tractors in the country, although demand for tractor services is quite high. After the CPA, a large numbers of tractors were introduced by the national and state governments, but many of them are not operational because of (a) lack of spare parts, (b) inadequate institutional capacity to operate large-scale mechanised farms, (c) inadequate maintenance skills and (d) poor tractor operators' skills. A small number of private tractor service providers are operating but they usually provide ploughing and harrowing services only. The private service providers cannot fill the high demand for these services.

Unavailability of tractor services hampers the expansion of the area farmed per household or group. Many progressive farmers and commercial farmers' groups have tried to expand their farms. They need tractor services for ploughing and harrowing for large farms sometimes reaching almost a hundred feddans, instead of hiring expensive manual labourers. They try to use private tractor service providers or government institutions which own tractors for renting out. However, it is difficult since everybody needs such services during the early stage of the rainy season, which is the most appropriate time for ploughing and harrowing.

Table 10-45 shows some private tractor service providers. It was difficult for the CAMP Task Team to find out about private tractor service providers during the situation analysis, even though the team was supported by the State Focal Points. The team was able to conduct interviews with service providers in only five states which implies that there are a limited number of service providers.

Prices vary from place to place. There are some large-scale mechanised schemes in Renk County in Upper Nile State where the price and scale of tractor services are completely different to other places. In Renk, the unit cost for ploughing is about 4% of that in Yei and Aweil, and 3% of that in Maridi and Bor. Farms are large and not scattered and the soil is suitable for tractor use, so the service providers can utilise their tractors very efficiently. All the service providers interviewed pointed out that the unavailability of spare parts is a serious issue for the smooth operation of their business. They have to purchase them from Uganda and Sudan.

Table 10-45: Tractor services in different places

Place	Service	Price (SSP/feddan)	Typical size of land	Average # of services provided	Geographic areas serviced
Yei	Ploughing	160-200	8-12 feddans	80 feddans/month, 8-10 farmers/month	30 km away (Yei-Morobo)
	Harrowing	180			
Maridi	Ploughing	300	Maximum 2 ha	50 farmers/month	Maridi, Yambio and part of Mundri West
Bor	Ploughing	300	1-45 feddans	15-30 farmers/month	Inside payam
	Harrowing	150			
Aweil	Ploughing	200	50 feddans	50 farmers/month	Aweil Central
Renk	Ploughing	7.5	240-1,000 feddans	1,000 feddans/week	Those who apply for services
	Planting	7.5			

Source: Tractor service providers, interviewed by CAMP crops subsector team, April to June 2013, CAMP Situation Analysis

Frequent breakdowns of tractors are also serious problems for the service providers. The main reasons for the breakdowns are poor farm conditions and inadequate tractor operators' skills. In the Greenbelt zone, vegetation cover is thick forest so farmers who want to reclaim large areas have to remove stones and tree stumps before ploughing. If stumps are not properly removed, the tractor and its implements are easily damaged. However, removal of large tree stumps cannot be done manually and farmers need to hire heavy equipment such as bulldozers, which are rarely found in rural areas and are expensive to hire. Unskilled tractor operators also cause breakages of tractors. The depth of ploughing should be determined based on soil texture and moisture, and the existence of stumps and stones. However, unskilled operators tend to plough deeper without paying attention to farm conditions. As a result, plough disks get damaged easily. There is no functional government training centre for tractor operators to obtain appropriate skills as of August 2013. The Kapuri Agricultural and Technology Transfer Centre (KATTC) is expected to be a training centre for tractor operators but training has not been conducted since 2011 due to limited budgets.

Even in the mechanised schemes in Renk, labourers are sowing seeds immediately after ploughing and harrowing by tractors. Combine harvesters are not utilised at all. Usually, postharvest activities, such as threshing and drying, are done manually. Small simple threshers for maize are sometime used by government institutions, and large scale and progressive farmers. A few small scale rice mills were introduced in the Greenbelt zone by NGOs and DPs on a trial basis. A large rice mill was introduced to the Aweil Rice Scheme, but it is not operational now due to lack of spare parts.

Ox ploughing was introduced by some NGOs to show this simple and affordable technology to subsistence farmers. In Lakes State, ox ploughing was adopted rapidly compared to other areas since the soil type (sandy soil) is suitable for ox ploughing. Some NGOs are helping farmers by providing training and the necessary tools. A plough suitable for ox ploughing, imported from Kenya, was approximately SSP 950 in Torit in April 2013.

10.8.6 Agricultural inputs

Most of the farmers interviewed in the CAMP situation analysis use their own seeds for cereal production. The seeds are harvested in the previous season and kept by the farmers. Even though farmers are willing to test new varieties of sorghum and millet, it is difficult for them to get access to new varieties of seeds. Some farmers in the Greenbelt zone can access hybrid varieties of maize and new varieties of upland rice more easily than improved sorghum and millet varieties.

Vegetable growers began to buy quality seeds from agro dealers as they transform from subsistence to commercial farmers. Quality vegetable seeds are mainly imported from Kenya and Uganda. The major seed companies are East Africa Seed, Freshco Kenya Ltd and Seed Company Ltd in Kenya, and NASECO Seed Company, East African Seed Company and Farm Input Care Centre Ltd in Uganda.

Chemical fertilisers are rarely utilised by farmers. Only a few progressive farmers working with a project supported by the International Fertilizer Development Center (IFDC) use urea (46% nitrogen content) and DAP: di-ammonium phosphate (18% nitrogen, 46% phosphate and 0% potassium content). These are available at shops supported by IFDC and are sold more cheaply to customers who are targets of the IFDC project.[273] Most of farmers do not use manure because: (a) manure preparation is labour intensive work, (b) many livestock are necessary to produce enough manure, so many farmers cannot afford it and (c) the soil

[273] Both Urea and DAP are the same price, SSP 35/bag (25kg), at the shop in Torit supported by IFDC in April 2013.

is still fertile enough to grow crops. If soil fertility decreases, some farmers move to different areas to leave the farmland fallow to recover its soil fertility.

As mentioned in Section 10.4.6 Private sector, the number of agro dealers that handle agricultural inputs is quite small, taking the agricultural potential into consideration. The CAMP Task Team could find agro dealers only in five states; it seems that demand for quality seeds, chemical fertilisers, pesticides and herbicides are still at a low level.

10.8.7 Plant protection

Through interviews with farmers, it was found that most farmers do not use chemicals for pests and diseases. A few progressive farmers sometimes utilised pesticides for termite nests. The most serious pest for sorghum production is a bird called Quelea quelea. Especially in mechanised schemes in Renk County, the damage from Quelea quelea is extremely serious. Although pest control is carried out in Sudan by aerial spraying[274], in South Sudan pest control measures are not taken at all. Due to serious damage from the birds, many farmers had very little harvest in 2012. Likewise, damage by insects (e.g., migratory desert locusts and grass hoppers) to sorghum and maize is serious, again due to the lack of pest control. To improve the situation, the national and state governments are considering some pest control measures for large mechanised schemes (e.g., spraying for Quelea quelea nests on trees) but the measures are not carried out due to budget constraints.

Other pests, such as monkeys, squirrels and termites, have a negative impact on agricultural products, but these are not so serious compared to the pests mentioned above. In addition, livestock kept by pastoralists sometimes causes serious damage to crops grown by local farmers which leads to tribal and inter-communal conflicts. Fencing is an effective prevention measure but local farmers cannot afford to fence their farmland due to financial constraints. In some areas, traditional conflict resolution mechanisms are working well to solve this issue, but not in all areas.

Cassava mosaic and brown streak diseases are threat for farmers in the Greater Equatoria Region, especially in the Greenbelt zone. Rosette virus and leaf spot are serious diseases of groundnuts.[275] Regarding weeds, the spread of striga is the most critical issue since herbicides are not effective in controlling striga.

Although damage by pests and diseases is serious, services related to plant protection (e.g. application of pesticides and quarantine of seeds and plants) are not provided by the government due to limited human and institutional capacity, no operating budget and no collaboration mechanism between the national and state governments. In 2012, South Sudan became a member of the Desert Locust Control Organization for Eastern Africa (DLCO-EA), which is a regional pest and vector management organisation established in 1962. This organisation is mandated to control migratory pests such as Desert locust, African armyworm moth, Quelea quelea and Tsetse fly.[276] It is expected that migratory pest control could be implemented through DLCO-EA.

10.9 Agricultural infrastructure

Although main roads, feeder roads, irrigation facilities, storage, drying yards and market facilities are key infrastructure for crop production and marketing, these facilities are not well developed in either the public or private sectors. Main road and feeder road

[274] Aerial spraying is carried out in mechanised schemes in Sudan by the government.
[275] FAO/WFP. 2013. *Crop and Food Security Assessment Mission to South Sudan*. p. 20. Rome: FAO/WFP
[276] DLCO-EA. http://www.dlcoea.org.et/ (accessed on 29 August 2013)

construction/rehabilitation are covered in Section 8*.10 Infrastructure*; this section focuses on other agricultural infrastructure.

There are only two large scale irrigation schemes in the country, i.e., the Aweil Irrigation Rice Scheme (AIRS) and the Renk Irrigation Schemes. ARIS was initiated by the British colonial government in 1945. The scheme expanded in area gradually and about 2,700 feddans of farmland are now operational. In 2009 the scheme was rehabilitated through the Aweil Irrigation Rehabilitation Project supported by GIZ under the Sudan Productive Capacity Recovery Programme (SPCRP), funded by the EU.[277] During the project period, demining, and dike and canal maintenance were carried out and agricultural machinery (e.g. large scale rice mill and heavy equipment) and technical assistance provided. However, after completion, the scheme has not operated effectively due to limited funds for operating costs and limited human resources. The Renk Irrigation Schemes, which are composed of 23 sub-schemes,[278]have not been operational for more than three years; most of the farmers have migrated away from the scheme areas to nearby towns due to lack of drinking water for humans and livestock. [279]

Small scale pump irrigation schemes that use surface water from rivers and streams or underground water are sometimes found in suburban areas. Some progressive farmers establish small irrigation systems, including water pumps, boreholes, pipes and water tanks, for dry season vegetable production. Some farmers' groups (e.g., women's group and cooperatives) are provided with water pumps and tanks by DPs for vegetable production. However, this is not common.

Regarding storage facilities, WFP is promoting medium scale warehouse construction through the Purchase for Progress (P4P) initiative. P4P planned to construct 10 to 15 warehouses to be managed by farmers' organizations and four of them are already established as of April 2013.[280] The floor area of each warehouse is about 300 to 400 square meters. P4P also provides farmers' organizations with training on warehouse management and some equipment (e.g., tarpaulins, pallets, trays and moisture meters). Nzara Farmer Association (NFA) in Yambio is one of the successful cases. NFA is working very actively to collect products from local smallholders. NFA sold sorghum and maize to P4P and earned about USD 64,000 in 2012.

Usually subsistence farmer households own small scale traditional grain storehouses, which have no ventilation to keep cereal dry. During the rainy season, cereals stored in these storehouses are often affected by mould due to high cereal moisture content caused by limited ventilation. To avoid this, many households keep cereal in sacks and put them in the ceiling of their houses but storage capacity is limited. Many farmers in the Greenbelt zone, where humidity is very high in the rainy season, face serious postharvest loss. To ameliorate this situation, some DPs introduced improved storage facilities made of tin roofs with wire mesh walls and floors.

Well established drying yards (e.g., cemented floors) for drying cereals and cassava are not commonly used. There is no large scale drying facility for postharvest processing. Farming households usually dry their produce on the mud ground, tarpaulin, or simple platforms.

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[277] GRSS. Ministry of Electricity, Dams, Water Resources and Irrigation. 2013. *Irrigation Development Master Plan:Progress Report 1 (Draft).* pp 3-1 – 3-3. 2013. Juba

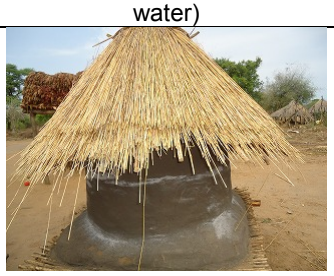
[278] GRSS. MWRI. 2010. *Assessment, Design, Installation of Irrigation Pumps and Rehabilitation of Water Control Infrastructures, Inception Phase, Preliminary Assessment Works on Renk Project, Final Report*. p. 8. Juba: MWRI

[279] GRSS. Ministry of Electricity, Dams, Water Resources and Irrigation. 2013. *Irrigation Development Master Plan:Progress Report 1 (Draft). P.* 3-20. 2013. Juba

[280] P4P incharge in WFP, interviewed by CAMP crops subsector team, 4 April 2013.

Public market facilities are poorly constructed with temporary materials, which are prone to outbreaks of fire. The floors are not cemented; drainage systems are poor, leading to many puddles with dirty water during the rainy season, when sanitation conditions are extremely poor. On the other hand, private market facilities constructed by landowners or merchants are permanent structures with cement floors and walls. These market facilities are usually for processed products, such as maize flour, sugar and cooking oil, so sanitation conditions are fair.

Figure 10-26: Agricultural infrastructure established by public and private sectors

Irrigation	 Aweil Irrigation Rice Scheme	 Irrigated vegetable production in peri-urban (using surface water)	 Small water pump for irrigated vegetable production
Storage	 Warehouse constructed by WFP through P4P	 Traditional grain storage	 Improved grain storage introduced by DPs
Drying yard	 Drying cassava on tarpaulin	 Improved drying platform	 Traditional drying platform
Market facility	 Shop established by the government	 Small shops established by the government	 Wholesaler's shop established by a landowner

Source: CAMP crops subsector team, April to September 2013, CAMP Situation Analysis.

10.10 Investment

Even though there is vast potential in the agriculture sector, not much investment has been made since CPA. Regarding public investment, the government failed to invest effectively and efficiently to develop the agricultural sector. In the Maputo declaration on agriculture and food security in Africa in July 2003, two targets were set: (a) increasing agricultural productivity by 6% per year through 2015 and (b) allocating at least 10% of the national

budget to agriculture and rural development within five years.[281] However, the budget approved for the former MAFCRD and MARF in 2012/13 were 1.6% and 0.4% of the total budget. Table 10-46 shows only 2% of the total budget was allocated to agriculture related ministries, while 38.1% and 3% of the total budget were allocated the Ministry of Defence and Veteran Affairs and the Ministry of Wildlife Conservation and Tourism.

Table 10-46: Approved budget 2012/13

Items	Approved budget 2012/13 (SSP)			
National total budget			6,664,162,036	100%
	MAFCRD		**MARF**	
Wage and Salaries	15,534,086		5,432,721	
Use of Goods and Services	16,095,269		10,938,316	
Capital Expenditure	32,875,644		-	
Transfer to Sates	40,160,750		11,210,504	
Sub-total	104,665,749	1.6%	27,581,541	0.4%
Grand total of agriculture related ministries			132,247,290	2.0%
Ministry of Defence and Veteran Affairs			2,542,356,046	38.1%
Ministry of Wildlife Conservation and Tourism			198,706,464	3.0%

Note: % is against the National total budget
Source: Republic of South Sudan approved budget 2012/13. p23, p34.

Investment for service delivery, such as research, training and extension, is very limited and ineffective. Only one research centre is functional in South Sudan and there are only a few government training centres providing training courses for Agriculture Extension Officers (AEOs) and farmers. Only 285 AEOs are assigned[282] and most of them are not well equipped in terms of transport and necessary materials for extension activities. Likewise, 252 Community Development Officers (CDOs) and 255 Cooperative Officers (COs) are working on the ground but they face a similar situation to the AEOs.[283] Public services do not reach most farmers.

Investment for infrastructure, such as feeder roads, irrigation facilities, storage and market facilities, is minimal (see section 10.9 Agricultural infrastructure). The government is working with DPs for infrastructure development. The World Bank, EU, WFP and USAID are the main DPs supporting feeder road rehabilitation/construction. In order to collect more agricultural products effectively and to facilitate private sector trading activities, some warehouses are constructed in strategic towns with support from WFP. However, public investment for infrastructure development is insufficient to meet demand.

In the private sector, almost all businesses in the country are small and medium sized enterprises (SMEs).[284] This is also true with respect to crop production; all agro dealers, retailers, wholesalers and producers are SMEs; there are no large enterprises for agribusiness. A large volume of investment by the private sector has not yet materialised. The former Ministry of Commerce, Industry and Investment set 11 priority sectors, including agriculture and agribusiness, who would receive benefits and incentives to encourage investment (Table 10-47). However, the investment environment is still not favourable due to

[281] FAO. 2012. *The State of Food and Agriculture: Investing in agriculture for a better future 2012*. p 26. Rome.
[282] Population of South Sudan in 2012 is estimated as approximately 10 million, so one AEO should cover about 35,000 people to deliver extension services for the whole nation.
[283] Number of AEOs, CDOs and COs are from 10.*8.3 Extension services*.
[284] African Economic Outlook. http://www.africaneconomicoutlook.org/en/countries/east-africa/south-sudan/ (accessed on 7 Octber 2013)

the unclear land acquisition process, multiple informal taxation, insecurity and the high cost of labour and commodities.

Table 10-47: Tax concessions and incentives regime

Concessions and incentives	Details
Duty exemption	Agricultural imports – tools, equipment, machinery and tractors, pharmaceutical, animal feed, seeds – for boosting food and cash crop productions shall be exempt from any duties and taxes for a period that shall be determined by law.
Tax incentives	Tax incentives include capital allowances ranging from 20% to 100%, deductible annual allowances ranging from 20% to 40%; and other depreciation allowances ranging from 8% to 20%.
Special incentives	Special incentives may be granted by the Board of Directors of South Sudan Investment Authority to investments in strategic or transformational sectors. These special incentives are only available on special application by investments in areas designated as strategic or transformational.

Source: GRSS. 2011. *Republic of South Sudan Investor Guide*. p 22. Juba

10.11 Cross cutting issues

(1) Gender

In South Sudan, 48.1% of the population are women[285] and 80% of the family labour is contributed by women.[286] 71% of women engage in crop farming as a main source of income.[287] Thus, women are an important labour force for farming. If they were widows, they would be the main income earners and/or decision makers.

However, the literacy rate of women between 15 and 24 years is 28% while for men it is 55%.[288] Women's net enrolment rate for primary school is 37.1% compared to 50.8% for men.[289] Lower educational profiles generally lead to the lower social status of women. Women normally do not have the right to own land, and the decision making system is based on male leaders, especially in rural areas. This negatively affects the opportunities for women to have equal access to resources. However, female farmers are essential for agriculture in South Sudan. Extension workers and staff of NGOs should be aware of this when they implement activities at a community level and provide equal opportunities of services to female farmers.

(2) Labour costs

Besides the importance of female labour force in the crop subsector, the younger labour force is also very important for agricultural development. Labour participation rates for those between 15 and 34 years old and those between 35 and 54 years old are 72% and 85%.[290] According to the data, about 30% of the age group between 15 and 34 years old are not employed.

It was identified through the CAMP situation analysis that agricultural labour costs are high. Most subsistence farmers cultivate only the area which is manageable by family members.

[285] 3.97 million are women out of 8.26 million total population in the 2008 Census. Source: National Bureau of Statistics, Government of Republic of the South Sudan (GRSS). January 2012. *National Baseline Household Survey 2009, Report for South Sudan 2012*. p. 8. Juba.
[286] NBS, Government of Republic of GRSS. *South Sudan Statistical Yearbook 2011*. p.11. Juba.
[287] NBS, GRSS. January 2012. *National Baseline Household Survey 2009, Report for South Sudan 2012*. P. 101. Juba.
[288] NBS, GRSS. 2011. *South Sudan Statistical Yearbook 2011*. p. 41. Juba.
[289] NBS, GRSS. 2011. *South Sudan Statistical Yearbook 2011.* p. 23. Juba.
[290] NBS, GRSS. 2011. *South Sudan Statistical Yearbook 2011.* p. 84. Juba.

Although there must be employment opportunities in other sectors, the figures shown above indicate that the agricultural sector can fill the gap between work opportunities and a surplus labour force. An agro dealer in Yei mentioned that he tried to hire young people to work for his experimental plots, but the young people stopped coming to the farm after one day. He had to find short term workers from Kenya and found that the total costs were lower.[291] High labour costs and low participation in the labour force are a hindrance to improving crop production and expanding the sizes of farmlands.

(3) Conflicts/security
In South Sudan, conflicts with Sudan and internal domestic conflicts occur. Causes of these conflicts vary, but it affects farming seriously. For example, in Upper Nile State, there are armed rebel groups who attack different communities to steal their food, money and belongings including cattle. Farmers abandon their farming. Some farmers even flee their communities and become internally displaced persons (IDPs). In some states, such as Western Bahr El Ghazal, Western Equatoria) and Jonglei, there are conflicts between farmers and pastoralists because livestock damages crops. These conflicts cause negative effects in agricultural production.

Only 3.8% (2.5 million ha) of the total land area of South Sudan (64.7 million ha) is used for crop farming as of 2009.[292] There are still large areas that are uncultivated, but land under cultivation is increasing. In Central Equatoria and Western Equatoria states large scale land clearing is being carried out.[293] In some areas, the cleared lands were dense forests causing land degradation and loss of biodiversity. Large-scale forest clearance is reported in the areas of Juba, Terekeka and Yambio.[293] If mechanization were promoted further, the land clearance would increase and the environmental impact would be larger.

[291] Century Seeds, *interviewed by CAMP crop sub-sector,* Yei, 13 April 2013. CAMP Situation Analysis.
[292] World Bank, Africa Region. 14 October 2011. *Strategic Choices for Realizing South Sudan's Agricultural Potential.* Washington D.C.
[293] GRSS, Ministry of Environment, and United Nations Environment Programme, January 2012. Environmental Impacts Risks and Opportunities Assessment: Natural resources management and climate change in South Sudan. p.36. Juba.

11. Livestock

11.1 Overview

South Sudan has a substantial livestock resource, a legacy of a historical endowment, that was well documented in the seminal pre-independence, pre-civil war 1954 British colonial assessment of the natural resources and development potential of the then Southern Provinces of the Sudan.[294] The assessment found that in 1954 southern Sudan had a considerable livestock resource recognized as a great asset that would be of significance for sustainably increasing the financial self-sufficiency of the region. There was widespread ownership of livestock across the region except for parts where trypanosomiasis (sleeping sickness in human beings) was prevalent. Animal production was based on traditional migratory systems (pastoral systems) but in most areas, mixed economies (agro-pastoral), in which cattle were an essential part, were evident. Today, South Sudan's ruminant livestock wealth is still largely in the hands of traditional agro-pastoralist and pastoralist systems that hold 47% and 43% of South Sudan's livestock wealth; the remaining 10% being in the hands of smallholder livestock keepers mainly in urban and peri-urban areas. The strengths of the traditional systems must be acknowledged in a situation where due to protracted civil war and marginalization livelihoods were decimated, input systems, animal health services and marketing were underdeveloped, never developed or greatly eroded effectively undermining productive and profitable economic activity. South Sudan also has a legacy of honey gathering and traditional beekeeping with honey playing an important role in supplementing diets, providing income and an important commodity in socio-cultural exchanges.[295]

A definitive estimate of the size of the livestock subsector is lacking, but a revised data based FAO estimates used officially by the national ministry, and considered conservative by some key stakeholders, put the national herd in 2013 at 11.7 million head of cattle, 12.5 million goats and 12.1 million sheep[296]. This would place the South Sudan national herd as the seventh[297] largest in Africa (Table 11-1), worth an estimated 7 billion South Sudanese Pounds (SSP), approximately 15% of the GDP[298]. This asset has tremendous potential; even within the current constraints and challenges, it is estimated that only 35% of the available supply base can meet the current domestic demand and social needs.[299] Given the relatively low human population of 8.26 million, South Sudan has the highest per capita holding of livestock in Africa, and a large land area of 648,000 sq. km, much of which is suitable for livestock production. The livestock subsector has great potential for meeting domestic demands and generating a surplus of livestock for export.[299] The large subsector base, with 72–85%[300] of households having at least one animal, offers a significant

[294]Sudan Government. 1955. *Natural Resources and Development Potential in the Southern Provinces of the Sudan. A Preliminary Report by the Southern Development Investigation Team 1954.* London.

[295]The Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA). 2012. *A Study on Traditional Beekeeping and its Contribution to Food Security and Poverty Alleviation*. Information for South Sudan Food Security and Policy Intervention. European Union.

[296]FAO/WFP.2013. Crop and Food Security Assessment Mission to South Sudan. 22 February 2013.

[297]South Sudan national herd is ranked as the 6th largest on the African continent ahead of Kenya. Data for the two countries would rank South Sudan 7th on the basis of both numbers and tropical livestock units. Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

[298]Government of Southern Sudan. 2010. GOSS Growth Strategy 2010-2012

[299]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

[300]The NBHS found that 72% of all South Sudan households own one or more livestock. Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF. The study cited a figure of 85% households owning at least one type of

opportunity for addressing food security, income generation, poverty reduction, employment, trade and broadening the economic base of South Sudan. Similarly, the findings of a study by the South Sudan Food Security and Policy Intervention (SIFSIA) indicate a huge potential for production of honey and related products based on the gathering of wild honey and traditional beekeeping, even before taking into account the potential from modern beekeeping.[301] A report asserts that over 60% of the honey on the Uganda market in the early 2000's came from South Sudan: Uganda is an exporter of honey to the European Union.[302]

Table 11-1 Livestock population in selected African countries in 2011[303]

Country	Rank in Livestock Holding in Africa	Cattle	Goats	Sheep
Ethiopia	1	53382194	22786946	25509004
Sudan	2	29618000	30649000	39296000
Tanzania	3	21300000	15200000	6400000
Nigeria	4	18871399	57300000	38000000
Kenya	5	18173500	28860700	17821600
South Africa	6	13688328	6165051	24302776
South Sudan[304]	7	11749245	12449624	12087020
Uganda	8	11408750	12449670	3410370
Madagascar	9	10000000	1300000	735000
Niger	10	9552611	13231429	10018857
Chad	13	7650000	6750000	3100000
Somalia	15	4850000	11500000	12250000
Egypt	17	4803000	4207400	5488000
Eritrea	26	2065000	1750000	2281000
Rwanda	33	1143231	2970780	829000
Burundi	37	653580	2285693	332463
Djibouti	45	296000	512000	468000
Total Africa		291,422,407	334,503,748	318,203,963

Sources: FAOStat 2011. FAO/WFP 2013. FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan for South Sudan data. Republic of Uganda. 2009. The National Livestock Census. *A Summary Report of the National Livestock Census, 2008.* Ministry of Agriculture, Animal Industry and Fisheries and Uganda Bureau of Statistics, for Uganda data.

The high potential of South Sudan's livestock subsector is similar to, and in some cases surpasses, that of other countries in the Horn of Africa, where livestock contribute significantly to livelihoods, national and regional economies. The region collectively has the highest concentration of livestock in Africa and the highest concentration of pastoralists and agro-pastoralists globally. Although there have been concerted efforts to improve the quality

livestock. National Bureau of Statistics. 2012. *National Baseline Household Survey 2009. Report for South Sudan 2012*.

[301]An assessment of three states i.e., Lakes, Western Bahr el Ghazal and Western Equatoria revealed that from traditional beekeeping and honey gathering alone the potential annual earnings from sale of honey could reach a minimum of SSP 31 million (USD 9.85). European Union. Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA). 2012. *A Study on Traditional Beekeeping and its Contribution to Food Security and Poverty Alleviation*. Information for South Sudan Food Security and Policy Intervention.

[302]Maku, J. 2004. *Honey Market in Uganda.* APIACTA, Vol 38 (2004), pp.302–306.

[303]Note: 2011 data used as 2012 data not yet available from FAOStat

[304]Calculated based on the conservative growth rates of 0.06 for cattle and 0.1 for goats and sheep suggested in the CFSAM 2013 Mission Report. 2013 data is an estimated

of its herd, sector development in the region is still largely based on indigenous stock.[305] Within East Africa alone, the livestock sector amounts to a multi-billion dollar industry estimated at $5 billion annually, representing over 14% of the total GDP of the East Africa region.[306] In neighbouring Ethiopia, with the largest livestock population on the continent, livestock exports are only second to coffee in generating foreign exchange. According to the National Bank of Ethiopia, formal trade of livestock and livestock products out of Ethiopia in 2006 generated US $121 million. However, there is an even larger informal (unregistered) trade of live animals out of Ethiopia into Kenya, Somalia and Djibouti which is estimated to generate between US $250 and US $300 million, annually.[307] South Sudan has historically been part of this regional trade and is still involved, even though at limited levels.[308] In Kenya, 70% of the national herd is in the arid and semi-arid lands held predominantly by pastoral and agro-pastoral groups[309]. Livestock in Kenya contribute 320 billion Kenya shillings to the agricultural GDP, only slightly below the contribution of crops and horticulture[310]. The Greater Horn of Africa region produces 42% of Africa's milk, with Kenya being the highest milk producer continentally. However, most of Kenya's milk is produced from high grade cattle, unlike Uganda's dairy industry that is largely based on indigenous cattle kept by pastoral, agro-pastoral and small holders, making it one of the few low cost milk industries globally. Uganda's milk production increased from 365 million litres in 1991 to an estimated 1.526 billion litres in 2012 and has over the last decade maintained a positive growth rate of 3% per annum compared to the declining growth rates in the food and cash crop subsectors in Uganda. The country, which was an importer of milk in the 1980s, now earns revenues from exporting to the region that have risen from $3.4 million in 2011 to an expected $12.1 million in 2013.

South Sudan's livestock subsector potential is untapped and underdeveloped for food security, livelihoods, income generation, industrial growth and export. The subsector potential is poorly conceptualized and articulated, which is a result of, among other things, the lack of reliable data especially on livestock population and the dynamics within the subsector. This lack of reliable data has impeded strategy development, planning, investment and coordination at all levels and across stakeholders. The subsector lacks a comprehensive policy, legislative and regulatory framework to guide and regulate subsector actors and to create an enabling environment for sustained increased investment. Areas of comparative advantage, within both the national and regional livelihood zones and economies, have not been clearly identified or exploited. Mutually beneficial linkages to the wider national economy, especially the crop sector, are not harnessed.

Major advantages/opportunities are: large livestock population; favourable livelihood zones; large base of producers, with many experienced livestock keepers; large production and productivity gap, where low level technologies already in existence and better organization of the actors can achieve substantive initial gains; livestock concentration areas that can be production cluster regions; high demand in urban and peri-urban centres; opportunities to

[305]Humanitarian Policy Group. 2009. *Getting it Right: Understanding Livelihoods to Reduce the Vulnerability of Pastoral Communities.* ODI Synthesis Paper.
[306]Kilimo Trust 2009. *Livestock Product Value Chains in East Africa: Scoping and Preliminary Mapping Study.* Final Report, Kampala, Uganda March 2009.
[307]COMESA. 2009. *Policy Framework for Food Security in Pastoral Areas. Comprehensive African Agriculture Development Programme,* Pillar III Consultative Draft. COMESA, December 2009.
[308]CAMP Livestock subsector team, March to July 2013, CAMP Situation Analysis., Sudan Government. 1955. *Natural Resources and Development Potential in the Southern Provinces of the Sudan. A Preliminary Report by the Southern Development Investigation Team 1954.* London
[309]Republic of Kenya. 2012. Sessional Paper No. 8 of 2012 on National Policy for the Sustainable Development of Northern Kenya and Other Arid Lands. Releasing Our Full Potential. Ministry of State for Development of Northern Kenya and Other Arid Lands. Office of the Prime Minister. October 2012
[310]Republic of Kenya. 2012. Sessional Paper No. 8 of 2012 on National Policy for the Sustainable Development of Northern Kenya and Other Arid Lands. Releasing Our Full Potential. Ministry of State for Development of Northern Kenya and Other Arid Lands. Office of the Prime Minister. October 2012

exploit a diversity of production systems and emerging species; untapped linkages with the crop sector that can produce critical inputs for commercialization. Additionally, there are regional opportunities including: access to existing technologies and innovations; resources to support and strengthen both domestic and transboundary animal health services; compare and learn from the strategies and paths of development of the livestock sectors of other countries in the region; existence of vibrant live animal trade; linkage into input production and distribution systems, sector investors and financing; research and training facilities in the region. All these advantages/opportunities could help 'jump start' production and productivity, commercialisation, industrialisation and trade.

11.2 Key issues and challenges

(1) An inadequate formulation and articulation of the potential and opportunities within the livestock subsector:

- Lack of authoritative data on the size of the subsector: fundamental to shaping strategies and undergirding arguments for increased and substantial investment in the subsector is a need for definitive estimates of its size and structure. Reliable data is needed to emphasise the importance and potential of the subsector for food security, improvement of livelihoods and incomes, and for increasing the economic base and export revenues. Lack of reliable data has undermined planning, coordination, delivery of services and investment at all levels of government and between sector actors.

- Lack of appreciation of the value, rationale and opportunities of the subsistence traditional livestock keeping systems that are the foundation of the South Sudan livestock sub-sector: this is a pervading narrative that is evident in policy, at the political level, among some implementers and within communities at the grassroots[311]. This narrative has not factored in the innovativeness and resilience of pastoral and agro-pastoral livestock keepers that utilise marginal resources and that have maintained a large livestock resource despite the challenges during the protracted period of conflict and marginalization. The potential of the livestock sub-sector, which is comparable to that of other countries in the region can only be realized through institution of policies and strategies that are aligned to the existing livestock sector resource

- Poor integration of the subsector within the broader national, transboundary and regional economies: the linkages between the livestock and crops subsector are not noted leading to missed opportunities for integrated approaches, such as using: draught power to increase crop production; livestock assets for cash to fund inputs for cropping; and, crop residues, milling by products, and forages and fodder for feed. There is a weak response by the subsector to the growing domestic demand within urban and peri-urban centres, a gap being filled by imports. There are also poor linkages to existing regional opportunities, including

[311] A nominal view is taken of pastoral and agro-pastoral systems i.e., as conservative, focused on social goals of increasing herds sizes for purposes of prestige and marriage, adverse to change and market integration without an interrogation of the underlying issues. The core strategies of pastoralists such as mobility and migration are viewed as irrational and the cause of conflict. This narrative has not factored in the fact that due to protracted conflict and marginalization, pastoralists face a number of challenges; due to inadequate services production and productivity are low, and losses to drought and disease high. Poor road infrastructure, long distances to markets, multiple formal and informal taxation, insecurity all increase transaction costs negating potential benefits of market integration. The tendency is to focus on re-stocking in an attempt to ensure the survival of a breeding herd in the face of the multiple challenges. Social networks including kinship relations, marriage and dowry payment are important institutional arrangements for distribution of livestock, ensuring food security and reducing risk.

access to and utilisation of technologies, innovative financing, capacity building facilities and trade opportunities.

(2) Structural constraints that are impeding the growth of the livestock subsector, which include:

- Inadequate road infrastructure and means of transportation that are not aligned to the needs of the subsector, increasing transaction costs and vulnerability to insecurity, raiding, disease and to multiple and informal taxation, plus impeding market integration and trade.

- Unclear and incomplete constitutional, legal, policy and regulatory framework for land tenure that has resulted in inconsistencies and conflicts in the interpretation and implementation of land tenure. This has adversely affected availability of land for livestock production, mobility and migration, marketing and processing in both rural and urban areas.

- Conflict and insecurity including cattle raiding/rustling have disrupted livestock activities, resulting in: loss of human life and livestock; displacement of communities; disrupting of access to and utilisation of key grazing and water resources; and, reduced access to stock routes for production, marketing and trade. Insecurity has negatively impacted livestock populations and dynamics. In some counties this has affected livelihoods, and increased food insecurity and poverty.

- Inappropriate taxation: livestock and livestock products suffer multiple taxation (formal and informal/unreceipted) due to the lack of an integrated taxation framework. This leaves livestock producers and traders liable for taxes from multiple government agencies and other stakeholders. Inputs for production, such as day old chicks and feeds, attract high taxes unlike foodstuffs, which has been a deterrent to the growth of businesses that import and distribute such imports. Individual farmers and projects are left to import such inputs on an ad hoc basis. Exports such as hides and skins also attract high taxes.

- Inadequate Information and Communications Technology (ICT) and mobile telephony connectivity: given the size of the country and the poor road network and means of transport, ICT and mobile telephony are critical for coordinating both public and private sector activities and for securing and reducing the cost of financial transactions based on the models of mobile money within the Horn of Africa region.

(3) Incomplete policy, legal and regulatory frameworks: There is a lack of a comprehensive policy framework, policies and lead institutions/authorities to allow the development of the subsector and its components such as the dairy, meat, poultry, honey and hides and skins industries. A comprehensive legal and regulatory framework that is tailored for South Sudan is lacking; there is a need to review and update the existing acts/bills for relevance and to institute mechanisms for their enforcement.

(4) A poorly resourced, top heavy, poorly coordinated public sector unable to deliver services: the national, state and county public sector structures lack adequate staff (numbers and capacity) to properly carry out their mandated roles and responsibilities; the most serious gaps are within the technical ranks and at the implementation levels in states and counties. Coordination including separation of duties, mechanisms for collaboration, facilitation and communication are lacking or

poorly resourced, with conflicts of interest evident in some cases. There is poor coordination between the government and other actors.

(5) Low production and productivity, and evidence of seasonality of production: the subsector is dominated by subsistence producers who rely on indigenous breeds, knowledge and technologies, weak animal health services and resource management approaches; they are vulnerable to droughts and floods. There is scope for making initial substantial gains in filling the large production and productivity gaps through improved animal health services and by using low-level technologies already in existence in the region and by organization of producers. There is also scope for diversifying both the species and production systems to utilise a broader range of resources and strategies.

(6) Low processing and value addition, poor commodity development and high wastage: production for subsistence means that there is low integration into value chains, with as much as 60% of production being consumed directly by households. Only minimal processing and value addition is undertaken, with low recognition and development of potential commodities (such as hides and skins and bees wax) which leads to high waste of existing resources. The capacity to enforce sanitary, and food hygiene standards is limited. There is poor coordination between subsector value chain actors which allows middle men to increase costs to consumers. There is poor capacity to run enterprises as businesses, and an inability to respond to market opportunities.

(7) Low market integration and trade: Inadequate market infrastructure with long distances to markets result in high transport costs and increased vulnerability to: insecurity; inadequate facilities for meeting livestock (grazing/feeding, watering, holding ground) and human needs; and market structures (such as middlemen, long turnaround time etc.) that reduce profits for upstream actors. There is strong competition in some states from cheaper products from regional and global actors. Raw commodities are exported to neighbouring countries which are used in their processing industries, and often re-exported for higher profits to more lucrative markets.

(8) Low and poorly structured investment in the livestock subsector: generally there is low investment in the subsector by the government (both budget expenditure, and for service delivery). There are limited national institutional financial services targeting the subsector even for commercial actors, who mostly finance their own enterprises, or receive grants, in-kind resources/subsidies from government and NGO projects. These subsidies have in some cases led to dependency, a lack of ownership by the beneficiaries and unsustainability of initiatives. Similarly, there are limited mechanisms for accessing financial opportunities available within the region. However foreign (non-South Sudanese) businesses can access credit elsewhere, which places South Sudanese businesses at a disadvantage.

(9) Inadequate attention to appropriate natural resource management: institutional arrangements and coordination mechanisms to address natural resource issues are lacking. These issues include: water for production; rangeland development; droughts and flooding; drought and conflict early warning; natural resource based conflicts over land and other resources; protection of key production and trade migration routes; and, shared transboundary resources.

(10) Inadequate and uneven non-standardized university training in animal production and animal health/veterinary sciences: There is significant variation among the four public universities offering courses. Other than the Juba University and John Garang Memorial University of Science and Technology, there is limited capacity

for practical training (laboratory and field), field placements and thesis writing. There is low funding from the government, including research funding, and limited teaching staff. There is limited collaboration with regional universities and consortiums, and no linkages to existing technologies, information and resources for research. Only one public training centre exists (Marial Lou) for technical skills development where technicians, animal health and animal production auxiliaries can be trained; these people are critical in the delivery of front line services at the county level.

(11) Limited research and development and extension: There are no dedicated public livestock research facilities and only limited research being conducted by the universities. Consequently, there are no well tested and adapted technological packages specific to South Sudan. There are very limited extension services that are uncoordinated. Farmers and other stakeholders rely on NGO's, limited radio broadcasts, farmer to farmer information, and the Internet for information. Often the information is not appropriate or is incomplete.

11.3 Policy framework

11.3.1 Policy review: broader policy context

The livestock resources subsector sits within the Natural Resources Sector, one of the three sectors constituting the Economic Development Pillar of the South Sudan Development Plan (SSDP),[312] which gives direction for broader economic development. The Natural Resources Sector Working Group [313] is a group that seeks to coordinate the efforts of interlinked sectors. The main sources of policy, which provide relevant guidance to the development of livestock resources, are listed in Box 11-1. However, no single document collates and harmonizes the various policies into a single consolidated reference for the whole livestock subsector. The Ministry of Animal Resources and Fisheries (MARF) Policy Framework and Strategic Plans (PFSP) 2012–2016, the key subsector document, provides only limited subsector policy guidelines upon which it is intended that policies will be further reviewed and developed. This has left room for varied policy interpretation and collusion, resulting in fragmented efforts and poor regulation of the different subsector actors.

Box 11-1: Key policy and strategy documents that contain policy for the sector

Broad Policy Context

- The Transitional Constitution of the Republic of South Sudan 2011
- The Government of South Sudan Growth Strategy
- South Sudan Development Plan 2011 – 2013
- Millennium Development Goals

Technical

- MARF Policy Framework and Strategic Plans (PFSP) 2012 – 2016
- Animal Resources Sector Policy and Strategic Plan (ARSP) 2006 – 2011
- National Agriculture and Livestock Extension Policy
- Trade and Investment Policy for South Sudan 2011
- Wildlife Policy
- National Strategy for Cooperative Development 2012 – 2015

[312] The objective of the Economic Development Pillar is diversified private sector-led economic growth and sustainable development that improves livelihoods and reduces poverty. GRSS. August 2011. *South Sudan Development Plan 2011 – 2013: Realizing Freedom, Equality, Justice, Peace and Prosperity for All.* Juba.

[313] The Natural Resource Sector is mandated to ensure food security and improve livelihoods and income generation for the people of South Sudan, through sustainable use of natural resources and land management. The sectors includes the Agriculture, Forestry, Cooperatives and Rural Development sector, the Animal Resources and Fisheries sector, the Land Commission, the Environment sector and the Agricultural Bank. GRSS. August 2011. *South Sudan Development Plan 2011 – 2013: Realizing Freedom, Equality, Justice, Peace and Prosperity for All.* Juba.

- Draft Water Policy, GoSS, 2007
- Ministry of Agriculture and Forestry Training and Capacity Development Policy 2011
- South Sudan Agricultural Research Policy
- IGAD Animal Health Policy
- OIE standards and guidelines

There is need for a review to ensure compliance of the PFSP to the Transitional Constitution of the Republic of South Sudan which sets out the overriding legal framework and mandate for the development of the country's livestock resources. Some important provisions in the Constitution that should be considered in a review of the livestock subsector policy, legal and regulatory frameworks and enforcement mechanisms include clauses on: inclusivity in formulation and implementation of development plans and programmes; regional equity in development; expediting rural development as a strategy for averting urban biased development. There are other constitutional provisions of relevance including: affirmative action to redress imbalances created by history, customs and traditions; freedom of children from exploitation and the right to education; principles of devolution and decentralisation; recognition and integration of traditional authorities and systems; regional integration and cooperation; human rights; communal land tenure; protection of seasonal access rights; land for investment; interstate trade and commerce, etc.

There is also need for a multi-sectoral review and integration of policies, as well as for a review of the impact of the current macro-economic climate on the desired development of the subsector. For example, in the liberalized South Sudan economy, trade tariffs are an important source of non-resource revenue, with imports presenting an easily taxable base. However, the current high tax regime on importation of production inputs reduces incentives for promoting increased production and productivity, commercialization and industrialization; and, undermines the capacity of South Sudanese producers to compete with regional and global actors. Uganda, for example, has priority investment areas that attract specific benefits, and a range of incentives under the Uganda Income Tax Act 1997 including: capital allowances on plant and machinery, start-up costs over four years, scientific research and training expenditure; tax deductible annual allowances on depreciable assets; annual depreciation allowances for farm works; import duty exemptions on plant and machinery for industry; duty drawback facilities that allow businesses to reclaim taxes on inputs used to manufacture exportable products; and measures for investment protection[314]. There is a need to clarify the land management framework critical to the livestock subsector development and investment; and to provide an implementable policy, legal and regulatory framework to resolve natural resource based conflict, a key constraint to sustainable subsector growth and investment.

11.3.2 Livestock subsector policy context

Following the Comprehensive Peace Agreement (CPA) in 2005 and subsequent creation of the Ministry of Animal Resources and Fisheries (MARF) by the Government of Southern Sudan (GoSS), the ministry developed the Animal Resources Sector Policy and Strategic Plan (ARSP) 2006-2011 to establish itself and guide its operations in the coming years. In tandem, MARF developed a 5 year budgeted Strategic Plan mainly targeting issues of post war recovery. After independence on 9 July 2011, MARF was instituted as a national ministry for the new nation through a Presidential Decree. This effectively meant that the policies and set-up of the Ministry needed to be reviewed and re-designed to meet with the national, regional and international responsibilities expected of a national Ministry. The MARF Policy Framework and Strategic Plans (PFSP) 2012-2016 was presented to the Economic Cluster, the Council of Ministers and subsequently the National Legislature of the Republic of South Sudan (RSS), where it is awaiting approval after having been scrutinized by the Natural Resources Specialized Committee. The Sector Policy document is divided

[314]DANIDA 2002. *Investing in Uganda's Dairy Industry*.

into two main parts: the Policy Framework, and the Strategic Planning and Implementation Matrix organized by Directorate. The key facets of the MARF Policy Framework are presented in Table 11-2.

Table 11-2: MARF Policy Framework 2012- 2016

Vision	Productive livestock and fisheries sectors contributing 5% annually to improvements in food security, household income, job creation and the national Gross Domestic Product.
Mission	To accelerate socio-economic development of the South Sudanese and enhance the livelihoods and food security of livestock and fisheries producers through improving livestock and fisheries production and productivity.
Strategic goals	• Key national data, legislation, regulations, policies, strategic plans and standards in support of the sustainable development and commercialization of the animal and fisheries resources of the Republic of South Sudan, researched, formulated, endorsed and operational. • Service-oriented, professional and accountable Ministry of Animal Resources and Fisheries developed, integrated and effectively collaborating with and building capacity of State MARF's, and providing quality and cost-effective services to the livestock and fishery sectors • Investment opportunities identified and private investment expertise and capital realized for the sustainable development of private and public-private commercial enterprises in the livestock and fishery sectors • An effective national livestock epidemio-surveillance and control system operational and meeting the requirements of the OIE and potential livestock and livestock product export markets • Significant and documented improvements in consumer protection achieved through improvements in the quality of marketed livestock and fisheries products resulting from improved processing infrastructure, hygiene, handling, processing and inspection
Some Key Targets	• 5% annual improvement in food security, household income, job creation and the national Gross Domestic Product • 10% of the national budget allocated to agricultural development – 3% to animal resources as stipulated in the Maputo declaration, 2003 • Increase milk production by 25% by end of 2015 • Increase the supply of poultry meat and eggs by 30% at the end of 2016 • Improve the quality of hides and skins for local and international markets • Increase honey and bee wax production
Direction of the Policy Framework	• Transform the livestock sector into vibrant productive and commercialized sectors making substantial contributions to the national economy (through increased production and productivity, increased commercialization, improved quality and value addition, facilitating access to credit, local and international markets) • Harnessing vast wealth for improved food security, poverty alleviation, sustenance of rural livelihoods, job creation, socio-economic development and contribution to the GDP • Develop the institutional capacity of MARF (infrastructural, managerial, research, diagnostic, diseases control and operational capability) • Restructuring to improve functionality at national MARF and SMARF • Alignment of state policies and strategies to the national policies and strategies • Policy framework for guidance in development of policies, legislation and regulations • Policy framework for guidance in the development of sectoral thematic policies • Collaborative research linkages to national universities and higher institutions
Guiding Principles	• Harnessing the high potential for sustainable increases in production and productivity • Increased commercialization • Promote increased investment • Delivery of basic services • Promotion of private sector-led growth/ private enterprise to reduce poverty

	• Improved quality and value addition • Improved access to credit and financial services • Development of markets and market infrastructures and Improved access to local and international markets • Maintaining peace and security foundational to development and progress • Improved government capacity to manage natural resources, public revenues and deliver public goods • Strong, transparent and accountable institutions • Institutionalization, development and empowerment of producer, trader and professional associations • Government model farms • Coordinated reporting and knowledge management • Improvement of animal genetic resources
Subsector Policy Guidelines	• Role of national ministry is to guide, regulate, promote, facilitate and document • Privatized delivery of veterinary services and supplies alongside public sector delivery • Public-private partnerships • Alignment of development aid to government priorities and pooling/ mainstreaming of development partner resources to implement the strategic plan, and mutual accountability • Transformation of traditional production practices into modern market-oriented systems • Increased commercialization • Community based extension programmes to change attitudes • Sustainable exploitation and management of emerging livestock resources • Guidelines on animal welfare and protection • At state level, fully fledged state ministries and not Directorates • Livelihood zoning as basis for improved production • Trypanosome infested belt to focus on pigs, poultry, trypano-tolerant ruminants and utilisation of crop residues and fodder crops • Routine/ annual vaccination target priority and economically important diseases • OIE guidelines for control of transboundary diseases in conjunction with regional and international partners • Intensive production in urban and peri-urban areas • Guidelines for recruitment, deployment and registration of professional and technical staff • Livestock population census • Indigenise leather industries and manufacture of finished products • Investment in model farms for demonstration • Drought monitoring, early warning and contingency planning • Development of a livestock breeding policy and strategy • Gender analysis and mainstreaming and gender disaggregated information; gender equity policy • Guidelines for cost recovery in routine vaccination and during emergencies • Penal code to criminalize cattle rustling • Develop information policy • Policies, laws guidelines on public and private sector livestock investment and marketing • Legislation and regulation of inputs

Source: GRSS, MARF. 2012. *The MARF Policy Framework and Strategic Plans (PFSP) 2012-2016.* Juba: GRSS

The process of formulation of the PFSP was not adequately consultative. The result is that the outlook and content of the document is focused on MARF, at the expense of the wider animal resources sector in South Sudan. The PFSP indirectly acknowledged the strengths of the ARSP, and the fact that ARSP approved plans were not implemented, mainly due to poor human resource capacity, both technical and managerial, poor allocation of funds and mediocre budget execution. However, many good elements of the ARSP were not reflected

in the PFSP. Indeed the ARSP is a document that still has relevance for the sector today.

Table 11-3: A comparison of the focus, outlook and strategies of the PFSP 2012-2017 and the ARSP 2006-2011

Document	PFSP 2012-2017	ARSP 2006-2011
Overall focus	Development and economic growth	Post conflict recovery Humanitarian/ emergency response
General outlook	MARF	Sector wide
Structure of the document	Overview of MARF/ institutional review MARF policy framework and strategic plans and budgets by Directorate	Situation analysis Animal resources sector policy MARF Strategic Plan Resource mobilization framework Monitoring and evaluation framework
Expected outcome	Transformation of the livestock sector into a vibrant productive and commercialised sector making a substantial contribution to the national economy	Actualize desired development of the vast untapped potential of animal resources Rural development: infrastructure and employment/ improved livelihoods Increased value addition and growth of agro-business
Investment focus	Commercialisation Private sector led growth	Equitable growth across states and livestock producers Both rural development and growth of agro-business
Technological scope	Modernization and social transformation	Growth that is sustainable socially, technologically, environmentally and economically

Source: GRSS. MARF. 2012. *The MARF Policy Framework and Strategic Plans (PFSP) 2012-2016.* GRSS. GoSS, MARF. 2006. *Animal Resources Sector Policy and Strategic Plan (ARSP) 2006-2011*. Juba: GoSS

As yet no subsectoral or supporting policy has been developed although the process of developing the dairy sector policy has commenced. The only subsector policy in existence is the National Agriculture and Livestock Extension Policy.

11.3.3 Legal Frameworks: Legislative and regulatory contexts

Activities related to animal health, production, welfare, food safety and trade certification require appropriate legislation for effective delivery of services, including but not limited to: early detection, transparency and notification and rapid response to outbreaks of animal diseases. It is understood that MARF has developed the following 13 draft bills that are now pending legislation:

- Animal Diseases and Pests Control Bill 2013
- Animal Production Bill 2013
- Cattle Cleansing Bill 2013
- Fertilizers and Animal Food Stuffs of Animal Origin Bill 2013
- Hides, Skins and Leather Processing Bill 2013
- Meat and Slaughterhouse Inspection Board Bill, 2013
- Range Management and Grass Fires Bill 2013
- Rustling and Livestock Theft Bill 2013
- Veterinary Drug Control Board Bill, 2013
- Veterinary Surgeons and Para-Veterinary Practitioners Bill 2013
- Meat Commission Bill, 2013
- Dairy Development Bill, 2013
- Animal Welfare Bill, 2013.

11.4 Institutions

11.4.1 Public Sector Institutions

11.4.1.1 National Ministry

Previously, the main public institution in the livestock subsector was the national Ministry of Animal Resources and Fisheries (hereafter referred to as MARF) which was mandated to guide, promote, regulate and facilitate the animal resources sector. In mid-2013 there was a re-organization of the GRSS ministries; MARF was merged with the Ministry of Agriculture, Forestry, Cooperatives and Rural Development and the Ministry of Tourism. This review is based on the old structure, since restructuring is on-going and it is still unclear how the livestock subsector will be accommodated. The national ministry provides guidance and leadership in formulating policies, legislation and regulations, and in strategy development. MARF is complemented at the state level by the respective state ministries. The structure of MARF is comprised of nine Directorates with 27 Departments (see Table 11-4).

Table 11-4: National MARF structure (Fisheries Directorate excluded)

Directorate	Department
Planning, Statistics and Documentation	• Planning and Policy Analysis • Statistics and Documentation • Gender Analysis and Mainstreaming
States and Special Projects Coordination	• State Affairs • Special Projects
Administration, Finance and Human Resources Development	• Finance • Procurement • Human Resource Development
Investment, Marketing and Supplies	• Investment • Marketing • Supplies
Animal Production and Range Management	• Animal Production • Range Management
Veterinary Services	• Veterinary Public Health and Food Safety • Disease and Vector Control • Epidemiology and Disease Information Systems • Diagnostic Laboratories • Wildlife and Aquatic Diseases
Extension and Pastoralist Development	• Livestock Production and Range Management Extension • Veterinary Extension • Fisheries and Aquaculture Extension • Pastoralist Development
Animal and Fisheries Research and Development	• Central Research Laboratory • Livestock Research Centre/Station • Fisheries Research Centre/Station • Satellite Laboratories

Source: GRSS, MARF. 2012. *MARF Policy and Strategic Plans 2012 -2016.* Juba: GRSS.

Most of the currently occupied positions are in the higher ranks, i.e., at Director General, Director and Assistant Director level, related to leadership and top management. The middle tier professional positions related to management, coordination of technical work such as drafting policies and strategies, and collaboration with states and other stakeholders, are inadequately manned making review and formulation of policies and implementation of strategic plans difficult. There is an overlap of functions between the Directorates of Veterinary Services and Investment, Marketing and Supplies, which does not augur well for

the structure and organization of a veterinary service vis-à-vis international certification.[315] The Ministry intends to delegate the registration and licensing of veterinarians and veterinary para-professionals, veterinary medicines and drugs, the inspection and licensing of and slaughter facilities statutory boards as stated in the respective bills.

11.4.1.2 State Ministries

All the states, with the exception of Western Equatoria, have state ministries in charge of livestock development generally known as the State Ministry of Animal Resources and Fisheries (SMARFs); however Jonglei State has a Ministry of Livestock and Fisheries. Western Equatoria has a Directorate of Animal Resources and Fisheries under the state Ministry of Agriculture, Cooperatives and Environment (SMACE). A resolution was passed that the Directorate of Animal Resources and Fisheries in Western Equatoria be upgraded to a fully-fledged state Ministry of Animal Resources and Fisheries.[316] Across the states, the separation from parent ministries of agriculture was received as a positive move for the livestock subsector, attracting stronger political will and support, increasing the visibility and presence of the sector, providing a more focused context for planning and implementing activities. In some states, expenditure and disbursement of funds improved although gains were eroded by the recent austerity measures. State ministries implement national policies and make rules and regulations to fit their respective situations as guided by the national law and state by-laws. The states also coordinate with local government at the county level to deliver public services.

The states developed strategic plans in alignment with the national ministry Policy and Strategic Plans 2012–2016, which are summarised in Table 11-5. These were the first such strategies, and many states received support from development partners and NGOs. Key themes in the state visions include aspirations for food security, economic development, increased production, increased incomes and increased employment opportunities. However, all the Greater Bahr el Ghazal states i.e., Western Bahr el Ghazal, Northern Bahr el Ghazal, Lakes and Warrap States have the same visions and the same strategic objectives. While these states have commonalities including large cattle populations, there are major differences and unique situations in each state that should inform their individual visions and strategies. This also points to the likelihood of inadequate consultation. Other than Jonglei, which has a well elaborated strategic plan, all the plans are more focused on the state ministry rather than having a sectoral approach that recognizes and covers all actors. The strategic plans also exhibit the lack of critical data and information for decision making and planning. The strategic plans, other than that of Jonglei, fail to clearly articulate strategies for realising the potential of their resources, being activity based, instead of being based on results linked to their strategic objectives.

The state ministry structures are presented in Table 11-6 and technical personnel in Table 11-7. All the states have very basic structures reflecting the fact that they are young establishments. Core directorates that exist are Animal Production, Veterinary Services, and Administration, Finance and Human Resources, under a Director General who provides both technical and administrative leadership. A few states have extension departments which are made up of both extension, and research and development.

Of the technical human resources involved in the provision of veterinary services at the national and state levels (presented in Table 11-7), there is 1 veterinarian for every 2 counties (a total of 76 counties in South Sudan). This assumes that at least 38 out of the 44 veterinarians at the state level are available for deployment at the county level. The ratio is more or less the same for the lower cadres, thus depicting a linear structure. The

[315] World Organisation for Animal Health (OIE). 2012. *Terrestrial Animal Health Code*. OIE.

[316] GRSS, MARF. 2012. *The Ministry of Animal Resources and Fisheries Policy Framework and Strategic Plans 2012 – 2016*. Juba: GRSS.

implementation level, i.e., counties and payams, is under-resourced with: little or no staffing; limited operating budgets for communication, mobility, service delivery, regulation and enforcement; and, with little capacity for policy engagement let alone interpretation of national and state policies as provided under the devolution of powers by the Constitution.

Collaborating ministries and departments at both national and state levels include the Ministries in charge of Health, Wildlife Conservation and Tourism, Environment, Water, Trade and Commerce, Agriculture, Lands and Internal Security and the Department of Customs. SMARFs also collaborate with NGOs and private sector actors to deliver services.

Table 11-5: Key facets of the state strategic plans

State, Plan Period and Support for Development of the Plan	Vision and Goal	Strategic Issues/ Specific Objectives
Central Equatoria 2012-2014 State staff and UNDP	Vision: Improved healthy and active life for all citizens in the state by providing affordable animal and fish protein. Goal: Increase production and productivity for sustainable livelihood.	• Poverty reduction (improve the social status of rural communities) • Ensure food security in productivity of livestock products • Render veterinary services • Render extension services to pastoralists , agro-pastoralist
Eastern Equatoria Policy Statement 2012-2013 Staff	Vision: Efficient and effective livestock and fisheries delivery for sustainable development of the state Goal: Sustainably contribute towards food security and employment creation by facilitating and supporting public and private sector in the animal resources sector	• Provide institutional capacity to guide, supervise and coordinate all activities in the livestock and fisheries sectors. • Develop animal health and protect humans against Zoonosis. • Promote sustainable management of fishery resources • Enhance and improve livestock production and productivity through technology transfer and sustainable use of natural resources. • Promote the integration of livestock and fish market chain actors into domestic and regional
Western Equatoria 2011-2013 State Ministry of Agriculture		• Construction and equipping of offices • Provision of water along livestock routes and grazing areas • Promote and improve livestock feeding (from traditional free range to a semi-intensive production system by 2013) • Improve livestock production and productivity (introduction of new improved breeds by 2013) • Improve delivery of key support services to 60% of the livestock keepers by 2013 • Recruitment of professional and technical staff and training
Jonglei 2012–2017 Staff of Ministry of Livestock and Fisheries, SNV, John Garang University	Vision: A state in which hunger is no longer a threat as a result of improved and sustainable livestock and fisheries production	• Strengthen institutional capacity to guide, supervise, coordinate and monitor all activities in the livestock and fisheries sectors • Improve livestock production and productivity through improved technologies and sustainable use of natural resources • Promote the integration of livestock chain actors into the domestic and regional markets
Unity State 2012-2014 State and VSF-Swiss	Vision: to be the leading state in the management of animal resources and fisheries in the Republic of South Sudan	

State, Plan Period and Support for Development of the Plan	Vision and Goal	Strategic Issues/ Specific Objectives
Upper Nile	Vision: Achievement of sustainable livestock and fisheries production level (quantity and quality) that reaps and maintains benefits to producers while contributing to poverty eradication and economic growth in the State	• Capacity building of staff working in animal production and range management, veterinary services and fisheries • Provision of inputs for animal resources production, fisheries, pastures and fodder • Strengthening of performance to increase animal, fisheries and veterinary services production
Northern Bahr el Ghazal National Ministry, FAO and EU		• Huge livestock resources and potential that need to be exploited for the benefit of the people of WBGS • Prevalence of livestock diseases and outbreaks • Cultural barriers and norms that hinder the uptake of new technologies by farmers • Low level of stakeholder empowerment, low level of awareness and skills necessary for full exploitation of the potential in livestock • Institutional challenges • Policy, legal and regulatory framework • Inadequate infrastructure, facilities and equipment • Weak planning, budgeting and resource mobilization • Gender issues not appropriately mainstreamed/ low empowerment and participation of women • Increasing threat of HIV/AIDS
Western Bahr el Ghazal 2012–2016 FAO and EU	Vision: Aspire to see a sustainable wealth and job creation, improved household incomes, food security and the economy of WBG State through the development of livestock and fisheries resources	• Huge livestock resources and potential that need to be exploited for the benefit of the people of WBGS • Prevalence of livestock diseases and outbreaks • Cultural barriers and norms that hinder the uptake of new technologies by farmers • Low level of stakeholder empowerment, low level of awareness and skills necessary for full exploitation of the potential in livestock • Institutional challenges • Policy, legal and regulatory framework • Inadequate infrastructure, facilities and equipment • Weak planning, budgeting and resource mobilization • Gender issues not appropriately mainstreamed/ low empowerment and participation of women • Increasing threat of HIV/AIDS

State, Plan Period and Support for Development of the Plan	Vision and Goal	Strategic Issues/ Specific Objectives
Lakes 2012-2016 National ministry, FAO and EU	Vision: Aspire to see a sustainable wealth and job creation, improved household incomes, food security and the economy of Lakes State through the development of livestock and fisheries resources	• Huge livestock resources and potential that need to be exploited for the benefit of the people of WBGS • Prevalence of livestock diseases and outbreaks • Cultural barriers and norms that hinder the uptake of new technologies by farmers • Low level of stakeholder empowerment, low level of awareness and skills necessary for full exploitation of the potential in livestock • Institutional challenges • Policy, legal and regulatory framework • Inadequate infrastructure, facilities and equipment • Weak planning, budgeting and resource mobilization • Gender issues not appropriately mainstreamed/ low empowerment and participation of women • Increasing threat of HIV/AIDS
Warrap 2012–2016 FAO and EU	Vision: aspire to see a sustainable wealth and job creation, improved household incomes, food security and the economy of Warrap State through the development of livestock and fisheries resources	• Huge livestock and fisheries resources and potential but low production, productivity and commercialization • Prevalence of livestock disease and outbreaks • Low level of stakeholder empowerment • Institutional challenges • Policy, legal and regulatory frameworks do not exist • Inadequate infrastructure, facilities and equipment • Weak capacity for planning, budgeting and resource mobilization • Gender issues are not appropriately mainstreamed in the Ministry • HIV/AIDS is a growing major threat

Source: CAMP Task Team, March-July 2013, CAMP Situation Analysis

Table 11-6: Directorates of the national and state ministries

	National	CES	EES	WES	Jonglei	UNS	Lakes	Unity	Warrap	WBG	NBG
Director General											
Planning, Statistics & Documentation											
Admin, Finance & HR											
Investment, Marketing & Supplies		Livestock Development									
Animal Production & Range Management			Animal Production and Veterinary Services	Directorate of Animal Resources and Fisheries			Livestock Development		Livestock Development	Livestock Development	
Veterinary Services											
Livestock & Fisheries Extension							Extension		Extension	Extension	
Animal & Fisheries Research & Dev											
States & Special Projects											
Any other								Information, Communication, Technology & Public Relations			

Source: CAMP Task Team, March-July 2013, CAMP Situation Analysis

Table 11-7: MARF and SMARF technical personnel as of December 2012

MARF/ State	Veterinarian	Technician	Lab technician	Veterinary assistant	Stock person	Veterinary auxiliary	Total
MARF[a]	13(+2[b])		8 (+4[b])				21 (+6)
CE	8	1	1	8	12	2	32
EE	5	0	1	8	12	13	39
Jonglei	4	1	1	7	8	18	39
Lakes	2	4	1	3	14	21	45
NBG	1	2	0	2	11	18	34
Unity	4	0	0	2	8	6	20
Upper Nile	6	22	0	3	18	32	81
Warrap	4	0	0	0	8	17	29

MARF/ State	Veterinarian	Technician	Lab technician	Veterinary assistant	Stock person	Veterinary auxiliary	Total
WBG	6	1	3	22	27	15	74
WE	4	0	0	4	8	12	28
Total	57(+2)	31	15	59	126	154	442(+6)

Source: MARF, Directorate of Veterinary Services. 2012.
Notes: [a] Staff here is limited to the Directorate of Veterinary Services and does not include others with a role in animal production such as investment, marketing and supplies and extension.
[b] These are staff seconded through the IGAD Initiative.

11.4.1.3 Model/demonstration farms

South Sudan has a long history of public sector model farms, with some of the existing model farms started in the 1970s in the former Sudan. Key objectives of the model farms were to combine demonstration and multiplication of improved livestock supported by limited research on breed improvement. In the pre-independence period, the public sector was heavily involved in direct production with models farms supplying livestock and livestock products. The model farms from that period included Marial Bai Dairy Farm, Jur River County, Western Bahr el Ghazal; MAFAO[317] Dairy and Poultry Demonstration Farm, Central Equatoria; Rumbek Ranch, Lakes State; Kapoeta Sheep Ranch, Eastern Equatoria; and Ezo Goat Centre, Yambio, Western Equatoria which was later moved to Maridi. The model farms were once all well stocked, vibrant institutions, but were badly affected by the protracted civil war. Infrastructure and facilities were destroyed, livestock was transferred elsewhere or stolen, key personnel left due to insecurity, and important research records were lost.

After the CPA, the GOSS Animal Resources Sector Policy and Strategic Plan 2006-2011 aimed to increase the number of model farms so that each state would have one. The process commenced with a bid to renovate the existing farms, but was marred by procurement irregularities especially for Ezo Goat Centre and Kapoeta Sheep Ranch. The subsequent MARF Policy Framework and Strategic Plan 2012-2016 (PFSP) has put even greater emphasis on model farms, which were envisioned as the main strategy for achieving the key targets of increasing milk production by 25% by the end of 2015, increasing the supply of poultry meat and eggs by 30% by the end of 2016, and improving the quality of hides and skins for both local and international markets. The model farms are therefore allocated 31% of the total MARF PFSP budget over 2012-2016, equivalent to 82% of the Directorate of Animal Production and Range Management, which has the largest share of the PFSP budget, i.e., 39% (Table 11-8). The PFSP pursues a regional approach, shifting away from the earlier plans to establish a model farm in each state: Marial Bai Dairy Farm and Wau Poultry Farm for the Greater Bahr el Ghazal region; Malakal Poultry Farm and Malakal Dairy Farm for the Greater Upper Nile region, and Central Equatoria Dairy Farm and Central Equatoria Poultry Farm.

[317]MAFAO was collaboration between the Ministry of Agriculture and Food and Agricultural Organization of the United Nations (FAO).

Table 11-8: Budget allocation of the Animal Production and Range Management Directorate to model farms

	Directorate of Animal Production and Range Management (Percentage)						
Budget	**2012**	**2013**	**2014**	**2015**	**2016**	**Total Directorate Budget**	**Total MARF Budget**
Staffing Budget	58	72	79	79	79	76	
Operations Budget	77	89	92	92	92	90	
Capital Investment Budget	69	83	81	74	45	75	39%
Total Directorate Budget	70	84	85	84	80	82	
Total MARF Budget							31%

Source: GRSS, MARF. 2012. *MARF Policy Framework and Strategic Plans 2012-2016*. Juba: MARF.

Despite the large planned investment, there is no strategic plan to guide the development of the model farms. Key mandates of the model farms and the extent of public sector involvement are not clearly defined. The constitution divests government from direct involvement in production, but it appears that the model farms will have some production activities. Programming and implementation strategies for harnessing the model farms to achieve the key PFSP targets, and for renovation and re-establishing facilities, human resources and operations are lacking. However, the model farms take 75%, 79% and 90% of the Directorate of Animal Production and Range Management capital investment, staffing and operations budgets in the PFSP plan period (Table 11-8). No exit strategy or divestiture plan for the remaining model farms is outlined. The renovation of Marial Bai, which is spread along a 20 km stretch on the north bank of the Jur River, has focused on infrastructure, but the design updates are poorly aligned with the needs of the livestock subsector, and there are no staff or on-going programmes. Work on MAFAO farm, which stands on over 500 hectares, commenced with the installation of facilities such as a 26,600 capacity hatchery, a feed mill, introduction of dairy goat breeds, and a programme for improvement of pastures. The facility has 10 graduates and support staff. However due to operational challenges these facilities have fallen into disuse despite the huge capital investment. There is tension between the state and national MARFs related to management and operational budgets on both model farms, even though there is a memorandum of understanding between the national MARF and the Central Equatoria SMARF. There are also outstanding land issues with communities related to boundaries and access to grazing land and water. The Malakal model farms have not been established.

A concept note for the rehabilitation of MAFAO into a model dairy farm was developed, but a more strategic approach is needed that reviews the purpose of the model farms which were meant to feature modern technologies and approaches best suited to commercial enterprises. The proposals are technological leaps for most of South Sudan's livestock keepers who are pastoralist, agro-pastoralist or urban and peri-urban smallholder farmers and a commercial sector is still emerging. There are also practical issues related to access to the regional model farms as there is no clear outreach plan. The World Bank has identified that resources invested in generation of appropriate agricultural technologies has far higher rates of return than investment in infrastructure, health and education.[318] South Sudan has no livestock research institutes: the existing model farms which are spread over most of the livelihood zones would provide an opportunity to develop a network of livestock research and technology outreach institutions. There were recommendations to expand the mandate of MAFAO to include dairy research and multiplication of dairy animals in addition

[318]World Bank. 2007. *World Development Report 2008: Agriculture for Development*. Washington, DC: World Bank.

to demonstration.[319] Both MAFAO and Marial Bai had breeding programmes where indigenous breeds were crossed with Boran, Friesian and Sahiwal breeds with some success in improving livestock for meat and milk.[320] There is potential for public-private partnerships in developing these facilities through collaboration for investment in facilities and in research, and to invest in production of key inputs like day old chicks.

11.4.2 Private sector

The main private sector actors are the producers themselves, i.e., 943,297 households involved in the different livestock enterprises from raising cattle and small ruminants to beekeeping, poultry, pig farming and production of other livestock. Of these 903,993 are cattle or small ruminant producers, with about 324,437 herders. Of the livestock producers, 746,777 are poultry producers and 238,112 are honey producers. There are approximately 4,500 live animal traders a group that includes animal trekkers, brokers/middlemen, rural traders, auctioneers, and importers, among others.[321] There are about 500 providers of market based kraals, community members assigned to key markets to ensure stolen animals are not sold, 1,500-2,000 personnel at slaughter facilities[322] and about 20 personnel at hides and skins facilities. Other important private sector actors include transporters, input suppliers and veterinary pharmacies. Community Animal Health Workers (CAHWs) are important private sector actors whose numbers peaked during the civil war when they were instrumental in providing primary animal health care and participating in control and eradication activities (vaccination, surveillance and disease reporting) of rinderpest in South Sudan.[323] As of December 2012, there were 2245 CAHWs in the whole country (Upper Nile 320, Unity 119, NBG 196, WBG 107, Lakes 330, EE 271, WE 240, CE 240, Jonglei 189 and Warrap 233).[324]

Informal actors make up the bulk of private sector actors, although there are a few formal sector actors, especially input suppliers. Traditional institutions such as cattle camps provide some level of organization of ruminant actors, as do traders, butchers, poultry and beekeeper associations. However the associations focus on solving problems rather than on growing the livestock value chain. There is a low degree of coordination among private sector actors necessitating middlemen and brokers. Ownership of key livestock infrastructure such as slaughter facilities, markets, and butchery stalls remain with government, while these functions could be better played by the private sector.[325] An enabling policy and regulatory environment for the growth of the private sector is lacking, and together with the unclear land tenure system, is a key constraint on the growth of the private sector.

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[319]Muriuki, H. 2010. *Rehabilitation of MAFAO to a Model Dairy Farm.* Report for MARF, Republic of South Sudan. Unpublished.

[320]Jada, A. W and D. L. Lual. 2010. *MARF Report on the Assessment of Pastures in Marial Bai Dairy Centre.* Directorate of Animal Production and Range Management, MARF, Government of South Sudan.
Muriuki, H. 2010. *Rehabilitation of MAFAO to a Model Dairy Farm.* Report for MARF, Republic of South Sudan. Unpublished

[321]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Secto in Southern Sudan; Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat.* Draft Report, SNV and MARF.

[322]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Secto in Southern Sudan; Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat.* Draft Report, SNV and MARF.

[323]Sudan was accredited rinderpest free status by the World Organization for Animal Health (OIE) in 2008

[324]MARF, Directorate of Veterinary Services, 2012

[325]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat.* Draft Report, SNV and MARF.

11.4.3 Educational and training institutions

There are four universities that offer degrees directly relevant to the livestock subsector, one institution that offers diploma and certificate courses for technicians, and one institution that provides technical training.

University of Bahr el Ghazal: Offers a degree in veterinary science run as a five year course on a two semester basis leading to the award of Bachelor of Veterinary Science degree (BVSc). The university has very low student enrolment and a shortage of staff, a result of the secession of South Sudan from Sudan. It lacks laboratory facilities and relies on regional/satellite laboratories in Wau for student practical training; unfortunately these laboratories offer very basic services. Similarly, although students do a field placement, the university is not able to carry out a rigorous field follow-up. The main employers of the universities' graduates are the university itself as it seeks to boost staffing levels, governments (national and state) and NGOs, while a few go into the running of veterinary pharmacies and agro-veterinary shops.

University of Upper Nile: Created in 1993, the University of Upper Nile was envisioned to serve the Greater Upper Nile region. The College of Natural Resources, which included Animal Production, Agriculture, Forestry and Range Management, was one of the founding colleges of the university, with the College of Veterinary Medicine added later along with other colleges. The university, like many other learning institutions, suffered from insecurity during the civil war which led to its relocation to Khartoum where there were better facilities and equipment. At the signing of the Comprehensive Peace Agreement in 2005, it was again relocated back to Upper Nile, a move which resulted in the loss of most of the teaching staff and equipment and other teaching facilities. Students continued to go to Khartoum for practical and field training, but even this access was stopped when South Sudan gained independence from the Sudan.

The College of Animal Production has two specializations: General Animal Production which attracts 90% of the students and Fisheries that takes the remaining 10%, with a total enrolment of 250–300 students in the 2012/13 academic year. The two specialisations share courses in the first two years but specialise from the third year onwards. The college curriculum was revised in 2010, but needs updating to increase relevance for the new country, to introduce different technologies already within the region, and to offer both graduate degrees and diplomas. The university is yet to make thesis writing mandatory, to develop and implement a research policy, and diversify its funding strategy away from dependence on public funding. Farm facilities for teaching and experimental work with livestock exist, but are not stocked.

Enrolment in the College of Veterinary Medicine is low, with a marked imbalance between male and female students (Table 11-9). The university lacks laboratory facilities, and students have to rely on a regional/satellite laboratory in Malakal for practical training, a facility which only offers very basic services. Students do field placements but the quality of the experience is not assured as there is limited follow-up by the university. Graduates are employed by the university itself, both national and state governments, and NGOs. Very few enter into private practice, running veterinary pharmacies and agro-veterinary shops. The university is yet to establish external linkages on matters pertaining to research and training.

Table 11-9: Statistics of enrolment and graduation from the Faculty of Veterinary Medicine, Upper Nile University for Academic Year 2012/2013

Class	Male	Percent Male	Female	Percent Female	Year Totals
First Year	24	83	5	17	29
Second Year	40	80	10	20	30

Third Year	21	88	3	13	24
Fourth Year	15	75	5	25	30
Fifth Year	12	75	4	25	16
Total	112	81	27	19	139
2011 Graduates	14	82	3	18	17
2012 Graduates	4	44	5	56	9

Source: Data from Upper Nile University, prepared by CAMP Livestock subsector team, April 2013, CAMP Situation Analysis.

John Garang Memorial University of Science and Technology: Founded in 2006 as a technical institute in Bor, Jonglei State, and upgraded to a university in 2008. The Faculties of Agriculture and Forestry and of Environmental Studies are of direct relevance to the livestock sector. Within the Faculty of Agriculture and Forestry is the Department of Animal Science and Production, which houses four units: Animal Health, Dairy Production, Animal Nutrition and Poultry Production. With a teaching staff of only 11 staff: 3 Associate Professors, 2 Assistant Professors, 4 lecturers and 2 Teaching Assistants, the Department relies heavily on part time lecturers from within the State Ministry and volunteers from the UNMISS Indian Battalion and NGOs based in Bor. Both diplomas and degrees are awarded: the first batch of degree awards will be in 2013. USAID has funded a collaborative project with Texas A&M University College of Agriculture and Life Sciences led by the Borlaug Institute which is working to improve the agricultural research, teaching and extension curriculum, and to enhance capacity in the areas of rangeland and livestock management, and ecosystem conservation and management. The Faculty has strong linkages to the State Ministry, being involved in the Ministry strategic planning and training of ministry staff.

Juba University: Established in 1977, has a College of Natural Resources and Environmental Studies which houses the Department of Animal Production that offers both undergraduate and graduate programmes. The five year degree programme in Animal Production offers basic science and animal science and natural resource courses in the early years, with production courses in the fourth year, and the fifth year devoted to research projects for the mandatory dissertations and advanced courses and seminars. The university also offers one year diplomas in Dairy Production and Technology, Meat Production and Technology and Poultry and Production.

The Department is understaffed with only 1 Professor out of 11 possible positions, no Associate Professor out of 13 positions, 4 Assistant Professors out of 18 positions, 2 lecturers out of 19 positions, and 3 Teaching Assistants out of 17 positions. Technical positions important to laboratory and fieldwork are also grossly understaffed. The university has laboratories, an experimental farm for demonstration and research, a library with audio-visual and electronic facilities and a computer laboratory.

Marial Lou Livestock Training Centre: The Marial Lou Livestock Training Centre (MLLTC) in Tonj North County, Warrap State, founded in 1996 by VSF-Belgium, is the only public sector Livestock Training Institute in South Sudan. The centre offers certificate courses targeting Animal Health Auxiliaries and stock persons; and short courses/outreach programmes related to agribusiness and enterprise development, animal production and livestock enterprise, animal health and livestock products and processing. The centre also operates a veterinary pharmacy jointly with VSF-Belgium.

Plans are underway with support from the Dutch government to expand and improve the courses on offer with a focus on certificate and diploma courses in animal production and on upgrading skills of extension workers. The aim is to impart knowledge and skills and to change attitudes while making graduates more relevant and business oriented for the changing and dynamic labour market. The target groups are those who hold a South Sudan School Certificate and graduate stock persons with at least one year of work experience.

The new curriculum has been developed, but the lack of teaching staff, accommodation and sponsorship is a challenge especially since the establishment of the new courses coincided with the austerity measures in the government. A six month course costs USD2,450 (approx. SSP9,980), which is well beyond most individuals;, MLLTC is competing against cheaper, more competitive costs in the region. The goal is to eventually reduce costs as the infrastructure is established. There are plans to open three branches across the country to make the course more accessible, to improve the demonstration farm and make it pay some of the costs, and to include internships with attachments within the industry. These are areas where there are financial and technical gaps. MLLTC is accredited by the government of South Sudan, and collaborates with IGAD and African Union Inter-African Bureau Animal Resources (AU-IBAR). Staff are sent to train in Ethiopia on hides and skins and in Bukalasa University in Uganda on poultry.

Yei Agricultural Training Centre: Located in Yei River County, Central Equatoria State, Yei Agricultural Training Centre (YATC), established by the Norwegian Peoples Aid (NPA) in 1991, has the goal to build the capacity of community based extension workers. It has demonstration facilities for dairy, apiary, goat, poultry, draught power and pasture and fodder production and improvement. Courses are hands on and meant to instil a business attitude and to enable graduates to help farmers establish and grow profitable and sustainable, and gender sensitive enterprises. There are a number of challenges including: low staffing levels with only 7 staff; inadequate space, with only 9 feddans for the dairy unit, resulting in challenges with feed for the cross breeds; technical challenges related to technologies being promoted, a reflection of the lack of livestock research and functional public sector extension services in South Sudan.

11.4.4 Civil Society and Non-Governmental Organizations

International and local non-governmental organizations (NGOs) and civil society had a strong presence and role in the livestock subsector in South Sudan throughout the period of civil war filling the gap created by the absence of or inadequate provision by government. In animal health, NGOs were particularly active in the late 1990s and 2000s when together with FAO they offered most of the animal health services; they were the main implementers of rinderpest eradication activities (vaccination campaigns and disease surveillance and reporting). NGOs were also important in the training and equipping of CAHWs who have since become the main primary animal health care service providers.

Table 11-10 is a list of some of the NGOs currently operating in the livestock sector in South Sudan. WBG and NBG have the most NGOs related to livestock i.e., 7 NGOs each; Unity State on the other hand has only one NGO, the rest of the states have between 2 and 4 NGOs. Coverage by NGOs is low, each being present on average in only one or two states, and covering only one or two counties per state.

Table 11-10: NGOs operating in Animal Production and Animal Health in South Sudan

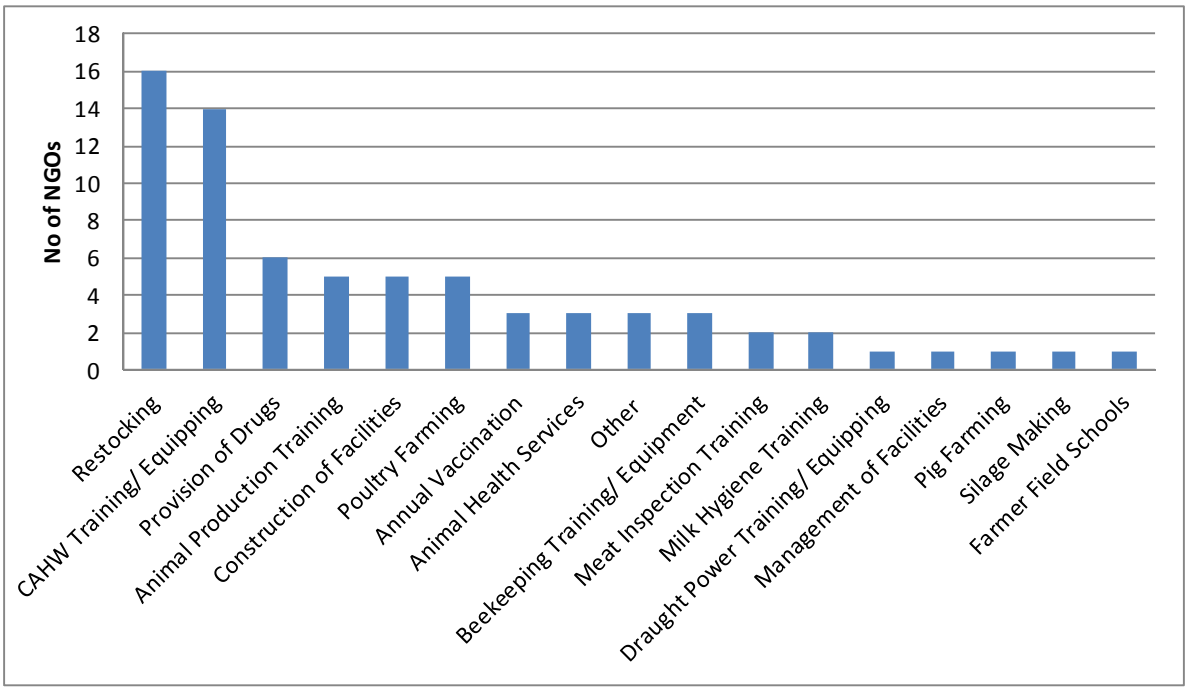
NGO	State it operates in	County	Main involvement
ADESO	NBG	Aweil West, Aweil North and Aweil Central	Training and equipping CAHWs and restocking
AECOM	Unity	Rubkona	Vaccination, community awareness on animal health
BRAC	WE	Yambio	Provision of oxen and ox ploughs and attachements, poultry farming
Catholic Relief Services (CRS)	EE	All counties except Pidi and Pochalla	Training and support to CAHWs and stockpersons; Provision of veterinary drugs; extension services and restocking
	WE		Provision of beekeeping and honey processing equipment and training
Concern	NBG	Aweil West and Aweil North	Training and equipping CAHWs, provision of transport and awareness creation
	Warrap		Silage making
Diocese of Torit (DOT)	EE	Greater Kapoeta	Provision of animal health services Capacity building of CAHWs, Farm field schools
DORCOS	WBG	Wau	Restocking goats and poultry and training women on animal husbandry
FARM Africa	EE	Kapoeta South	Training and capacity building Provision of drugs
GIZ	NBG	Aweil West and Aweil North	Training in management of livestock auctions, building of butcheries, establishment of a slaughter house
HARD	WBG	Wau	Restocking goats, poultry and pig farming
Tearfund	NBG	Aweil Central	Training and equipping CAHWs and restocking
OXFAM	WBG	Wau	Restocking goats and poultry and training women on animal husbandry
	Lakes		Training and equipping CAHWs and restocking
Norwegian People's Aid (NPA)	Lakes		Training of CAHWs, vet drugs on a cost recovery basis, food security programs
	WE	Movolo	Goat restocking
	CE	Kajo-Keji, Terekeka, Juba, Lainya	Training of CAHWs Provision of veterinary equipment
NICCODO (local NGO)	CE	Juba	Treatment and vaccination Training on milk hygiene
Oxfam Intermon	WBG	Wau	Restocking goats and poultry and training women on animal husbandry
Oxfam GB	Lakes	Rumbek North, Rumbek Centre, Cueibet County	Animal health services, animal production training, food security and livelihoods programs, training of CAHWs
Save the Children	Jonglei	Bor	Training in poultry keeping Capacity building and support to CAHWs
SNV, Netherlands	EE	Torit	Capacity building of CAHWs Establishment of a holding ground Fencing materials for cattle keepers
Tearfund	NBG	Aweil central	Technical advice, goat restocking program
UMCOR	NBG	Aweil West and Aweil	Goat restocking programme, especially

NGO	State it operates in	County	Main involvement
		North	for returnees
UN Indian Battalion	Jonglei, UN	Bor, Makal	Veterinary clinical services Laboratory services
VSF-Belgium	CE	Terekeka, Juba	Meat hygiene and provision of drugs
	Lakes		Strengthening public sector institutional capacity; Food security and livelihoods recovery programme; Training and equipping CAHWs and construction of slaughter house and provision of cold chain
	Jonglei	State wide	Annual vaccination, regular treatment, training of CAHWs and stockpersons Poultry and goat restocking
	Warrap	Marial Lou	Restocking programme for the vulnerable
VSF-Germany	Jonglei	State wide	Annual vaccination, regular treatment, training of CAHWs and stockpersons Poultry and goat restocking
VSF-Suisse	NBG	Aweil East, Aweil West	Training and equipping CAHWs, supply of drugs, restocking programme
	Unity	All nine counties	Capacity building of CAHWs and meat inspectors; vaccination and treatment, provision of cold chain facilities, restocking targeting returnees, construction of slaughter facilities, milk collection centres and butcheries, supply of vet drugs
Vet Work trust	CE	Terekeka, Juba, Lainya, Kajo-Keji	
WATAP	WBG	Wau	Restocking goats and poultry and training women on animal husbandry
WDG	WBG	Wau	Restocking goats and poultry and training women on animal husbandry
World Vision	WE	Yambio and Tambura	Construction of slaughter facilities, goat demonstration farm and hides and skins store, training of CAHWs, farmers and beekeepers, provision of beekeeping equipment, restocking of goats to vulnerable groups,

Source: Elaborated by CAMP Livestock subsector team. CAMP Situation Analysis . 2013.

NGOs are involved in a number of activities, with the two dominant activities being restocking of small ruminants, particularly goats, and poultry; and training and equipping of CAHWs, followed by provision of drugs (Figure 11-1). There is no restocking of cattle going on, and only limited involvement in extension on cattle husbandry. There are also almost no activities related to improving the natural resource and feed base, producing surplus for market and export, processing and value addition, milk and meat handling, marketing, support to strengthening organizational capacity of livestock subsector actors, natural resource based conflict resolution and management, and finance and credit. Many NGOs activities take an emergency/ humanitarian approach, addressing survival and food security, not unexpected in the post-conflict/recovery situation with limited resources. There is a need to empower livestock keepers to move beyond survival and subsistence to income generation and production for market and export as a means of ensuring resilient livelihoods, and for better integrating livestock into the wider economy. Civil society important for elevating the issues and advocating for the rights and support that the livestock subsector is lacking.

Figure 11-1: Key areas of intervention of NGOs working in the livestock subsector



Source: CAMP field data collected between April 2013 and July 2013

NGOs continue to play an important role in animal health services supporting CAHWs and with a combined force of 23 veterinarians distributed in all states except Western Bahr el Ghazal and Western Equatoria: Upper Nile 4; Unity 3; Northern Bahr el Ghazal 2; Lakes 2; Eastern Equatoria 3; Central Equatoria 5; Jonglei 4; and Warrap 4.[326]

The efforts of NGOs and community based organizations are limited in relation to the magnitude of needs, their resource constraints, the short term nature of their presence, and the fragmented approach with each organization focusing on its own priorities. While NGOs have had mostly positive impacts on extension services, CAMP field visits showed that many of the technologies being advocated and utilised are inappropriate. A key critique of NGO activity is the inconsistency with cost recovery. While some NGOs have instituted cost recovery mechanisms, others provide free or heavily subsidized services, creating a dependency syndrome among communities and undermining the growth of the private sector.[327] A policy, legal and regulatory framework is needed to provide clear guidance on the roles and responsibilities of NGOs, coordination between the government and NGOs and for balancing cost recovery against the current needs of livestock keepers and supporting the growth of private sector, and for regulation of training.[328] Mechanisms for instituting strategic partnerships between the government and NGOs are needed.

11.4.5 Development partners

During the civil war and post-conflict period Development Partners (DPs) were critical actors in the livestock subsector involved in emergency interventions and humanitarian assistance, especially in response to disease outbreaks and surveillance, and drought and conflict response. Since the CPA, similar interventions have prevailed alongside food security and

[326] GRSS MARF, Directorate of Veterinary Services 2012

[327] GoSS, MARF. 2006. *Animal Resources Sector Policy and Strategic Plan (ARSP) 2006-2011*. Juba: GoSS.

[328] GoSS, MARF. 2006. *Animal Resources Sector Policy and Strategic Plan (ARSP) 2006-2011*. Juba: GoSS.

livelihoods support. The main bilateral development partners that have been involved in the livestock subsector are Germany, Japan, USAID, CIDA, UK and the Netherlands. Multi-lateral partners are EU, FAO, UNDP, UNICEF, the Indian Battalion of UNMISS (INDBATT) and the World Bank. Key regional partners are the African Union Inter-African Bureau Animal Resources (AU-IBAR) and Inter-Governmental Authority on Development (IGAD).

DP support for the livestock sector has been in decline with very few DP supported interventions since the CPA due to poor returns for investment because of low capacity for implementation and problems with procurement. However, most aid has been short term with two thirds of the funding being for less than one or two years, which is a mismatch with the medium to long term funding needed for positive results based on the 3 year production cycle for indigenous breeds. Most DP-supported projects are not managed directly by the government, a situation that requires review and alignment to the Accra Agenda for Action 2008 and the Paris Declaration on Aid Effectiveness 2005 which requires associated capacity building.

11.4.6 Community and Traditional Institutions

Within South Sudanese societies, there are a diversity of tribal chiefs, elders and opinion leaders: the Transitional Constitution of the Republic of South Sudan vests power in the institutions, status and role of these traditional authorities. They are recognised as integral institutions of local government with jurisdiction over matters affecting local communities. While the structures of integration appear to remain informal, traditional authorities wield great influence on local communities and act as intermediaries between communities and local governments.[329]

These hierarchies are particularly important among pastoral and agro-pastoral communities where traditional institutions such as cattle camps, kinship relations and dowry, important to sustainable livestock production and livelihoods, are overseen by traditional authorities. Migrations were only executed after consultation with chiefs, who together with cattle camp leaders were key decision makers in migration and camp management, and conflict and disease management. Cattle camp leaders have intimate knowledge of the situation in the camps: numbers of livestock, households involved, migration routes and areas, challenges (especially diseases), and conflicts, and are therefore important linkages for any interventions.

Customary law is also recognised and given equal weighting within statute law and there are some explicit provisions of the constitution that recognise customary law such as the protection of customary seasonal access rights to land. This is the main cause of much of the resource based conflict related to access to land that has customarily been dry season grazing for livestock keeping communities, but whose access and usage are now challenged by other competing users. The understanding of land holding under customary law has also presented challenges for the development of livestock subsector infrastructure. Often chiefs are not consulted or sidestepped in the siting of infrastructure, a situation that has resulted in conflict and, many times, closure of such infrastructure[330].

Fragmentation of communities during the protracted conflict led to erosion of traditional authority as well as the establishment of alternative community structures among internally displaced, refugee and returnee communities. New values emerged among communities that were forced to weave together diverse backgrounds. Many of these groups challenge traditional authority and claim it is incompatible with social rights, especially the rights of

[329]Wassara, S.S. 2007. *Traditional Mechanisms of Conflict Resolution in Southern Sudan.* Berghof Foundation of Peace Support. March 2007.
[330]CAMP 2013. CAMP field visits from April 2013 to July 2013.

women, enshrined in the Transitional Constitution.[331] These contradicting sources of community authority have contributed to the disruption of social order since the signing of the CPA.[332]

11.4.7 Stakeholder Coordination

At the national level, MARF coordinates with other ministries and departments through inter-ministerial meetings. Internally, the national Directorate of States Coordination and Special Programmes is responsible for coordination with SMARFs and development partners, as well as ensuring horizontal communication and coordination among the 9 directorates on policy and development matters. For example, through the Sudan Productive Capacity Recovery Program (SPCRP) and Multi-Donor Trust Fund (MDTF) Southern Sudan Livestock and Fisheries Development projects, this directorate assisted some states, for example Northern Bahr el Ghazal, in preparing its SMARF policies and strategic plans while aligning them to the MARF PFSP 2012-2016.

In the specific case of animal health, further coordination with the states is enabled through annual MARF coordination meetings that bring together national and state Directorates of Veterinary Services. The national Directorate of Veterinary Services (DVS) participates in bilateral (cross-border), regional, continental and international meetings for the purposes of trans-boundary disease control (TAD) and standard setting. At the same time, DVS collaborates with the Ministry of Health (MoH) on public health matters, particularly in the control of zoonoses (diseases that can be transmitted from animals to humans). There is far less coordination within the Directorates of Animal Production and Range Management.

At the state level, the SMARFs coordinate with other state government ministries and departments, international organizations, NGOs and training institutions (as in the case of Western Bahr el Ghazal and Upper Nile States that are working very closely with the faculties of veterinary science at the University of Bahr el Ghazal and Upper Nile University). The state veterinary services convene annual animal health coordination meetings. Recently, the state veterinary service of Western Bahr el Ghazal State collaborated with the Ministry of Health and veterinary services in all the neighbouring states, on the subject of control of zoonoses and TADs.

11.5 Production Systems and Performance of the Livestock Subsector

11.5.1 Structure of the Livestock Subsector

11.5.1.1 Challenges with availability of reliable estimates of the size of the livestock subsector

The official livestock population data currently used at the policy level by the national Ministry is an estimate by FAO, extracted from data generated for the whole of South Sudan in 2009 (see Table 11-11). The 2009 FAO estimate put the South Sudan herd at 11,735,159 head of cattle, 12,424,760 goats and 12,062,883 sheep[333]. While the FAO estimates are considered conservative, this would place the South Sudan national herd as the seventh[334]

[331]Wassara.S.S. 2007. *Traditional Mechanisms of Conflict Resolution in Southern Sudan*. Berghof Foundation for Peace Support.

[332]Wassara, S. S. 2007. *Traditional Mechanisms of Conflict Resolution in Southern Sudan*. Berghof Foundation for Peace Support.

[333]The Republic of South Sudan. 2012. *The Ministry of Animal Resources and Fisheries Policy Framework and Strategic Plans 2012-2016.*

[334]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF. In their report, Musinga et al. 2010. rank the South Sudan national herd as the 6thlargest on the African continent ahead of Kenya. However a comparison of data for the two countries would rank South Sudan 7th on the basis of both numbers and livestock units

largest in Africa. This large livestock holding is in keeping with other neighbouring countries in the Horn of Africa region, which collectively has the highest concentration of livestock in Africa, and the highest concentration of pastoralists in the world. Based on estimated growth rates of 0.06% for cattle, and between 0.1 and 0.4 for goats and sheep, also considered conservative, the revised estimated livestock populations for 2013 are 11,763,349 cattle, 12,549,421 goats and 12,111,207 sheep (Table 11-11).[335] Given the low human population, South Sudan has the highest per capita Tropical Livestock Units (TLUs), a national average of 1.5 animals compared to a continental average of 0.66. [336] The highest per capita TLUs are in Western Bahr el Ghazal (3.3), Unity (2.0) and Northern Bahr el Ghazal (1.9).

An attempt was made to generate a national livestock population estimate during the 2008 Sudan Population and Housing Census by the Southern Sudan Centre for Census Statistics (SSCCSE). The SSCCSE data estimates 35.5 million cattle, 20.8 million goats, and 27.3 million sheep. According to this data set, South Sudan would have the second largest national herd in Africa, second only to Ethiopia. However, the livestock questionnaire was administered to only 500 households bringing into question the credibility of the data. The National Baseline Household Survey gave an estimate of 17.9 million cattle, 13.3 million goats, 8.5 million sheep and 3.8 million poultry based on a questionnaire that was administered to all households in the survey. However, there is a very large skew, with 60% (11.3 million) of the cattle, 55% of the goats (7.3 million) and 68% of the sheep (5.8 million) in just one state i.e., Eastern Equatoria. The Rinderpest Dossier 2007 data generated during the eradication of rinderpest, is perhaps the closest to the FAO estimates. There is even less information concerning minor and emerging livestock species, which are known to be of value for the improvement of food security, employment and incomes for both urban and rural smallholder households. They could be of particular value for vulnerable groups including women, female-headed households, youth, returnees and internally displaced persons (IDP's). Data from the states is incomplete.

At the implementation level (state and county), the data challenges and inconsistencies are more challenging. There is no agreed approach for working with the limited reliable data. In their Policy and Strategic Plans, the state Ministries are using livestock population estimates from different sources, including estimates made within the state from vaccination programs, estimates from FAO and other agencies, etc. Some states are using outdated data sources such as the 1997 Rinderpest vaccination data or do not cite their data sources. The formats for presenting data also vary from

[335]FAO/WFP 2013. *Special Report: FAO/WFP Crop and Food Security Assessment Mission to South Sudan.* 22 February 2013.
[336]FAO website. Module 1: An Overview of Cattle Production Systems in Sub-Saharan Africa.

Table 11-11: Livestock population in South Sudan: a comparison of data sets used by different stakeholders

State	Official MARF Data 2009			Per Capita Total TLU	Data in the State Strategic Plans				Data given to CAMP			
	Cattle	Goats	Sheep		Cattle	Goats	Sheep	Poultry	Cattle	Goats	Sheep	Poultry
Central Equatoria	880,544	1,157,903	1,271,049	0.8	Incomplete	N/A	N/A	N/A				
Eastern Equatoria	890,412	1,137,078	1,029,404	0.9	N/A (was livestock units)	11,453,163 livestock units for all livestock	N/A	N/A	2,500,000	5,200,000	2,400,000	1,500,000
Western Equatoria	676,713	1,157,903	1,174,391	1.1					500,000	1,200,000	700,000-800,000	1,500,000
Jonglei	1,468,189	1,212,050	1,406,369	0.9	2,674,555	1,718,328	349,860		2,674,555	1,718,328	349,860	
Upper Nile	985,388	4,415,026	642,774	0.8					2,400,000	2,000,000	1,800,000	200,000
Lakes	1,313,852	1,470,287	1,237,219	1.7	900,000	60,000	40,000		3,000,000	1,500,000	1,500,000	68,000
Unity	1,183,258	1,761,849	1,493,361	2.0	2,500,000-3,000,000	N/A	N/A					
Warrap	1,531,507	1,374,489	1,295,213	1.4	2,910,000	N/A	263,000		3,000,000	Shoats 2,000,000		N/A
Western Bahr el Ghazal	1,250,533	1,124,582	1,271,049	3.3	1,200,000	750,000	980,000		1,200,000	750,000	980,000	800,000
Northern Bahr el Ghazal	1,582,953	1,636,892	1,290,380	1.9	1,500,000	1,800,000	1,300,000	2,500,000	1,800,00	Shoats 1,200,000		N/A
Total	11,763,349	12,549,421	12,111,207	1.3								

Sources: Official MARF Data estimates for 2009: based on FAO Livestock Population Estimates, Oct 2009; FAOStat: http://faostat.fao.org/ (accessed in Aug 2010); Respective state strategic plans and data collected during the CAMP Situation Analysis to each state between March and July 2013.

one state to another making it difficult to coherently compile and compare data from different states. For some states there was a marked inconsistency between the data provided during the CAMP field data collection exercise and that in the current state strategic plans (Table 11-11). This situation presents challenges for planning, investment and coordination of activities at all levels. For example, in the case of vaccination, the data inconsistencies could be partly responsible for the lower vaccination coverage[337]. A systematic approach for capturing and updating livestock population figures is important for understanding changes in the livestock subsector. At the policy level, there is an urgent need for an authoritative livestock population database. Without accurate data, the potential of the livestock subsector cannot be realised. Estimating livestock numbers, especially among mobile pastoral populations, remains a major challenge for governments. More reliable census data is costly to generate and there are significant methodological challenges. However, experience from other African countries has shown the benefit of investment in a census. In Niger, an FAO facilitated census uncovered the fact that Niger had 30% more livestock than previously assumed and the biggest stock in West Africa[338]. This finding was the basis for increasing Niger's GDP by 2%. It also meant that Niger had the capacity to grow its dairy sector to meet domestic demands and to become an exporter of meat. This justified a substantive increase in public sector investment in the livestock subsector. There are similar findings for Ethiopia, where the livestock subsector was found to contribute 45% of the agricultural GDP, up from a previous estimate of 25%[339]. The last livestock census covering South Sudan was conducted in 1976[340]. A discussion paper to initiate a stakeholder dialogue and feasibility study on a livestock census was prepared and submitted by the EU funded Livestock Epidemo-Surveillance Project (LESP) in 2011[341].

There are direct implications concerning the lack of authoritative livestock numbers for the CAMP situation analysis, and for the development of CAMP strategy and investment plans. It is beyond the scope and capacity of CAMP to generate the necessary primary data or to validate the available estimates. There is a need for South Sudan to prioritise investment in a livestock census to generate credible figures to realise the full potential of the subsector. For purposes of the development of the Comprehensive Agricultural Master Plan therefore a caveat is necessary. The FAO estimates which are what the national Ministry is using officially will be used as the base population figures. Where there are discrepancies between the FAO estimates and data and findings collected during CAMP field work, or with other existing data that is important for this report, this will be highlighted.

11.5.1.2 Cattle population, trends and areas of concentration

According to the National Baseline Household Study, 63% of all households in South Sudan (825,500 households) own cattle. By 1954, southern Sudan had an estimated 2,400,000 head of cattle, recognized as a great asset for sustainably increasing the financial self-sufficiency of the region[342]. The distribution in 1954 was such that the Bahr el Ghazal Province had the most cattle with 1,256,000 head, followed by Upper Nile Province with 1,149,000 head and the Equatoria Province with 291,000 head. It was reported that the cattle growth rate was greater than what was required for the domestic market. At that point

[337]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

[338]Food and Agriculture Organization. 2007. *First Ever Agricultural and Livestock Census Uncovers Niger's Hidden Wealth.* FAONewsroom. http://www.fao.org/newsroom/en/field/2007/1000727/

[339]IGAD LPI. 2010. *The Emergency Industry and the Shaping of Innovative Response Capacity*. IGAD Livestock Policy Initiative Brief No. 9.

[340] MARF/Livestock Epidemo-Surveillance Project 2011. *Discussion Paper: Republic of South Sudan First National Livestock Census.* Livestock Epidemo-Surveillance Project, MARF, EU and VSF Belgium.

[341] MARF/Livestock Epidemo-Surveillance Project 2011. *Discussion Paper: Republic of South Sudan First National Livestock Census*. Livestock Epidemo-Surveillance Project, MARF, EU and VSF Belgium

[342]Sudan Government. 1955. *Natural Resources and Development Potential in the Southern Sudan Provides of the Sudan.* A Preliminary Report by the Southern Development Investigation team. London, 1954.

only 10% of the surplus was being exported and it was recommended that the extraction rate be raised through increased trade into urban markets in northern Sudan and expansion into new markets in Uganda. Construction of a meat-packing plant was also recommended. Over the next half century, which coincided with protracted periods of civil war (1955-1972 and 1983-2005), cattle populations were affected by conflict and marginalization, with only minimal support to the subsector. Disease also had a negative impact such as rinderpest that decimated livestock populations in the then southern Sudan in the early 1990s[343]. By 2001, reports show that estimates of the cattle population ranged from 5-7.8 million for the whole of southern Sudan[344].

Based on revision of 2009 FAO estimates and a low annual growth rate of 0.06% over the five years since 2009, it is estimated that the cattle population of South Sudan in 2013 stands at 11,763,349[345]. This data strongly suggests stagnation in cattle populations over the past four to five years. There is a pronounced regional distribution of cattle with the same pattern as was in the 1950s. The Greater Bahr el Ghazal region - Northern Bahr el Ghazal (NBG), Western Bahr el Ghazal (WBG), Lakes and Warrap - has the largest cattle population (48%) (see Figure 11-2). The Greater Upper Nile region (Upper Nile, Jonglei and Unity) has 31% of the cattle, while the Greater Equatoria region (Western Equatoria, Central Equatoria and Eastern Equatoria) has 20% of the cattle. Within the Greater Bahr el Ghazal region, NBG has the highest cattle population with 1,582,953 head, followed by Warrap, Lakes and WBG. NBG has the highest number despite the fact that the 1983-2005 civil had a devastating impact on livestock in the state, with over 40% of households losing all their livestock, a factor that contributed to the severe famine that ravaged the state in 1998 [346]. During that period, due to the internal conflict in the whole of Greater Bahr el Ghazal, dependence on livestock rearing and cultivation was significantly reduced, and households turned to gathering of wild foods as a key coping strategy[347]. Given the low growth rate in the post war period since 2005, herds have not fully recovered to pre-1983 levels[348]. Many households are still restocking[349].

In the Greater Upper Nile region, Jonglei has the highest livestock population of 1,468,189 head, followed by Unity and Upper Nile. In the Greater Equatoria region, Eastern Equatoria has the largest cattle population with 888,278 head, followed closely by Central Equatoria, with Western Equatoria having the least cattle. Parts of both the Greater Upper Nile and Greater Equatoria regions have experienced increased insecurity, natural resource based and inter-ethnic conflicts and cattle raiding which have affected cattle populations negatively.

The most affected areas include Jonglei state, Eastern Equatoria and Central Equatoria. For example, in Central Equatoria CAMP field data collection interviews show that there has been a significant decrease in cattle numbers in Juba County, falling sharply from an estimated 700,000 before 2008 to around 100,000 in 2013 due to an increase in cattle

[343]Catley, A., T. Leyland and S. Bishop. 2005. *Policies, Practice and Participation in Complex Emergencies: The Case of Livestock Interventions in South Sudan.* A Case Study for the Agriculture and Development Economics Division of the Food and Agriculture Organization. March 2005.

[344]Jones, B. 2001. Review of Rinderpest Control in southern Sudan, 1989-2000. African Union-Interafrican Bureau for Animal Resources. Quoted by Catley, A., T. Leyland and S. Bishop. 2005. *Policies, Practice and Participation in Complex Emergencies: The Case of Livestock Interventions in South Sudan.* A Case Study for the Agriculture and Development Economics Division of the Food and Agriculture Organization. March 2005.

[345]FAO/WFP 2013. *Special Report: FAO/WFP Crop and Food Security Assessment Mission to South Sudan.* 22 February 2013.

[346]Biong Deng, L. 2013. *Changing livelihoods in South Sudan.* Humanitarian Exchange Magazine. Issue 57, May 2013.

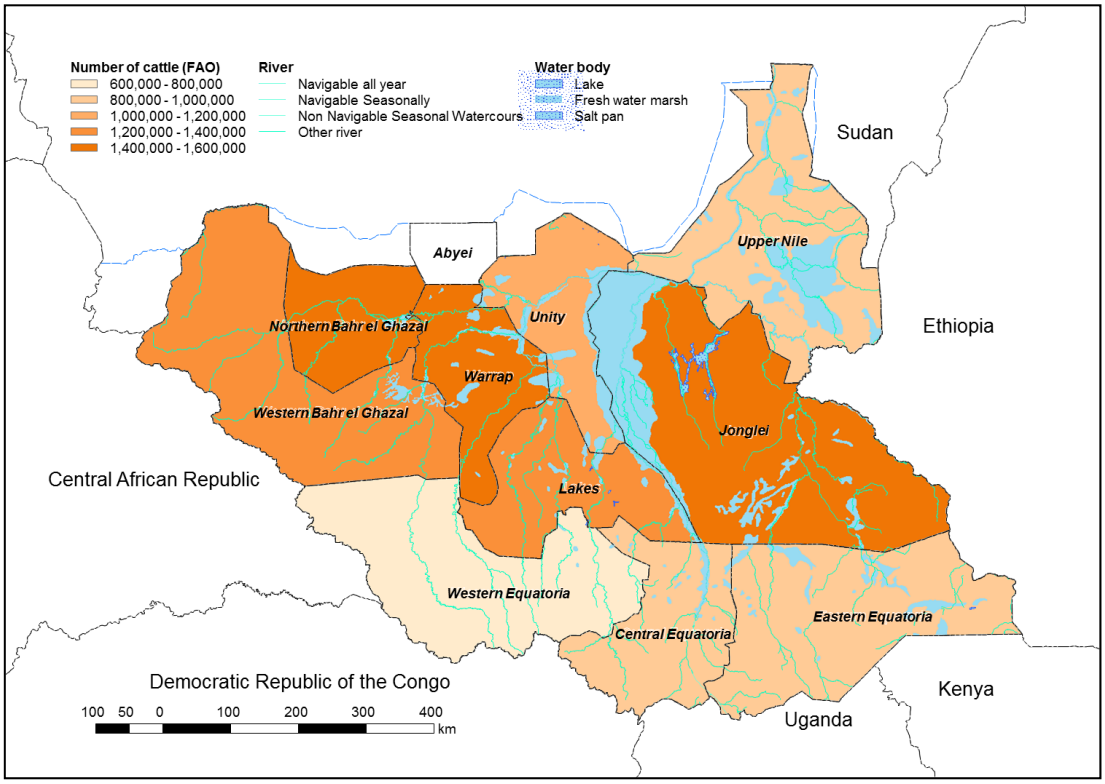
[347]Biong Deng. L. 2013. *Changing livelihoods in South Sudan.* Humanitarian Exchange Magazine. Issue 57, May 2013.

[348]Biong Deng. L. 2013. *Changing livelihoods in South Sudan.* Humanitarian Exchange Magazine. Issue 57, May 2013.

[349]State Ministry of Animal Resources Northern Bahr el Ghazal. 2012. Ministry of Animal Resources and Fisheries Strategic Plan 2012. Northern Bahr el Ghazal. December 2012

rustling and insecurity. Numbers of cattle in cattle camps has drastically fallen and many households now prefer to tether or zero graze (cut and carry) the few cattle that remain.

Figure 11-2: Cattle populations at state level in South Sudan



Source: FAO/WFP 2013. *Special Report: FAO/WFP Crop and Food Security Assessment Mission to South Sudan*. 22 February 2013 based on 2009 FAO estimates for the whole of Sudan

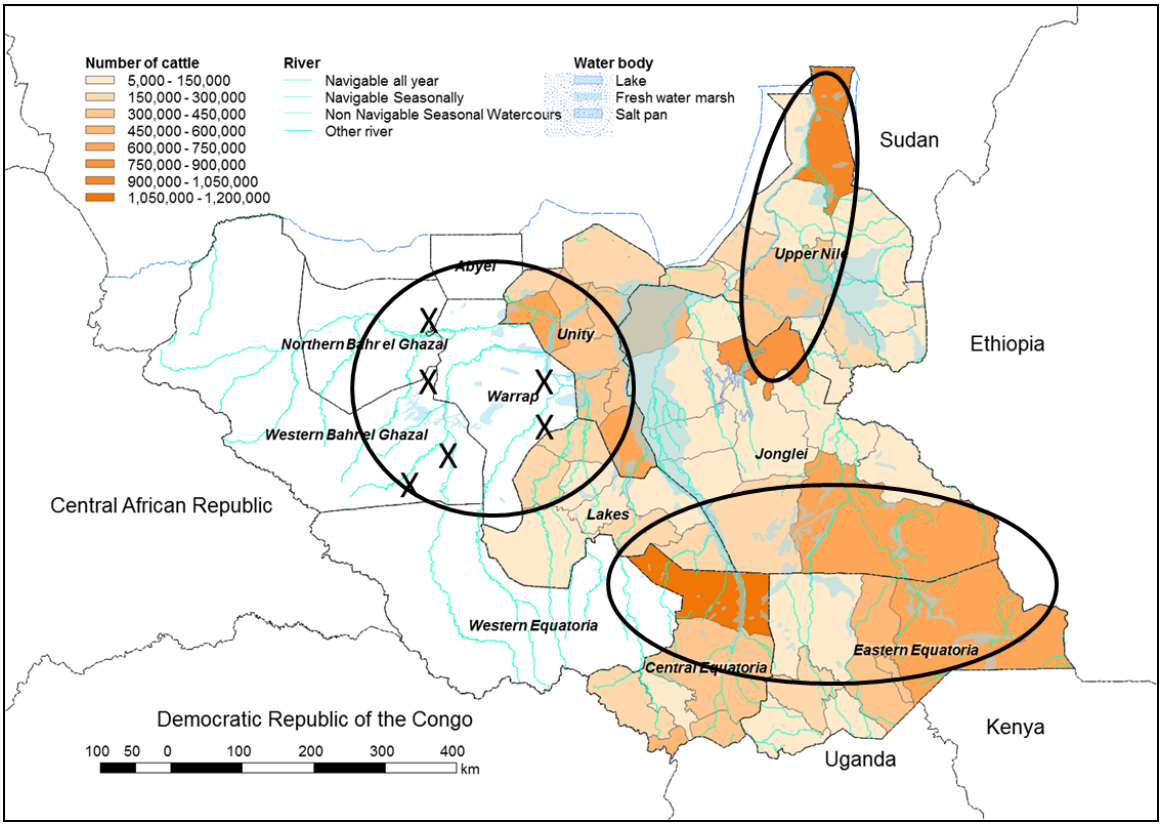
However, cattle populations in neighbouring Terekeka County have grown from 1.2 million before 2008 to an estimated 1.75 million in 2013. This is partly due to decisions within the state to have all livestock that were moved away during the civil war, returned to their original administrative locations. These movements inadvertently caused a need for increased disease control, as incoming livestock spread East Coast Fever from Western Equatoria, as well as increased pressure on feed resources in Terekeka County. In both Yei County, CES and the Greater Mundri region changes in marriage culture, introduced through intermarriages, have made cattle rearing more important, thus increasing community interest in raising cattle.

Areas of concentration: There are areas where cattle are concentrated (Figure 11-3) including: the Greater Kapoeta region in Eastern Equatoria; Nyirol and Pibor Counties in Jonglei; Nasir, Baliet and Renk in Upper Nile; Panyinjar, Mayom and Leer in Unity; Terekeka in Central Equatoria[350]; Aweil East and Aweil South in Northern Bahr el Ghazal, Tonj North and Tonj East in Warrap, Jur River and Wau in Western Bahr el Ghazal[351]. Terekeka, the Greater Kapoeta area and Pibor already supply Juba and would therefore be of strategic importance in meeting the demands of the fast growing urban population. There is also great potential for expanding trade into Uganda, Kenya and Ethiopia, which is currently very limited or has ceased. A second identifiable cluster is within the Greater Bahr el Ghazal area and Unity which would be strategic for supplying this area with the highest human population

[350]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.
[351]CAMP field data. 2013.

density, and meeting the demand in Western Equatoria. A third cluster encompassing Nyirol in Eastern Equatoria and Nasir, Baliet and Renk in Upper Nile are strategic for supplying markets in Malakal and for trade with Sudan and Ethiopia. The clusters are particularly important for the development of a dairy industry.

Figure 11-3: Areas of concentration of cattle in South Sudan



Source: Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF and CAMP data.

The areas that have least concentration of cattle are those that have historically been infested with tsetse flies and therefore trypanosomiasis has been a major deterrent to livestock keeping. These include Western Equatoria and Raga County of Western Bahr el Ghazal. However, a recent assessment conducted by the national MARF indicates that tsetse infestation is now more wide spread; it is only Lakes, Unity and parts of Central Equatoria where the presence of the vector is yet to be confirmed[352].

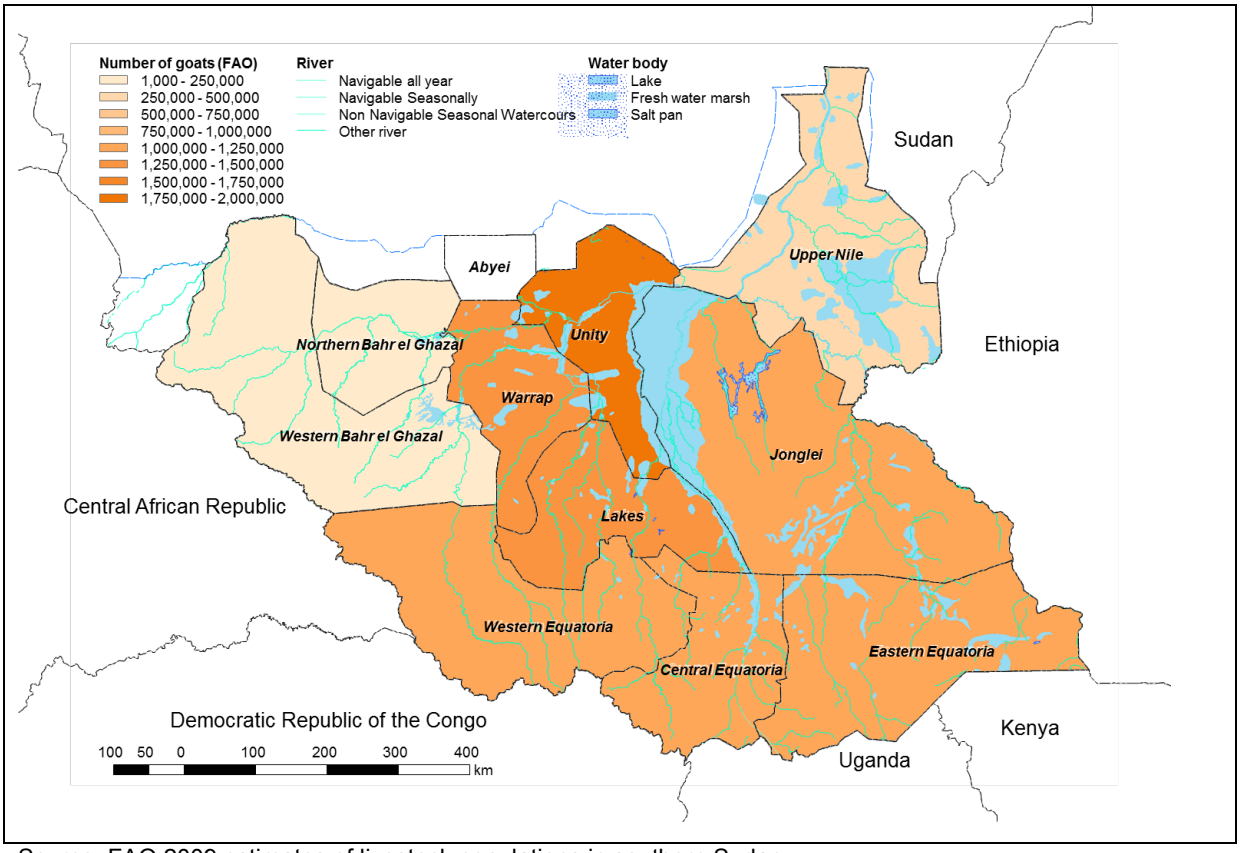
11.5.1.3 Goat population, trends and areas of concentration

In 1954, South Sudan had 2,400,000 goats and sheep, with the largest population of 1,144,100 head in the Flood Region (parts of Upper Nile, eastern and north-eastern parts of Bahr el Ghazal and parts of north-eastern Equatoria), followed by the Equatorial Region with 1,338,000 sheep and goats (south-western and western parts of Equatoria province)[353]. The Central Rainlands (part of Upper Nile Province) had the lowest population with 80,000 head. Currently, goats are the most widely kept ruminant livestock with 69% of all households owning goats, i.e., 904,120 households[354].

[352]MARF 2013. Unpublished Report on Tsetse Fly Distribution and Trypanosomiasis Incidence in the Republic of South Sudan.
[353]National Bureau of Statistics. 2012. *National Baseline Household Survey 2009.*
[354]National Bureau of Statistics. 2012. *National Baseline Household Survey 2009.*

Revised figures for 2013 based on FAO 2009 livestock estimates show that there are an estimated 12,549,421 goats in South Sudan[355]. Like cattle, goat populations are highest in the Greater Northern Bahr el Ghazal region which has 45% of the goats (see Figure 11-4) with NBG and Unity having the highest number of goats. The Greater Upper Nile and Greater Equatoria regions have equal numbers of goats i.e., 27% each, emphasizing the universal presence of goats in the country. Goats are an important asset at household level where they serve as savings and insurance that can be quickly mobilized to solve household problems. Goats are particularly important in Western Equatoria and parts of Central Equatoria where they are the main ruminant livestock kept under small holder/ household systems. A large percentage of goats are kept as part of mixed herds with cattle, and therefore the same factors that have affected cattle populations like drought, disease, conflicts and insecurity have affected goat populations.

Figure 11-4: Goat population across South Sudan states

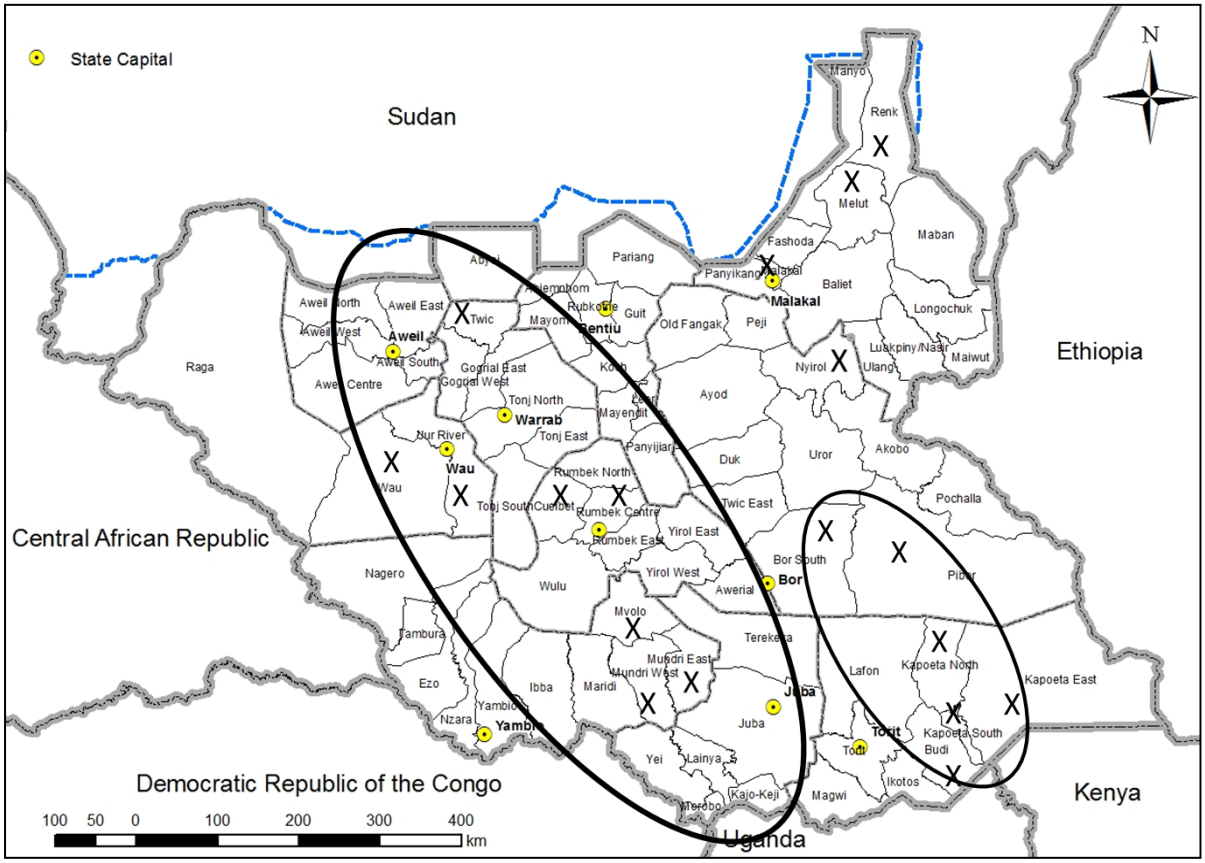


Source: FAO 2009 estimates of livestock populations in southern Sudan

Areas of concentration of goats: Unlike cattle, goats are more evenly distributed reflecting their versatility and adaptability to a range of livelihood zones and production systems. Over the last few years goat restocking has been an important component of interventions focused on improving livelihoods and food security. This has resulted in an increase in the number of households owning goats and the number of goats held per household. Nonetheless there is a belt of concentration of goat populations running diagonally from the north-west through the centre of the country to the south-eastern region (see Figure 11-5). A second area of concentration is in the southern parts of Jonglei State and the Greater Kapoeta area of Eastern Equatoria. Goats are also concentrated in the western parts of Upper Nile state.

[355]FAO/WFP 2013. *Special Report: FAO/WFP Crop and Food Security Assessment Mission to South Sudan*. 22 February 2013.

Figure 11-5: Goat concentration



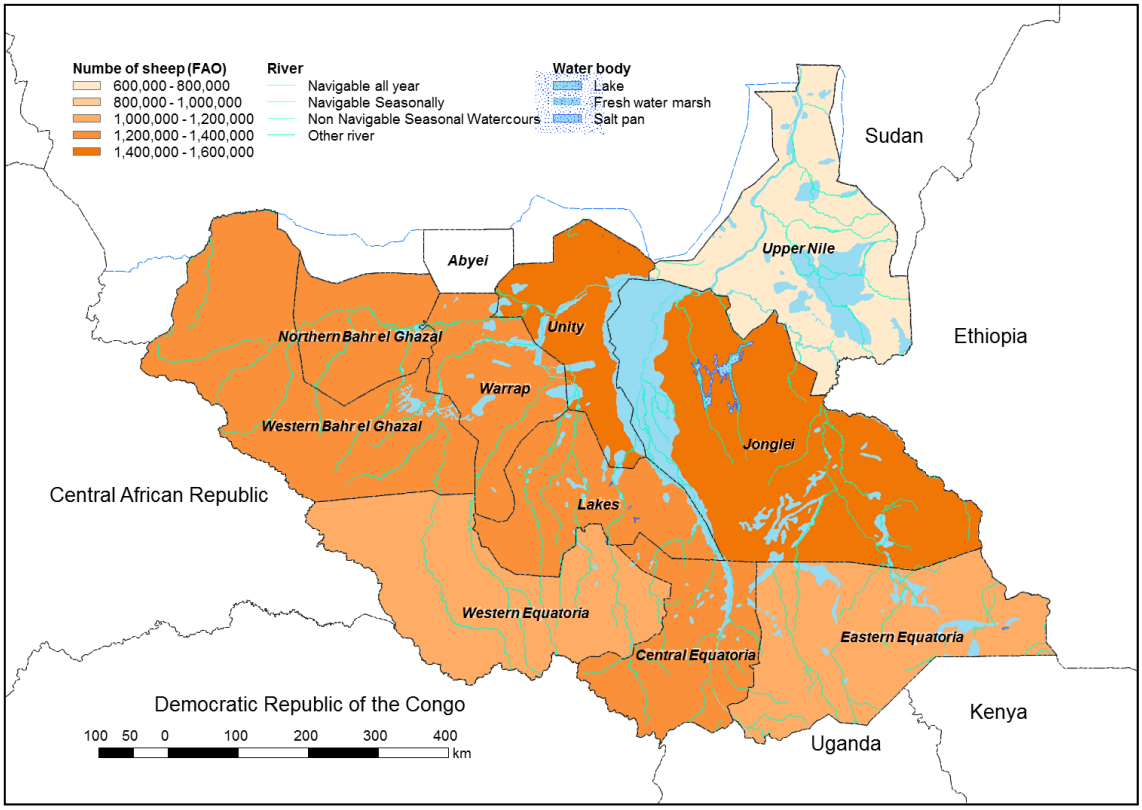
Source: CAMP data 2013

11.5.1.4 Sheep population, trends and areas of concentration

Although there are almost equal numbers of sheep as goats in South Sudan, i.e., 12,111,207 head, only 38% of households own sheep indicating concentration of sheep among a few households i.e., 497,800 households. Many indigenous communities have taboos and/or cultural practices related to both the keeping of sheep and consumption of its products. Like the other ruminant species, sheep are most concentrated in the Greater Northern Bahr el Ghazal region which has 42% of the sheep, with the largest populations in NBG and Unity States (Figure 11-6). The other two regions i.e., Greater Upper Nile and Greater Equatoria have equal numbers of sheep i.e., 29% each.

Areas of concentration of sheep production: The concentration of sheep production to some extent mirrors that of goat production (Figure 11-5). Concentration areas include the Greater Kapoeta area in Eastern Equatoria, the Greater Mundri area and Mvolo in Western Equatoria, a corridor through Greater Bahr el Ghazal including Cueibet and Wulu in Lakes, Wau and Raga in WBG, and Aweil South and Aweil East in NBG. There is a concentration of sheep production in western parts of Upper Nile including Melut, Fashoda and Panyikang and the neighbouring county of Pariang in Unity State.

Figure 11-6: Sheep population across South Sudan states



Source: FAO 2009 livestock estimates

11.5.1.5 Poultry population, trends and areas of concentration

The official estimate for poultry was 5.6 million birds in 2006[356]. The National Baseline Household Survey 2009 estimated that the national flock was 3,871,693 birds. However this data is skewed with Eastern Equatoria having the highest number of poultry i.e., 796,441 (21%) which is not corroborated by information from the ground. From data gathered from the current State Strategic Plans and CAMP field interviews in the states, the total poultry flock size for six states excluding Warrap, Unity, Jonglei and Central Equatoria is 6,568,000 birds (see Table 11-11). According to this data, Northern Bahr el Ghazal has the highest number of poultry with 2,500,000, followed by both Eastern Equatoria and Western Equatoria with 1,500,000 birds each. Western Bahr el Ghazal has an estimated 800,000, Upper Nile 200,000 and Lakes State 68,000. The data is however not broken down by species, but from CAMP field visits, local chicken followed by ducks make up the majority of poultry. Rearing of exotic chicken, both broilers and layers, is still falteringly emerging and the growth rate can be expected to be very low or even negative. For example, out of the forty-two poultry farms established with the support of the Central Equatoria SMARF and NGOs, less than five were operational in 2013. There is no data on other poultry species that include ducks, turkeys and guinea fowl.

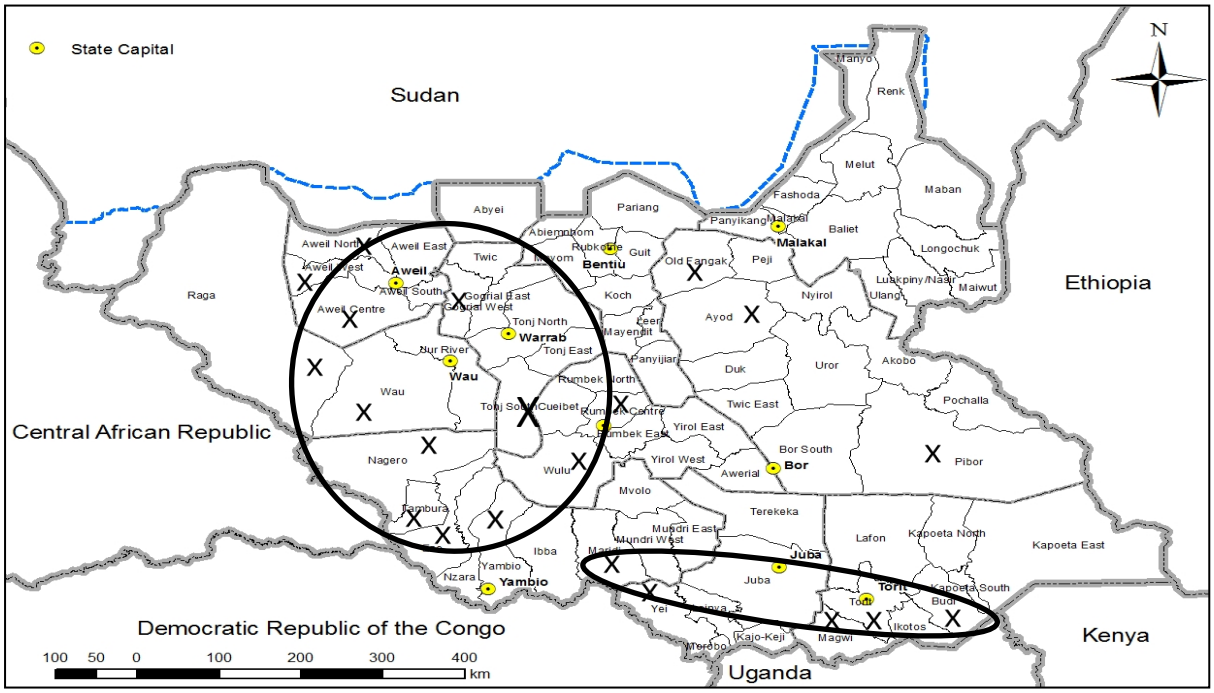
11.5.1.6 Population of honey producers, trends and areas of concentration

Honey production, especially through traditional practices and gathering of wild honey is a livelihood activity of many South Sudanese households who derive food and income from honey and other bee products. For some South Sudanese communities such as the Jurbel in Wulu County, Lakes State, honey plays important socio-cultural roles related to marriage

[356]Government of Southern Sudan/ Ministry of Animal Resources and Fisheries. 2006. *Animal Resources Sector Policy and Strategic Plan 2006-2011.*

and kinship[357]. The 2006-2011 MARF Policy and Strategy document estimated that the production potential for honey was about 100,000 metric tonnes and 5,000 metric tons of beeswax[358]. This may however be an overestimation as Ethiopia, which is Africa's leading producer, and 10th globally, produced 45,300 metric tons in 2010, up from 36,000 metric tons in 2005.

Figure 11-7: Areas of concentration of honey production



Source: CAMP data

A study showed that there are approximately 18,308 traditional beekeepers/honey gatherers in just three of the main honey producing states i.e., Western Bahr el Ghazal, Lakes and Western Equatoria. On average it was estimated that each could produce 420 kg just from traditional beekeeping and gathering, for a total of 7,690 metric tonnes. Traditional beekeepers and honey gatherers constitute 80.2% of honey producers, therefore together with modern beekeepers there are approximately 22,885 beekeepers in the three states producing a minimum of 9,611 tonnes. Based on these findings, since modern beekeepers have a much higher production, it would require approximately 238,112 beekeepers/honey gatherers, 18% of households to produce 100,000 tonnes of honey in South Sudan annually. There is a need to verify this data.

Areas of concentration: Vast natural forest covers over 80% of South Sudan's territory, meaning there is potential for honey production in most of the country. However, honey production is concentrated in the Greater Equatoria region and parts of Western Bahr el Ghazal and Lakes State, where there is expansive forest cover, but also adequate rainfall supporting growth of crops; this makes them natural habitats for bee colonies (Figure 11-7).

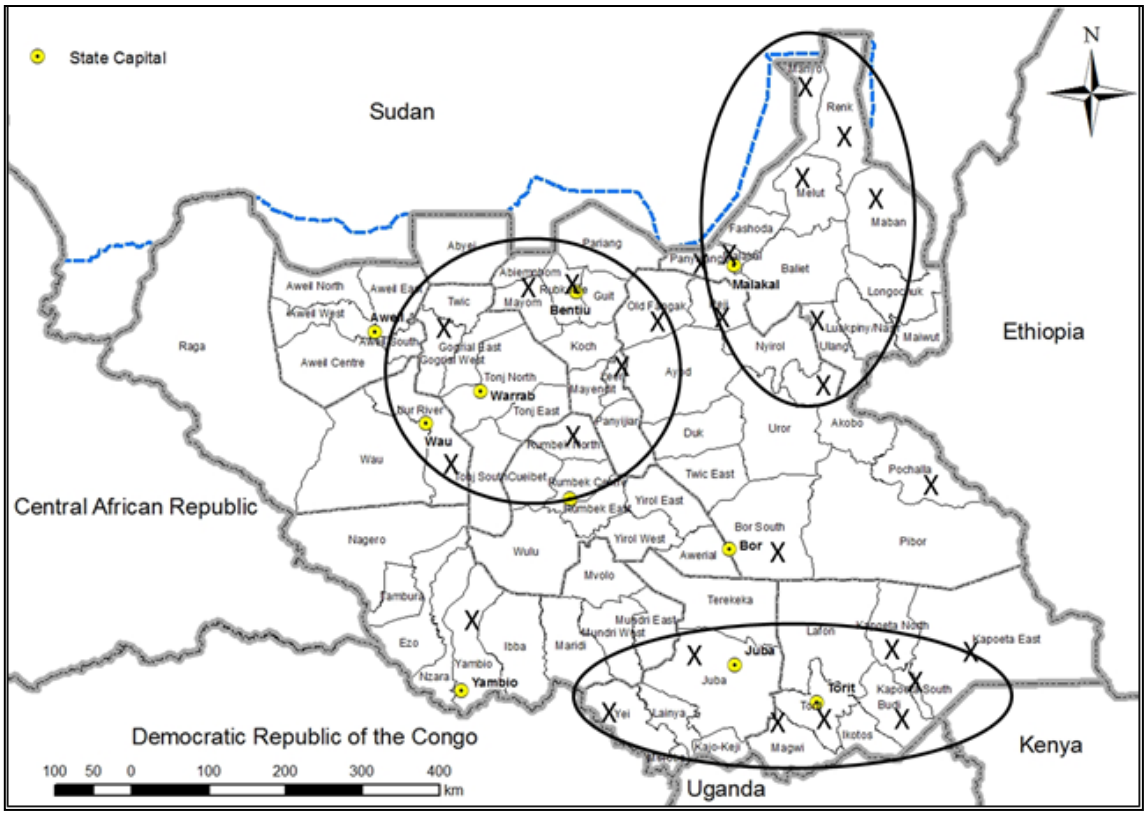
11.5.1.7 Population of emerging livestock, trends and areas of concentration

There is a paucity of information in the literature in relation to minor and emerging livestock species including camels, ducks, turkeys, ostriches, quail, pigeons and rabbits, and on equine donkeys, horses and mules. Neither is there data on crocodiles and snakes, which

[357]Sudan Institutional Capacity Programme: Food Security Information for Action. 2012. *A Study on Traditional Beekeeping and its Contribution to Food Security and Poverty Alleviation.* Information for South Sudan Food Security and Policy Intervention. Republic of South Sudan, EU and FAO.
[358] Maku. 2004. *Honey Market in Uganda. APICATA 38* (2004) p.302-306.

are potential sources of leather[359]. Data from the states is incomplete. Currently there are an estimated 100,000 camels and 10,000 donkeys. There are a few commercial enterprises producing rabbits in Western Equatoria and other parts of the country. Rearing of pigs is an emerging activity in South Sudan. The highest concentration of pigs is in Maban County, Upper Nile State, where there are an estimated 35,000 pigs kept by the indigenous community for whom pigs are the most important livestock, followed by small ruminants and then cattle[360]. Data collected by CAMP from states shows that there are an estimated 13,720 pigs in Eastern Equatoria. Other states have very few pigs, mostly kept by just one or two persons or communities i.e., 20 pigs in Rumbek North, Lakes State; 150 pigs in Rubkona Country Unity State and 163 pigs in Wau, Western Bahr el Ghazal. There are however a few commercial enterprises in Juba, the largest with 400 crossbreeds, and 100 local breed pigs.

Figure 11-8: Areas where pigs are currently being reared in South Sudan



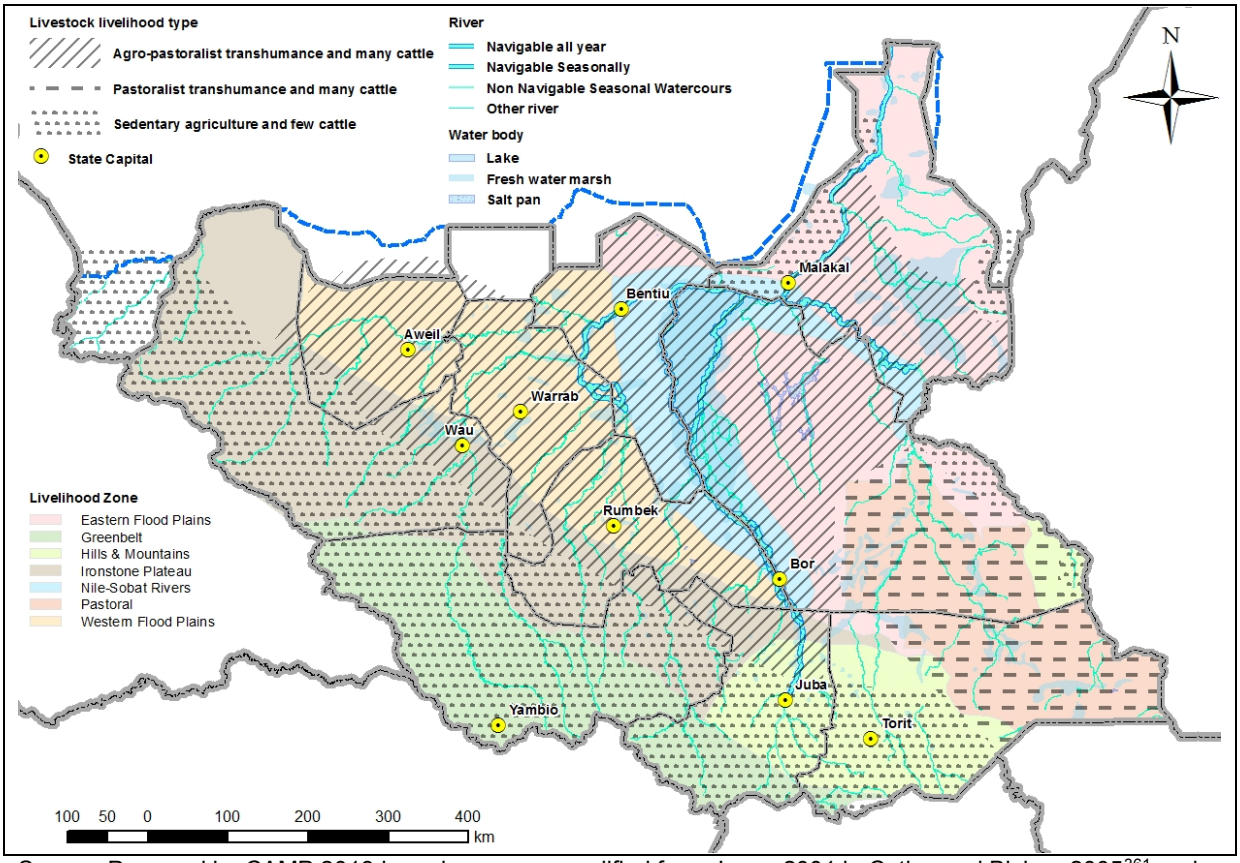
Source: CAMP data and information

11.5.2 Production systems

There are commonalities among the main livestock production systems in South Sudan; all are largely traditional systems, of a subsistence nature, non-monetized/non-wage earning, with low inputs and a dependency on natural resources. Commercial production systems are emerging but still rudimentary. There is low adoption of other possible livestock production systems that could utilise a wider range of feed and management options. This is a result of protracted conflict, marginalization, and lack of infrastructure and services that led the South Sudanese population to revert to dependence on the natural resource base and indigenous knowledge systems and strategies. The main livestock production systems are therefore strongly aligned to the livelihood zones (see Figure 11-9 and Table 11-12).

[359]Government of Southern Sudan/ Ministry of Animal Resources and Fisheries. 2006. *Animal Resources Sector Policy and Strategic Plan 2006-2011.*
[360]Food and Agriculture Organization. 2012. *Maban Assessment Report: Livestock Livelihood Based Assessment.* September 2012.

Figure 11-9: Main cattle production systems in South Sudan



Source: Prepared by CAMP 2013 based on a map modified from Jones 2001 in Catley and Bishop 2005[361] and from SSCCE[362] livelihood profiles

Table 11-12: Livelihood Zones

Livelihood Zone and the States covered	Main zone characteristics in relation to livestock rearing	Key issues
Greenbelt Zone • Eastern Equatoria • Central Equatoria • Western Bahr el Ghazal	• Rely almost exclusively on agriculture • Smallholder rural and urban/peri-urban livestock keeping focused on poultry and goats. Few cattle • Emergence of commercial poultry • Honey through traditional and modern beekeeping and gathering of wild honey	
Arid/ Pastoral Zone • Eastern Equatoria • Jonglei	• Driest zone, with one cropping season and seasonal rivers except swamps which are dry season grazing areas	• Delayed rain and recurrent drought the norm • Seasonal migration for water and pasture with

[361]Jones, B. 2001. *Review of Rinderpest Control in Southern Sudan 1989-2000.* African Union – Interafrican Bureau of Animal Resources, Nairobi, Kenya. In Catley, A., T. Leyland and S. Bishop. 2005. *Policies, Practices and Participation in Complex Emergencies: The Case of Livestock Interventions in South Sudan.* A Case Study for the Agriculture and Development Economics Division of the Food and Agriculture Organization. March 2005.
[362]Southern Sudan Centre for Census, Statistics and Evaluation. 2006. Southern *Sudan Livelihood Profiles. A Guide for Humanitarian and Development Planning.* SSCCSE and Save the Children, UK.

Livelihood Zone and the States covered	Main zone characteristics in relation to livestock rearing	Key issues
	• Nomadic and transhumant pastoralism with strong reliance on livestock which are the main source of income, rely on wildlife and plants as well • Mostly cattle and goats • High reliance on milk as a source of food and nutrition • Crop supplementing livestock with small scale cereal production • Reliance on livestock trade for food and income (as high as 24% of households in some years). • Large herd sizes • Exchange of livestock for grain: during food shortage periods, distress sales with poor cattle to grain terms of trade	movements as far as Ethiopia, Jie, the Kidepo Valley and towards the Uganda border • Community priorities include need for provision of alternative water sources for livestock (hafirs) to reduce clashes and insecurity and improvement of market access • Crop failure • Insecurity, conflict and cattle raiding disrupt livelihoods and in Jonglei • Inter-tribal clashes hamper livestock trade • Natural resource based conflict • Animal disease • High reliance on market for purchase of grain therefore terms of trade between livestock and grain important • Mobility dependent coping mechanisms such as fishing, hunting and gathering
Hills and Mountain Zone • Central Equatoria • Eastern Equatoria • Jonglei	• Both agriculture and pastoralism Pastoralism mostly among households in Torit and Budi • Reliance on cattle increased during difficult years • Opportunity for trade with Ethiopia and Kenya	• Droughts in the mountains • Floods in the lowlands or plains • Resource based conflict
Western Flood Plains Zone • Northern Bahr el Ghazal • Warrap • Lakes • Unity	• Short vegetation, black clay soils and wetlands (toic) that are prone to flooding • Agro-pastoralists, who keep livestock combined with crop agriculture, supplemented by fish and wild foods • Seasonal flooding common in an area characterised by lakes, rivers and low lands. Flooding makes agriculture difficult • Livestock are important for both food and income • Stable security especially in NBG	• Vulnerability to flood and droughts • Poorly developed market infrastructure • Significant number of female headed households • Distress sale of livestock to cope with food shortages • Poor quality of dry season pastures
Eastern Flood Plains Zone • Eastern Equatoria	• Pastoralists and agro-pastoralists • Low lying terrain and black cotton soils pre-disposes to	• Long distance migrations for grazing • Inter-ethnic hostilities due to different tribes

Livelihood Zone and the States covered	Main zone characteristics in relation to livestock rearing	Key issues
• Jonglei • Unity • Upper Nile	flooding • Livestock, agriculture, supplemented by fish, wild foods and game hunting • Trade of livestock is important for food security	• Wildlife • Few vibrant markets in some areas and poor access to markets due to poor roads • Distress sale of livestock during food shortages
Ironstone Plateau Zone • Eastern Equatoria • Central Equatoria • Western Equatoria • Lakes • Warrap • Northern Bahr el Ghazal • Western Bahr el Ghazal	• Heavily dependent on crop production but parts like Terekeka in CES is largely agro-pastoral with livestock production predominant and sale of livestock especially as distress sales • High potential for commercial beekeeping • Host area for in-migrating cattle keepers from the Nile-Sobat River Zone	• Tsetse infested areas limit livestock production • Cattle raiding has affected parts of CES (Terekeka) • Drought • Soils with low water retention capacity, therefore prone to water shortages • Conflicts with in-migrating livestock keepers
Nile and Sobat Rivers Zone • Lakes • Unity • Jonglei • Upper Nile	• Clay soils and swampy areas(toic) close to the Nile and Sobat rivers so abundance of water sources • Good vegetation for grazing but flooding hampers access • An important dry season grazing area to which transhumant livestock migrate to set up cattle camps but also crops grown • Wild foods and fish important • Agro-pastoral zone • Both crops and livestock important sources of food security • In Unity small business along the highways • Good accessible roads due to oil companies in Unity • Remittances are important source of income like in Shiluk areas and in Bor	• Seasonal flooding • Limited access to major markets further hampered by tribal tensions, inter-ethnic conflicts and cattle raiding • High socio-cultural values attached to livestock which are rarely sold except as distress sales during food shortages when surplus livestock in markets results in low prices and erosion of productive assets

Sources: CAMP data 2013; Southern Sudan Centre for Census, Statistics and Evaluation.2007. *Southern Sudan Livelihood Profiles*. 2nd Edition May

11.5.2.1 Ruminant production systems

Ruminant livestock in South Sudan i.e., cattle, sheep, goats and camel are predominantly raised under extensive rangeland based pastoral systems where mixes of the different species are herded together. Pastoral systems are estimated to make up over 90% of livestock producers, with urban and peri-urban livestock keepers constituting the remaining

10%[363]. The main determinant of pastoral production systems is rainfall; pastoral and agro-pastoral systems are adapted to environments where rainfall is both low and highly variable, and temperature and evapotranspiration are high. Water stress, in the form of shortages during the distinct dry seasons and drought are the norm. The importance of pastoralism lies in the capacity to utilise livestock to convert resources into food for human consumption and income generation in marginal landscapes, where there are few other viable and sustainable livelihood options.

Pastoral strategies, which include migration to access resources in the dry season, mean that pastoralists compete for scarce resources with crop farmers and wildlife, and conflict is inevitable. Conflict has been rated as the most damaging hazard for livelihoods and basic food security in South Sudan[364]. The magnitude of natural resource based conflict, together with the widely held perception that pastoralists prefer to keep large herds as a status symbol, and not for economic reasons, has resulted in very strong political sentiments against traditional pastoralism. These views were presented very strongly at the Second Governors' Forum which coincided with the Second Annual Agricultural Forum held in Juba in November 2012 and presided over by the Vice President of South Sudan. There were equally strong proponents for the protection of pastoral systems. Resolutions from the Governors Forum included control of the movement of pastoralists by classification of land into farm (crop) and pastoral land and by demarcation of migration routes; and secondly, a call to implement innovative approaches to educate pastoralists on more attractive economic alternatives of livestock production to replace pastoralism[365]. Similar sentiments against traditional pastoral systems were expressed by the political leadership of many of the states visited during the CAMP field data collection, even those states where pastoral production is a key contributor to the state economy.

The national MARF Policy Framework and Strategic Plans (PFSP) recognizes the fact that South Sudan's huge livestock endowment is a legacy of the ingenuity of traditional pastoral systems that persisted through decades of protracted civil war and marginalization with little public sector support. However, beyond that acknowledgement, neither the national MARF Policy Framework and Strategic Plans, nor the State strategic plans, definitively address the development of pastoralists. An analysis of the contribution of pastoralism to food security, livelihoods, employment, trade, agricultural development, and socio-cultural cohesion is lacking, as is analysis of the efficiency and resilience of pastoral systems within the past, prevailing and future development contexts. Key interventions focus on more modern farming systems, with the PFSP seeking to 'modernize' pastoral systems on the basis of making them more sedentary (less migratory) and market oriented rather than taking a more transformative approach that supports pastoral production and lets the system evolve and integrate with the wider national and regional economy.

At the implementation level, especially within counties, communities grapple with how to keep a balance between different but equally necessary livelihoods. The prevailing approach to post-conflict interventions tends to favour settlement of pastoralists and support for communities to get into crop production, rather than developing pastoral migratory routes, restoring trade, developing new markets, and promoting the exchange and market

[363]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

[364]Southern Sudan Centre for Census, Statistics and Evaluation. 2006. *Southern Sudan Livelihood Profiles. A Guide for Humanitarian and Development Planning*. SSCCSE and Save the Children, UK.

[365]Republic of South Sudan. 2013. *Final Resolutions of the Second Governor's Forum.* Freedom Hall, Juba. 26-29 November 2012.

opportunities that are central to the functional economy between pastoral and other non-pastoral groups[366].

The challenge of defining the most appropriate approach to the development of livestock resources, within a context where most or a significant number of livestock are held under pastoral systems is not unique to South Sudan. It is a subject of regional and continental concern. Inappropriate strategies and investments in pastoralism across the continent, including the Greater Horn of Africa region, have severely eroded pastoral productive and resilience capacities making them highly vulnerable to shocks. This was once again brought into sharp focus during the 2011 drought which put over 14 million people at risk of starvation, mostly pastoralists across the Greater Horn of Africa. Pastoral systems are the basis for livestock sectors across countries in the region which collectively have the largest concentration of livestock on the African continent, with 50% of the cattle, 39% of the goats, 36% of the sheep and 72% of the camels. Over 85% of the livestock in the region are indigenous and are largely in the hands of pastoralists, who hold 100% of the livestock in Somalia, 99% in Tanzania, 73% in Uganda, 70% in Kenya and 24% in Ethiopia.

Pastoralists supply most of the live animals and meat consumed domestically, as well as supplying the neighbouring Middle East and North Africa (MENA) region, in what is the largest global trade in live animals. The informal trade of live animals from Ethiopia into Kenya, Somalia and Djibouti, organized by pastoralists, generates an estimated total value of between US$250 and US$300 million[367]. On the other hand, exports of livestock and livestock products by the Ethiopian formal sector were worth US $121 million. In Ethiopia, exports of livestock and livestock products are second only to coffee, with livestock contributing 45% of the agricultural Gross Domestic Product (GDP). Within East Africa alone the live animal and meat industry, based largely on pastoral production, generates $5 billion annually, equivalent to an estimated 14% of the total GDP of the region[368]. The Horn and East Africa region produces 46% of Africa's milk[369]. In Uganda, one of the few low cost producers of milk globally[370], most of the milk is produced by pastoral herds and small holders with indigenous stock; improved cattle make up only 5% of the national herd. Uganda's dairy industry has expanded tremendously from 365 million litres in 1991 to an estimated 1.53 billion litres in 2013. This was based on interventions that included: improved collection of milk from pastoral areas, enforcement of food hygiene regulations, and increased processing and marketing capabilities. From importing milk in 1991, Uganda is now one of the key exporters of milk to the region, expected to earn USD 12.1 million in 2013, up from USD 3.4 million in 2011.

Despite the contribution of pastoralism to national and regional economies, public and formal private sector investments are not commensurate with the value provided by the pastoral sector, especially in relation to food security, poverty reduction and improved livelihoods. A Policy Framework for Pastoralism in Africa was approved by Heads of African Union Member States in 2011 to provide guidance for the development of more appropriate pastoral and livestock development strategies. Countries within the Greater Horn of Africa region are taking steps to review and re-articulate both pastoral development and the wider development of their livestock sectors. The Inter-Government Authority Development (IGAD), which is constituted of Members States within the Greater Horn of Africa, and of which South

[366]Southern Sudan Centre for Census, Statistics and Evaluation. 2006. Southern *Sudan Livelihood Profiles. A Guide for Humanitarian and Development Planning.* SSCCSE and Save the Children, UK.
[367]Pavanello, S. 2010. *Working Across Borders. Harnessing the Potential of Cross-border Activities to Improve Livelihood Security in the Horn of Africa Drylands*. Humanitarian Policy Group Brief 41. ODI.
[368]Kilimo Trust.2009. Livestock Product Value Chains in East Africa:Scoping and Preliminary Mapping Study. Final Report, Kampala, Uganda, March 2009.
[369]FAO. 2012. FAOStat data on milk production.
[370]Masinde, A. 2013. Only 20% of Uganda's Milk is processed. Agribusiness. The Daily Monitor Newspaper. Published January 28, 2013. Kampala, Uganda.

Sudan is a member, developed its regional Comprehensive Africa Agriculture Development Plan (CAADP) in 2012 with a strong focus on pastoral/ dryland development. In 2012, Kenya developed a National Policy for the Sustainable Development of Northern Kenya and other Arid Lands[371] and an accompanying Development Strategy for Northern Kenya and other Arid Lands, a strategy that is seen as important to achieving the national Vision 2030[372]. Most of Kenya's livestock (70%) is held by pastoralists in the arid and semi-arid lands. It is estimated that the contribution of livestock to agricultural GDP is Kshs. 320 billion, only slightly less than that from crops and horticulture, which attracts far more investment, and policy and regulatory support.[373]

Compared to other countries in the Horn of Africa and beyond, the differences between pastoral and agro-pastoral groups in South Sudan are not pronounced.[374] Both groups have a settled home base and practice transhumant[375] migration especially in the dry season or during drought. Cropping has become increasingly common even in pastoral communities[376], with both pastoral and agro-pastoral communities even planting crops at cattle camps[377]. The difference between the two groups is embedded in the level of dependence on livestock for consumption and income.

Nomadic Pastoral

There are no indigenous nomadic pastoralist communities in South Sudan but seasonally a significant number of nomadic groups from Sudan and beyond enter into the northern parts of the country to access dry season resources. With the exception of Northern Bahr el Ghazal, since South Sudan attained independence and an international border was established with the Sudan, there have been lower levels of migration into the northern states[378]. Nomadic communities that enter into South Sudan include: the Habbania and Rizegat who enter Western Bahr el Ghazal (WBG) and Northern Bahr el Ghazal (NBG); the Misseriya who migrate into Unity, with large groups entering into the contested Abyei area; and large migrations of Arab and Fellata communities into Upper Nile, with small groups entering into neighbouring states[379]. Conflict with host communities is a common feature of the migration of nomadic pastoralists into South Sudan; but, nomadic pastoral groups also bring benefits for communities and states, including livestock and livestock products, some livestock breeds of superior quality, and trade and border revenues. Makal County, Upper Nile State, receives over 50,000 head of cattle and shoats, with a revenue charge of 10SSP per head of cattle and 5SSP per shoat, providing important revenues for the County[380]. Most migrating groups stay for short periods, but there is a trend for longer stays among

[371]Government of the Republic of Kenya. 2012. *National Policy for the Sustainable Development of Northern Kenya and other Arid Lands. Realizing Our Full Potential*. Sessional Paper No. 8 of 2012. Ministry of State for Development of Northern Kenya and other Arid Lands. Office of the Prime Minister.

[372]Government of the the Republic of Kenya. *Vision 2030: Development Strategy for Northern Kenya and Other Arid Lands.* Ministry of State for Development of Northern Kenya and other Arid Lands.

[373]Government of the Republic of Kenya. 2012. *National Policy for the Sustainable Development of Northern Kenya and other Arid Lands. Realizing Our Full Potential*. Sessional Paper No. 8 of 2012. Ministry of State for Development of Northern Kenya and other Arid Lands. Office of the Prime Minister.

[374]Musinga, M., J. M. Gathuma, O. Engorok and T.H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

[375]Transhumance refers to the seasonal migration of livestock to suitable grazing grounds. World Initiative for Sustainable Development (WISP) website on Definitions for WISP, citing the Collins English Dictionary, 1992.

[376]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

[377]FAO/WFP 2013. Special Report: FAO/WFP Crop and Food Security Assessment Mission to South Sudan. 22 February 2013.

[378]Concordis International. 2012. *Crossing the Line: Transhumance in Transition Along the Sudan-South Sudan Border*. A Concordis International Report, drafted with the assistance of the European Union.

[379]Concordis International. 2012. *Crossing the Line: Transhumance in Transition Along the Sudan-South Sudan Border.* A Concordis International Report, drafted with the assistance of the European Union.

[380]CAMP 2013 data. Livestock subsector field visit to Upper Nile State, April 2013.

some groups, which impacts resources and services. It is therefore critical that their needs and those of the South Sudan host communities are factored into the development of CAMP, in particular those of competing livestock keepers.

There is no policy framework to govern cross-border movement of the nomadic pastoralists into South Sudan, although there were high level agreements between the two countries to establish areas for safe movement of people, livestock, goods and services[381]. There are no functional border entry points with veterinary authorities along the northern border with Sudan. There are differences in how states and host communities receive nomadic pastoralists. WBG and Warrap State policies oppose migration, while in NBG there is strong state support and security is guaranteed for cross-border pastoralism[382]. There is equally strong state support in Unity State, with local arrangements agreed between some nomadic groups and host communities, with similar arrangements for most nomadic groups entering into Upper Nile. Political will and leadership plus community leadership and traditional authority are critical in managing the migration of nomadic communities.

Transhumant Pastoral

A commonly used definition of pastoralism in literature is one where livestock are produced under extensive systems in arid and semi-arid environments, where there is some form of mobility, and at least 50% of gross household revenue, including income and consumption is derived from livestock or related activities[383]. A second commonly used definition, that de-emphasizes the economic criteria, defines pastoralist as an entire ethnic group, irrespective of whether all members actually keep livestock or not, making it a cultural identity[384]. In South Sudan there are communities that are traditionally recognized as pastoralist i.e., the Toposa and Nyangatom in Eastern Equatoria and the Murle and Jie in Jonglei. From the perspective of the economic definition, the National Baseline Household Survey (NBHS) 2012 indicated that nationally only 6% households i.e., 78,000 households depend mostly on livestock for their livelihoods[385]. According to the NBHS report, dependence on livestock based livelihoods is particularly important in the rural areas of Upper Nile and in both the rural and urban areas of Eastern Equatoria, Jonglei and Unity. Dependence on livestock is also important to a lesser extent in both the rural and urban areas of Warrap and Lakes States.

A 2010 report by SNV/MARF[386] gives much higher figures with an estimated 37% of all households being pastoral, 40% agro-pastoral, 8% livestock producers based on other system and 15% do not keep any livestock[387]. This data showed that as many as 70% of households in Jonglei State, 65% in Warrap State, 45% in each of Northern Bahr el Ghazal and Lakes State were pastoral. Only Western Equatoria had no pastoral population. There is therefore a large discrepancy between the two data sets generated within the same period, a matter that could be resolved by a livestock census.

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[381]Concordis International. 2012. *Crossing the Line: Transhumance in Transition Along the Sudan-South Sudan Border*. A Concordis International Report, drafted with the assistance of the European Union

[382]Concordis International. 2012. *Crossing the Line: Transhumance in Transition Along the Sudan-South Sudan Border.* A Concordis International Report, drafted with the assistance of the European Union.

[383] Swift, J. 1998. *Major Issues in Pastoral Development with Special Emphasis on Selected African Countries.* FAO, Rome. On the World Initiative for Sustainable Pastoralism website, Definitions for WISP. http://data.iucn.org/wisp/pastoralism-definitions.html

[384] Baxter, P. 1994. *Pastoralists are People: Why Development for Pastoralists not the Development of Pastoralism?* The Rural Extension Bulletin No. 4. On the World Initiative for Sustainable Pastoralism website, Definitions for WISP. http://data.iucn.org/wisp/pastoralism-definitions.html

[385] National Bureau of Statistics. 2012. *National Baseline Household Survey 2009.*

[386]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

[387]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

There is evidence that pastoral livelihoods especially in Jonglei and Eastern Equatoria have been further eroded and decimated since the signing of the Comprehensive Peace Agreement (CPA) in 2005, due to increased conflict and insecurity. At the signing of the CPA the Sudan's Peoples Liberation Army (SPLA), which had provided security was removed, and not replaced by civil law enforcement[388]. In the same period, there were recurrent prolonged dry seasons and droughts. However, the crises were rooted in an escalation of conflict and cattle raiding related to increased migration and the changing dynamics of conflict, with large though infrequent raids by organized militia on top of repeated small scale incidents by a small number of raiders.[389]

Key characteristics and issues of pastoral production systems

- Based on the economic definition, pastoral communities are concentrated in the Arid/Pastoral, the Western and Eastern Flood Plain, and the Nile and Sobat livelihood zones. Common characteristics of these zones are lowland areas prone to drought and flooding, rainfalls ranging from 200 mm in south-eastern Equatoria to 700-1300 mm in the flood plains, with a distinct dry season in which temperatures reach as high as 35^0C.
- Livestock are the main assets and the fundamental basis for wealth and are a symbol of status and prestige.[390] Among Toposa pastoralists in South Kapoeta, marriage was given as the main objective for keeping livestock, followed by food, and income to solve socio-economic problems[391]. The institution of marriage and dowry payment serves to strengthen kinship ties, which are the main form of social capital and safety nets, which reduce risk through the distribution of livestock and building alliances and support systems that are critical during periods of food shortage[392].
- Production is for subsistence and non-specialized based on indigenous breeds. Herds are structured for breeding and milk production purposes with large cow/heifer to bull ratios.
- Milk and meat are important foods and sources of nutrients, as is blood, which is consumed in greater amounts during prolonged dry seasons and droughts.
- Pastoralist communities hold large herds: among the Toposa, medium sized herds range between 100 to 300 head, richer households have between 400 and 600 heads, while poor households have less than 30 cattle[393]. CAMP data collection in South Kapoeta found among 400 households in Koria village that on average a household had 500-600 head, with rich households having 2000, and those with 10-100 considered poor. Eastern Equatoria is known to have the largest herds in the country; in general across South Sudan, there are only 5% households with more than 200 head of cattle[394]; correlating with the NBHS figure of 6% of households reliant on livestock as their main source of livelihoods.
- Production is natural resource based, with households relying almost entirely on rangelands for grazing and water.
- The pronounced dry season and recurrent drought precipitate the need for seasonal transhumant migration. Core herds are left within the homestead to provide for the family. The rest of the livestock migrate to cattle camps located next to more permanent water

[388]Richardson, T. 2011. *Pastoral Violence in Jonglei. ICE Case Study.* Number 274. December 2011.
[389]Richardson, T. 2011. Pastoral Violence in Jonglei. ICE Case Study. Number 274. December 2011.
[390]Southern Sudan Centre for Census, Statistics and Evaluation. 2006. Southern *Sudan Livelihood Profiles. A Guide for Humanitarian and Development Planning.* SSCCSE and Save the Children, UK.
[391]CAMP 2013. Field data collection between April and July 2013.
[392]Southern Sudan Centre for Census, Statistics and Evaluation. 2006. *Southern Sudan Livelihood Profiles. A Guide for Humanitarian and Development Planning.* SSCCSE and Save the Children, UK.
[393]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.
[394]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

sources. Cattle camps are large; CAMP visited camps with as many as 6-8,000 head in Upper Nile and Jonglei, but larger camps up to 12,000[395] exist. Communities tend to return to the same camp site for a number of years (4-5 years) except when affected by conflict or disease. However, herders reported that there is a trend of a decrease in the number of cattle camps and the size of the camps.[396]

- Pastoral production depends on high labour engagement, employing household members and kin, many of whom are below 18 years, and who are not paid wages.[397] Men and youth are mostly involved in daily herding, migration and management of cattle camps. Women and young children manage livestock left within households.
- Cultivation is practiced within water catchment areas, with a growing practice of even cultivating within cattle camps. However, crop failure is not unusual.
- Trade and exchange are critical to ensuring food security among pastoral communities whose main source of grain is through the market, as their own production, if any, is insufficient for consumption needs[398]. During periods of severe food shortages, there are poor terms of trade between livestock and grain which threatens livelihoods. The trade generates important revenue sources for counties and states; the Greater Kapoeta area, with a significant pastoral population, contributes 80% of Eastern Equatoria's state revenues from live animal trade and other local taxes, and export of hides and skins to Uganda.
- Conflict and insecurity are endemic and major constraints and impediments to livestock production, marketing and trade. The nature of the conflicts has changed from largely natural resource based conflicts and small cattle raids to rebel activity, large scale inter-ethnic clashes and large scale, organized and sophisticated cattle rustling.

Transhumant Agro-pastoral

Most ruminant producers are agro-pastoral, where livestock are an essential part of their livelihoods, and co-existent with cropping activities. From an economic point of view, agro-pastoral households derive more than 50% of their household gross revenue from cropping and 10-50% from livestock[399]. In South Sudan agro-pastoralists are sedentary, and like pastoral groups, are dependent on the natural resource base and are transhumant, migrating for up to six months in search of grazing and water resources. The agro-pastoral systems are dispersed across South Sudan (Figure 11-9). There are ethnic communities that have been traditionally agro-pastoral such as the Dinka, the Nuer and the Mundari, for whom livestock are very important but do not contribute over 50% of their livelihood[400].

Key characteristics and issues of agro-pastoral production systems

- Cultivation of crops form a major part of production, with livestock supplementing crop production, and being particularly important for years when crops fail.
- Key objectives for keeping livestock include food/ household consumption, dowry/kinship relations, solving socio-economic problems including cultural and legal obligations,

[395]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

[396]CAMP 2013. Information from WBG, UN, CES (Juba and Terekeka) showed that both the number of camps and the size have shrunk over the last few years.

[397]Musinga, M., J.M. Gathuma, O. Engorok and T.H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat.* Draft. Report, SNV and MARF.

[398]Southern Sudan Centre for Census, Statistics and Evaluation. 2006. Southern *Sudan Livelihood Profiles. A Guide for Humanitarian and Development Planning.* SSCCSE and Save the Children, UK.

[399]Swift, J. 1988. *Major Issues in Pastoral Development with Special Emphasis on Selected African Countries.* Rome: FAO.

[400]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

pastoral investment by way of restocking and storage of wealth/savings, etc.[401] Milk is important but not the main source of food, rather supplementing grain.

- Herd sizes are small to medium: 10-100 head of cattle plus small ruminants. In Jonglei State 57% of the households fell in this category[402]. CAMP found that in Western Bahr Ghazal the average holding was 15-50 head of cattle per household; 1-10 head was considered poor and more than 200 wealthy. The communities reported that they are in the process of restocking, with numbers of livestock increasing since the CPA, when poor households had no cattle, and those with 5 head were considered moderately wealthy and 50 head well off. It is estimated that for an average household to sustain itself on livestock as a main source of livelihood, it requires at least 50 head of cattle.[403]
- There is a substantial reliance on natural resources but crop residues are also important. CAMP field surveys found that dialogue within a community can determine migration, with evidence that, as in Jur County, Western Bahr el Ghazal (WBG), some migrations were made during the wet season to avoid conflict with the crop farmers and to preserve dry season resources. When livestock returned during the dry season, they grazed on standing stover (leaves and stalks left after crop harvests) and provided manure for the crop fields.
- Similar to pastoral groups, cattle camps are important institutions, and while the camps are transient in nature, there is evidence of cropping at cattle camps[404].
- Market integration and trade are low, with most sales made only in periods of food shortage i.e., distress sales, or to address specific socio-economic issues or obligations. However, livestock plays an important role in food security as it gives households a coping strategy; in particular, households with goats have been found to be relatively more food secure than those without[405]. Market integration is hampered by market inefficiencies including distance to markets, insecurity and poor terms of trade against grain
- Years of insecurity have weakened kinship ties considerably, eroding resilience capacity leading to some households becoming chronically food insecure; this is shown by high levels of chronic food insecurity in states with high livestock populations.
- Natural resource based conflict and insecurity from ethnic clashes and cattle raiding are endemic, but especially concentrated in the two Flood zones and the Nile and Sobat Rivers zone.

Urban and Peri-urban

Small holder ruminant livestock keepers

Both cattle and small ruminants are kept within urban and peri-urban areas. Some urban centres like Malakal have passed ordinances banning urban livestock keeping, which has particularly reduced cattle numbers within town limits. The cattle kept with urban and peri-urban households are usually those for milking i.e., cows and calves. Only a few animals are brought at a time to provide for household milk needs and for milk for sale. They are kept in stalls or a kraal, and taken to graze by a herdsman or left tethered. Nutrition and other husbandry practices are major problems. Calves are allowed to suckle almost exclusively for six months before being put out to graze; this practice is not necessary for the calf's physiological needs and reduces production of milk for household consumption and for sale. However some farmers attached to milk collection centres, who had received training, had better practices; they milked up to 2.5 litres per cow per day compared to 500ml to 1 litre for most cows.

[401]CAMP Data. Collected during CAMP field trips April-July 2013.
[402]State Ministry of Livestock and Fisheries Jonglei State. 2012. Strategic Plan 2012 to 2017.
[403]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF
[404]FAO/WFP. 2013. *FAO/WFP Crop and Food Security Assessment Mission to South Sudan*. 22 February 2013.
[405]FAO/WFP. 2013. *FAO/WFP Crop and Food Security Assessment Mission to South Sudan*. 22 February 2013.

Small ruminants, goats and sheep, are kept within urban and peri-urban households across South Sudan. Most keep 2-20 animals, with the objective of meeting consumption needs for milk and meat, but also for income and meeting socio-economic obligations[406]. Households derive food, milk and meat from goats, Animals are left to free-range/ browse, scavenge or tethered depending on the surroundings. They are also feed on cut or purchased fodder, and on by products from local brews. There is a problem with adequate feed for small ruminants which are generally not given supplementary feeds. Goats are housed in whatever shelter is available including thatched huts (luak). There is no extension support, and households rarely seek veterinary assistance for treatment of small ruminants. Animals sometimes cause damage for which owners are fined.

Emerging peri-urban cattle camps

'Permanent' cattle camps are emerging next to urban centres in locations that are close to permanent water sources. Reasons for their existence are diverse including: communities moving away from insecurity and conflict areas; returnees and IDP's; and cattle camps created to provide holding and grazing services for large markets and cattle auctions. In some towns, new ordinances prohibit keeping livestock in urban centres resulting in congregation of herds in specific locations within the peri-urban precincts.

Key characteristics and issues of emerging peri-urban cattle camps

- They lack cohesion with no traditional institutions such as traditional leadership and kinship relations. They are made up of different communities/ individuals congregating in one area. There is a mix of permanent and transient communities.
- Most of the herders within these cattle camps are either households fleeing insecure areas often having lost livestock, returnees or hired herdsmen. These herders have different livelihood objectives to the actual owners of the livestock. Therefore, households within these camps have more than one livelihood source, with household members seeking wage earning jobs in nearby urban centres.
- There are poor services for both humans and livestock despite being close to urban centres; they have characteristics not unlike peri-urban slums: poor access to clean water; poor access to health services for both humans and livestock; poor and unsafe housing/ lack of housing; and poor sanitation facilities.
- Women and children face many challenges. Women struggle to meet household food needs; most of the livestock have owners who retain the right to milk. In a peri-urban camp in Upper Nile women resorted to buying their own cattle to meet needs for milk for household consumption and for sale to purchase grain. NGOs in the vicinity provided training on basic milk hygiene, supplied hygienic metal cans on a daily basis and purchased milk from the women. However, milk prices are low given the amount each woman can sell (no more than 50% of production) and the comparatively high price of grain, especially in the dry season. Children participate in livestock related activities and many miss school. Children, in the Upper Nile camp, purchased their own goats with money saved from fetching water in urban areas; their objective was to cover costs of school requirements themselves.
- The peri-urban cattle camps boost milk supply to the adjacent urban population. However milk purchase is affected by the cyclic pattern of salaries of civil servants, which has become more pronounced with the austerity measures; overall salaries have been reduced and are often paid late.

11.5.2.2 Poultry

Subsistence/backyard

[406]CAMP. 2013. Common questionnaire data collected between April and July 2013.

Most poultry in South Sudan is raised under subsistence/ backyard systems that produce for household consumption with sales only made in situations where families need to quickly raise money. Mostly chickens that are unselected for meat or eggs are kept[407]. There is a reluctance to raise exotic chickens due to lack of access to chicks and feeds, and the fact that they are more prone to disease. Other species being kept include ducks, turkeys, quail and pigeons: ducks are viewed as even more productive than chickens. The average number of birds kept is 15, with most households (80%) keeping 2-50 birds, and only 20% keeping more than 50[408]. Households in Western Equatoria are known to keep the largest numbers of local poultry.

Poultry are allowed to free range/scavenge for foods and are fed kitchen waste, supplemented by grain. Birds are housed in purposely built houses or within human shelter or stores. Generally households lack fences, exposing the poultry to disease and predation by wild animals. There is no extension support, and poor access to veterinary services constrained by the cost, and a misconception that veterinary services do not cover poultry. Almost all produced is consumed by the household; eggs are harvested only leaving enough to ensure flock increase. Poultry meat is not regularly consumed, with most households preferring to raise them for important occasions, consuming more red meat and fish. Some poultry are raised for even up to 3 years before consumption. However in Western Equatoria most meat is from poultry and small ruminants, with households consuming an average 44kgs of chicken and eggs annually, 97% of which comes from their own production[409].

Commercial poultry production

There are very few commercial poultry production enterprises in South Sudan despite the demand for poultry. The sector is falteringly emerging, with efforts hampered by lack of inputs within the country. In 2008 CES SMARF, working with NGOs, helped establish 42 commercial poultry farms; only 5 are in still in existence, and are struggling. Many of the commercial poultry enterprises are linked to projects or efforts by government and NGOs. Both local and exotic birds are kept. Most enterprises raise broilers, although layers were kept before the CPA. From the CAMP field data, enterprises range from 250 to 2500 birds. Currently there are no functioning hatcheries in South Sudan, although MAFAO farm, a public establishment, has a hatchery with an incubator with installed capacity to produce more than 26,000 chicks per batch. All chicks are imported from Uganda, Khartoum or Kenya as are all other inputs including feeds, nutritional supplements, drugs and feeding equipment. There have been unsuccessful attempts to start producing feed. Land for commercial poultry production is a recurring problem; communities are reluctant to release land to individual enterprises. Housing is made from locally available materials, some of which are not appropriate for poultry production. In many cases NGOs and government subsidize the establishment of infrastructure as well as the purchase of chicks, feeds and vaccination. This has left many communities as beneficiaries, who have no understanding of commercial poultry production.

Farmers hire workers from Uganda and elsewhere to manage their poultry enterprises, because of the lack of knowledge of poultry production within South Sudan and the lack of extension services. In NGO and government projects there is better access to information; in some cases the NGO or government provides the farm workers. Biosafety standards are lacking, especially among private owners. There are high losses within commercial poultry enterprises starting with the mismanagement of the importation process of day old chicks. However, the highest losses, of up to 30-60%, come from disease and poor nutrition

[407]The Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA). 2009. *Livestock Marketing in Southern Sudan. Information for Southern Sudan Food Security and Policy Interventions.* Funded by EC and implemented by GOSS with technical support from FAO.

[408]CAMP 2013 data gathered using a Common Questionnaire developed on the basis of the National Bureau of Statistics National Baseline Household Survey.

[409]National Bureau of Statistics. 2012. *National Baseline Household Survey*. Consumption Data.

management. Farmers attempt to mix feed to reduce costs and end up providing sub-standard nutrition. Almost all enterprises have poor access to clean water resorting to fetching water from rivers and other unsafe sources. Most commercial poultry enterprises fail after the first or second batch of chicks, due to the lack of support services, notably extension, animal health, input services especially for day old chicks, feeds and feeding equipment. High production losses discourage farmers from continuing with the enterprise.

11.5.3 Livestock productivity

Low productivity is the most significant constraint at the production level.[410] Natural herd increase is slow and most livestock keepers do not attain sufficient annual increases to allow them to meet social obligations (social offtake) and for commercial offtake. Key factors affecting productivity are the almost 100% reliance on unimproved indigenous breeds with low genetic potential, nutritional management of the animals, the poor resource base with seasonal changes in availability and quality of water and feed, and disease.

11.5.3.1 Breeds: production traits and potential

Nearly all cattle in South Sudan are indigenous *Bos indicus* species (Table 11-13). The endemic cattle are zebu species which include the Nilotic breed, the Toposa and Murle breed and the South-Eastern Hills Zebu whose main morphological and production features, and areas of distribution are summarised in Table 11-13. The different breeds are generally associated with specific ethnic groups, but by 1954, the Nilotic breed was the most widespread. They are well adapted to the South Sudan environment, with high heat tolerance, partial resistance to ticks, a frame adapted to walking long distances, low nutritional requirements due to small to medium size, low metabolic rate and efficient digestion at low feeding levels.[411] They are also physically adapted to walking long distances, and in the case of the South Eastern Hills Zebu, the small frame is suited to hilly areas. These are critical adaptations to the survival and sustainable production of livestock in South Sudan.

The breeds endemic to South Sudan have remained unimproved and have not been selected for economically related characteristics important for specialised milk or meat production. Reproductive efficiency is low, with females reaching maturity at 36-49 months, and first calving at about 44-56 months.[412] The Nilotic breeds have a medium frame, comparable to the Ankole breeds in Uganda, with a carcass weight of 160 – 200kg. Their meat is preferred over other breeds in the Sudan/Khartoum markets[413]. The Toposa – Murle breed, which is well adapted to survival in harsh arid environments, is rated to have both superior potential for meat and milk. The South Eastern Hills Zebu are small, with a carcass weight of 125 kg. Generally the indigenous cattle breeds have low milk production, with milk let down tied to the presence of the calf. The practice of castrating the best-grown bull calves for 'song bulls' eliminates superior genes from the core breeding stock.[414] Smaller numbers of other breeds exist in the country including Sudanese Zebu breeds i.e., the Kenana and Butana; and the Amborora (Red Fulani) brought into the north of the country by migrating tribes. The Kenana and Butana are the most promising dairy breeds of the African zebu with average yields of 1500 kg[415] per lactation period but it appears there has been very limited crossbreeding with the indigenous Zebu breeds. Ankole cattle, with strong meat

[410] Musinga

[411] Food and Agriculture Organization. Crossbreeding Bos indicus and Bos Taurus for Milk Production in the Tropics. Chapter 4: Types and Breeds of Tropical and Temperate Cattle. FAO Corporate Document Repository.

[412]Mugerwa-Mukasa,

[413]Government of Sudan. 1955.

[414]Government of Sudan. 1955.

[415]Food and Agriculture Organization. Crossbreeding Bos indicus and Bos Taurus for Milk Production in the Tropics. Chapter 4: Types and Breeds of Tropical and Temperate Cattle. FAO Corporate Document Repository.

conformation, are imported into the country from Uganda, but most are destined for slaughter markets. Research is required to better characterise the South Sudan breeds and potential for improved production and productivity under different livelihood zones and management systems.

Table 11-13: Breeds of South Sudan

Type	Key Morphological Characteristics	Production	Distribution
Cattle breeds/ strains			
Nilotic type Five major categories kept by a different Nilotic tribes: long horn by Aliab (Eastern Dinka); Mundari; Western Dinka; Abigar (Anyuaki) and Short horn by the Nuer	Medium sized, 'leggy' appearance. Cows reach 250 kg, 3 yr steers 240 kg, mature bull 400 kg. Height at withers 115 cm. Horns: gigantic in the Aliab and Bor cattle, growing outwards, upwards and forward, horn can be 152 cm in length, tips curving inwards and backwards. Northern (Aweil Dinka and Nuer) horns shorter and finer 30 -40 cm but of similar shape to Aliab and Bor cattle. Cervico-thoracic hump, small in female, medium large in male. Generally light boned and lean limbs. Dewlap fairly full up to 25 cm deep and seldom folded. Umbilical fold present in cows. Fairly level back, and tail setting higher than in most zebu cattle. Whole or broken colours: cream or grey especially Aliab, and dun, brindle, yellow, brown, black in Bor. But also patterns of colour on a white background or patches of color covering the flanks of a light colored animal.	Low milk producers 0.5 – 1.5 liters per day, but under good nutrition and management 896 liters over a 263 day lactation period (average 3.4 liters per day[416]) Beef: capable of producing a large steer, meat which is preferred in Sudan markets in comparison to the northern Sudan zebu	Found in all states except WE and Unity. In CES, Terekeka County; and South western Ethiopia. Kept by the South Sudanese Nilotic tribes: Anyuak, Dinka; Western Dinka (Aweil & Warrap) and Eastern Dinka (Aliab, Bor); Nuer (Eastern Nuer and Western Nuer; Shilluk & Mundari
Toposa-Murle type: (Toposa: Karamojong Zebu and Murle: Sudanese Shorthorn Zebu)	Medium sized, long bodied, height at withers 115 cm. Short – medium horns (not exceeding 46 cm) upward and forward curved, tips growing inwards and forwards. Cervico-thoracic hump tending towards thoracic, muscular, marked pyramidal shape, prominent and large in both male and female. Dewlap moderate developed and slightly folded, umbilical fold present by inconspicuous in cows and not apparent in bulls. Udder is moderately well developed. Medium heavy boned limbs. Color: a wide variety of whole and broken colours: grey, cream, yellow, brown, red, black with combinations of colors and roans.	Low milking ability 05. – 1.5 liters per day but under good feeding and management conditions up to 918 liters in 255 days (3.6 average per day) with calf suckling[417]. Beef: good beef conformation, with considerable value	Eastern Part of EES (Kapoeta East, K. South and K. North and Budi counties), up to the Kenyan and Ugandan borders. Boma (Pibor County) of Jonglei State up to the Ethiopian Border.
South-Eastern Hills Zebu Mongalla; Lugware (Kuku/ Mangbattu)	Similar to the Bukedi Zebu/ Small East African Zebu. Small, stocky, well-fleshed cattle, height at withers 100 – 105 cm. Mongalla is the smallest of the East African zebus. Short to medium horns (20 – 30 cm) in outward and upwards direction in line with or slightly in front of or behind the line of the profile. The hump is rather large in relation to the size of the animal, generally cerico-thoracic, marked slope to the rear, often with overhang to the rear and in bulls to one side. Umbilical fold small in female not apparent in the male. Light boned limbs. Generally light colors, grey, dun, brindle, brown, black with full colours and patterns on a white base. Grey and dun are predominant in the	Generally poor milk yield, 1.6 litres per cow per day, with 532 litres in 300 days with calf suckling. Some types like Bari capable of superior performance Good beef production	The Mongalla is found in CES (Juba, Terkeka, Lainya Counties). North-western and Western part of EES (Torit, Lafon & Budi Counties). Kept by Nilo-hamitic tribes: Bari, Didinga, Latuko, Lopit, Lokoya, Nyangwara, Pari and Pojulu The Lugware is in South eastern WES (Mundri East and West, Mvolo and Maridi, Southern CES (Yei, Morobo, Kajo-Keji, Kaya) up to the border with DRC and Uganda. Kept by the Jur-Mvolo, Kuku, Kakwa, Lugware and Moru tribes,

[416]Average of 47 records of Nilotic cattle at Malakal Government Dairy in 1953-54 obtained under dairy conditions with housing and better feeding than within community conditions. Government of Sudan. 1955.

[417]Mean value of 15 Murle cows at Malakal Government Dairy in 1953-54 under dairy conditions

Type	Key Morphological Characteristics	Production	Distribution
	Mongolla.		and tribes in Uganda and DRC
Other cattle breeds/strains in the country			
Baggara Cattle (Sudanese Zebu)	Medium size; varied coat colour, horn shape and conformation; cattle in Darfur have the largest horns; hump is large in males; dewlap is well developed		Western Sudan , Southern Darfur, Southern Kordofan, Nuba Mountains, Central Chad. Also found in some areas in the Western and North-western parts of the Republic of South Sudan (NBGS, WBGS, Warrap and Abyei). Kept by the nomadic (Baggara) Arab tribes: Rizigat, Beni Halba and the Misirya. Also kept by a few South Sudanese individuals close to the border
Kenana Cattle (Sudanese Zebu)	Medium to large cattle; coat colour is typically blue-grey to white with black shadings on the head, neck hump, hindquarters and legs; horns are black; hump is prominent in males and in most cases cervico-thoracic in position; large dewlap and sheath; udder is well developed	500 – 2000 per lactation; calving interval of 12 – 24 months. Mature bull 400 – 610 kg; mature cow 300 -435kg.	Northern Part of UNS (Renk , Maban Counties). In Sudan, east of the confluence of the Blue and White Niles, south-east to the Ethiopian border, and the western banks of the Blue Nile to southern Khartoum. Kept in small numbers by the Arab Nomads and by some South Sudanese individuals at the border areas of UNS
Ambororo/ Fellata (red Fulani) Cattle	Medium to large cattle; coat color is usually dark red, but may also be lighter red with white patches; hump is mostly in a thoracic position, but may be cervico-thoracic; dewlap is of moderate size; udder is well developed		Northern and North-western parts of South Sudan (UNS, US and Greater Bahr El-Ghazal). Kept by the Nomadic Fellata tribes: Ambororo, Selim, Sobajo and a few South Sudanese in UNS and Greater Bahr el Ghazal.
Sheep			
Southern Sudanese sheep	A small animal, 50 – 60 cm high at the withers, but vary with nutrition. The profile is straight to slightly convex, ears are short, with very short horns in both sexes. The tail is of medium length and does not carry fat. Normally white, with patches of another color, usually black or brown. The outer hairy coat is short and loose. The ram often has a ruff on the underside of the neck form chin to breast. The limbs are light and poorly muscled.		Greater Upper Nile and Bahr El-Ghazal regions (JS, UNS, WBG, US, LS and WS); CES, and other parts of the Greater Equatoria Region. Kept by Nilotic and Nilo-hamitic tribes
Murle-Toposa Sheep	About 50 – 60- cm high at the withers, but has a longer body than the Southern Sudan sheep. It's head is similar to the Southern Sudan sheep, but it has a prominent dewlap. The ram has well-developed horns, which grow downwards and with a single forward cure. Some ewes have small, straight horns. The rump and tail carry a considerable amount of fat which varies with the condition of the animal. The color is basically white with patches of black or brown, which normally include the head and neck giving it a close resemblance to the Somali sheep.	The Murle-Toposa sheep appears to have more value for meat production than the Southern Sudan sheep	Found in Greater Kapoaeta Region of eastern Equatoria State. Kept by the Toposa, Boya, Didinga, Tenet and other tribes of EES.
Nubian (Sudanese Nubian goat)	Tall (70–75 cm height) ,(40–70 kg); markedly convex facial profile; long, broad and pendent ears that may turn upwards at the tips and trail on the ground when the head is down for		Originally a Sudanese breed. Also found in some areas in the far Northern, North-eastern and North-western parts of the

Type	Key Morphological Characteristics	Production	Distribution
	feeding; neck is long; back is straight; croup is well developed with tail set high; long and well-proportioned legs; udder well developed; coat colour is generally black except for ears which are grey or speckled; coat is long haired, generally longer on front legs and hindquarters.		Republic of South Sudan (Border areas) Arabs Nomads Refugee from Sudanese' Blue Nile and Nuba Mountains Some few south Sudanese.
Mountainous goat (Equatoria goat)	Small and compact animals, about 40 – 50- at shoulder height. Small head with straight profile, and in the male a convex forehead. The horns, straight or backward curved and generally in line with the profile, are short in the female and of medium length in the male. The body is short, broad and deep with well-sprung ribs. The legs are strong-boned and well-muscled. Colors vary, with basic white common, with varying amounts of black, brown, or black and tan in large patterns or spotting. The coat is short and gleaming. The male is bearded and maned .	Hardy animals able to thrive in a number of environments, even those intolerable to cattle or sheep. Milk yields are small. Twinning (pairs of kids) is common.	Greater Equatoria region But mostly in Hills and Mountainous Livelihood zones of EES and CES Various Nilo-hamatic and Sudanic tribes of Greater Equatoria Other Sudanic tribes in Bahr El-Ghazal
Nilotic goat	Although displaying considerable local and individual variability in size and colour, the various populations included in this group, as widely separated geographically as they are, are of a fairly similar general type. They have small and slender body; head is small with straight or slightly concave profile; pendulous, semi-pendulous or horizontally carried ears of medium size; and homonymously twisted horns in both sexes; the back is of moderate length and the rump is very short and drooping to the tail root; the tail is carried high; coat colour varies with locality		Jonglei, Upper Nile Unity, WBG, NBG, Lakes, Warrap Nuba Mountain and Ingessana Kept by South Sudanese Nilotic ethnic group; Dinka, Shilluk Nuer, Anyuak.
Southern Sudan Dwarf goat	It is generally characterized by a black-and-white colour pattern, less frequently by a brown or black coat; a short head with prominent forehead; occasionally polled or furnished with short scimitar-like or twisted horns; short erect ears; absence of a beard: occasional presence of throat lappets: a large chest, and a plump; very compact and well covered body standing on short straight or crooked legs.	The milking qualities are negligible	Greater Equatoria region Some parts of Iron stone plateau in Bahr El-Ghazal Various Nilo-hamatic and Sudanic tribes of Greater Equatoria Other Sudanic tribes in Bahr El-Ghazal
Toposa camel			Found only in Kapoeta Region (especially K. East). Kept mainly by one tribe; the Toposa. Also kept by the neighboring Turkana in Kenya.
Pigs: Maban pig Other local non-descript pigs			Maban, Melut and Renk UNS, Khorfulus, JS. Kept traditionally mainly by the Maban people. Also kept in small numbers by other communities in Upper Nile and Jonglei States. Found throughout the country
Chicken: Beladi and the Bare Neck, exottic			Found throughout the country

Sources: CAMP field survey March to September 2013. Sudan Government. 1955. Natural Resources and Development Potential in the Southern Provinces of the Sudan. A Preliminary Report by the Southern Development Investigation Team 1954. London. International Livestock Research Institute. Background on African Cattle.

http://www.ilri.org/InfoServ/Webpub/fulldocs/Zebucattle/2Background.html. Udo, M. G. (2006). Livestock Field Survey in Central Equatoria State Report (Ph D Project). Udo. M. G. (2004): Prospect for Rehabilitation and Development of Post War Southern Sudan, University of Bahr el Ghazal. 1st edition. Udo. M. G. (2006): Sustainable Livestock/Range Management System – A way forward to Progressive Development of South Sudan.

The main breeds of goats include Nilotic, Southern Sudanese, Sudanese Nubian, Toposa and Yei. Local breeds of sheep include Mongola, Murle, Nilotic, Nuba Maned, Nuba Mountain Dwarf, Southern Sudanese, and Uda (Table 11-13). The sheep and goat breeds in Southern Sudan are all indigenous and unimproved, and generally of poor productivity both in terms of milk yield as well as low carcass weights for meat. A rigorous program for understanding the indigenous breeds and for improvement through management, selection and crossbreeding is needed.

11.5.3.2 Feeding and nutrition

Much of the desired improvement in both milk and meat production can he achieved through management of nutrition. Animals are generally released from kraals/ cattle camps late and returned early, with a significant part of the time spent trekking.[418] Seasonal feed shortages and lack of supplemental minerals also have negative impacts. Under experimental conditions, better milk production were realised under improved nutrition i.e., 3.6 litres and 3.4 litres for Toposa-Murle and Nilotic breeds. [419] Poor nutrition affects vulnerability to disease, attainment of maturity, and calving and growth of the calves.

11.5.3.3 Herd increase

Herd Structure: South Sudanese cattle and small ruminant herds are structured to favor reproduction and milk production with many more female than male animals: on average, minus calves, there are 56.3% female animals in the herd (Table 11-14). The average herd structure across African pastoral systems is between 51 and 63% females, not counting female calves. [420] On average the cattle herds have 23% male animals (not counting male calves). However, the number of breeding bulls alone is 10.5%, which is higher than that in other pastoral systems i.e., 4.2%.[421] But this differs from state to state: in Kapoeta South, EE, there are no castrates, and only 6% of the herdare breeding bulls. The herd structure has a very strong leaning towards maintaining a breeding herd and to herd growth rather than for example production for meat. This is important since the fertility rate among indigenous cattle is low and some of the endemic diseases tend to further reduce fertility or cause sterility. However the tendency is also to keep cows more than 10 years when their productivity has reduced markedly, for example 18% of the female animals in Jonglei herds are over 10 years[422]. The structure of small ruminant herds is between 67 and 75% female.

Table 11-14: Cattle herd structure

	Male (bulls and steers)	Female (cows and heifers)	Calves
Greater Kapoeta, EE	10	80	10
Warrap	30	50	20
Jonglei	30	53	17
Average	23	61	16
Africa pastoral average	19	56.3	22.9

Sources: CAMP field data collection April to September 2013. Republic of South Sudan. 2012. Strategic Plan 2012 to 2017. Ministry of Livestock and Fisheries Jonglei State, Bor. Otte, M. J. and P. Chilonda. 2002. Cattle and Small Ruminant Production Systems in Sub-Saharan Africa. A Systematic Review. Livestock Information Sector Analysis and Policy Branch, FAO. Rome. Calves are < 2 years, heifers 2-3 years, cows and bulls >3 years.

[418]An observation by both Musinga et al. 2010 and Government of Sudan. 1955. Refrences:

[419]Government of Sudan. 1955.

[420] Otte, M. J., and P. Chilonda. 2002. Cattle and Small Ruminant Production Systems in Sub-Saharan Africa. A Systematic Review. Livestock Information Sector Analysis and Policy Branch, FAO. Rome.

[421]Otte, M. J., and P. Chilonda. 2002. Catthe and Small Ruminant Production Systems in Sub-Saharan Africa. A Systematic Review. Livestock Information Sector Analysis and Policy Branch, FAO Rome.

[422]Republic of South Sudan. 2012. Strategic Plan 2012 to 2017. Ministry of Livestock and Fisheries, Jonglei State, Bor.

11.5.4 Contribution to livelihoods

11.5.4.1 Source of livelihood

Ruminants: Over 72% of household's keep at least one type of livestock, but only 6% of households nationally cite livestock as their main source of livelihood. In UNS, almost 14% of the population, mostly in the rural areas (18% of the rural population) depend on livestock as their main livelihood. There are also appreciable populations in other states: 12.3% in EE, 9.5% in JS and 9.4% in US (Figure 11-10). For these households production, sale and trade of livestock and livestock products play an important role in household food security and incomes. For most South Sudanese households, livestock are essential but supplemental to crop cultivation, salaries, wages, fishing, remittances, petty trade and other livelihoods activities.

The capacity to make livestock the main source of livelihood is dependent on the maintenance of a herd size that can ensure meeting key household livelihood objectives of: sufficient supply of food of animal origin especially milk, but also blood and meat; and, income to meet basic needs such as purchase of grain, paying of medical bills and school fees. Among pastoral communities, meeting social obligations related to kinship ties, marriage, safety nets and rituals are important considerations. The household must also factor in the risks to livestock keeping such as the loss of animals or livestock productivity to disease and rustling and to drought and flooding. On average a South Sudanese household must own and maintain at least 50 head of cattle to be enable it depend on livestock as the main livelihood capable of meeting at least 50% of its needs.[423] Only 25% of households that keep cattle own 50 or more heads of cattle (Table 11-14).[424] The number need to sustain a livestock based livelihood would vary according to the environment, management practices and herd dynamics: households in more arid zones that have a higher dependence on livestock products for food and on sale of animals to buy grain, would require many more cattle. In parts of Greater Kapoeta South in EE, for example, a household with 10 – 100 heads of cattle is considered poor, with the average household owning 500-600 head of cattle.[425] The average number of cattle for EE is 174 head of cattle. [426] Households with less than 50 head of cattle tend to focus on herd building through purchase, loans of animals from other households to expand the breeding base or through illegal practices such as cattle rustling[427].

[423]Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. The Livestock Sector in Southern Sudan; Results of a Value Chain Study o fthe Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat. Draft Report, SNV and MARF.

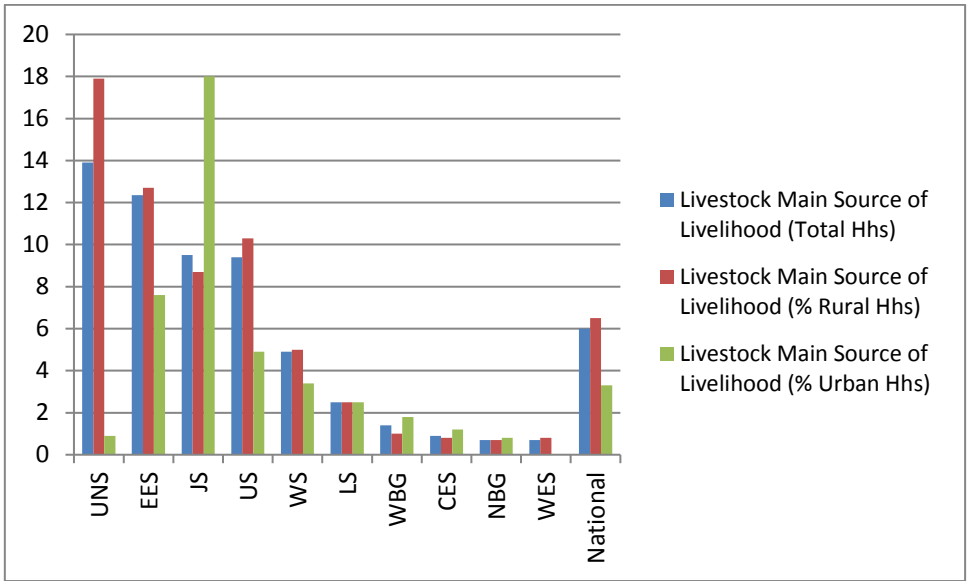
[424]South Sudan Centre for Census, Statistics and Evaluation. 2010. Population and Housing Census 2008.

[425]CAMP field data collected between March and September 2013

[426]South Sudan Census and ***. Population and Housing Census. September 2010.

[427]Republic of South Sudan. 2012. Strategic Plan 2012 to 2017. Ministry of Livestock and Fisheries, Jonglei State, Bor.

Figure 11-10: Importance of livestock as a main source of livelihood



Source: National Bureau of Statistics. 2012. *National Baseline Household Survey 2009. Report for South Sudan 2012*. Juba.

Table 11-15: Number of cattle owned per household

Number of Cattle Owned	Percent of Households
1-9	27
10 – 19	18
20 – 29	13
30 - 49	17
50 - 69	7
70 - 99	7
100 - 149	3
150 - 199	1
200 - 499	4
500+	3

Source: South Sudan Centre for Census, Statistics and Evaluation. 2010. Population and Housing Census 2008.

Beekeeping: Beekeeping is an important supplemental source of livelihood for 18% of South Sudanese households. It is practiced by mostly crop cultivators who keep bees or collect wild honey as an off-farm, off season activity. However, in some counties beekeeping is the most important enterprise such as in Mvolo, Bogori and Mundri West in WE, and in Raga WBG, where the county emblem is a honey bee, symbolising the importance of beekeeping to the economy of the county.[428] Honey contributes to food security, consumed locally, and is sold for income to meet food needs. The income potential of honey is not realized as over 56% is consumed locally. Beekeeping is an important livelihood option for vulnerable communities: women's groups, including those from female headed households are benefitting from income from sale of honey, as are returnees, for whom beekeeping is

[428]Sudan Institutional Capacity Programme: Food Security Information for Action. 2012. *A Study on Traditional Beekeeping and its Contribution to Food Security and Poverty Alleviation.* Information for South Sudan Food Security and Policy Intervention. Republic of South Sudan, EU and FAO.

one of the three most important livelihood options, such as in WBG. For some tribes such as the Jurbel in Wulu County Lakes State and the Bongo in Warrap, honey plays important socio-cultural roles related to marriage and kinship ties[429].

Poultry: Under the predominantly subsistence systems, the potential contribution of poultry to livelihoods, especially employment and as a source of income, is not realised, as most poultry are consumed within the household. Sale of indigenous chicken which attract as much as 85 SSP each could provide important income streams for many households especially those with low assets and vulnerable communities.

11.5.4.2 Food and nutrition security

Food insecurity is prevalent among the states with high livestock populations. Livestock are important as a source of food for many South Sudanese with protein of animal origin (livestock and fish) constituting close to 35% of total protein consumed[430]. Other than Western Bahr el Ghazal State, protein of animal origin is particularly important for the diets of those states where there is both high ownership of livestock and a significant dependence on livestock as a source of livelihood. Protein of animal origin makes up 53%, 44% and 39% of the total protein consumed in the diets in Upper Nile, Eastern Equatoria and Jonglei. Milk is a critical and preferred food for many pastoral and agro-pastoral livestock keepers. Blood is an important food especially during the dry season or when there is a poor harvest or insufficient milk – increased consumption of blood is therefore an indicator of food insecurity[431]. Milk from sheep and goats is drunk during the dry season when cattle migrate, Meat is not a staple component of many pastoral and agro-pastoral; households preferring to sell or exchange cattle for grain. Pastoral and agro-pastoral households are vulnerable to food shortages related to prolonged dry seasons, droughts, floods and conflict; and dependence on purchase of a large part of their grain needs from markets or through bartering to meet food shortages.

According to the WFP 2012/2013 Annual Needs and Livelihood Analysis Report dependence on high risk sources of income such as selling livestock, livestock products and fodder pre-disposes households to under nutrition. Most livestock sales are either of culled animals for income for food and other obligations or distress sales made when the livestock are in poor condition; this increases the risk of the loss of the animal en route to market; not making a sale; and obtaining a poor price in a saturated market. There are generally poor terms of trade between grain and livestock during periods of food shortage.

11.5.4.3 Employment

Livestock subsector activities provide employment for a significant population, most of whom are under 18 years[432]. Currently most livestock production activities are subsistence related and not monetized and those employed in the subsector do not receive wages. Women and girls in particular do not benefit as their ownership of livestock, and authority to sell animals and livestock products and to decide on the use of income is limited. On the other hand there are great potentials: the knowledge base, the opportunity for diversified production systems and for commercialization. There is a wealth of knowledge and capacity for livestock production within the South Sudan population passed down from generations of keeping livestock that is an important resource for the subsector. There are numerous opportunities to use a greater diversity of livestock species and employ a wider array of

[429]Sudan Institutional Capacity Programme: Food Security Information for Action. 2012. *A Study on Traditional Beekeeping and its Contribution to Food Security and Poverty Alleviation.* Information for South Sudan Food Security and Policy Intervention. Republic of South Sudan, EU and FAO.

[430]NBS

[431] WFP. February, 2012. Annual Needs and Livelihoods Analysis South Sudan 2012/2013. Juba.

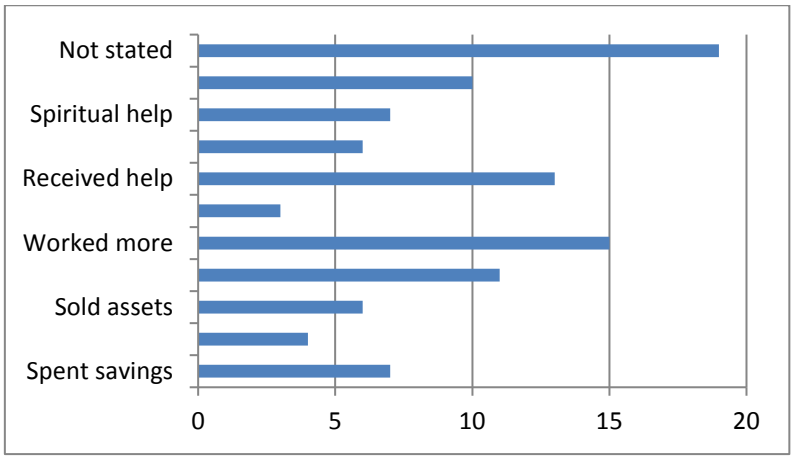
[432] Musinga, M., J. M. Gathuma,

production systems, which use a more diversified resource and input base, and that can harness areas of comparative advantage. There is huge potential for commercialisation of livestock production and for development of the livestock value chain. This would create thousands of additional jobs, both core livestock related jobs and services, as well as industries based on the subsector.

11.5.4.4 Mobilisation of resources for socio-economic needs and to cope with shock

In South Sudan, assets are commonly saved in the form of livestock which represent very significant assets for some families [433]. Indeed across farming households in South Sudan, livestock are the most important household asset for addressing socio-economic needs and for coping with shock (Figure 11-11 and Figure 11-12). The top two strategies for coping were: working more which included working more / longer hours, putting other household members to work who previously were not working, starting a new business, removing children from school to work, and migrating elsewhere to work; and turning to seeking help from elsewhere, from religious institutions, local NGO, international NGO's, government, or family/friends. While sale of livestock was overall the third most important coping strategy, its importance lies in the fact that it allowed households to rely on mobilising their own asset base. Livestock were particularly important in situations of drought and floods, where it was the most common response by 22% of households. Livestock were also key resources when there was loss of crops due to diseases or pests, and when there was a severe health problem or death in the family.

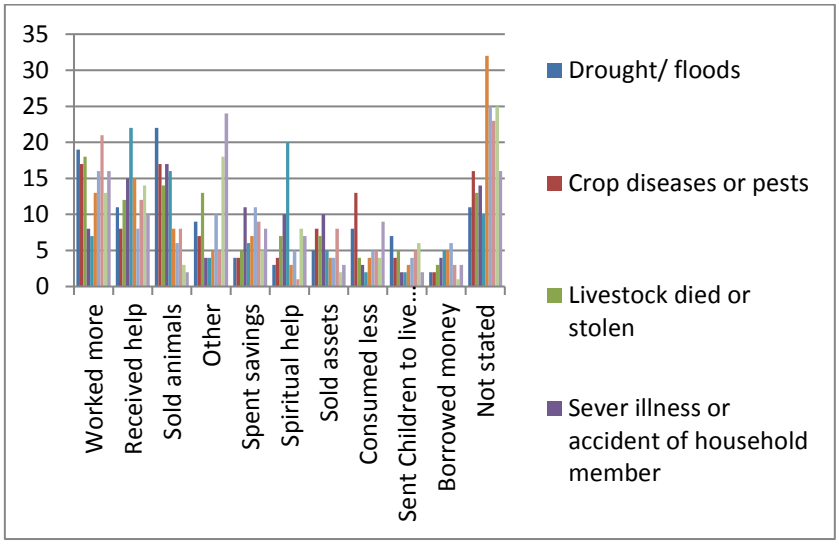
Figure 11-11: Main coping strategies employed by households affected by shock between 2004 and 2009



Source: National Bureau of Statistics. 2012. *National Baseline Household Survey 2009. Report for South Sudan 2012*. Juba.

[433] Muchomba, E and B. Sharp. 2007. Southern Sudan Livelihood Profiles. 2nd Edition, May 2007. Southern Sudan Centre for Census, Statistics and Evaluation and Save the Children, UK.

Figure 11-12: How households coped with different shocks experienced between 2004 and 2009



Source: CAMP 2013 presentation of data from the National Bureau of Statistics, National Baseline Household Data 2009

11.6 Endemic Animal Diseases and Pests

11.6.1 Priority diseases

The World Organization for Animal Health (OIE) has divided animal diseases into two broad categories: production and OIE listed diseases[434] [435] on the basis of who has responsibility for their prevention and control, public or private sector. Thus, the prevention and control of animal diseases with a view to the economic development of livestock production industries (production diseases) do not fall within the sovereign duties of the state, and are the responsibility of the private veterinary sector (provided it has the capacity). However, the prevention and control of OIE listed diseases (zoonoses or diseases with a strong economic impact, subject to veterinary inspection) are considered of national and/or global public importance and are therefore the responsibility of the state and its veterinary administration. FAO refers to the OIE listed diseases as transboundary animal diseases (TADs)[436] and categorises them into three types for the purposes of prevention and control, namely: strategic, tactical and emerging or evolving. Countries and regional and global organizations set their disease priorities based on these two precepts. Important endemic livestock diseases in all 10 states are presented in Table 11-16. Animal diseases can be prioritised according to their impact. In interviews in the situation analysis, the CAMP team prioritised diseases.[437] These results and those obtained in other studies are presented for each species in Table 11-17 to Table 11-20.

Table 11-16: Important endemic livestock diseases in South Sudan

[434] Means the list of transmissible diseases agreed by the World Assembly of OIE Delegates and set out in Chapter 1.2 of the Terrestrial Animal Health Code.

[435] World Organisation for Animal Health (OIE). 2012. *Terrestrial Animal Health Code*. OIE

[436] Those diseases that are of significant economic, trade and/or food security importance for a considerable number of countries; which can easily spread to other countries and reach epidemic proportions; and where control/management, including exclusion, requires co-operation between several countries.

[437] CAMP Task Team. 2013. Data was collected through focus group discussions with livestock keepers (including CAHWs) at 17 villages and cattle camps and with state and county veterinary service officials in all the 10 states and 15 counties between April and July 2013. Participants were requested to discuss and agree among themselves on 5 important diseases of each species (it was not necessary to list the diseases in order of priority). Next, they were probed to establish why the diseases are important as a basis for conducting disease impact assessment.

Disease/ Affected species	OIE Category and Brief Description	Economic Impact
Anthrax Cattle, sheep, goats, equine and wildlife	OIE listed. An acute infectious disease caused by the spore-forming bacterium *B. anthracis*	High mortality. Re-occurrence of outbreaks after heavy rainfall, flooding and drought, especially with close grazing of animals on fresh shoots of grass in contaminated areas after rainfall
Black quarter (BQ)	An acute, infectious disease caused by *Clostridium chauvoei* - a Gram-positive, anaerobic organism.	High mortality affecting herd growth Cost of prophylactic vaccine, and annual revaccination.
Brucellosis Cattle	OIE listed. A highly contagious zoonosis caused by *Brucella abortus*	Reduction in herd growth due to abortions in unvaccinated cattle, still births and birth of weak calves. Reduced milk production, weight loss in animals, loss of young, infertility and lameness. Costs of surveillance and vaccination, disruption of market access, loss of consumer confidence
Contagious Bovine Pleuro-Pneumonia (CBPP). Cattle	OIE listed.	Affects herd growth due to mortalities. Reduction in milk production. Loss of weight gain in diseased animals. Can impact international trade.
East Coast Fever (ECF) Cattle, sheep and goats	OIE listed. Infection by a protozoan parasite *Theileria parva s*pread by ticks	Morbidity and mortality with high calf mortality 40-80% in unvaccinated calves therefore reduction in herd growth, calf growth severely impaired. Loss of income from sale of cattle and cattle products. High cost of measures to control ticks and disease (between $6-$36 per adult in East Africa). Endemic cattle tend to be carriers.
Foot and Mouth Disease (FMD) Cattle, sheep, goats and pigs	OIE listed. Highly infectious disease that can spread rapidly	High morbidity but with low mortality, i.e., deaths rare in adults, but can be heavy among calves; Abortion and infertility/ delayed conception, therefore need to cull mature cows or increase number of cows changing the herd structure. Greatest impacts are severe loss of milk production and chronic mastitis. Reduced meat production
Lumpy Skin Disease (LSD) Cattle and wildlife.	OIE listed. Caused by a virus of the family *Poxviridae*, spread by biting insects	High morbidity but low mortality. Loss in milk and meat production. Cost of vaccination and treatment
Haemorrhagic Septicaemia (HS) Cattle	OIE listed. Acute infectious bacterial disease that is highly fatal, with death within 10 -72 hours	High morbidity and mortality. The level of morbidity is a function of immunity, environment and herd management with close herding and wet conditions predisposing animals. Costs of control and eradication
Malignant Catarrhal Fever Cattle	Viral disease, for which sheep and wildebeest are reservoir hosts	Generally fatal, peracute (rapid onset) disease with few clinical signs, rapid progression and death. No treatment.
Trypanosomiasis (sleeping sickness in humans) Cattle, sheep and goats, wildlife, humans	OIE listed. Transmitted by tsetse flies Protozoan parasites that infect domestic, wild animals and man.	Debilitating disease that impedes cattle and small ruminant rearing especially in the most agriculturally productive areas due to inability to graze areas that are tsetse infested, altering livestock distribution. Conflict with forest conservation policy and tsetse control. Reliance on trypanotolerant species which are genetically limited. Abortion, mortality, loss of production of milk and draught power. Disruption of market access or lower prices for infected livestock. Costs of prophylactic drugs, and treatment, some parasite resistance and side effects of treatment.

Disease/ Affected species	OIE Category and Brief Description	Economic Impact
		Environmental consequences of control of vector.
Liverfluke disease (fascioliasis) Cattle, goats and sheep	Parasitic disease caused by *Fasciola spp.*	Mortality, and decrease in milk, meat and wool production and reduction in growth rate, fertility and draught power. Condemnation of infected liver at slaughter. If treated, animals recover quickly and resume healthy production. Public health significance, causing human fascioliasis
Peste des petits ruminants (PPR) (goat plague) Sheep and goats	OIE listed. Highly contagious viral disease related to rinderpest, caused by a morbillivirus	Loss of production, death and abortion; morbidity and mortality rates can reach 100% but lower in endemic areas. Limits trade, export, introduction of new breeds and development of intensive production. Cost of quarantine, movement control, no treatment, but a vaccine exists
Contagious caprine pleuropneumonia (CCPP). Goats	OIE listed. Highly contagious disease caused by members of the *mycoplasma* genus.	Cause of major economic loss to goat producers with very high morbidity and mortality rates especially under conditions of overcrowding and confinement, and under malnutrition and long transport. Cost of treatment.
Mange (scabies) Cattle, sheep and goats.	Contagious disease due to mites.	Scratching for relief causes damage to hides and skins, and wool and exposure of lesions to infection
Internal Parasites Goats and sheep	Gastrointestinal worms	Morbidity and mortality. Reduced performance and loss in productivity/ reduced growth rates. Animals badly affected can be hindered in reproductive performance. Affects land use practices as larvae live in the lower blades of overgrazed areas, therefore requires rotation. Costs due to resistance to common anthelmintics and cost of integrated approaches.
Sheep and Goat Pox (SGP) Sheep and goats.	OIE listed. Contagious, skin disease of small ruminants caused by viruses of the family *poxviridae*	High morbidity, but low mortality in endemic areas (5-10%); decreased milk production, damage to the hides and wool, and loss in meat production. Can limit trade, and prevent development of intensive production. Cost of quarantine, or isolation, and movement controls.
Foot Rot Sheep and goats	Foot rot is a contagious painful bacterial disease caused by *Dichelobacter sp nodosus* in association with other bacteria.	Can be a severe, debilitating disease resulting in poor growth rates, poor wool growth and quality, ewe fertility and reduced value of sale sheep. There are significant costs associated with the control of the disease including isolation of infected animals
Orf Sheep and goats.	A cutaneous zoonotic condition, caused by a *parapox* virus	Prevents lambs suckling therefore affecting growth of lambs. Infection on the udder of the ewe can lead to mastitis and affect milk production. Affects growth rates as severe cases affect many body parts and can cause lameness.
Newcastle Disease (NCD) Domestic and wild species	OIE listed, transmissible to humans. Contagious disease	Can appear in acute form, with high mortality and morbidity. Costs of improved management of faecal matter/ litter, and feeding and watering equipment; Cost of isolation and vaccination.
Coccidiiosis Poultry	A parasitic disease of the intestinal tract caused by seven different types of coccidian protozoa.	A common and costly disease. Chicks, older than three weeks, may suffer severe symptoms and die, most infected birds are asymptomatic. The outbreak may run its course, and clear of its own accord, or be severe with quite high mortalities. Birds may die suddenly before symptoms are obvious. Cost of treatment or medication.

Disease/ Affected species	OIE Category and Brief Description	Economic Impact
Fowl pox Poultry, especially chicken and turkeys	Slow spreading, viral disease with cutaneous lesions and lesions of mucous coats of the upper alimentary and respiratory tract.	Poor growth, poor feed conversion and reduced egg production. Mortality if the mouth and air passages are affected. No treatment. Poor handling of vaccination can cause infection. Cost of vaccination and mosquito control
Gumboro Poultry	Highly contagious viral infection	High mortality at age 3-6 weeks. Costs of improving biosecurity and management. Costs of research to establish a vaccination programme that is effective for the country taking into account the different production and management systems. Costs of vaccination.
Fowl typhoid Chicken, turkeys and other poultry	OIE listed. Transmitted from infected birds, their faeces and eggs, and ingestion of contaminated food, water or bedding	High mortality rate, especially in young chicks where there is an acute infection with sudden death. High risk from imported live infected chicken, and hatching eggs. High risk for hatchery enterprises. Loss from market disruption for poultry meat and eggs. Cost of isolation and destruction of contaminated flocks and carcasses
Ecto-parasites Sheep and goats	External parasites of sheep and goats like lice, ticks, mites and flies	Reduced weight gains and milk production, damage of hides, skins and wool resulting in rejection or downgrading, reducing commercial value of animal
Salmonellosis Poultry	From salmonella bacteria	Morbidity is 0-90% and mortality is usually low. Affects production. Costs of improving nutrition, improving management of breeding flocks and hatcheries, and treatment costs.

11.6.1.1 Priority diseases of cattle

As expected, the CAMP team found that the highly transmissible diseases or TADs are widespread and are therefore priorities in all or nearly all the 10 states with seven out of the nine top diseases OIE listed (Table 11-17). Contagious Bovine Pleura-Pneumonia and Hemorrhagic Septicaemia are important in all the 10 states, while the very highly infectious Foot and Mouth Disease, but with low mortality, is important in all except Warrap State. For cattle, the CAMP findings are comparable with the 2007 study but less so with the 2010 study The criteria used in 2010 gave more weight to zoonoses; perhaps the reason why CBPP is ranked 6th and HS not ranked among the top six, yet both are important diseases of production and land use, and trade as well in the case of CBPP.

Table 11-17: Cattle disease prioritization by different methods

CAMP 2013		**Baumann 2010**		**Kimani et al. 2007**	
Disease	***No. of States*** [a]	***Disease***	***Rank*** [C]	***Disease***	***Rank*** [b]
CBPP [d]	10	Tryps	1	CBPP	1
HS [d]	10	ECF	2	ECF	2
FMD [d]	9	Fasciolosis	3	HS	3
BQ	7	BQ	4	BQ	4
Tryps [d]	7	LSD	5	Diarrhoea	5
Brucellosis [d]	6	CBPP	6	Tryps	6
Liver fluke	5			FMD	7
ECF [d]	5				
Anthrax [d]	5				

Elaborated by CAMP Livestock subsector team. CAMP Situation Analysis. 2013.
Sources: Kimani, M Tabitha and W. S. Njue. 2007. *Socio-economic impact assessment of priority livestock diseases in Southern Sudan.*

Baumann, P O Maximilian 2010. *A study to identify and assess the relative importance of priority animal diseases in Southern Sudan.*

Notes: [a] Number of states where disease was listed among 5 important diseases, in decreasing order of priority. [b] Pair-wise or simple ranking based on whether disease is of socio-economic importance, in decreasing order of priority. [c] By livestock disease prioritisation methodology of EU, in decreasing order of priority. [d] OIE listed diseases

11.6.1.2 Priority diseases of goats

The CAMP team found that Peste des petits ruminants and Contagious Caprine Pleuro-Pnemonia are important in all states except Western Equatoria (WE) and Warrap State respectively. Also that production diseases predominate (4 out of 7). Results from the 2007 and 2010 studies are comparable, despite differences in sample sizes and methods.

Table 11-18: Goat disease prioritization by different methods

CAMP 2013		**Baumann 2010**		**Kimani et al. 2007**	
Disease	***No. of States***	***Disease***	***Rank***	***Disease***	***Rank***
PPR [d]	9	Mange	1	CCPP	1
CCPP [d]	9	PPR	2	PPR	2
Mange	9	Helminthiasis	3	Diarrhoea	3
External parasites	6	CCPP	4	Mange	4
Internal parasites	4	Pox	5	Liver fluke	5
Goat pox[d]	3	Lice	6	Foot rot	6
Foot rot	3				

Elaborated by CAMP Livestock subsector team. CAMP Situation Analysis. 2013.
Sources: see Table 11-17.
Notes: see Table 11-17.

11.6.1.3 Priority diseases of sheep

The CAMP team found that production diseases predominate (5 out of 7), but Pestes Petit des Ruminants, a highly infectious disease, tops the list even though it is not important in WE. Results from the 2007 and 2010 studies are comparable, despite differences in sample sizes and methods.

Table 11-19: Sheep disease prioritization by different methods

CAMP 2013		**Baumann 2010**		**Kimani et al. 2007**	
Disease	***No. of States***	***Disease***	***Rank***	***Disease***	***Rank***
PPR [d]	9	Mange	1	PPR	1
Mange	9	PPR	2	Pneumonia	2
Helminthiasis	8	Helminthiasis	3	Diarrhoea	3
Foot rot	5	CCPP	4	Mange	4
Other external parasites	4	Pox	5	Helminthiasis	5
Sheep pox [d]	3	Lice	6	Sheep pox	6
Orf	3			Liver fluke	7

Elaborated by CAMP Livestock subsector team. CAMP Situation Analysis. 2013.
Sources; see Table 11-17
Notes: see Table 11-17

11.6.1.4 Priority diseases of poultry

The CAMP team found that Newcastle Disease is a priority in all the states, but production diseases predominate (4 out of 6). The CAMP findings are comparable with the results obtained in 2010 and 2007 despite differences in sample sizes and methods.

Table 11-20: Poultry disease prioritisation by different methods

CAMP 2013		Baumann 2010		Kimani et al. 2007	
Disease	***No. of States***	***Disease***	***Rank***	***Disease***	***Rank***
NCD [d]	10	NCD	1	NCD	1
External parasites	9	Fowl typhoid [d]	2	Coccidiosis	2
Coccidiosis	7	Fowl pox	3	Ecto-parasites	3
Fowl pox	6	Coccidiosis	4	Internal parasites	4
Gumboro [d]	6	Gumboro	5		5
Salmonellosis	4				6

Elaborated by CAMP Livestock subsector team. CAMP Situation Analysis. 2013.
Sources: see Table 11-17.
Notes: see Table 11-17.

11.6.1.5 Priority diseases of other species

Among draught animals (horse and donkey), injury wounds top the list and are important in 4 states: Eastern Equatoria (EE), Jonglei, Upper Nile and Western Bahr el Ghazal (WBG) States. Rabies, a zoonotic disease primarily of the canine species, is prominent in all states except Lakes State.

11.6.1.6 Main animal pests

Ticks and tsetse flies, the vectors of East Coast Fever and trypanosomosis are the main animal pests in South Sudan. The following ticks have been identified: *Rhipicephalus appendiculatus* the vector for *Theilaria parva*, *Rhipicephalus evertsi* the carrier for *Anaplasma marginale* and *Babesia bigemina*, *Ambyloma variegutum* the vector for *Anaplasma marginale*, *Boophilus decoloratus* a carrier for *Anaplasma marginale*, *Boophilus microplus*, and *Hyaloma truncutum*.[438] So far the diseases they transmit are confined to the Equatoria region, Jonglei and Lakes States.

The tsetse fly belt has extended to areas previously free of the flies and now infests large areas of South Sudan covering all the Equatoria States as well as Warrap, WBG, NBG States and the eastern parts of Upper Nile State[439]. Animal trypanosomiasis is widely spread within the country, but only in the Equatoria region is there an occurrence of both the animal disease, trypanosomiasis, and the human disease, sleeping sickness. There are on-going efforts to eradicate the tsetse fly, but these are hampered by inadequate financial resources, poor facilitation, insufficient technical personnel at county level to implement activities, low awareness among communities of the dangers tsetse flies pose, inadequate laboratory facilities and field equipment[440,441].

11.6.2 Recent disease outbreaks

Reported outbreaks of notifiable [442] diseases in 2012 provide a picture of the disease situation in South Sudan (Figure 11-13). The four bacterial diseases (HS, CBPP, BQ and anthrax) that mainly affect production and land use have the highest number of outbreaks across all the states. Rabies, a multi-species zoonotic disease was also recorded across all

[438] Kivaria, Fredrick M. 2010. *Baseline survey to map the extent of the expansion of East Coast Fever in Southern Sudan,* 2010

[439] MARF. 2013. *Tsetse Fly Distribution and Trypanosomiasis Incidence in the Republic of South Sudan.* Compilation of Field Visit Reports from UNICEF Operation Lifeline 2000, University of Edinburgh 2004 and Free University of Berlin, Germany in 2013.

[440] Pan African Tsetse and Trypanosomiasis Eradication Campaign, Sudan National Programme

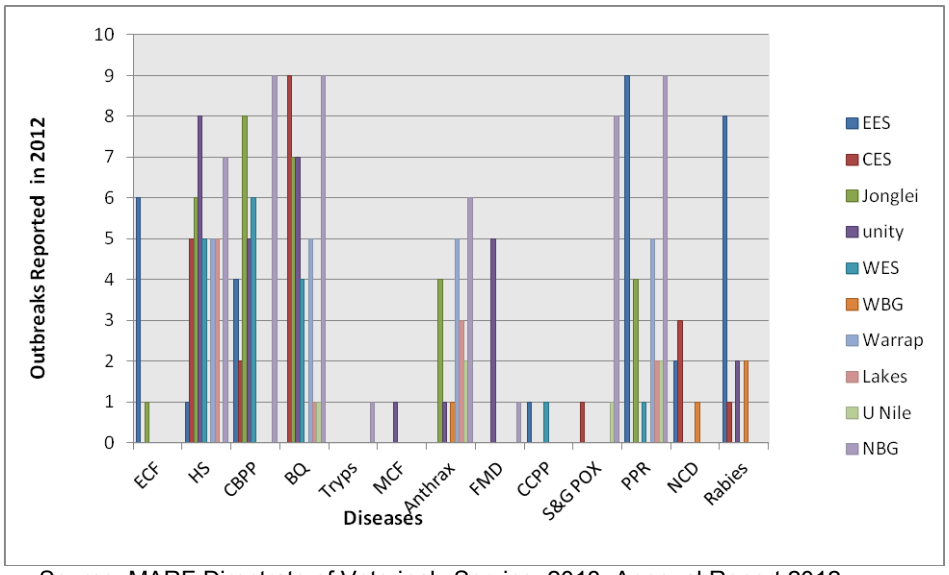
[441] MARF. 2013. *Tsetse Fly Distribution and Trypanosomiasis Incidence in the Republic of South Sudan*. Compilation of Field Visit Reports from UNICEF Operation Lifeline 2000, University of Edinburgh 2004 and Free University of Berlin, Germany in 2013.

[442] Means a disease listed by the Veterinary Authority, and that, as soon as detected or suspected, should be brought to the attention of this Authority, in accordance with national regulations (the list of notifiable diseases is normally determined from among the OIE listed diseases)

the states, the highest number of outbreaks being in Eastern Equatoria State, followed by Unity and Western Bahr el Ghazal States, while the least outbreaks were reported in Central Equatoria State. The highly trade sensitive FMD was only reported in Unity and Northern Bahr el Ghazal States, while ECF was limited to Eastern Equatoria and Jonglei States, and trypanosomiasis to Northern Bahr el Ghazal State.

For sheep and goats, Pestes Petit des Ruminants leads, followed by contagious caprine pleura-pneumonia and sheep and goat pox. For poultry, only Newcastle Disease was reported, with the highest number of outbreaks in Central Equatoria State, followed by Western Equatoria State and Western Bahr el Ghazal State.

Figure 11-13: Disease outbreaks reported in 2012



Source: MARF Directrate of Veterinaly Service. 2013. Annnual Report 2012.

Note: ECF East Coast Fever, HS Haemohagic Sepicaemia, CBPP Contagious Bovine Pleuro–Pneumonia, BQ Black Quarter, Tryps Trypanomiasis, MCF Malignant catarrhal fever, FMD Foot and Mouth Disease, CCPP Contagious Caprine Pleuro-Pneumonia, S&G Pox Sheep and Goat Pox, PPR Peste des Petit Ruminants, NCD New Castle Disease

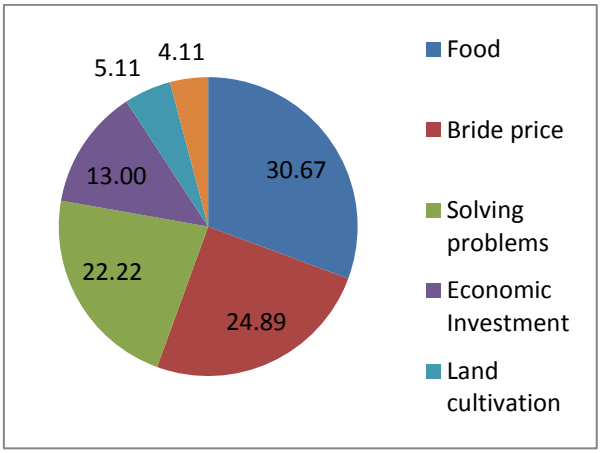
11.6.3 Disease impact

11.6.3.1 Impact of disease on benefits derived from cattle

Among the many benefits derived from rearing livestock are: sources of food and nutrition especially for the young, elderly and sick; economic investment; solving social problems (school fees, cash to buy food such as cereals and milk, and payment of fines); payment of bride price; draught power for land cultivation and transport and manure for crop production (Figure 11-14). Food (milk, ghee and meat) is the highest benefit derived from cattle (30.67%), followed by payment of bride price during marriage (24.89%).[443]

[443] By simple proportional piling method. CAMP Task Team.

Figure 11-14: Benefits derived from cattle in South Sudan (%)



Source: Elaborated by CAMP Livestock subsector team.
CAMP Situation Analysis. 2013.

The CAMP team found that CBPP has the highest impact on livelihood benefits (24.56%),[444] nearly twice as much as the second placed ECF (15.89%). HS and FMD are tied at 11.44% and followed by BQ and anthrax at 7%, brucellosis at 6.5%, trypanosomosis at 5.56%, while liver fluke has a significant showing at 4% (Figure 11-15).

A benefit cost analysis[445] in 2007 showed that the total farm gate value and national value losses associated with 11 priority animal diseases in Southern Sudan to be USD436.4 million and USD264.0 million. Only losses with respect to milk and meat and disease control costs were considered. CBPP was the most economically important disease followed in order of decreasing importance by rinderpest, Rift Valley Fever (RVF), ECF, HS, FMD, PPR, black quarter and anthrax, CCPP and lastly highly pathogenic avian influenza (HPAI). Since then, out of these top 11 diseases, rinderpest has been eradicated globally; Sudan was certified free in 2008. Currently RVF is not listed as important by farmers interviewed. However, RVF is a disease that comes in cycles of about 10 years and was last in the Horn of Africa region in 2007. The global HPAI scare of 2005-2008 has disappeared; South Sudan is said to have been affected in 2007 but the infection disappeared without intervention.

[444] Disease impact matrix scoring. CAMP Task Team.

[445] Kimani, M Tabitha and Njue, W Sophycate. 2007. *Socio-economic impact assessment of priority livestock diseases in Southern Sudan*

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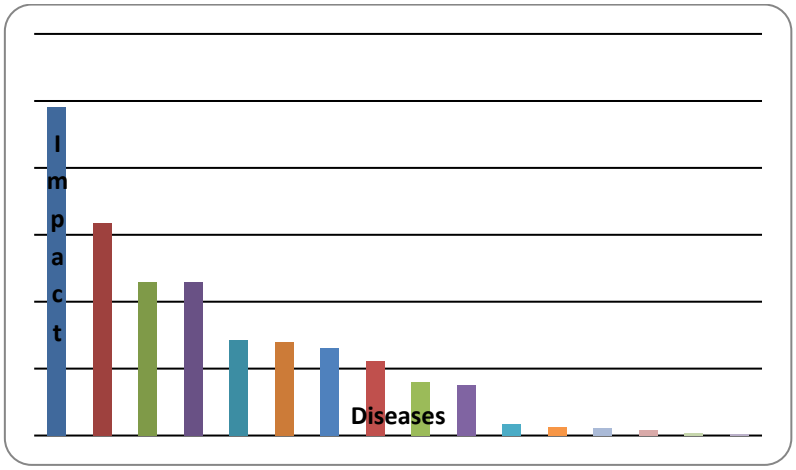
Figure 11-15: Cattle disease impact on livelihood benefits (%)



Source: Elaborated by CAMP Livestock subsector team. CAMP Situation Analysis. 2013.

11.7 Animal Health Services

11.7.1 Provision of Animal Health Services

Animal health services provision falls into 4 categories, namely: veterinary care for animals, input delivery systems, advice (extension) and training of farmers. Veterinary care services in South Sudan are provided by both the public and private sectors.

11.7.1.1 Public sector actors

The public sector actors are mainly found in major towns (national and state capitals) and the surrounding areas where they provide curative and prophylactic services against non-notifiable diseases and do surgical interventions alongside their core business of prevention and control of notifiable diseases. On the basis of public sector staffing levels of 34 veterinarians, each on average caters for 344,117 cattle, 364,705 goats and 355,882 sheep.[446]

11.7.1.2 Private sector actors

Community animal health workers (CAHWs) are the only true private sector service providers in South Sudan. Private veterinary and para-veterinary practices are yet to emerge, and there are many concerns about the viability of private veterinary practice in South Sudan. Many livestock keepers are not able or willing to pay for services due to their subsistence orientation, made worse by a dependence syndrome that has been cultivated and entrenched by NGOs and the government practices of waiving or heavily subsidizing the costs of animal health services. CAHWs serve the vast but remote rural areas where they provide frontline curative services, participate in government/NGO sponsored vaccination programmes and report disease outbreaks to the public veterinary services directly or through NGOs. However, the number of CAHWs has dwindled over the years from a peak in the late 1990s and early 2000s. In Central Equatoria State, for example, the government at one time stepped in by replenishing their drug-kits, but these quickly run out. Sustainability of the CAHW system is a major problem, given that the government expects a lot from them, but without much incentive, and there are challenges with implementing a sustainable cost recovery scheme for the CAHWs. However, good examples exist where CAHWs were trained further to become animal health auxiliaries, and later stock-persons.

[446] South Sudan Livestock population of 11.7 million cattle, 12.4 million goats and 12.1 million sheep (FAO. 2009. Livestock Population Estimates)

11.7.1.3 FAO and NGO actors

FAO and various NGOs have over the last two decades or so been involved in training and equipping CAHWs with medical start-up kits, including bicycles for transport in some instances. The minimum entry requirements for training are: ability to read and write, interest, and be a cattle owner. The respective county veterinary services are responsible for supervising the CAHWs, selection for refresher training and subsequent absorption into the public service as veterinary auxiliaries. The other main NGO involvement is in emergency operations especially during droughts when they support treatments, such as de-worming and external parasite control, both materially and financially through the government and CAHWs.

11.7.1.4 Accessibility and cost of animal health services

Given the low collective coverage by public, private and FAO/NGO actors, there is generally poor accessibility to animal health services especially in rural areas. The residents of Aditidi village, located about 14 km from Wau town had this to say "Whenever our animals fall sick, we use local herbs to treat them, or at times buy drugs from the open air market, usually tetracycline powder meant for humans which we dissolve in water and treat the animals. We have never been served by the veterinary services, not even CAHWs or NGOs"[447]. This is a common experience across states. Table 11-21 shows the prices charged by the veterinary service veterinarians and para-vets for curative services for some of the common disease conditions in South Sudan.

Table 11-21: Cost of treatment in SSP of common livestock diseases in South Sudan

Species	**Cattle**					**Shoats (Sheep and Goats)**				
State	**CE**	**Jonglei**	**WBG**	**Unity**	**EE**	**CE**	**Jonglei**	**WBG**	**Unity**	**EE**
Disease										
Bacterial diseases	10	15	20	20	15	5	10	10	10	5
Trypanosomosis	5	22	10	15	10	-	-	-	-	-
ECF	70	100	30	0	60	NA	NA	NA	NA	NA
Babesiosis	15	-	20	-	-	NA	NA	NA	NA	NA
Anaplasmosis	10	-	20	-	-	NA	NA	NA	NA	NA
Deworming	15	24	10	20	20	10	15	6	5	10

Source: CAMP Task Team. 2013. Notes: NA Not applicable. - Data not available.

11.7.2 Disease prevention and control services

Disease prevention and control are the core of national veterinary services and could be made up of several components including: early detection and rapid response; epidemiological surveillance; laboratory diagnostic support and control interventions.

11.7.2.1 Early detection and rapid response

The key to success in handling animal disease epidemics is early detection. If a disease can be detected very early in the phase of epidemic development, the possibility exists that it can be arrested and eliminated before it actually inflicts damage. Early detection presupposes that there is a surveillance system in place that will bring infection to light when it is first seen.

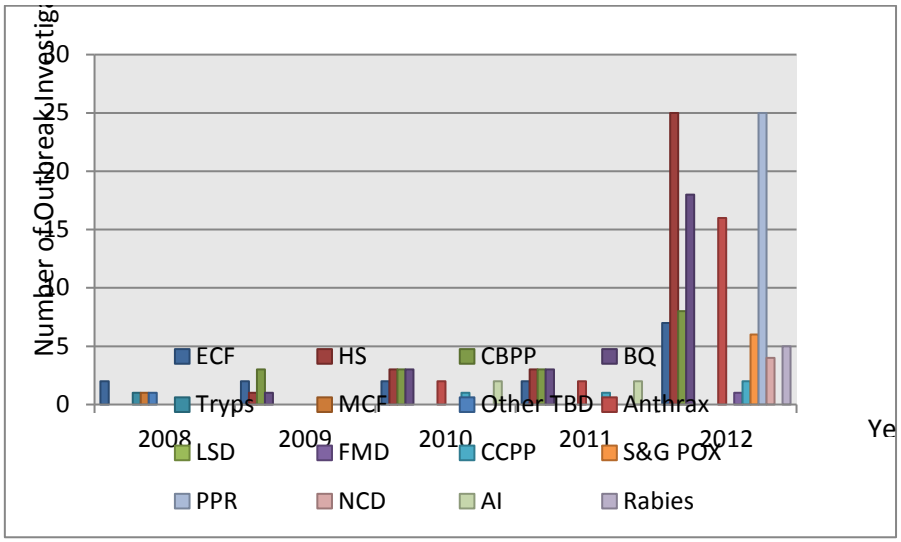
In South Sudan, service provision in this regard is at 3 main levels. At the grassroots level are the livestock owners, community leaders and CAHWs who by law are supposed to report notifiable disease outbreaks, and present animals for vaccination and/or treatment as required. Community leaders and CAHWs create awareness for impending interventions, with the latter also assisting the public sector in implementing disease control interventions. At the intermediary level are state veterinary services and NGOs. The former receive and

[447] CAMP Task Team. 2013. These words were said in the presence of the State Director of Veterinary Services.

transmit disease outbreak reports to MARF and implement disease control measures on the basis of the outcome of investigations. NGOs assist in disease outbreak reports transmission and during disease intervention by providing vaccines, operational funds and logistics. At the tertiary level is the MARF Directorate of Veterinary Services (DVS) who responds to outbreaks by conducting investigations and recommending and facilitating appropriate control measures including but not limited to vaccination and treatment.

Thus, the channel for disease early detection and response in South Sudan is: pastoralists, community leaders, CAHW, payam, county, state, and national. The means of reporting include telephone, email, paper, person-to-person and rumours. Depending on the seriousness of the disease/emergency; some of the steps in-between may be by-passed. Disease outbreaks reported between 2008 and 2012 are presented in Figure 11-16. The number of reported outbreaks is low for all the diseases in the first 4 years and suddenly increases up in 2012. Many state veterinary services complained of the poor response by MARF to disease outbreaks and expressed fear that this was likely to impact negatively on disease reporting.

Figure 11-16: Disease outbreaks between 2008 and 2012



Source: MARF Directorate of Veterinary Services 2013 . Annual Reports.

A comparison of the performamnce of South Sudan with other countries in the region is presented in Table 11-22. The comparison is based on 9 notifiable disaeses in the 4 countries. Furthermore, the diseases are the subject of regional harmonisation and coordination of control efforts for purposes of facilitating intra and extra-regional trade.[448] South Sudan's performance in the first 4 years (2008-2011) is dismal compared with its 4 neighnours, however, the performance is comparable in 2012, even performing better than Uganda.

Table 11-22: Comparison of disease outbreaks: South Sudan and neighbouring countries

Year	Country	FMD	CBPP	PPR	CCPP	SGP	BRU	LSD
		18	313	67	16	297	+	130
	Kenya [a]	43	+	0	7	0	4	0
	South Sudan [b]	-	1	-	-	-	-	-
	Sudan [a]	14	1	25	0	16	3	6
	Uganda [a]	32	3+	9+	+	-	2	-
2009	Ethiopia	34	15	75	6	270	+	248

[448] Standard Methods and Procedures- Animal Health (SMP-AH) Project of AU-IBAR and IGAD as well as other initiatives in the pipeline by these two organizations.

Year	Country	FMD	CBPP	PPR	CCPP	SGP	BRU	LSD
	Kenya	62	3+	+	17	+	21	0
	South Sudan	2	4	0	-	-	-	-
	Sudan	6	4	19	0	23	2+	0
	Uganda	2+	4+	2	0	-	+	-
	Ethiopia	67	46	113	14	310	+	180
	Kenya	61	2+	+	5	0	11	0
2010	South Sudan	-	3	-	1	-	-	-
	Sudan	9	4	13	0	26	2	6
	Uganda	4	8	1	0	-	+	-
	Ethiopia	85	36	85	14	197	+	177
	Kenya	60	2	+	8	0	7	0
2011	South Sudan	+	3	-	1	-	-	-
	Sudan	9	2	20	0	18	2	6
	Uganda	20	11	+	0	-	17	+
	Ethiopia	97	28	63	13	171	+	79
	Kenya	49	+	+	2	0	4	0
2012	South Sudan	6	34	32	2	10	-	-
	Sudan	7	0	16	0	10	0	2
	Uganda	-	0	-	0	-	-	-

Sources:

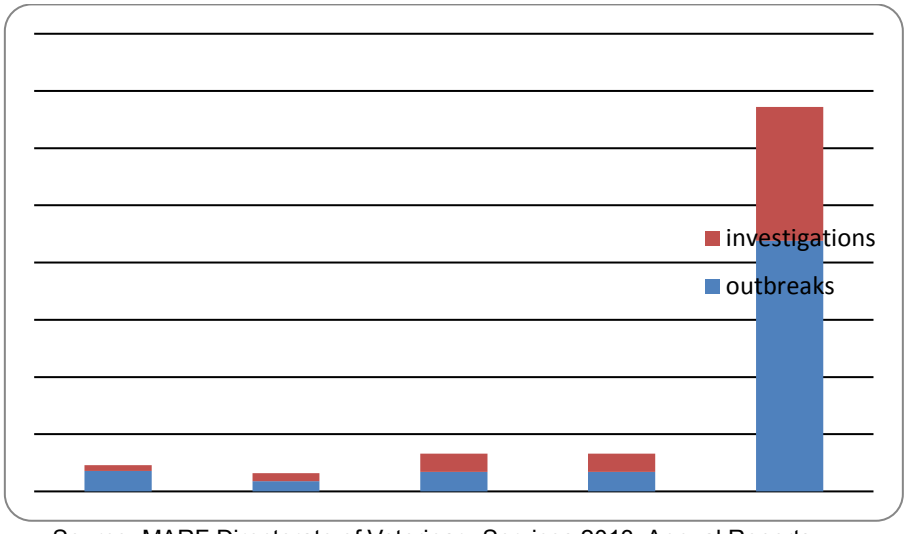
[a] World Animal Health Information Database (WAHID). April 2013.

[b] MARF DVS. July 2013. MARF Directorate of Veterinary Services. Annual Reports

Notes: Key for WAHID derived data: - No Surveillance data available; + Suspected cases; 0 Zero cases reported and 1+ More cases than the number indicated. For South Sudan data, - No data available.

More than a half of the reported disease outbreaks in the country are not investigated (Figure 11-17). In effect, nobody knows the causes and outcome of these uninvestigated outbreaks. Most state veterinary services lamented the failure by MARF to investigate and respond to outbreaks and the lack of training opportunities and/or refresher courses for field based staff. MARF is also accused of conducting disease investigations without involving the state veterinary services. A major response activity undertaken by MARF in recent years was the containment of ECF in five counties of Jonglei State by a national ECF Task Force appointed by the Minister. During the exercise, 3,248 cattle were treated for ECF and 528 sprayed for ticks.

Figure 11-17: Disease outbreaks investigated, 2008-2012



Source: MARF Directorate of Veterinary Services 2013. Annual Reports.

11.7.2.2 Epidemiological surveillance

Epidemiological surveillance is the systematic and continuous effort to provide a reliable picture of the disease situation in time and space for use in planning, implementation and

evaluation of disease control measures. Passive disease reporting is the main form of epidemiological surveillance conducted in South Sudan.[449] The data captured includes notifiable disease outbreaks and clinical cases of non-notifiable diseases. The reports are submitted from the field to MARF DVS as an integral part of the monthly reports and follow the same channels described for outbreak reporting.[450] Table 11-23 shows how the states submitted reports to MARF in 2012.

Table 11-23: States submission of reports to MARF in 2012

State	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
NBG [a]	+	+	+	+	+	+	+	+	+	-	-	-
U Nile [b]	+	+	+	-	-	-	-	-	-	-	-	-
Unity [c]	+	+	+	+	+	+	+	+	+	+	+	+
WBG [d]	-	-	-	-	-	-	-	-	+	+	+	+
WE [e]	-	-	-	-	-	-	-	+	+	-	-	-
EE [c]	+	+	+	+	+	+	+	+	+	+	+	+
CE	-	-	-	-	-	-	-	-	-	-	-	-
Warrap	-	-	-	-	-	-	-	-	-	-	-	-
Lakes	-	-	-	-	-	-	-	-	-	-	-	-
Jonglei	-	-	-	-	-	-	-	-	-	-	-	-

Source: MARF Directorate of Veterinary Services 2013. Annual Report 2012.
Notes: [a] Monthly and 3 quarterly reports. [b] One quarterly report. [c] Annual report [d] Monthly reports. [e] Two monthly reports. Blank cells = No report submitted

Even though Unity and Eastern Equatoria States submitted annual reports, this is not sufficient for the early detection of emerging events. Northern El Bahr Ghazal State was the best performing (nine monthly and 3 quarterly reports). Four states (Central Equatoria, Warrap, Lakes and Jonglei) did not submit a single report. In addition to national use, OIE member countries are obliged to share these reports with other members by submitting bi-annual and annual reports to OIE to ensure transparency in international trade.

Three epidemiological studies have been conducted in recent years with a view to benchmark disease control interventions. ECF and other tick-borne diseases (anaplasmosis and bovine babesiosis) are endemic in the Equatoria states and are expanding northward into the northern state. FMD mean antibody prevalence was found to be 37%, 22% and 36% in cattle, goats and sheep respectively, and serotypes O, A.C, SAT 1 and SAT2 were identified.[451] The results of a PPR survey conducted in Eastern Equatoria State in 2012 are still awaited.

Some of the staff members of the Epidemiology and Disease Information Department of the DVS have been trained on 2 disease information systems: TAD-Info and ARIS 2 fronted by FAO and AU-IBAR respectively.

11.7.2.3 Laboratory diagnostic services

Laboratory diagnostic services are an essential and integral part of disease control and veterinary cares services in that they complement epidemiological surveillance, disease outbreak investigations and clinical diagnosis. The Central Veterinary Diagnostic Laboratory (CVDL) situated in Juba Town offers diagnostic services for the whole country as well as referral services for regional/satellite laboratories. The CVDL has developed a total of 4

[449] The reporting system is based on a standard format developed by the Epidemiology and Disease Information Unit of the Directorate of Veterinary Services.
[450] 11.7.2.1
[451] Ngeiywa, Kisa Juma and Sangula Abraham Kiprotich. 2012. *Sero-survey of Foot and Mouth Disease in South Sudan*.

standard operating procedures, 10 test methods, 6 working instructions and 14 formats, all of which have been approved. In addition, the central laboratory trains veterinarians and laboratory technicians on basic techniques and Enzyme Linked Immuno-sorbent Assay (ELISA), which together offer a practical approach to diagnosis of a wide variety of disease conditions. Table 11-24 shows the samples received and analysed by the CVDL in 2012.

Table 11-24: Summary of samples received and analyzed, January - December 2012

Sample type	Test(s) requested	Species	No. of samples
Whole blood	PPR	Caprine	10
Serum	ELISA (ECF)	Bovine	539
Eye swabs	PPR	Caprine	3
Nasal swab	PPR	Caprine	6
Rectal swabs	PPR	Caprine	2
Blood spot filters	ECF molecular	Bovine	400
Feacal sample	Microscopy for ova and cysts	Caprine and Bovine	27
Ticks	Identification		3
Pancreas (Impression smear)	Gram's Stain	Elephant	1
Tissue - Liver	Histopathology	Elephant	1
- Lung	Histopathology	Elephant	1
- Pancreas	Histopathology	Elephant	1
- Spleen	Histopathology	Elephant	1
Blood and Lymph node smears	Giemsa staining for heamo-protozoans Parasites	Bovine	790
Blood smear	Gram's Stain	Elephant	1
Total number of samples			**1786**

Source: MARF Directorate of Veterinary Services. *Annual Report 2012.*

Overall, the laboratory set up/design in respect of bench space and equipment for specialized diagnosis, waste disposal facilities and storage for equipment, reagents and chemicals is not appropriate for efficient diagnostic services. Furthermore, critical utilities, such as water and electricity, are irregular. The human resource capacity and technical capability to undertake specialized diagnostic tests and procedures are lacking as well as the specialized equipment necessary to perform them. Currently, the laboratory relies on neighbouring countries, particularly Kenya, for specialized diagnostic services.

At the state level, laboratory diagnostic services are available in Wau and Malakal in Western Bahr el Ghazal and Upper Nile states. The services are mainly limited to the 2 towns and their environs and limited to microscopy. Samples that require more advanced testing are submitted to the central veterinary laboratory in Juba; however, feedback is rarely provided. In Malakal, the services are provided by Indian Battalion of the United Nations (INDBATT) in collaboration with the Upper Nile University and SMARF in a very old building. A building that was ear-marked for laboratory work was converted into the minister's office after a Multi-Donor Trust Fund project failed to renovate the building as planned.

11.7.2.4 Disease prevention and control interventions

Disease prevention and control interventions are discussed in the context of: past projects and programmes, on-going disease control programmes and strategies, quarantines and border controls and livestock identification and traceability.

(1) Past projects and programmes

Some of the national or sub-national projects and programmes implemented in South Sudan in the last 10 years that have a strong bearing on the current animal health status of the

country are summarized in Table 11-25.

Table 11-25: Completed and on-going projects in animal health

Name of project	Development partners involved	Project focus and scope	Achievements
Pan African Programme for the Control of epizootics (PACE) 1999-2006	EU, AU-IBAR and FAO	Control and eradication of rinderpest	Controlled and eradicated rinderpest
Livestock Epidemio-surveillance Project (LESP) 2007-2012	EU	▪ Verification of rinderpest eradication ▪ Strengthen epidemiological surveillance for major diseases	▪ Sudan accredited free from rinderpest in 2008 ▪ Epidemiological surveillance capacity built ▪ Baseline epidemiological and socio-economic impact studies conducted (ECF and FMD). ▪ PPR control strategy formulated
Support Programme for Integrated National Action Plans in Animal for Avian and Human Influenza (SPINAP-AH) 2008-2011	EU and AU-IBAR	▪ Control of avian influenza ▪ Capacity building for avian and human influenza control (surveillance, diagnosis, bio-security and awareness)	▪ Avian influenza controlled and eliminated ▪ Capacity for early detection, surveillance and control strengthened
Emergency Relief Support to Combat Avian Influenza (ERSCAI)	AfDB and AU-IBAR	Capacity building for disease surveillance and diagnostic capacity	Capacity for early detection, surveillance and control strengthened
Sudan Productive Capacity Recovery Programme (SPCRP) 2007-2012	EU and FAO	Institutional capacity development (WE, Lakes, Warrap, NBG and WBG)	• Purchased vehicles • Constructed offices, • Started farmer field schools
Multi-Donor Trust Fund 2007- 2011	Various DPs through WB	Institutional capacity development (EE, CE, Jonglei, Upper Nile and Unity)	• Bought mobile clinics (20), motor-bikes (30) • Constructed research centre and offices in some states

Source: Compiled by the CAMP Task Team based on information obtained from GRSS MARF. 2013.

The lessons learnt from implementing projects in Table 11-25 and others not included in the table (mainly NGO-led projects in the counties and states) are summarized in Table 11-26.

Table 11-26: Lessons learnt in project implementation

Project clusters	Lessons
Rinderpest eradication and verification[452]	• Disease eradication programmes require sustained political will to support technical interventions in an environment of peace and security. • Sustained funding by development partners was critical in eradicating rinderpest. • Rational and strategic vaccination (immuno-sterilization) based on rigorous epidemiological surveillance, not only reduces wastage of scarce public funds but also speeds up the process of disease eradication. • Innovative approaches (including the use of CAHWs and participatory epidemiology techniques) to animal health services delivery facilitated access and elimination of the disease from remote areas affected by political instability, civil strife and insecurity. • Sustained funding for effective disease reporting/early warning system incorporating all stakeholders is necessary to ensure early detection and rapid stamping out of any future incursion of rinderpest. • Enhanced coordination and harmonization between the veterinary services of neighbouring countries proved critical for the final eradication of rinderpest.
Post CPA institution capacity building projects[453]	• Poor procurement and accountability capacity and practices in management of project resources • Some of the NGOs especially local ones like Vetworks used all the money but had no results to show for it. The international ones like VSF Swiss at least did something. • A pilot project on chicken broilers failed because when the day old chicks arrived in the country, they were not delivered to the intended beneficiaries. • Buying of mobile laboratories was a technological leap. Simpler, more appropriate technologies like kerosene run fridges would have been better. Generators and fridges were removed from the vehicles and all three put to the personal use of the State Governors.[454] • The procurement system particularly for MDTF was cumbersome, even with the World Bank technical experts seconded to MDTF. • MDTF helped improve linkage and coordination between the states and MARF which were very poor initially, however, the same problem between states and counties was not resolved. • Implementers wrote reports but never got feedback from management . • Monitoring and evaluation did not work even though training was done (done too late?). • There was a good attempt to coordinate all the partners, but there were also challenges
NGO projects in the states and counties[455]	• Many NGOs do not consult with SMARF veterinary services when designing projects and some NGOs lack transparency.

Source: Elaborated by the CAMP Task Team, CAMP situation Analysis.

(2) Disease control programmes and strategies

There are no national on-going disease specific control programmes. However, there are two on-going regional programmes in which South Sudan is participating as shown in Table 11-27. Even though the Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC) has been ongoing for a number of years, it has not received sufficient funding to enable it to start control activities. The few activities the project has implemented were

[452] AU-IBAR. 2011.*The Eradication of Rinderpest from Africa: A great Milestone.*

[453] Discussion with development partners and NGOs, CAMP Task Team, March-July 2013, CAMP situation Analysis.

[454] Each mobile laboratory was bought at a cost of 150,000 USD.

[455]. Discussions with SMARF Veterinary services, CAMP Task Team. 2013, CAMP situation Analysis

funded by MARF and the Bill & Melinda Gates Foundation. MARF has developed a strategy for PPR control with a long term objective to eradicate the disease. The immediate and midterm objectives are to limit the socio-economic impact, using a combination of tools: strategic vaccination of 80% of the national sheep and goat population; quarantine and movement controls; decontamination; tracing and risk based surveillance and awareness campaigns.[456] So far, the strategy remains on paper. South Sudan subscribes to a regional roadmap for FMD control; as of March 2012, the country had not made much progress because it lacked sufficient data to enable it prepare a risk-based strategy based on the principles of the Global FMD Strategy.

Table 11-27: On-going regional disease control programmes

Project	DPs involved	Focus and scope	Achievements
Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC) 2009-on-going	AfDB and AU Bill Gates Foundation	Eradication of tsetse and trypanosomosis- in Africa. In South Sudan, the focus is on 6 states	Field staff trained on basic survey and making of traps in Yambio in 2011 (MARF funding) Mapping studies in Kajo-Keji in 2011 and 2012 (financed by the Bill & Melinda Gates Foundation)
Standard Methods and Procedures in Animal Health (SMP-AH)	USAID, AU-IBAR and IGAD	Framework for uniform epidemiological surveillance, disease prevention and control, laboratory procedures and interpretation and quarantine and border controls All IGAD member countries and Tanzania	The project is still at MARF level.
FAO operated projects in different states		Provision of vaccines Training of CAHWs ECF control PPR vaccination Convenes food security meetings Drugs and logistics during emergencies	—

Source: Compiled by the CAMP Task Team based on information obtained from GRSS MARF. 2013

In the absence of disease specific control strategies that would need to be integrated for cost-effectiveness, MARF has developed a seasonal based vaccination calendar for all notifiable diseases.[457] The vaccination coverage for 2012, based on the quantity of vaccines dispatched by MARF, is shown in Table 11-28. The vaccine figures include what was used in outbreak responses. Veterinary officials in all the 10 states conceded that the vaccination coverage is too low to prevent and protect the target livestock populations.

Table 11-28: Vaccination coverage in 2012

State	Anthrax	BQ	HS	CBPP	CCPP	PPR	S/G Pox	NCD	Rabies	Total
Warrap	40,000	35,500	42,000	30,000	15,700	56,000				219,200
NBG	7,500	11,250	11,250	5,000		14,000				49,000
CE	30,000	61,000	31,500	62,500	27,500	55,650	7,500	8,500	200	284,350
Upper Nile	20,000		7,500	10,000	16,000	21,000	20,000			94,500
Jonglei		21,500	56,500	20,000	20,000	28,000				146,000
Unity	15,000	35,500	20,000	25,000		45,500				141,000
Lakes		10,000	66,950			14,000				90,950

[456] Kivaria Fredrick M. 2010. *Disease Strategy. Pestes des petits ruminants 2010*

[457] Kivaria Fredrick M. (Undated) *National Vaccination Programme to Control Epidemic Diseases in the Republic of South Sudan.*

State	Anthrax	BQ	HS	CBPP	CCPP	PPR	S/G Pox	NCD	Rabies	Total
WE		5,000	5,000		15,000			1,000	3,460	29,460
Total	**112,500**	**179,750**	**240,700**	**157,500**	**94,200**	**244,150**	**27,500**	**19,500**	**3,860**	**1,054,460**

Source: MARF Directorate of Veterinary Services. Annual Report 2012.

(3) Quarantine and border control

This is the authority and capability of the veterinary service to prevent the entry and spread of diseases and other hazards from animals and animal products. This is normally proved by the list of certificates and forms used in export/import activities, the infrastructure and facilities for the import/export of animal and animal products, and the legal framework which governs the activity of veterinary services.

Juba International Airport (JIA) and Nimule check-point are the only functional border entry points. The rest of the border entry points are not controlled. South Sudan has planned for the establishment of 10 border posts.[458] Goods entering through JIA are mainly day old chicks, which come from Uganda, Kenya and Ethiopia and pets brought in by expatriate workers. The rest of the recorded animals and animal products enter the country by road via Nimule (Eastern Equatoria State); they include eggs, day old chicks, frozen chicken, sausages, cattle and goats. The list of imports for 2012 shows that the origin of some livestock and livestock products, between March and May, was not established. At the 2 entry points, veterinary infrastructure is not developed, and the veterinary service is as yet to establish appropriate capacities to implement a compliance programme consisting of inspection and verification of regulatory norms for selected products and processes. The latter is linked to the Animal Diseases and Pests Control Bill 2013 becoming law. At JIA, for example, the only officer assigned to the airport has to split her time between the airport and the office at MARF.

MARF officials attend cross-border and regional meetings aimed at strengthening coordination and harmonisation of disease control activities. Internal livestock movement control throughout the country is constrained by the absence of a legal framework, a situation made worse by multiple taxation and widespread cattle rustling, creating a state of insecurity and undermining livestock marketing and trade. In Upper Nile State, the local authorities insist they are the *bona fide* authorities to issue livestock movement permits and therefore collect revenue.

(4) Animal identification and traceability

Animal identification and traceability are tools for addressing animal health (including zoonoses) and food safety issues. These tools may significantly improve the effectiveness of activities such as: the management of disease outbreaks and food safety incidents, vaccination programmes, herd/flock husbandry, zoning/compartmentalisation, surveillance, early response and notification systems, animal movement controls, inspection, certification, fair practices in trade and the utilization of veterinary drugs, feed and pesticides at farm level. Besides these technical uses, animal identification is also a useful tool for curbing livestock theft.

In an effort to develop a livestock identification and traceability system for South Sudan, a two-year pilot project for cattle identification and traceability has started in Northern Bahr el Ghazal State with the objective of identifying a suitable cattle identification and traceability system that can be applied to the whole of South Sudan.

[458] GRSS, MARF. 2012. *The MARF Policy Framework and Strategic Plans (PFSP) 2012-2016.* Juba: GRSS .

11.8 Marketing and Trade

11.8.1 Demand and supply

11.8.1.1 Demand for foods of livestock origin

In urban areas, the demand for animal source foods is high and will continue to grow driven by population growth (2.43% per annum) and the rapid urbanization that has characterized South Sudan since the CPA.[459] Juba is the fastest growing city in Africa, estimated to grow at more than 20% annually, propelled by the increased expenditure by government and new inflows of money from growth of the services and construction sectors, small businesses and development aid. Incomes grew from USD 90 in 2004 to USD 500 in 2010.[460] The austerity measures instituted since mid-2012 have however had a marked effect on demand: in some states, market sales of livestock have fallen sharply due to the cuts in civil servant salaries. The sales dwindle even further to largely only sales of animals for slaughter when there is a delay in payment of civil servant salaries. The effect is also felt in slaughter houses and butcheries where the supply of meat reduces. Demand for milk also follows the pattern of the dynamics in civil service salaries and allowances especially in the major upcountry urban and peri-urban areas. Input suppliers are also affected e.g., fodder vendors and the services of CAHWs. In the more affluent and faster growing urban centres to the south of the country, notably Juba, the demand for meat, milk and other products is met through importation from the region and globally.

11.8.1.2 Overall consumption and comparison to other African countries

Data from the National Household Baseline Survey estimates that the average consumption of meat fresh beef, beef liver, beef accessories, beef offals, goat meat, sheep meat, goat and sheep accessories, goat and sheep offals, chicken and other poultry, and other meat) is 16 kg/person/year (Table 11-29). There is higher consumption in the urban areas i.e., an average of 19.7 kg compared to rural areas with 13.8 kg. This is much higher than the average estimate made in the red meat value chain study of 4.745 kgs per person per year broken down as 1.095 kgs of mutton (sheep), 1.46 kgs of chevron (goat meat), and 2.19 kgs of beef (cattle).[461]

The average consumption of meat is lower than what was quoted for the former Sudan (before independence of South Sudan) i.e., 22.2kg; and is also below the average for Africa of 19.4 kg/person/year in 2009, and that of Africa in 2000 which was an average of 17.1 kg. In terms of the type of meat most consumed, the profile of meat consumption in South Sudan is similar to most of the countries where beef is the most important meat, unlike in South Africa and Egypt where poultry is the most consumed meat.

National consumption of milk averages 11kg/person/year, with more milk consumed in the rural areas i.e., 12 kg than in the urban areas 10kg (Table 11-30). Milk consumption is well below the average for the African continent which was estimated at 43.90 kg/person/year in 2009, and 38.30 kg/person/year in 2003.[462]

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[459]Musinga, M., J. M. gathuma, O. Engorok and t. H. Dargie. 2010. The Livestock Sector in Southern Sudan: results of a Value Chain Study of the Livestock Sector in Five Stated of Southern Sudan Covered by MDTF with a Focus on Red Meat. Draft Report, SNV and MARF.

[460]Musinga, M., J. M. gathuma, O. Engorok and t. H. Dargie. 2010. The Livestock Sector in Southern Sudan: results of a Value Chain Study of the Livestock Sector in Five Stated of Southern Sudan Covered by MDTF with a Focus on Red Meat. Draft Report, SNV and MARF.

[461]Musinga, M., J. M. gathuma, O. Engorok and t. H. Dargie. 2010. The Livestock Sector in Southern Sudan: results of a Value Chain Study of the Livestock Sector in Five Stated of Southern Sudan Covered by MDTF with a Focus on Red Meat. Draft Report, SNV and MARF.

[462]FAOStat.

Table 11-29: Consumption of meat, milk and other livestock products in South Sudan

Commodity	Key Sources for Urban Areas	Key Sources for Rural Areas	(Average Kg/year/person)			Highest consumption	Lowest consumption
			Urban	Rural	Nation		
Meat							
Fresh beef	Procured 96%	Procured 58% except JS 40%, US 66% and EE 54% from own production	6	2	3	JS urban 10 kg, NBG & WE urban 9 kg, CES urban 8 kg	UNS urban/ rural and WS rural 1 kg
Beef liver	Procured 97%	Procured 75%	1	0	0	WE & EE urban 2 kg	Most areas
Beef accessories	Procured 100%	Procured 62%	4	0	1	UNS urban 19kg	Most areas
Beef offals	Procured 99%	From own production 91%	1.1	.2	.4	LS urban & EE rural 22 kg	JS and US urban, WS and NBG urban and rural and LS rural 0 kg
Goat Meat	Procured 58%; except JS 45%, EE 37% own production	Procured only 18%, own production 54%;	2	3	3	EE rural 9kg; & Jonglei urban 8 kg	US urban; WS urban & rural; WE rural 0kg
Sheep Meat	Procured 91%	From own production 46%	3	2	2	Jonglei/ urban 9kg; EE 8kg	WS, WE, CE both urban/ rural, and LS urban 0 kg
Mutton and Sheep offals, cleaned	Procured 75% except EE 100% from own production	From own production 86%	.6	.6	.6	EE 88 kg, & CES 17 kg	JS both urban/rural, WS, LS & WE rural & US urban 0 kg
Sheep & Goat Accessories	Procured 94%	Procured 79%	1	1	1	JS rural 6 kg	Most areas
Chicken and other poultry	Procured 68%	From own stock 80%	1	4	4	WE rural 44 kg, & JS and WS urban & CES rural 2 kg	US both rural/ urban; UNS rural, NBG rural & LS urban 0 kg
Other meat	Procured 88%	Procured 49%	0	1	1	JS rural 2 kg	Most areas
Total Meat			19.7	13.8	16		
Dairy and Other Products							
Fresh Milk	Procured 65%; except WS 40%, CES 61% and EE 45% own	Own production 70%; except NBG 58% & LS 41%	9	12	11	UNS rural 26 kg; US rural 23 kg, JS urban 20 kg,	WE both urban/rural 1 kg; CES & NBG rural 2kg

Commodity	Key Sources for Urban Areas	Key Sources for Rural Areas	(Average Kg/year/person)			Highest consumption	Lowest consumption
			Urban	Rural	Nation		
	production	procured					
Powder milk	Procured 85%; except US 69% gift/ other sources. EE 71% own production	Procured 69%; exception EE 87% from own production	1	0	0	UN urban, WS urban, & EE urban 2	JS, US, NBG, LS, CES rural & WE rural/ urban 0 kg
Total Milk			10	12	11		
Other dairy products: cheese, yoghurt etc	Procured 86%, except JS urban where 62% from own production	Own production 93% except US 54%, LS 84%, CES 100% procured	0	1	1	EE 8 kg	Most areas
Eggs	Procured 100% very low in JS, US, and WS urban	Procured 100%; very low in JS, US and WS	2	0	0	Western Equatoria 28 kg; N BG 2kg, EE 1 kg	Very low in JS, US, WS, WBG, LS and CES

Source: NBS 2012. National Household Baseline Survey 2009. Offals adjusted to 11.4% of meat weight

Table 11-30: Consumption of meat and milk in selected African countries

	Meat (Kg/person/year)								Milk Kg/person/year		
Region/ Country	Bovine Meat	Mutton & Goat Meat	Poultry	Offals	Pig Meat	Meat, Other	2009	2000	Region/ Country	2009	2000
Africa Region											
Africa 2009	6.4	2.80	5.5	1.7	1.4	1.6	19.4		Africa 2009	43.9	
Africa 2000	6	2.70	4.20	1.6	1.0	1.6		17.1	Africa 2000		38.3
Countries											
South Africa	15.4	3.8	32	4.7	6.8	0.7	63.4	45.4	Sudan (former)	175	164.2
Central African Republic	19.5	3.9	1.2	2.7	3.1	5.9	36.3	34.3	Kenya	92.9	72.7
Niger	14.7	6.9	0.7	3.8	0.1	3.2	29.4	23.6	Niger	63.8	53.2
Djibouti	13.2	5.2	5	3.7	0.2	0.2	27.5	19.3	Egypt	59.3	49.2
Egypt	12.3	1.8	10	1.5	0	1.5	27.1	24.4	South Africa	55.3	53.3
Sudan (former)	8	8	0.7	3.2		2.3	22.2	22.4	Djibouti	45.2	69.4
Kenya	12.2	2.2	0.6	2.5	0.4	1.2	19.1	13.7	Tanzania	38.3	23.8

	Meat (Kg/person/year)								Milk Kg/person/year		
Region/ Country	Bovine Meat	Mutton & Goat Meat	Poultry	Offals	Pig Meat	Meat, Other	2009	2000	Region/ Country	2009	2000
Chad	8.3	3.6	0.5	2.3	0.1	0.5	15.3	16.3	Uganda	33.9	20.2
Uganda	4	1.3	1.4	1.3	3.4	0.9	12.3	12.2	Eritrea	26.3	26.8
Tanzania	6.7	1	1.1	1.2	0.4	0.4	10.8	11.4	Chad	23.3	25.2
Ethiopia	4.8	1.8	0.6	1.6	0	1.3	10.1	8.2	Ethiopia	20.2	16.3
Nigeria	1.9	2.8	1.7	0.9	1.5	0.9	9.7	9.5	Central African Republic	17.9	17.1
Eritrea	4.5	2.4	0.3	1.7		0.5	9.4	10.8	Rwanda	16.9	14.9
Rwanda	3.4	0.8	0.2	0.9	0.7	1.3	7.3	5.1	Nigeria	8	6
Burundi	1.9	0.9	0.9	0.6	1.5	0.1	5.9	4	Burundi	5.7	5.2

Source: FAOStat 2009 and 2000 data. Milk data excludes butter.

11.8.1.3 Urban and rural patterns of consumption

Beef (bovine meat – meat with bones, liver, offals and accessories) is the most consumed meat, with a national average consumption of 4.4 kg/person/year. There is much higher consumption in urban areas i.e, an average of 12.1 kg/person/year compared to rural areas where it is only 2.2kg/person/year. There is a conservative slaughter of cattle in rural areas, mainly on special occasions and holidays. On the other hand, there is more chicken and other poultry consumed among rural populations, i.e., 4 kg/person/yr compared to only 1 kg among urban dwellers.

Most of the meat consumed in urban areas is purchased and not from own production: 96 – 100% of the different beef parts are from the market. However only 58% of goat and 68% of poultry meat is procured from the market indicating there is still a significant level of slaughter of small ruminants and poultry within households. Most sheep meat (91%) is bought from markets. In rural areas, only 58% of beef is from the market, with as high as 40%, 54% and 60% of beef coming from own production in JS, US and EE, respectively. Only 18% of goat meat and 36% of sheep meat is from the market in rural areas except in NBG, WE and Warrap where 89%, 80% and 60% of goat meat is from the market.

Most milk 65% consumed in urban areas is from the market, except in CES, EE and Warrap where 61%, 45% and 40% of the milk is from own production. Milk consumed in rural areas is largely from own production 70%, except in NBG and Lakes where 58% and 41% of the milk is purchased. Powdered milk is mostly purchased i.e., 85% in the urban areas and 69% in rural areas. Most of the other dairy products like cheese, yoghurt and other milk products are purchased in urban areas (86%) with the exception of urban JS where 62% of the dairy products are produced by households.

Most chicken (80%) consumed in the rural areas is from own stock. In both urban and rural areas, eggs are almost all from markets reflecting the sale of eggs by households and the importation of eggs from neighboring countries.

The highest consumption of beef is the urban centres of JS, NBG, WE and CES. JS and EE have the highest consumption of goat and sheep meat, while WE has a far higher per capita of consumption of poultry and eggs i.e., 44 kg per capita per year of poultry meat, followed by JS, WS and CES with a distant 2kg; and 28 kg of eggs. Milk consumption is highest in UNS, US and JS.

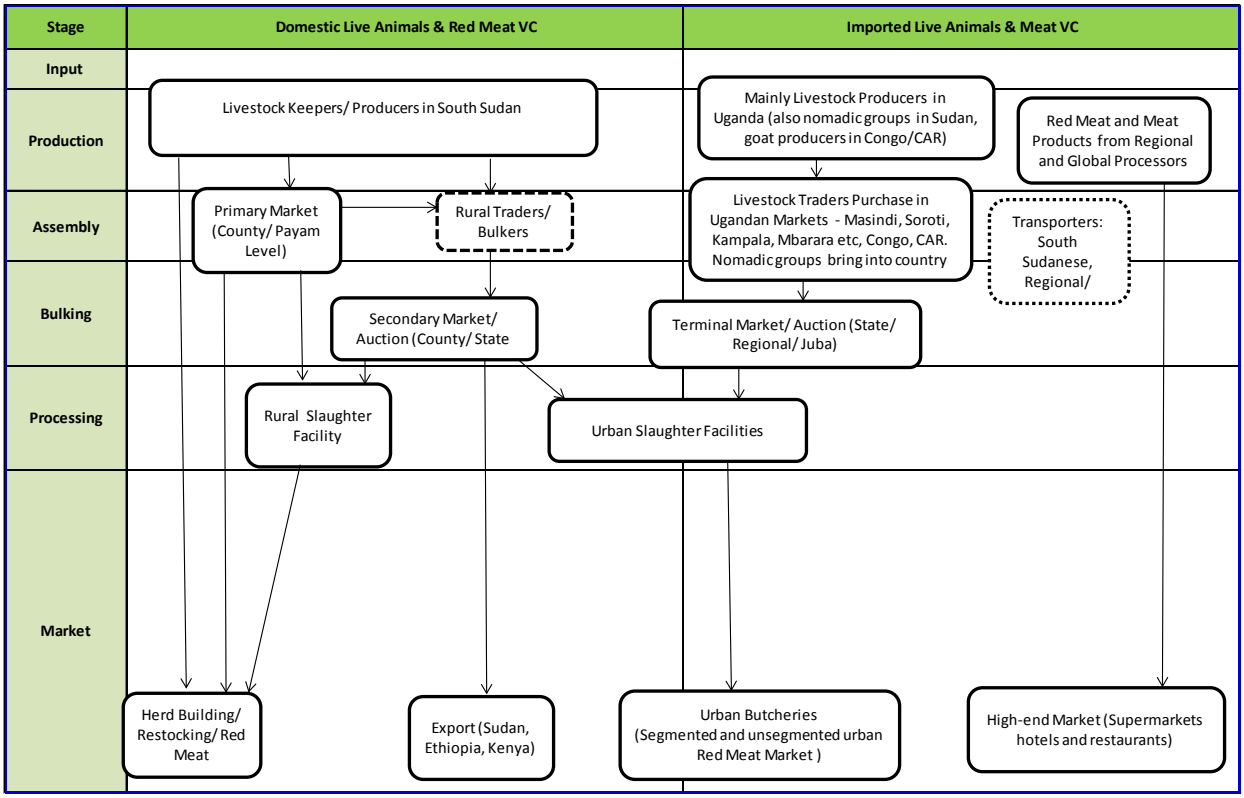
In the rural areas, the demand for milk is high as it is a staple of the diets of many livestock keepers alongside grains especially sorghum (dura). The consumption of meat is moderated by the reluctance to slaughter animals, especially cattle. For most livestock keepers, meat is consumed only on occasions or holidays. More goat, sheep and poultry are consumed in the rural areas than cattle.

11.8.2 Main value chains

Five main livestock subsector value chains exist: live animals and red meat, poultry, dairy, hides and skins, and honey.

11.8.2.1 Live animals and red meat value chain

Figure 11-18: Live animal and red meat value chain



Source: CAMP Task Team, March-July 2013, CAMP Situation Analysis

11.8.2.2 Poultry value chain

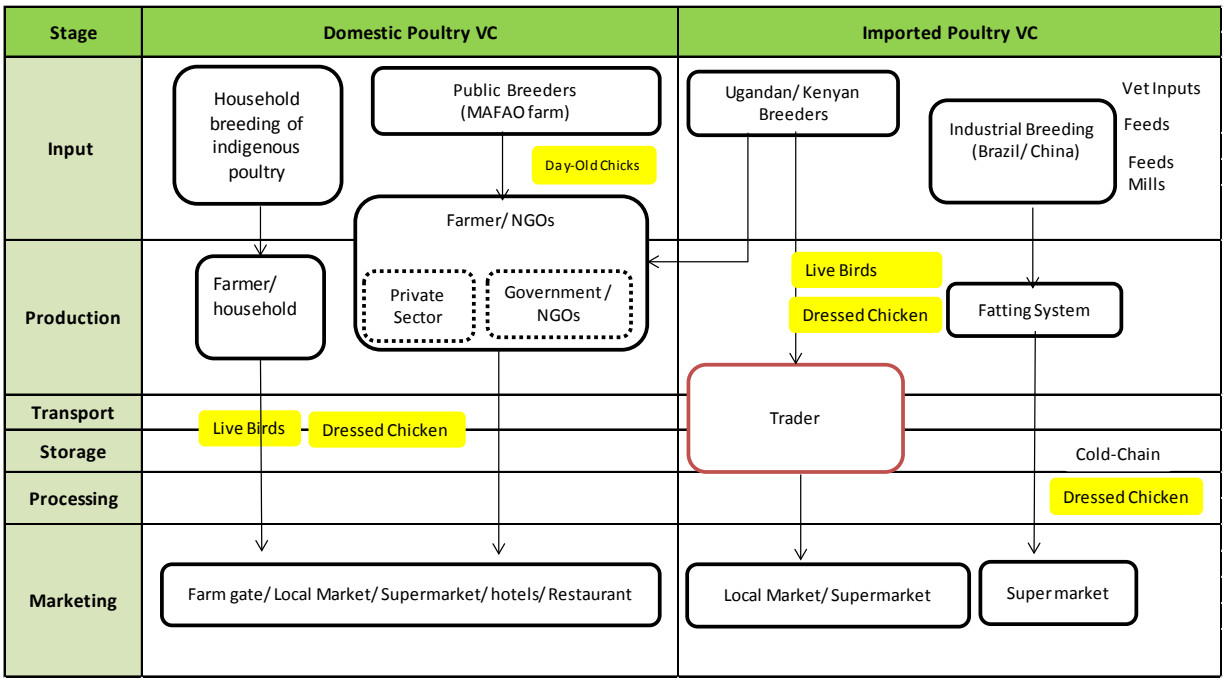
Key actors in the domestic poultry value chain (VC) include households which breed their own poultry and commercial breeders in Uganda, Kenya and the Sudan which supply both exotic and indigenous breed day old chicks. The majority of producers in the domestic VC in both urban and rural areas are smallholder subsistence farmers and households that raise largely chickens but also ducks, turkeys and guinea fowls for household consumption. Other important actors are NGO's and government actors who promote and facilitate poultry production working with farmers and groups. More often than not, they subsidise the farmers with in-kind support such as day old chicks, feeds, construction of housing, vaccination, management and identifying markets. On the other hand are private sectors actors with more focused commercial objectives, who are mostly located in urban and peri-urban areas. Generally they aim to run their enterprises along business lines bearing most of the costs and marketing their products themselves. The imported poultry VC is dominated in the production phase by competitive regional actors who produce both exotic and indigenous chicken, and also most of the eggs that enter the South Sudan markets. The regional actors face even more stiff competition from global actors, from as far as China and Brazil, who use

high tech. breeding, feeding, processing and cold chain techniques that cut costs of production; they ship poultry to South Sudan targeting mostly up-market outlets like supermarkets in urban centres.

Marketing: Live birds are sold predominantly at the farm gate or at local markets. Primary collectors/traders buy live birds and sell them at secondary markets. Live birds are brought from Uganda into the Juba markets. Frozen, dressed chicken comes from regional or global processors into supermarkets, hotels and other facilities in the main urban centres.

Major constraints include: The use of poor techniques and technologies in raising, processing and marketing poultry; failure of the emergence of a support industry for commercial production of poultry. There is a critical gap of domestic production of day old-chicks since the breakdown of the government owned and managed hatchery in Central Equatoria State. Many chicks are lost in transit due to poor handling, transit and customs delays. The sector depends on the importation of feed from Uganda; but, with no wholesale importers and distributors of feed, each farmer imports feeds on a per need basis, increasing the overall costs. Feeds and day old chicks are heavily taxed at the border as the tax regime does not accord special status to productive inputs important for developing the domestic industry. Currently there are no feed mills within the country despite the availability of the bulk feed resources i.e., by-products from milling of human food, suitable fish products and oyster shells. Mills and farmers who mix feeds on their own generally apply poor techniques and lack the full range of ingredients for properly mixing and balancing feeds. Poultry farmers face high costs of veterinary inputs and poor access to veterinary services and advice, with many farmers carrying out vaccinations without the necessary training and advice. A lack of knowledge and understanding of the importance of biosecurity is pervasive. Lack of credit and financing mechanisms limits the size of enterprises and discourages many poultry farmers from developing their businesses. In urban centres there is stiff competition from cheap products imported from the region and globally despite the fact that protracted transit time from country of origin reduces the quality of the products.

Figure 11-19: Poultry value chain



Source: CAMP Task Team, March-July 2013, CAMP Situation Analysis

Opportunities include: the high demand for poultry meat and eggs due to rapidly growing urban centres; the existence of regional hatcheries is important for immediate growth of the sector; the already installed hatchery capacity within the Central Equatoria Livestock and Poultry Integrated Farm more popularly known as MAFAO[463], with an incubation capacity of 21,000 eggs, should promote local production of day old chicks. There is potential for feed mill businesses in areas already milling human food, and for wholesale importation of feeds.

Policy issues include the need for a sectoral policy which should address issues of whether or not, like other countries, South Sudan should choose to put in place policies to protect, promote and support its nascent poultry industry. This is a policy that many other countries in the region adapted to provide the initial boost for growth of the sector. Other policy issues include the need to review the taxation policy on imports that support growth of commercialization; policy guidance on public sector versus private sector and public-private partnerships in facilitating and stimulating the emergence of support services for the poultry sector, such as the engagement in the hatchery industry and provision of day old chicks.

11.8.2.3 Milk value chain

Although a variety of different dairy products are available in the South Sudan market, there are two main segments: domestically produced fresh cow milk, and imported powder milk: the fresh milk segment dominates, with an estimated total production of around 550 million litres annually[464], with a value of SSP 4.5 billion at an average price of SSP 5 for 600 ml[465]. However some fresh milk is brought into the country, for example from Arua, in northwest Uganda to Yei. Powder milk is important in urban centres and even in the rural areas of states with low cattle populations where up to 2kg/person are consumed annually, with an estimated 3874 tons imported annually[466]. Small amounts of goat and sheep milk are produced in some states, like in Eastern Equatoria, mainly to supplement diets during periods of food stress especially during prolonged dry seasons and droughts. Most is consumed domestically and does not enter the market.

Key actors at the production level in the domestic milk VC are the over 903,995[467] agro-pastoral, pastoral and smallholder livestock keepers producing milk from indigenous dual purpose cattle with low genetic milk potential, further hindered by grazing patterns, poor nutrition and diseases that reduce milk production. There are very few exotic and cross-bred dairy cattle in South Sudan, most kept by political leaders for demonstration purposes, many of which tend to succumb to the prevalent diseases or do poorly under local conditions. Most milk is produced by individual households, and milk production is seasonal, following the patterns of rainfall and grazing and water availability. However, because of the congregation at water sources of large numbers of cattle (from 1000 to over 8000 head) in cattle camps during the dry season, there is a marked boost in the amount of milk available for the period of existence of the cattle camp. Many large urban centres are located close to the large permanent water sources which are preferred locations for cattle camps. There is an emerging phenomenon of 'permanent' cattle camps next to urban centres, due to insecurity and/or the enforcement of urban ordinances that restrict keeping of cattle within urban limits, forcing owners to keep livestock in the peri-urban cattle camps.

[463] The then MAFAO Dairy and Poultry Demonstration Farm established in 1970 was a joint venture between the Ministry of Agriculture and FAO

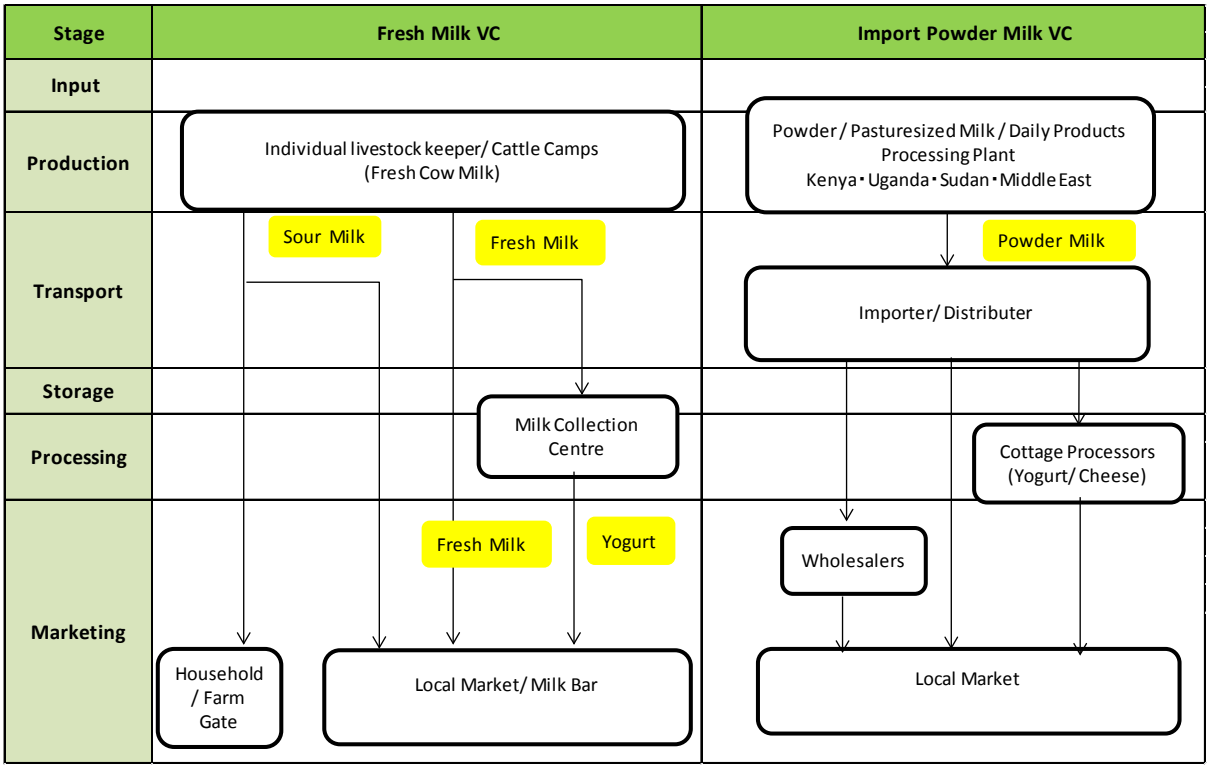
[464] Musinga et al. 2010, Muriuki, H.G. 2010. Development of the Dairy Industry in Southern Sudan: Issues and Suggestions. Ministry of Animal Resources and Fisheries, Directorate of Animal Production and Range Management and Directorate of Special Projects.

[465] From CAMP 2013 collection of field data the ten states between March and July 2013

[466] National Bureau of Statistics. 2012. *National Baseline Household Survey 2009. Report for South Sudan 2012*.

[467] National Bureau of Statistics. 2012. *National Baseline Household Survey 2009.*

Figure 11-20: Milk value chain



Source: CAMP Task Team, March-July 2013, CAMP Situation Analysis.

On average the indigenous breeds produce 0.5–1 litre per day per lactating cow, although some breeds like the Kenana and Botana area said to be high milk producers[468]. Generally traditional milking and handling practices with low hygiene standards are used. Some NGO's in Malakal, Upper Nile State are building the capacity of women, who do most of the milking, to improve their milk hygiene practices so that their milk can enter the local market. Close to 90% of the milk produced is consumed within households, only 10% is offered for sale. The powder milk segment is predominated by milk producers and processors in Sudan, Uganda, Kenya and the Middle East and North Africa (MENA) region, especially the United Arab Emirates and Egypt.

Marketing: For the fresh milk segment, there is a short marketing chain with the main actors being producers who market their products themselves, bulkers or milk collection centres and milk vendors. Two main marketing channels are evident within the domestic fresh milk segment: sour milk, which is an indigenous fermentation technology to prolong the consumption value of milk under conditions in which its quality would otherwise deteriorate rapidly; and fresh milk. Within the South Sudan market, there appears to be an almost equal preference for fresh and sour milk in most of the urban and rural areas of key milk producing areas. It is estimated that in some states, sour milk is the form in which as much as 80% of the marketed milk is sold In the milk markets visited by CAMP, almost equal amounts of fresh and sour milk were for sale.

Handling and packaging milk for sale is a major challenge; innovation and necessity has made use of empty bottled water bottles a common trend. The practice has immense public health challenges; almost all the bottles are recycled, and are gathered from where they have been disposed, almost invariably rubbish heaps. There is a general lack of clean water

[468] Muriuki, H.G. 2010. *Development of the Dairy Industry in Southern Sudan: Issues and Suggestions.* Ministry of Animal Resources and Fisheries, Directorate of Animal Production and Range Management and Directoroate ofSpecial Projects.

and detergent with which to carry out basic cleaning of the bottles. In Wau, milk vendors claimed that they had entered into a deal with a restaurant owner who collected empty water bottles within his premises and washed them before selling them at 1 SSP per bottle to the milk vendors. The milk vendors admitted that they could not verify nor control the process of cleaning the bottles. The bulk of both fresh and sour milk is sold at road sides or within local markets, often exposed to the elements. At a Malakal cattle camp, an NGO provided women with clean small metal cans that were exchanged daily as part of facilitating improved milk hygiene and marketing.

Powder milk is brought into the country by a few large scale importers in Juba who distribute to other urban centres. In some cases, wholesalers come to Juba to buy powder milk which they distribute in their respective towns; they incur high transport costs and face multiple taxation, including informal /unreceipted taxation. Different brands are imported to cater for different budgets and tastes. Main brands include Nido, Jesa, Safa, Al Mudhish, Powder milk from Khartoum has historically been cheaper than that from other locations.

Opportunities: High milk demand, but also a large gap between current per capita consumption levels and recommended levels, means there is a large and fast growing demand and therefore business opportunity. The major production and processing gaps can be closed with relatively low level technologies, promotion of milk hygiene and organization of the sector to give the sector an initial boost. Emerging peri-urban 'permanent' cattle camps provide a tremendous opportunity for an embryonic organized milk industry. Areas of high cattle populations are opportunities for the establishment of collection centres with installed cooling facilities. The fact that most urban centres are located close to permanent water sources is an opportunity for the growth of intensive small holder dairy production units that can use available or planted fodder and forages. Existing collection centres provide practical models for improving handling and bulking of milk.

Key challenges: Deeply entrenched traditional grazing patterns, disease management, milking and milk handling and management practices that lead to low production and productivity and poor hygiene practices. The natural expanse, remoteness and poor access to pastoral and agro-pastoral areas is a challenge for the improvement in production and milk handling practices and for collection and bulking of milk. Research and development and extension services are lacking. Financing and credit for South Sudanese actors to support initial capital intensive dairy infrastructure and to improve the organization of the sector is lacking.

Policy issues: Lack of a sectoral policy, lack of a legislative and regulatory framework and mechanisms for promoting and enforcing phyto-sanitary and food hygiene standards. Potential for herd improvement, especially for creating a nucleus dairy herd for urban and peri-urban centres, is impeded by lack of a breeding policy and public breeding institution.

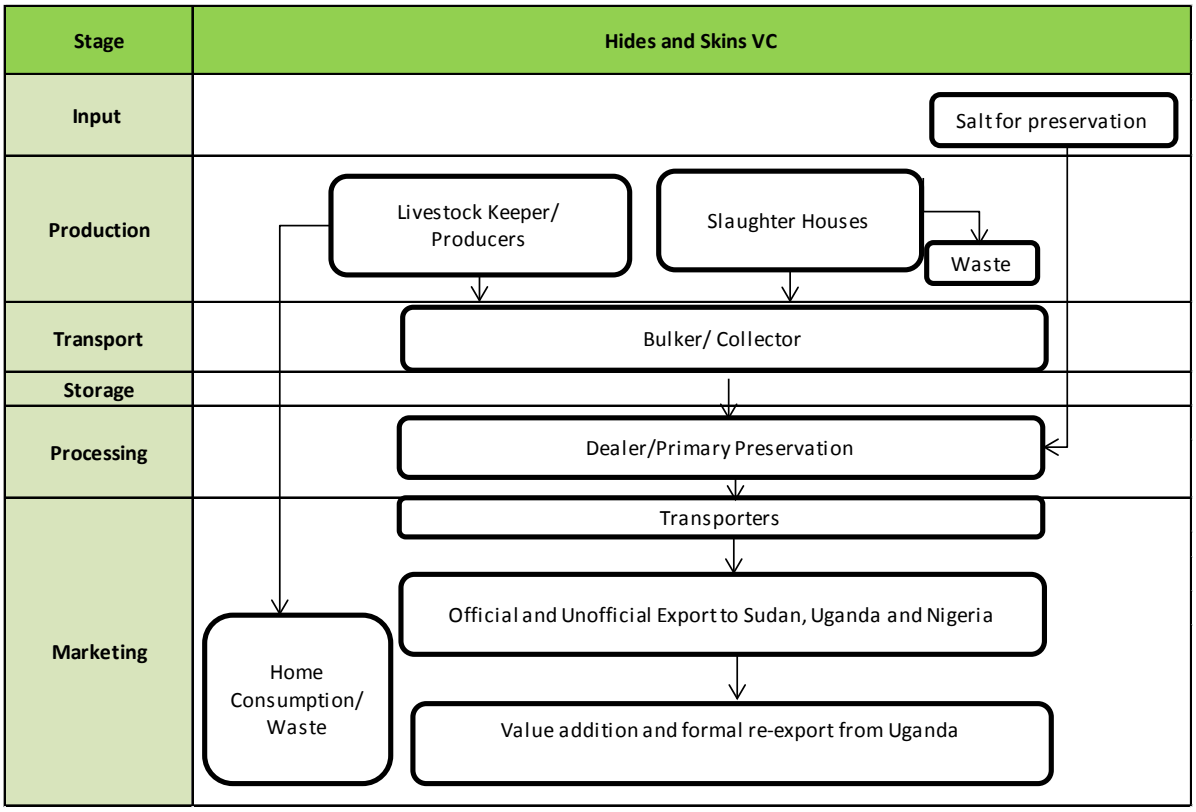
11.8.2.4 Hides and skins value chain

Two key factors characterise the hides and skins VC in South Sudan: first the virtual 'collapse' of the trade since the CPA in 2005. Before the CPA the trade was dominated by Ugandan and North Sudanese buyers, who have since exited the trade due to prohibitively high transport fees and taxes. The second factor is massive waste. Hides and skins emerge as harvestable commodities at slaughter, an estimated annual production of 170,000 hides and 1.6 million skins[469].

[469] Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

While the concentration of slaughter is within slaughter facilities, many livestock, especially small ruminants are slaughtered in homes or restaurants where the hides and skins are not recognized as a marketable commodity and either disposed as waste or consumed domestically. While most of the hides and skins that are traded originate from slaughter facilities, it is estimated that even through that channel only 20%[470] of recovered hides and skins eventually enter the market.

Figure 11-21: Hides and skins value chain



Source: CAMP Task Team, March-July 2013, CAMP Situation Analysis.

Slaughter facilities, households and any other facilities that slaughter animals are key actors; their role is critical in recognizing the commodity and protecting the quality of the hides and skins. It is the practice to utilise hides and skins as part of the protective surface during slaughter of livestock. Poor flaying techniques, and poor management of hides and skins after slaughter, expose the hides and skins to damage. In some slaughter facilities, routinely youth scrap hides and skins to recover any flesh which is sold in scrap meat markets that cater to lower budget customers.

Bulkers/ collectors play an important role in harvesting hides and skins from both slaughter facilities and from households and restaurants. Usually the bulker is a direct employee of the hides and skins dealer, and receives a monthly fee for his services plus assistance with transportation in form of a motor bike or money to hire transport. Hides and skins are usually bought on a per piece basis, in only a few cases are they sold on a weight/ quality basis, in which case the dealer has to provide the weighing scales.

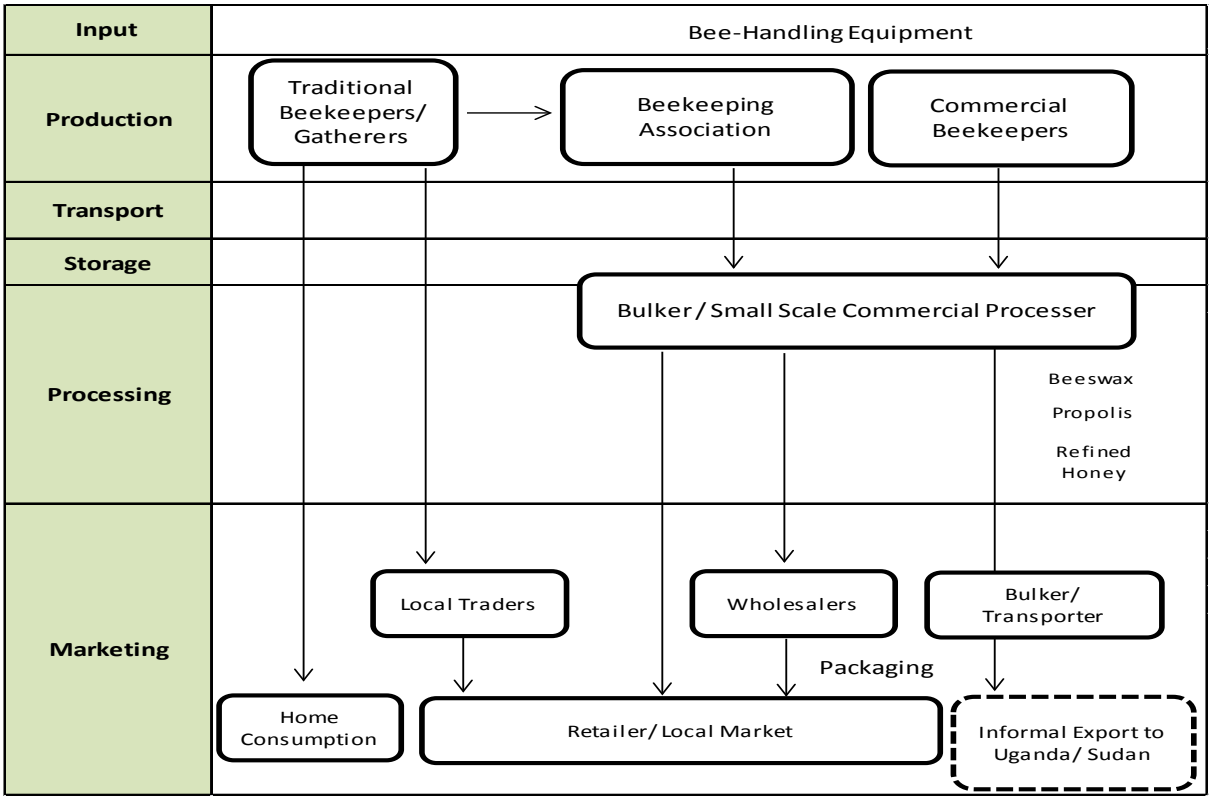
Dealers also hire a person to preserve and store the hides and skins. Preservation and storage facilities are rudimentary and public health issues are evident; where sun drying is

[470] Musinga, M., J. M. Gathuma, O. Engorok and T. H. Dargie. 2010. *The Livestock Sector in Southern Sudan: Results of a Value Chain Study of the Livestock Sector in Five States of Southern Sudan Covered by MDTF with a Focus on Red Meat*. Draft Report, SNV and MARF.

practiced, a combination of frame drying and drying on the ground is common practice. Poor salting techniques and management of effluent are issues as is the use of salt for preservation. Salting costs SSP 265 per 50 kg bag in Malakal which can preserve 7 pieces of hide. Generally more waste occurs at the processing phase. Where dealers are closely involved in the business, there is better management of processing and grading, as was the case in Yei. Preservation methods depend on the target market, with Khartoum preferring sun-drying. Hides and skins are transported in bulk, and therefore transportation is a large cost which is charged per hide or skin. Some dealers opt to take loans to purchase their own trucks to cut costs. Hides and skins are exported from the south of the country to Uganda, which in turn re-exports them after grading and minimal secondary processing. States in the north of the country export to Khartoum where there is a vibrant leather industry, or as far as Nigeria where they are consumed as food.

11.8.2.5 Honey value chain

Figure 11-22: Honey value chain



Source: CAMP Task Team, March-July 2013, CAMP Situation Analysis

11.8.3 Imports and Exports

11.8.3.1 Imports

Since the CPA, an increasing share of the high demand for livestock products in the main cities and towns of South Sudan is being met by imports from the region and from global producers and processors. This is despite the fact that South Sudan has a surplus of cattle, sheep and goats, and the meat of both local and commercial produced poultry is fresher than that that has been in transit for months. More basic products like cattle and goats, eggs, chicken (both live and dressed/frozen) are also imported, inflating the import bill. A total of 44,347 livestock were imported from Uganda through Nimule border point in 2012 which included 13,277 cattle, 23,524 sheep and goats, 7,529 poultry, 10 pigs and 17 donkeys. More and more high value processed livestock products are imported to meet the needs of

niche markets in Juba especially where there are growing expatriate and affluent populations, with six tons constituted of 1864.6 kg poultry, 1200 kg pork, 2463 kg beef, 178 kg fresh lamb and 250 kg cheese imported in 2012 via Juba airport alone. Larger amounts were imported through Nimule, and there were also importations from Sudan. Most of the eggs and chicken feed, come from Uganda. Chicks are imported from Uganda, Sudan and Kenya. Other countries include the Democratic Republic of Congo from which goats and chicken are imported into WE. Powder milk, frozen chicken and other value added meats and dairy products, and veterinary inputs and supplies come from Kenya, the Middle East and Egypt, and from Brazil and China. Goats and live chicken are brought in from the DRC into WE for slaughter and restocking. Imported live animals both for slaughter and for other purposes such as restocking attract premium prices as do livestock products. This has negative effects on growth of urban and peri-urban livestock enterprises given the stiff competition from more experienced high tech and low cost producers. This imbalance is fuelled by lack of an enabling environment for growth of urban and peri-urban livestock enterprises including lack of policies and regulations, lack of finance and credit and the low public and formal private sector investment, poor roads and transport, insecurity, numerous checkpoints which levy unreceipted informal taxes, and the lack of supportive input and service enterprises.

Main ports of importation are Juba Airport, Nimule and Kaya to the south of the country for goods from or transiting through Uganda and Kenya, and the northern border with Sudan. Hostilities with Sudan since the CPA and or greater effect since the establishment of the international border when South Sudan got independence from Sudan have affected importation of livestock goods from Khartoum, which were considered cheaper than the goods coming into the country through the southern ports. Movement permits and health certificated are demanded for live animals at Nimule and Juba airport the only official border points.

11.8.3.2 Exports

South Sudan is not realizing its potential for export of live animals and livestock products, with the export profile characterised by low and/or largely unofficial export of live animals and export of only meagre quantities of low quality raw products. Potential for export was documented as early as 1955 when it was established that the country had a large surplus and opportunity to enhance offtake for export to existing and new markets should be explored. Before the CPA there was a net export of livestock and livestock products including live animals to Uganda, Kenya and Ethiopia, and hides and skins and honey to Uganda and Sudan, and hoofs and horns to Uganda[471]. Currently, there is no export of live animals to Uganda through Nimule, and unofficial export of livestock into Kenya and Ethiopia. Trade of live animals to Sudan was reported in Sudan Government 1955 report, which cited preference for meat from South Sudanese breeds to that of Sudan breeds. According to the Jonglei State Strategic Plan 2012 to 2017, the trade of live animals from the state into Sudan through Malakal and Nassir, and to Ethiopia from Akobo is estimated to be the highest proportion of states' commercial offtake. Export of live animals has been affected by insecurity and taxation, disease, and the apparent desire to restock livestock and to clear social obligations such as dowry payments since the cessation of the civil war. The Lamu Port- South Sudan – Ethiopia Transport Corridor (LAPSSET) is expected to stimulate export of livestock from South Sudan.

It appears that the export of hides and skins from the southern part of the country to Uganda has again picked up from lows after the CPA due to insecurity and prohibitively high taxation. Trade of hides and skins from the northern parts of the country (the Greater Bahr el Ghazal and Upper Nile regions) has continued, albeit with considerable disruption due to the volatility of hostilities between South Sudan and Sudan. In some states there is strong

[471]Yoshino. Y., G. Ngungi and E. Asebe. 2011. Africa Trade Policy Notes: Enhancing the Recent Growth of Cross-Border Trade Between South Sudan and Uganda. Policy Note No.21. World Bank.

support and involvement of government which facilitates the trade like in WBG, CES and UN where government facilitates storage and grading. Onl;y a small proportion of hides and skins are prepared for export, all of which are exported with only the most basic of processing, a significant opportunity for increased value addition and increased export. A policy is needed to enhance hides and skins from production through to export and addressing the development of a domestic leather industry.

There is an unverified export of honey to Uganda and Sudan. It appears that in the early to mid 2000s large quantities of honey from South Sudan entered the Uganda market, helping to boost Uganda's export of honey to the European Union. There are conflicting reports of export of honey to Uganda now, with claims that there is not an appreciable differential in price to make export to Uganda profitable due to high transport costs and poor accessibility to production areas, and poor organisation of producers and processors. South Sudan has potentially high quality honey due to the pristine nature of its vegetation which is chemical free.

South Sudan has both long standing and recent experience with trade of livestock, and has breeds with the desired qualities for meat, and can generate substantial livestock products for export. There is a large regional trade of live animals in the Greater Horn of Africa worth millions of US dollars, with trade flows towards more lucrative markets such as Nairobi, Kenya and to high demand Middle East and North Africa (MENA) regional markets. Like other countries in the region, there is need to balance the objectives of formal trade and the reality of the informal structures within which pastoral live animal trade are conducted in. Policies and infrastructure to support export are lacking.

11.9 Services

11.9.1 Extension Services

A National Agriculture and Livestock Extension Policy (NALEP) and a NALEP Implementation Framework, Plan and Budget were developed jointly in 2011 jointly by the then Ministry of Agriculture and Forestry (MAF) and MARF. The NALEP promotes a pluralistic extension system, with government as a regulator, but little has yet been implemented. Currently extension is by the public sector, led by the national Directorate of Extension and Pastoral Development, and the either state level Directorates (UN and US) or Directorates combined with research and or animal production and veterinary services, and through NGOs. There are no private sector extension services[472].

Key challenges for livestock extension are the inadequate staffing and facilitation at state and county level, and lack of clear mandates and clarity of the functions of the extension agents [473]. Resources for extension are lacking such as authoritative information on appropriate technologies and technology packages, demonstration facilities, and access to technologies and inputs, and financing for their proper exploitation. Extension staff themselves lack training and exposure to the appropriate technologies. In animal health, where even curative services are lacking, the only form of extension provided is sensitisation and awareness during vaccination campaigns, and through the efforts of CAHWs. While NGOs often provide the only source of information, most also lack the technical staff who can provide the necessary extension services. The current focus of extension is production, with little or no attention to processing, packaging and marketing components, and to social and cultural issues[474] as is evident from the focal areas in which most NGOs function.

[472]Republic of South Sudan. 2011. National Agriculture and Livestock Extension Policy.

[473]Republic of South Sudan. 2012. Lakes State Strategic Plan 2012 – 2016. Ministry of Animal Resources and Fisheries, Lakes State

[474]Republic of South Sudan. 2011. National Agriculture and Livestock Extension Policy.

Without the existence of a vibrant research system to generate technologies and technology packages, a functional input system and marketing network there may be a need to review the NALEP to reflect the realities on the ground until the sector is more market oriented and stakeholders can demand for services based on the anticipated profits. There also seems to be a disconnect between the NALEP approach to extension services for pastoralists and the view in the MARF which focuses on education and 'modernization' of pastoralists

11.9.2 Research and development

South Sudan has a rich research history, with animal health research documented in the MARF Policy framework and Strategic Plan (PFSP) 2012-2016, and animal production captured by the 1955 Government of Sudan report on the resources and potential of Southern Sudan, and MAFAO and Marial Bai reports. The research facilities were decimated by 1983 to 2005 civil war and important research information and technologies lost. The national MARF Animal and Fisheries Research and Development Directorate is the public sector lead, and has a mission to establish a participatory, demand driven, pluralistic and sustainable research system. The research agenda elaborated in the MARF PFSP is limited: not reflective of the subsector stakeholders, of the production systems, and of the existent technologies and technology packages and collaboration and innovative funding opportunities within the region. The PFSP research agenda focuses on construction of veterinary research facilities, tsetse and ECF research on the animal health side, and genetic improvement of animal resources, feed formulation and quality assurance under animal production. A comprehensive research policy, regulatory and legal framework to facilitate the development of a national and pluralistic research system that will provide guidance for all stakeholders and to provide linkage to extension services is needed. The integrated livestock centres (formerly model farms) should be considered as potential candidates for research and development centres. South Sudan has the potential to make significant contributions in livestock and rangeland genetic resources and indigenous livestock production knowledge to the wider region.

One of the efforts after the CPA, and funded by the Multi-Donor Trust Fund was the construction of a Central Veterinary Lab (CVL), and two regional ones with diagnostic and research functions. The CVL facility with basic infrastructure is situated on 500 x 500 metres of land at Rejaf West, about 10 km from Juba Town. So far, little has been achieved concerning the priorities set out in the strategic plan due to limited funds for the necessary infrastructure and initiating research activities. The only work being undertaken is the mapping and molecular characterisation of tsetse flies, supported by the Bill & Melinda Gates Foundation under PATTEC. The centre currently employs young graduates who need further training to meet the research needs of the country.

11.9.3 Input Delivery Systems

Veterinary supplies outlets are mainly found in state capitals and county headquarters, although in some cases, they have networks in payams and bomas. Currently, the state veterinary services licence veterinary pharmacies and agro-veterinary stores. The main criteria for licensing in Central Equatoria State are: the license owner is a professional veterinarian, the inspected and compliant (concrete, well ventilated and roof with ceiling board). In Upper Nile State, two types of licences are needed: veterinary licence (150 SSP/year) and local authority (1,350 SSP/year). The main clients of these stores are pastoralists, CAHWs and NGOs. Drugs are sold to pastoralists based on a clinical description of the ailment. In Malakal, medicines sourced from Juba are more expensive compared to those from Khartoum or Ethiopia, while in Northern Bahr el Ghazal State, medicines from Khartoum are very expensive compared to those from Uganda. A sample of prices of commonly used veterinary medicines and products is presented in Table 11-31.

There are opposing views on the trend of business since the signing of the CPA. In Upper

Nile State, it is felt that before CPA, people moved freely and therefore sales were higher. Excessive taxation post-CPA has made matters worse. On the contrary, veterinary supplies operators in Northern Bahr el Ghazal State feel that the business environment has improved after CPA. They are able to move around freely and market their products. Many of the operators see no role for the government in the distribution of drugs; and feel that the government only hinders the private sector. For example, the government took over all the bush pharmacies OXFAM had developed in Upper Nile State, but within a short time, they all stopped functioning.

The main constraints cited by veterinary supplies operators across the country include: poor road infrastructure making access to the interior very difficult; unreliable supply sources; high cost of transport; huge seasonal fluctuations in sales; low purchasing power even for those with many animals; and insecurity across many parts of the country.

Table 11-31: Prices of Commonly used Veterinary Medicines and Products

Medicine	CE	U Nile	NBG	Jonglei	Unity	EE	WE	WBG	Lakes	Warrap
Ox tetracycline 5%	*	20	16	15	20	*	*	15	20	*
Ox tetracycline 10%	*	*	20	20	40	15	25	0	0	*
Ox tetracycline 20 %	20	35	25	25	50	15	25	20	30	*
Ox tetracycline 30%	30	*	*	30	50	*	*	0	0	*
Amoxicillin	35	*	*	25	40	25	*	50	30	*
Penicillin	35	*	37	30	40	25	*	50	30	*
Ethidium—Tab	5	7	*	5	5	3	*	5	5	*
Tryponil 25%--Sac	3	7	*	5	5	5	*	3	5	*
Acaracides	25	30	*	35	50	20	*	15	35	*
Multivitamin	25	50	*	70	50	35	15	30	30	*
Ivermactine 50ml	50	35	*	50	35	45	35	15	50	*
Albandazol /oral	35	50	*	35	50	35	35	50	50	*

Source: Compiled by the CAMP Task Team based on information obtained from GRSS MARF. 2013

Agro-input/ animal feed and equipment/ day old chick outlets: dealers specialising in providing animal production inputs and equipment are almost non-existent across South Sudan. There is very low utilisation of inputs among the majority of livestock keepers. Commercial enterprises or those supported by NGOs import feed, equipment and other inputs directly from Uganda, Sudan, and Kenya increasing unit costs. A number of feed mills were started but closed due to lack of finance, in consistent supply of key ingredients or poor sales. A government feed mill at MAFAO, renovated under the Multi-Donor Trust Fund (MDTF) closed due to disease that affected the adjacent hatchery. Private sector dealers are reluctant to carry equipment and other inputs on their stock lists without assurance of sales.

11.9.4 Food safety assurance

To provide a better guarantee of food of animal origin, one of MARFs key objectives is to improve meat and milk hygiene in all the 10 states. So far, no milk quality assurance takes place in any of the states, understandably because the quantities of milk produced and marketed are too limited to warrant such efforts. NGOs in different states are working with communities, especially women to improve the quality of milk on offer for sale.

Most state capitals have slaughter slabs, with some like Aweil, Northern Bahr el Ghazal State, now having a slaughter house. However, in the majority of county capitals animals are slaughtered in the bush without veterinary supervision and inspection. The slaughter facilities are government owned but operated by local authorities. Visits to some of the slaughter slabs/houses revealed the following: 1) animals are not accompanied by movement permits; 2) absence of animal handling facilities. In the case of Juba, the land originally meant for this has been grabbed and put to personal use; 3) ante-mortem is conducted the previous day. Slaughtering is done at dawn and meat inspectors cannot travel

to the slaughter slabs at this hour due to security concerns and lack of transport; 4) animals are not stunned before slaughter; 5) some carcasses are inspected on the floor alongside the offal; 6) meat inspectors have no jurisdiction over meat carriers; 7) very poor waste management systems (drainage and soak pits are either missing or blocked); 8) human settlements and businesses are fast encroaching on the slaughter facilities; and 9) there is an uncontrolled dog population.

Good examples exist: the Aweil slaughter house was constructed under SPCRP which has animal handling facilities that offer ample space for animals to rest and drink water and facilitate ante mortem inspection. A major constraint expressed across the country is the absence of a legal framework to facilitate meat inspection and failure by the other arms of government to consult with veterinary authorities in situating slaughter houses. Since the CPA, the veterinary service directorate relies on goodwill and the old laws to carry out meat inspection. Otherwise, the owners of the meat/cattle have the final say on the status of the meat. The common reasons for organ or carcass condemnation are bovine tuberculosis, *Cystercircus bovis*, icterus, liver flukes, liver cirrhosis and abscesses.

11.9.5 Animal welfare

Animal rights fall into five categories namely; freedom from hunger, thirst and malnutrition; freedom from fear and distress; freedom from physical and thermal discomfort; freedom from pain, injury and disease; and freedom to express normal patterns of behaviour. Good animal welfare is therefore an integral part of animal production and manifests in better production, market access and safe and mutually beneficial companionship. This is all summed up in this quote from Mahatma Gandhi, *"*The greatness of a nation and its moral progress can be judged by the way its animals are treated*".*

At most markets and auction yards, ruminant species are generally well catered for. This was very evident in Malakal where fodder is available for sale in the markets, while animals that fail to sell are taken for grazing in the afternoon to early evening. The main concerns for ruminant species is at the slaughter houses where the majority have no animal handling facilities for animals to rest and drink water and the failure to stun before slaughtering. Some of the vehicles used for moving animals are not appropriate; in Nimule trailers were used. Horses and donkeys are mistreated and left to die, despite being the main means of transport for goods and water, especially in the northern states like Upper Nile. As a result, over 75% of the cases handled by the INDBUTT clinic for these two species of animals are injury wounds inflicted by owners and through poor harnessing techniques.

In Wau Town, the state veterinary service conducts fitness tests for draught animals. However, the same town has perhaps the most stray dogs. The veterinary service absolves itself from blame and instead blames it on the municipal authority. Luckily, the Ministry of Health in the area has taken on leadership and brought together all the key stakeholders with a view to containing the stray dog and rabies menace.

11.10 Infrastructure

Infrastructure is a key foundation for development, necessary for lowering the cost of doing business including enforcement of regulations and standards, improving security, increasing value addition, improving coordination and strengthening integration of the subsector with the rest of the economy.

11.10.1 Production facilities

Water for production infrastructure: Livestock across the states depend on natural water bodies as the main sources of water. The seasonality of these sources is one of the triggers of migration and of inter-community conflict over scarce water during periods of prolonged dry seasons and drought. Extensive mapping of grazing lands in Central Equatoria, Eastern

Equatoria and Jonglei showed the strong link of migration to water needs. Movement is towards more permanent water resources or to areas where it is possible to dig temporary wells. In the past, development of water infrastructure, such as haffirs (manmade lake/ water reservoir), were common, documented in the 1955 Government of Sudan report. Pastoral communities hand dig micro-scale haffirs, but these are often too shallow and inadequate for the needs, drying up during the dry season. A 30 million cubic-meter water haffir constructed by UNDP under the South Sudan Recovery Fund (a joint GOSS, donor community and UN) in Jie, Kapoeta East County curtailed Toposa migration for the first time in the living memory of the community, deflecting the occurrence of tensions and violent conflicts often associated with the migration. Three more haffirs are being constructed within the Greater Kapoeta area. Haffirs are planned in Duk, Pibor, Ayod and Akobo Counties under SSRF funding in areas most prone to water related conflicts after the success of four haffirs in Nyirol and Uror Counties. SSRF also funded two haffirs in Tonj East, Warrap State. Community consultations and Crisis Recovery Mapping Analysis were used to determine the appropriate location of water points. Such large infrastructure is costly and experience in the region has showed their long term disadvantages including degradation of rangelands. More localised infrastructure, which is aligned to rangeland resources, cheaper and amendable to community management, is also needed.

Migratory infrastructure: Security of migration to access dry season resources is critical for nomadic and transhumant pastoral and agro-pastoral livestock keepers. Access to seasonal resources is protected under the Transitional Constitution of South Sudan, but there is no policy, legal and regulatory framework. Migratory routes were mapped by MARF but protection of the routes is yet to be actualized. South Sudan stands to learn from Darfur State, where between 2005 and 2012, 4000 km of transhumance routes were demarcated, each 150 metres wide, with markers at 1-3 km intervals. The State compensated land that was integrated into the migration route, and services such as water points, schools for nomadic communities, mobile veterinary clinics were established. Security is also provided for the migrating groups, with local administrators and police accompanying the migrating communities.

Poultry infrastructure: Production infrastructure for poultry production including feed mills and hatcheries is lacking. Mills for food for human consumption exist and generate substantial by-products needed for feed mills.

11.10.2 Marketing facilities

Stock routes: stock routes from main production areas to markets are not developed. Herds in transit to markets are exposed to water and feed shortages and to disease that affects the body condition of the animals. Periodic flooding makes the stock routes impassable affecting supply of livestock to markets. Insecurity and rustling are common and directly affect the usage of a route and the selection of the destination market.

Ruminant market infrastructure: the ruminant livestock markets infrastructure is a network of:

(1) Primary markets (local markets, rural to rural transactions) where producers are the main seller. These are an estimated 3-4 per country that has a significant livestock population i.e., approximately 60% of the counties or 136 markets.

(2) Secondary markets/auctions (domestic markets with rural to urban transactions) where sellers are a mix of producers and traders. There is approximately one market or auction per county that has a large livestock population i.e. 4 in Unity, 5 in Warrap, 5 in NBG, 9 in Jonglei, 5 in CES, 1 in WE, 2 in Upper Nile, 3 in WBG, 9 in Lakes and 6 in EE for a total 48 secondary markets or auctions .

(3) Terminal markets/auctions (hubs in the Greater Equatoria, Upper Nile and Bahr el Ghazal regions with urban to urban transaction) where livestock from surrounding counties and states are sold for mostly slaughter: eight in Central Equatoria, and one each in Upper Nile, Western Bahr el Ghazal, Jonglei, Northern Bahr el Ghazal and Eastern Equatoria, i.e. 13 terminal markets; and a total of 197 livestock markets. Livestock from South Sudan are exported to markets in Sudan, Ethiopia and Kenya; and were exported to markets in Uganda before the CPA.

The number of markets, given the size of the country and the livestock population, is inadequate. Livestock keepers trek 2-3 days to reach primary markets and more than a week to reach secondary and terminal markets. At least one primary market is necessary per payam to adequately serve livestock producers. The infrastructure at local markets is rudimentary, an open space, with trees and no facilities, sellers and buyers negotiate and agree a price. The local authorities levy taxes and the sellers manage and keep the facility clean. The infrastructure at secondary markets and auctions differ from one to another, but with more animals on offer for sale, the site is larger, and the sale area is enclosed, and cattle and shoats are sold in separate areas. Water and grazing are challenges: there may be a market based kraal on site, with or without a small, adjacent grazing area, or a 'permanent' cattle camp nearby which offers kraaling services. A fee is paid per head of livestock for the kraaling services. The markets are owned by the state and/or the county and managed by them or private entrepreneurs. Animals that die at the facility are burnt or thrown in a river. Some terminal markets/auctions may have more facilities including holding grounds and water sources, and auctioneer and revenue collection offices. Land for markets is a key issue: with the re-zoning that has taken place since the CPA, markets have officially been allocated land outside of town/urban centres. Traders consider this a risk to business and in terms of security. Some markets have lost land to other developments. The uncertainty with land affects investment in market facilities.

Poultry markets: poultry are sold within local markets in rural areas and at the main markets at county and state level. An area of the market is dedicated to poultry sale, with a shelter constructed for the poultry which are displayed on the ground or on raised platforms. No veterinary services are offered.

Border check points and quarantine stations: Nimule and Juba International Airport are the only functional border points that are controlled. Ten other border posts are planned.

11.11 Investment

11.11.1 Public sector expenditure and investment

Due to significant issues of public interest, the national government's role is important in funding and investment in development of the livestock sector. Key infrastructure and services such as markets, border control posts and quarantines, diagnostic labs and facilities, water for production (dams, hafirs), protection of migratory routes are areas where the nature of investment is best suited to public sector funding.

National budgetary allocation to MARF for livestock subsector development is well below the 3% stipulated under the Maputo Declaration and envisioned to as critical to achieving 6% annual growth. Between 2006 and 2012/13, the whole Natural Resources and Rural Development Sector which included Agriculture and Forestry, Animal Resources and Fisheries, Cooperatives and Rural Development and the Land Commission received a meagre 1.5% of the government budget. Under the 2012/13 austerity budget, Development Partners funded 31% of the MARF budget, and some key areas important to livestock were left unfunded including: support to animal health service delivery i.e., control of diseases,

sero-surveillance, and procurement of drugs and vaccines; land management (land policy development, research on land ownership and causes of disputes over land, and resolution of conflict over land); and economic management projects to improve livelihoods in rural areas and facilitate the settlement of returnees[475].

State governments: At state level, budget allocation to the livestock subsector is not commensurate to the contribution of the sector to the state economies. In Eastern Equatoria, the Greater Kapoeta area, with a significant pastoral population, provides 80% of the State revenues through taxation on live animal trade and other local taxes related to livestock subsector activities, and from the export of hides and skins to Uganda. Although state revenues are quite modest in relation to central government transfers, they are important for state functionality, as emphasized by loss of that income under austerity measures.[476] Only 1.1% (2,212,438 SSP out of 193,041,480 SSP) of the 2012/2013 Eastern Equatoria State budget was allocated to animal resources development. This was a common trend across the states.

Since the CPA and through support from MDTF and FAO, GIZ, VSF, SNV and other NGOs state and county governments have made greater investments in livestock infrastructure including markets, auctions, slaughter facilities, hides and skins storage facilities and water infrastructure. These have been important investments especially in states in which government has successfully divested the business to private sector. In some cases the divesture is neither complete nor is a public private partnership formalized impeding private sector investment.

11.11.2 Private investment

Formal private sector in the livestock subsector is emerging, the informal sector dominates. Cash circulation is minimal in a non-monetized economy where the majority of the subsector assets are held as live animals. A large proportion of primary transactions (between producers or with grain traders) are on an exchange, loan or batter arrangement. Traders and butchers function with minimal cash investments, sometimes procuring animals on credit from producers or rural traders. The indigenous poultry and honey value chain similarly functions with minimal cash investment by primary actors. Few formal private sector actors have a substantial investment in the sector besides a few commercial producers and processors, wholesale traders in livestock products such as powder milk and a handful of veterinary input dealers based with urban areas.

South Sudan is however attracting attention from regional investors who are already benefitting from exporting to the lucrative urban markets. The fast growing dairy industry in Uganda is looking to expand milk collection and processing into the country. There are also similar plans for development of hatchery facilities.

11.11.3 Development partner investment

Development Partners (DPs) have played an important role in funding livestock subsector investments from support to establishment of state ministries, in strategic planning, development of infrastructure, capacity building and investment in animal health especially annual vaccinations and supporting the establishment of veterinary input supply chains. However much of DP investment timeframe is short.

[475]National Budget Plan, Financial Year 2012/13. June 2012. Ministry of Finance and Economic Planning, Republic of South Sudan.

[476]Republic of South Sudan. 2012. Final Resolution of the Second Governor's Forum. 26-29 November 2012. Freedom Hall, Juba.

11.11.4 Investment climate

The growth of private investment is impeded by lack of sectoral policies; a legal and regulatory framework and enforcement mechanism; lack of finance and credit; lack of coordination between segments of the different value chains; limited infrastructure; land issues and conflict and insecurity which all undermine investor confidence.

12. Forestry

12.1 Overview

South Sudan is endowed with diverse natural forests and woodlands with a high potential for economic and environmental value creation. Previously, the resources and opportunities were taken advantage of by previous governments and the private sector. Since the early 20th century, legal and institutional arrangements were established to guide, regulate and support development of the forestry subsector. South Sudan went through the two civil wars before its independence in 2011. Although it is said that forest resources, teak plantations in particular, helped to finance military operations, the wars disrupted proper management of forest resources for decades. During this period, institutional strengths and human resources necessary for the proper management of forest resources deteriorated.

Since South Sudan's independence in 2011, the forestry subsector in the country is in a transitional period as the old legal system must be replaced by a new system. The new system is in the early stage of development; so far, the forest policy was only recently formally adopted. Many perceive that there are no laws to govern the forestry subsector because (although arguable) the old legal system is invalid. This perceived legal vacuum creates a peculiar situation for the subsector where anyone can do anything without fear of, for example, prosecution. This absence of a legal system influences the professional community of the subsector, and it is necessary to report this at the beginning of this chapter. Interpretations of the legal framework vary even in the same individual, who can describe an activity as illegal but comment that there is no law to arrest the perpetrator of the activity.

The Directorate of Forestry in GRSS and state governments, and forest officers and guards deployed to county governments and Central Forest Reserves (CFRs) are the main public sector actors in the subsector. Their limited resources and capacity are shown in their inadequate level of on-the-ground public service delivery. Management of CFRs is, in general, disastrous. Natural and plantation forests in CFRs are the subject of widespread illegal activities and encroachment. However, large tracts of teak plantations in CFRs in the Greater Equatoria Region are still intact or less affected by illegal activities due to bad road conditions. Private sector involvement in the subsector is represented by two concessionaires operating in Western Equatoria State, timber dealers, out-growers, sawmills, forest products wholesalers and retailers, charcoal producers, traders and retailers, and small informal businesses handing various minor forest products. Forest products are marketed locally (e.g. fuelwood), nationally (e.g. charcoal), regionally (e.g. gum acacia), and globally (e.g. teak timber).

12.2 Key issues and challenges

Key issues and challenges identified through the situation analysis are summarised based on the structure defined in the Forest Policy 2013. Most of the key issues are directly or indirectly linked with the most challenging issue of weak management and service delivery capacity in the public sector.

(1) Commercial forestry

- Development of forest plantations and woodlots by farmers and businesses in the form of agroforestry and small-scale plantations has happened to some extent in the Greater Equatoria Region. However, potential further expansion of teak plantations and woodlots for sustainable production is not fully exploited due to limited extension efforts by the government and a speculative market environment.
- A poor legal framework and infrastructure result in a perceived high investment risk and high production and marketing costs, which seriously hinder private sector investment

and employment creation in the subsector. Up to now the limited cases of private investment were forest management under concession arrangements.

- Traditional and micro- and small-scale enterprise oriented marketing of forest products and services dominate in the sector. Only specific products (teak timber and gum acacia) have accessed regional and global markets but to a limited extent. Risks and uncertainty associated with the poor legal framework and infrastructure, and weak technical and regulatory support from the public sector discourage the further investment necessary to enhance existing markets and explore better marketing opportunities for other forest products and services.

(2) Community forestry and agroforestry

- Food security and rural development through enhancement of community forestry and agroforestry require clear legal frameworks consistent with the varying customary law mechanisms and governments' extension expertise and skills in order to clarify land rights and to mobilise local resources for forest production. Although the concept community forestry is defined in the Forest Policy 2013, there is no firm legal framework nor sufficient experience and expertise to implement on-the-ground public service delivery for the promotion of community forestry and agroforestry.
- The same is true for collaborative management of Central Forest Reserves and other types of public forest reserves involving forest fringe communities, private sector concessionaires and processors, traders, and governments. The legal framework, governments' experience and technical expertise must be enhanced to realise a community management regime.

(3) Conservation

- It is probably too early for South Sudan to invest a significant amount of public resources in biodiversity conservation and habitat conservation. Illegal and uncontrolled utilization of biodiversity resources has, and still is, widespread and the country has experienced rapid degradation of such resources. Government resources are limited and are not sufficient to implement conservation measures in an effective manner.
- Conservation and management of CFRs deteriorated during the period of the second civil war. The current status of CFR management is disastrous and recovery and strengthening of CFR management are urgently to avoid further uncontrolled exploitation of forest resources and encroachment.
- Collaboration among authorities in GRSS and state governments for management and conservation of forest resources is weak due to an inadequate legal framework, expertise, and communication and transportation resources.

(4) Institutional arrangements for the forest sector

- The legal framework to determine power, responsibilities, functions and financial modalities of the national, state and local governments is still under development. Coordination among the national, state and county governments is lacking for the generation of complementary efficiency gains. There are serious accountability, and supervision and reporting problems concerning, for example, transfers from the national to the state governments.
- Although the establishment of the South Sudan Forest Commission and Forest Development Consultative Forum is proposed in the Forest Policy 2013, the viability and efficiency of such organisations in contrast to private sector investment and decentralised forest management have not been thoroughly analysed.

(5) Policy implementation

- Government delineation of authorities and responsibilities and their ownership of projects and programmes have been inadequate for the implementation of the Forest

Policy 2013. Key legal instruments such as Forestry Law, related acts and other legal instruments are still not in place or only partially implemented.

- Completeness, fairness, and efficiency of forest revenue collection are neither achieved nor can be achieved due to unrealistic administrative provisions with respect to the human and financial resources allocated. Therefore forest revenue and fee collection became sporadic and in many cases tarnished by corrupt practices which hinder private sector development. It is reported that the private sector considers the government as a business obstacle who provides no public service delivery for the taxes and fees they paid. Both the public and private sectors do not trust each other and this is a serious issue.
- There is a common perception that budgets of national, state and local governments are insufficient.
- Planning, implementation, monitoring and supervision, and evaluation of GRSS agencies, state and local governments, and DP supported programmes and projects are not well coordinated.
- Insufficient financial resources are allocated for human resource development, application of modern science and technology, and knowledge creation activities.

12.3 Forest resources

As shown in Figure 12-1, South Sudan is endowed with diverse natural forests and woodlands with an estimated total area of 191,667 km^2, or about 30% of total land area.[477] The extreme south and southwest of South Sudan represent the sub-tropical vegetation zone, which changes relatively abruptly into savannah. Large areas of South Sudan exhibit low-density woodland savannah vegetation of mixed scrubs and grassland. These are the areas abundant with gum trees. The Ironstone Plateau, which borders the Democratic Republic of Congo (DRC) in the southwest, supports forestry and intensive agriculture. In the extreme south of South Sudan are the Imatong, Dongotona, and Acholi mountain ranges that flank the White Nile and contain dense forests. Mount Kinyeti within these ranges reaches an elevation of 3,187 meters, being the highest point in South Sudan. Further west of these ranges contain one of the best remaining teak plantations.[478] However, deforestation pressures are increasing, driven mainly by demands for agricultural land, fuelwood, and charcoal.[479]

Over 5% of South Sudan is covered by permanent wetlands and flood plains, linked to the Nile tributaries that traverse the southern plains, with the largest such wetland, the Sudd, covering 30,000 km^2 and lying between the towns of Bor and Malakal. This large wetland area comprises multiple channels, lakes, and swamps, which have been less impacted by man and represent a safe haven for wildlife, including migratory birds.[480]

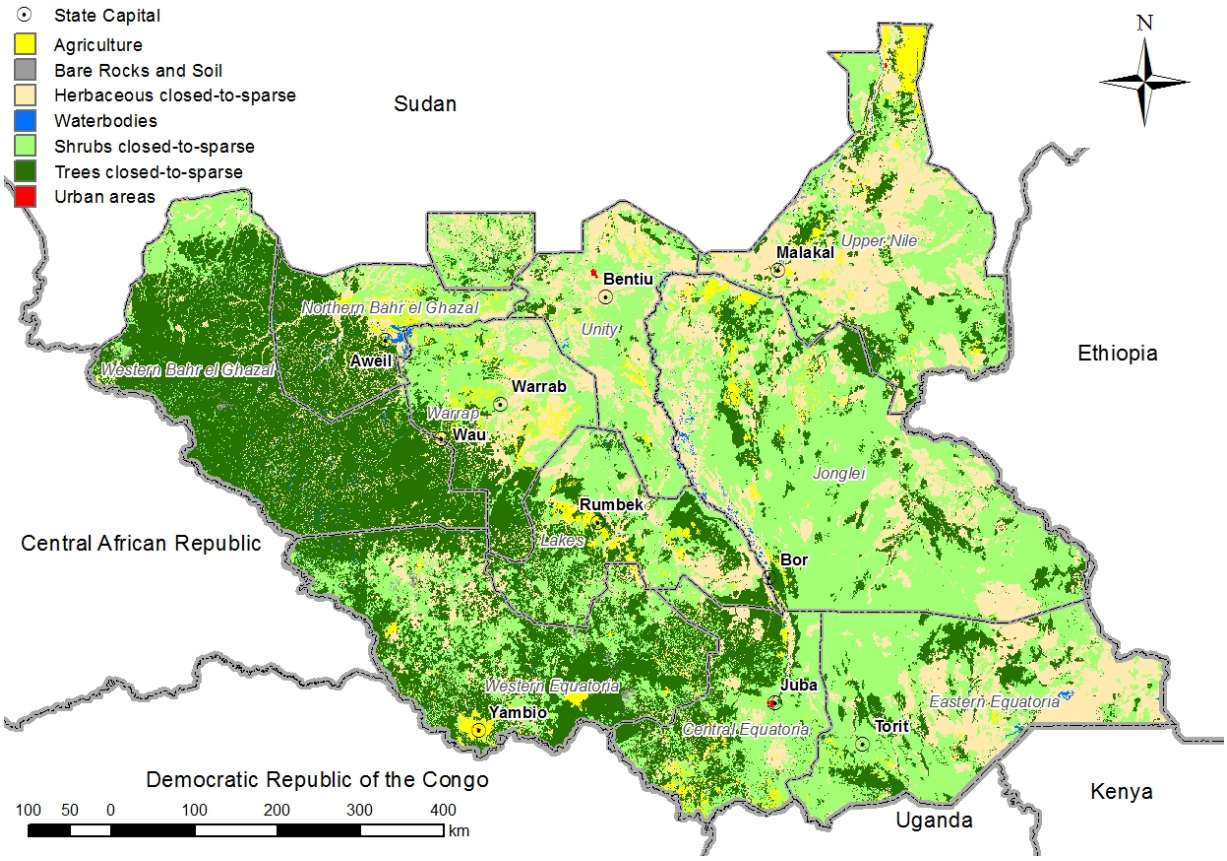
The country is endowed with soil and rainfall conditions favourable for growing forest plantations with a wide range of trees from rainforest species (such as mahogany, teak and eucalyptus) to temperate climate species (including pines and cypresses).[481] Forest reserves comprise 17,460 km^2. Plantations, consisting largely of teak, covered 1,879 km^2 prior to the

[477] Ministry of Agriculture, Forestry, Cooperatives and Rural Development. 2013. Forest Policy. Juba: The Government of Republic of South Sudan. p. 10.
[478] World Bank. 2010. A legal and institutional policy framework for sustainable management of forest resources in Southern Sudan - a policy note. World Bank: Washington D.C.
[479] World Bank. 2010. A legal and institutional policy framework for sustainable management of forest resources in Southern Sudan - a policy note. World Bank: Washington D.C.
[480] World Bank. 2010. A legal and institutional policy framework for sustainable management of forest resources in Southern Sudan - a policy note. World Bank: Washington D.C.
[481] Ministry of Agriculture, Forestry, Cooperatives and Rural Development. 2013. Forest Policy. Juba: The Government of Republic of South Sudan. p. 10.

start of the civil war, but are now estimated to have been extensively degraded during the years of conflict. [482]

Non-wood products include shea nut, locally known as "lulu" fruits, fibres, grasses, honey, oils, resins and gums, plus sand, gravel and forest soils. Many non-timber forest products are harvested for local use and to some extent for trade. Gum acacia also constitutes one of the major export products of South Sudan. In Eastern Equatoria, Northern Bahr el Ghazal, Upper Nile, Unity, Jonglei and Warrap States, there is significant unexploited potential for gum trees.[483]

Figure 12-1: Forest cover (trees closed-to-sparse) in South Sudan



12.4 Forest policy and legal framework

12.4.1 Background

In July 2013 the draft Forest Policy 2013 was presented to the National Legislative Assembly of the Government of Republic of South Sudan (GRSS) for its approval. The policy is the first framework forest policy for the new nation of South Sudan, which has been formulated during the period from the Comprehensive Peace Agreement (CPA) in 2005 and through independence in 2011. The policy has been developed in the legal and policy context shown in Table 12-1.

[482] World Bank. 2010. A legal and institutional policy framework for sustainable management of forest resources in Southern Sudan - a policy note. World Bank: Washington D.C.

[483] Republic of South Sudan. 2013. South Sudan Development Initiative 2013-2020 Final draft report. Government of Republic of South Sudan: Juba.

The history of forest management by public authority in South Sudan dates back to early 1900s when the Anglo-Egyptian government[484] passed the Forest Law and Ordinance of 1902 which was premised on policies to ensure sustained production of fuel and sleepers for railway operation and to ensure forest protection and conservation. Although this marks the first attempt to manage and control forest resources by colonial authority, natural and forest resources have long been managed through customary laws and rules by community based traditional authorities. The Central Forests Act of 1932 and the Provincial Forest Act of 1932 provided for (i) establishment and management of central and provincial forest reserves, (ii) development of industrial and non-industrial plantations of fast-growing tree species, and (iii) regulated access by and benefits to forest adjacent communities. The Forest Law and Regulations of 1972 provided for sub-regional (i.e., by Southern Sudan) planning and control. [485] This devolved system was repealed by a 1983 Presidential Decree, and management and control of Central Forest Reserves (CFRs) were returned to the central administration of the Government of Republic of the Sudan[486] (GRS) in Khartoum.

12.4.2 Major policies affecting the Forest Policy 2013

In Southern Sudan the outbreak of civil war in 1983 limited further policy formulation and implementation until the CPA of 2005. During this period the following four major policy and legislation were developed by the government of GRS affected the forestry sector[487]:

1. Adoption of the 1986 forest policy which holds to the present day. The policy gave a mandate for actions related to conservation, sustainable utilization of forest products, promotion of environmental protection and individual and private sector contribution to national afforestation efforts. The policy sets a national target of 20% of total land to be under forest reserves and protected forest.
2. Through Ministerial Order No. 284 of 1986, the Forests National Corporation (FNC) was established to manage Central Forest Reserves in a business-like manner and to provide technical guidance on forestry development throughout the country.
3. Through a Constitutional Order 1994 the government adopted a federal system with 26 states and local governments.
4. A new Forest and Environment Act was introduced in 2003 which applies to the present day. The act ensures sustained environmental services of forests. It provides for a mandatory area of agricultural land which must be forest at least 10% of rain-fed agricultural schemes and at least 5% of irrigated agricultural land must be forest.

12.4.3 Devolution of power and benefit sharing arrangement

The Forest Policy 2013 is consistent with the legal framework adopted by the Transitional Constitution of the Republic of South Sudan 2011. The devolution of powers to and benefit sharing arrangement with state and local governments, among others, are significant characteristics of the legal framework adopted not only by the Transitional Constitution but also by the CPA and the Interim Constitution of Southern Sudan 2005. In the framework, responsibility for managing forests is shared between GRSS and state governments. The equitable sharing and allocation of natural resources and their revenues are based on the constitutional requirement. The framework also recognizes Traditional Authority and customary law which is a major part of the legal system in South Sudan. In line with the devolution of powers, active community participation in forest management is to be

[484] Anglo-Egyptian Sudan referred to the manner by which Sudan was administered between 1899 and 1955, when it was a condominium of Egypt and the United Kingdom.

[485] Ministry of Agriculture, Forestry, Cooperatives and Rural Development. 2013. Forest Policy. Juba: The Government of Republic of South Sudan

[486] Independence on 1 January 1956.

[487] Ministry of Agriculture, Forestry, Cooperatives and Rural Development. 2013. Forest Policy. Juba: The Government of Republic of South Sudan

promoted. Previous forest policies before CPA had focused on government-managed forestry development where communities adjacent to the forests were allowed limited benefits from forests and did not actively participate in management of the forest. On the other hand mobilization of community capacity for sustainable forest management and conservation can be achieved under this new framework. [488]

Table 12-1: Summary of the legal and policy framework for forestry in South Sudan

Legal and policy framework for forestry in South Sudan		Period		
		Pre-CPA*1 (Before Jul. 2005)*2	Southern Sudan AR*3 (Jul. 2005 - Jul. 2011)	Republic of South Sudan (After Jul. 2011)
Constitutional framework	• Constitution of the Republic of Sudan, 1998	Established		
	• The Comprehensive Peace Agreement, 2005		Established	
	• Interim Constitution of Southern Sudan, 2005		Established	
	• Interim National Constitution, 2005		Established	
	• Transitional Constitution of the Republic of South Sudan, 2011			Established
Forest policies	• Forest Policy, 1986	Established	Applicable	Applicable
	• Forest Policy Framework, 2007*4		Established	
	• Forest Policy, 2013			Established
Forest laws	• Woods and Forests Ordinance, 1901	Established	Repealed	
	• Forest Law and Ordinance, 1902	Established	Repealed	
	• Forests Ordinance, 1908	Established	Repealed	
	• Forest Conservation Rules, 1917	Established	Repealed	
	• Central Forests Act, 1932 (CFA 1932)	Established	Repealed	
	• Provincial Forests Act, 1932 (PFA 1932)	Established	Repealed	
	• Forest Law and Regulations, 1972*5	Established	Repealed	
	• Forest Act, 1989*6 (FA 1989)	Established	Repealed?	
	• Forests National Corporation Act, 1989 (FNCA 1989)	Established	Repealed	
	• Forests and Renewable Natural Resources Act, 2002*7	Established		
	• Timber Utilization and Management Act, 2003 (SPLM law)	Established	Not applied	
	• Forest and Environment Act, 2003	Established	Applicable	Applicable
	• Forestry Commission Act, 2004 (SPLM law)	Established	Not applied	
	• Forestry Training Centre Act, 2004	Established		
	• Forestry Bill, 2009 (draft)*8			(draft)
Related policies and laws	• Land Settlement and Registration Act, 1925	Established	Applicable	Applicable?
	• Limitation and Prescription Ordinance, 1928	Established	Applicable	Applicable?
	• Land Acquisition Ordinance, 1930	Established	Applicable	Applicable?
	• Unregistered Lands Act (ULA), 1970	Established		
	• Civil Transactions Act (CTA), 1984*9	Established	Applicable	
	• Local Government Act, 2006			
	• Land Act, 2009		Established	Applicable
	• Land Policy (under preparation)		Established	
	• Customary laws*10	Established	Established	Established
Regulations and executive orders	• Ministerial Order No. 284, 1986*11	Established	Applicable	Applicable
	• Official Circular on the Rule of Law Institutions, 2006*12		Established	
	• Ministerial Decree, 2006*13		Established	
Strategies and plans	• Forest Sector review, 1984-86	Established		
	• Ministry of Agriculture and Forestry Strategic Plan 2007-2011		Established	
	• South Sudan Development Plan 2011-2013 (SSDP)			Established
	• Ministry of Agriculture, Forestry, Cooperatives and Rural Development Strategic Plan 2012-2018 (Draft)			(draft)
	• South Sudan Development Initiative 2013-2020 (final draft)			(draft)

Note: 1) CPA: Comprehensive Peace Agreement. 2) Anglo-Egyptian Sudan (condominium of Egypt and the United Kingdom) period is 1899-1955, and the year of Republic of the Sudan's independence is 1956. 3) AR: Autonomous

[488] Ministry of Agriculture, Forestry, Cooperatives and Rural Development. 2013. Forest Policy. Juba: The Government of Republic of South Sudan. p. 23.

Region. 4) The policy states that 1986 Policy and 1989 Forest Act are still applicable to date. 5) The Act allows sub-regional (i.e. South Sudan) planning and control. The Act was repealed by a 1983 Presidential Decree which returned management and control of Central Forest Reserves to central administration of Khartoum. 6) This Act repeals CFA 1932 and PFA 1932. 7) This Act merges Ministerial Order of 1986, FA 1989 and FNCA 1989. 8) This bill will be finalized once Forest Policy 2013 is approved. 9) This Act replaces ULA of 1970 and declaring that unoccupied and unregistered land is deemed to be government property. 10) Customary law varies from community to community, and is largely oral, unrecorded, and dynamic. 11) This order establishes National Forest Corporation. 12) This circular declares that laws enacted in SPLM-held areas are part of the legal framework. 13) This decree bans illegal logging and prohibited the export of teak and mahogany.
Source: WB. 2010. A legal and institutional policy framework for sustainable management of forest resources in Southern Sudan - a policy note. Washington D.C.:WB
The Republic of South Sudan Ministry of Agriculture and Forestry. 2012. Final Draft of Forest Policy. Juba.
United Nations Environment Programme. 2007. Sudan post-conflict environmental assessment. Nairobi: UNEP.

12.4.4 Forest Policy 2013 and legal framework

The Forest Policy 2013 is a national policy providing a framework for managing forests at all levels across the country. National forest laws and regulations, and state forest policies, laws and regulations will be formulated in conformity with this policy. Because the Forest Policy is approved recently (in July 2013), there are no forest statutes and state policies approved conforming to the Policy. Currently a draft of forestry bill has been prepared conforming to the Policy for further discussion. As shown in Table 12-1 the relevant existing laws and regulations are temporarily applied to allow public service delivery to administer the forestry subsector. These existing laws and regulations may not be fully consistent with the 2013 Forest Policy; also, policy and legal frameworks of other sectors in South Sudan are in the midst of development. This means that effective implementation of the Policy will require more consistent legal and institutional arrangements. Linkage with the Land Act 2009 and customary law

Proper implementation of Forest Policy is dependent on the recognition of rights associated with land and forest resources on the land by all stakeholders concerned. Therefore, administration and management of the forestry subsector require coordination with the policies, laws and institutions governing land. The 2009 Land Act provides for community land to be designated for forestry purposes. This provision, for example, creates uncertainty around forest and land ownership which will cause serious limitation to any investment in forestry development. The effect of these ambiguities is that National Forest Reserves and other public forests are frequently claimed by various stakeholders. This is an important example of institutional issues to be addressed during CAMP development. For the implementation of the Forest Policy integration of customary law and the functions of Traditional Authority with forest resources management needs to be considered. Customary law is sometimes the only regulatory framework for the management of land both for cultivation and pasture. Under communal ownership systems, customary land law plays a central role in dispute resolution and also in general land use.[489]

12.4.5 The Forest Policy 2013

The policy recognizes the importance of forest for commerce, communities, and conservation, and it defines a set of institutional and implementation measures.[490] As indicated in Table 12-2 these core elements for forestry subsector development are reflected in the structure of the policy statements. The forestry subsector part of CAMP will be consistent with this policy structure. To meet South Sudan's development goals, 1) commercial forestry management is important to achieve sustainable national economic growth and development, 2) involvement of communities in forest resources management contributes to improvement of their livelihoods, food security and welfare; and 3) conservation of the natural resource base upon which the people and ecosystems of South Sudan depend contributes to creation of public and global goods and values.

[489] World Bank. 2010. A legal and institutional policy framework for sustainable management of forest resources in Southern Sudan - a policy note. Washington D.C.: World Bank.

[490] Ministry of Agriculture, Forestry, Cooperatives and Rural Development. 2013. Forest Policy. Juba: The Government of Republic of South Sudan. p. 7.

The Forest Policy 2013 identifies strengths and opportunities, and challenges for the forest sector as indicated in Table 12-3. Although the Policy recognizes the very high forestry potential and the opportunities to enhance people's livelihoods in rural areas and to develop sound forest product industries and markets, it also recognizes the challenges that the forestry subsector faces. In order to address the challenges, effective and efficient interventions by the government are justified in the Policy.

Table 12-2: Structure of policy statements of Forest Policy 2013

Contents of policy	
1 Policy goal	The policy aims at ensuring a sufficient and sustained forest resource base and flow of forest goods and services to support livelihoods and socio-economic development for the present generation without compromising this endowment for future generations.
2 Guiding principles	• Consistency with Constitution • Commercial, community and conservation values • Sustainable and equitable management • Conservation of biodiversity • Sustainable forest management • Forest sector growth • Meeting wood demand • Community participation through collaborative management schemes • Partnership among forest stakeholders • Promotion of forest products industries • Strengthening of forestry institutions and services • Commitment to regional and international agreements • Application of best knowledge, information and practices
3 Commercial forestry	1) Development of forest plantations and woodlots; 2) Private sector investment; and 3) Marketing of forest products and services
4 Community forestry and agroforestry	1) Forestry in integrated rural development; and 2) Collaborative forest management
5 Conservation	1) Biodiversity and habitat conservation; 2) Enhanced benefits from forest services; 3) Collaboration with relevant GRSS authorities
6 Institutional arrangements for the forest sector	1) GRSS Ministry responsible for forestry; 2) South Sudan Forest Commission; 3) state governments; 4) Counties, payams, bomas, and communities; and 5) Forestry Development Consultative Forum
7 Implementation	1) Delineation, ownership, and management responsibility; 2) Forest revenue collection; 3) Funding for implementation; 4) Central, state, and local government planning; 5) Human resources development; 6) Effective application of modern science and technology; 7) Inter-agency coordination; 8) Monitoring and evaluation; 9) Prevention and control of wild fires; and 10) Forest Act and implementing legislation

Source: Ministry of Agriculture, Forestry, Cooperatives and Rural Development. 2013. Forest Policy. Juba: The Government of Republic of South Sudan.

Table 12-3: Strength and opportunities and challenges identified in the Forest Policy 2013

Strengths and opportunities and challenges
1. Strength and opportunities 1) Forest resource base; 2) Climate, soils and land forms; 3) Investment potential in the forest sector
2. Challenges for the forest sector 1) Deforestation and forest degradation; 2) Poor forest governance and lack of agreement regarding ownership of forest resources; 3) Forest fires; 4) Charcoal and fuelwood; 5) Limited investment and technology; 6) Linkages with land; and 7) Gender inequality

Source: Ministry of Agriculture, Forestry, Cooperatives and Rural Development. 2013. Forest Policy. Juba: The Government of Republic of South Sudan.

12.4.6 Forestry Bill 2009

A summary of the Forestry Bill 2009 is shown in Table 12-4. Currently, the approval and adoption of the Forestry Law by GRSS is urgently needed; there have been no laws and regulations to manage and enhance forestry subsector in South Sudan since its independence in 2011. This situation is one of major causes of the devastating status of, for example, Central Forest Reserve (CFR) management. The approval of the Forest Policy 2013 in July 2013 should result in the alignment of the Bill with the Policy and accelerate drafting and approval of the Bill. The Bill establishes public forest reserves and rights associated with the reserves. The Bill also defines the establishment of the Southern Sudan Forest Corporation[491] and its functions. Although the Bill establishes ways for communities to participate in public forest management, but the degree of decentralised management is less than that proposed in the Forest Policy 2013. Furthermore, the Bill is silent about private sector involvement in forest management and conservation, and in this regard the Bill needs further alignment with the Policy.

Table 12-4: Summary of Forestry Bill 2009

Chapter and contents
Chapter I - Preliminary provisions 1) Short title and commencement, 2) scope, 3) repeal and saving, and 4) interpretation
Chapter II - Reservation and management of forests 1) Reservation of forests, 2) acquisition of land for reservation, 3) maps of areas declared forest reserves, 5) revocation of reservation, and 6) creation of forests in urban and peri-urban areas.
Chapter III - Southern Sudan Forest Corporation 1) Establishment, 2) functions, 3) board of directors, 4) staff of the Corporation, 5) decentralization of Corporation operations, 6) corporation funds, 7) forest management plans, 8) collaborative forest management, 9) forest concessions, 10) management of indigenous forest and woodlands, 11) mining and quarrying within forests
Chapter IV - Community participation in forest management and protection 1) Establishment of community forestry associations,2)participation in forest management, 3) benefits to community forestry associations, and 4) termination of management agreement.
Chapter V - Enforcement 1) Forest offences, 2) enforcement, and 3) penalties.
Chapter VI - Miscellaneous 1) Subsidiary legislation, rules and guidelines, 2) registry, and 3) international and regional obligations.
Chapter VII - Transitional provisions 1) Repeal, vesting of assets and transfer of liabilities

[491] Southern Sudan Forest Corporation should be read as Sough Sudan Forest Corporation under current circumstances.

12.5 State and local governments engaged in forest management

At state level the Directorate of Forestry is found in a relevant state ministry (usually the ministry of agriculture) and plays a major role in forest resources management. The Directorate deploys Assistant Commissioners of Forestry to county governments in the state. At the county level, Assistant Commissioners are the main actors for on-the-ground delivery of forest management and extension services to address food security, poverty reduction and rural development issues. In the rural setting in South Sudan production and marketing of timber and non-timber forest products are important elements of the coping mechanism of rural communities. Under the supervision and policy guidance of GRSS, the Directorates in the state governments throughout South Sudan perform the following functions:

(1) Implementation of forest policies and regulation of the forestry subsector;
(2) Collection of forestry related revenues;
(3) Conservation and protection of forest resources;
(4) Management and protection of public forest reserves including Central Forest Reserves;
(5) Extension training of agroforestry and afforestation by out-growers;
(6) Enhancement of forest products industries and markets;
(7) Monitoring and supervision of concessionaires; and
(8) Operation of nurseries and sawmills belonging to a forestry directorate for production of tree seedlings and timber products.

12.5.1 Human and physical resources

As shown in Table 12-5 and Figure 12-2 with respect to the major roles assigned to the Directorates, their human, physical, and financial resources are far from sufficient to restore the forest management system. The system has deteriorated due to the long-lasting civil war where significant areas of forest plantations were logged to finance the war. The high priority given to the recovery of the livelihoods of war-affected populations after the CPA, and the growing markets and demand for forestry products such as charcoal, fuelwood, logs and timbers, resulted in the rapid degradation of natural and plantation forests and unregulated conversion of forest land for agriculture.

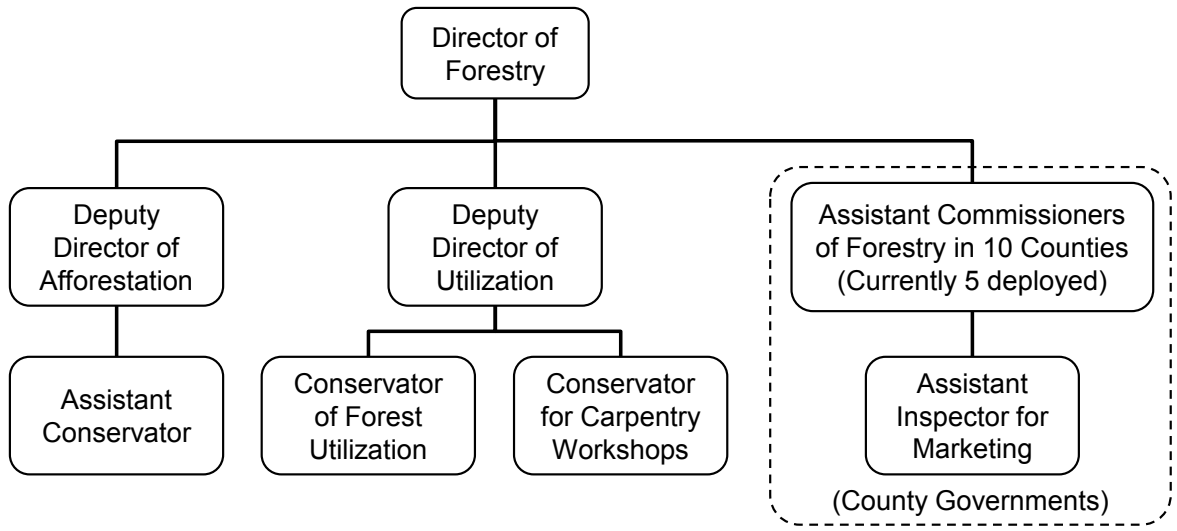
For example, state Directorates in Western Equatoria and Eastern Equatoria States, both of which are endowed with rich forest resources and high forestry production potential, deploy 17 and 19 forest officers, respectively. In terms of the mobility necessary to conduct forest management and revenue collection functions in these states properly, each Directorate operates only one car. The situation is even worse in Greater Bahr el Ghazal and Greater Upper Nile Regions where widespread destruction and encroachment of the forest reserves and degradation of natural forests are serious problems. However, there are only 5 to 8 forest officers in each state to regulate and enhance the forestry subsector in Warrap, Northern Bahr el Ghazal, Western Bahr el Ghazal, and Lakes states.

Table 12-5: Human and physical resources of state Forestry Directorates interviewed

State	Upper Nile State	Warrap State	Northern Bahr el Ghazal State	Western Bahr el Ghazal State	Lakes State	Western Equatoria State	Central Equatoria State	Eastern Equatoria State
1. Name and year of establishment								
1) Name of state ministry to which forest department belongs	(TBD)	(TBD)	State Ministry of Agriculture and Forestry	State Ministry of Agriculture, Forestry and Livestock	(TBD)	State Ministry of Agriculture, co-operatives and Environ-ment	(TBD)	(TBD)
2) Name	(TBD)	Directorate of Forestry	Directorate of Forestry	Directorate of Forestry	Directorate of Forestry	Directorate of Forestry	(TBD)	Directorate of Forestry
3) Year of establishment	(TBD)	2006	1971	1953	2006	2006	(TBD)	1940s
2. Human resources								
1) Officers								
Director level	(TBD)	1	1	1	1	1	(TBD)	1
Deputy/assistant director level	(TBD)	0	1	3	2	4	(TBD)	5
Inspector/conservator level	(TBD)	3	2	2	4	11	(TBD)	6
Forest ranger/guard level	(TBD)	1	3	2	0	1	(TBD)	7
Total number of officers	(TBD)	5	7	8	7	17	(TBD)	19
5) Temporary staff/casual labour	(TBD)	45	11	128	66	72	(TBD)	106
Total number of human resources	(TBD)	50	18	136	73	89	(TBD)	125
3. Asset and equipment								
1) Car	(TBD)	0	1	2	1	1	(TBD)	1
2) Lorry	(TBD)	0	1	0	0	0	(TBD)	1
3) Tractor	(TBD)	0	1	0	0	0	(TBD)	1
2) Motorcycles	(TBD)	0	2	0	1	0	(TBD)	1
4) Buildings	(TBD)	1	2	1	1	1	(TBD)	1
5) Sawmill	(TBD)	0	1	0	0	0	(TBD)	0

Source: CAMP Task Team

Figure 12-2: Organogram of Directorate of Forestry, Western Equatoria State Government



Source: Directorate of Forest, Western Equatoria State

12.5.2 Financial resources and revenue collection

As shown in Table 12-6 the budget sources for a state Directorate of Forestry are the conditional transfer from the then Ministry of Agriculture, Forestry, Cooperatives and Rural

Development (MAFCRD), GRSS, the state's own revenue sources, and external sources such as DPs and NGOs. In general, major expenditures incurred by state Directorates of Forestry are 1) salaries, 2) capital development, 3) purchase of vehicles and equipment, 4) nursery establishment and operation, and 5) other operation costs such as costs of fuel, consumables, and maintenance services.

The amounts and types of conditional transfers, particularly from MAFCRD to each state Ministry of Agriculture where the Directorate of Forestry belongs are shown in Table 12-7 Whereas the values of the conditional transfers for operating and capital expenditures are uniform among the 10 states, the transfers to cover salaries of officers in the state ministries vary significantly due to the large difference in numbers of officers supported by the GRSS transfers. The largest amounts of conditional transfers to cover salaries of state officers including forest officers (i.e. forest guards for the protection of Central Forest Reserves) are provided to Central Equatoria and Western Equatoria states. However, according to state officers such funds were never recognized nor applied to engage forest guards for the protection of CFRs.

State Directorates of Forestry collect fees and revenues shown in Table 12-6. Particularly, licence and permit fees, and rates on forestry products indicated in Table 12-8 are important revenue sources for state governments. Responsibility to collect these fees is given to the Directorate of Forestry. However, their consolidation as state revenue and allocation of the revenue to the Directorate is the responsibility of the state revenue authorities. To enhance forestry services and forest resources by the Directorates, there is a regulatory arrangement that a set percentage (usually 40%) of the collected fees by the Directorates is to be allocated as a part of their annual budget. However, according to state forestry officers, this arrangement not normally respected and no budget is allocated regardless of the amount they collect. Further, budgets for operations and capital investments are not generally executed due to insufficient state revenues to cover budgeted costs.

12.5.3 Issues of revenue collection by Directorate of Forestry

Table 12-8 indicates that an extensive range of forest products are subject to fees. However, these products are ubiquitous, commonly produced, traded and consumed in rural settings in South Sudan. It is impractical to perform fair and complete revenue collection according to the regulations and rate list. Field observation indicates that such fee collection can only be fair and complete at the enclosures officially assigned to forest products wholesalers and retailers, for registered business entities, and well organized checkpoints where all transported forest products can be captured.

Table 12-6: Budget sources of and revenue collection by Directorates of Forestry

Budget sources	Revenue collection responsibilities/opportunities
1) Governments' sources • Conditional transfer from the then Ministry of Agriculture, Forestry, Cooperatives, and Rural Development, GRSS • State revenue sources 2) External sources (DPs/NGOs) • e.g. UNEP 5,500USD in 2011 in Eastern Equatoria State • e.g. NPA 92,000SSD in 2011 in Eastern Equatoria State	• License and permit fees • Rates on forestry products • Sale of forestry products • Sale of tree seedling and agricultural crops

Source: CAMP Task Team

Table 12-7: Conditional transfers from GRSS to state ministries of agriculture

States \ Budget items	Personnel	Conditional transfers in SSP				Conditional transfers in USD at 3SSP/USD				
		Salaries (SSP)	Operating (SSP)	Capital (SSP)	Total (SSP)	Salaries /month /staff (USD)		Operating (USD)	Capital (USD)	Total (USD)
Ministry of Agriculture, Forestry, Cooperatives and Rural Development										
General Administration										
Ministers Office, admin and finance (Agriculture and forestry)										
Upper Nile			219,646	409,937	629,583			73,215	136,646	209,861
Jonglei	12	208,956	219,646	409,937	838,539	69,652	484	73,215	136,646	279,513
Unity	63	832,115	219,646	409,937	1,461,698	277,372	367	73,215	136,646	487,233
Warrap	14	206,220	219,646	409,937	835,803	68,740	409	73,215	136,646	278,601
Northern Bahr El-Ghazal	97	1,441,716	219,646	409,937	2,071,299	480,572	413	73,215	136,646	690,433
Western Bahr El-Ghazal	2	40,920	219,646	409,937	670,503	13,640	568	73,215	136,646	223,501
Lakes	7	134,086	219,646	409,937	763,669	44,695	532	73,215	136,646	254,556
Western Equatoria	116	964,656	219,646	409,937	1,594,239	321,552	231	73,215	136,646	531,413
Central Equatoria	327	2,945,439	219,646	409,937	3,575,022	981,813	250	73,215	136,646	1,191,674
Eastern Equatoria	38	490,812	219,646	409,937	1,120,395	163,604	359	73,215	136,646	373,465
Total	676	7,264,920	2,196,460	4,099,370	13,560,750	2,421,640	401	732,153	1,366,457	4,520,250

Source: Republic of South Sudan. 2012. Approved budget 2012/13. Juba: Republic of South Sudan. p. 37.

However, due to the limited capacity and mobility of forestry officers, fee collection is assumed to be sporadic and inefficient with room for evasion, and so, not fair. It should be considered that the forest revenue system is unworkable, despite the fact that the 2004 Timber Utilization Act and the 2004 Forestry Commission Act were enacted to ensure the forest fiscal system was efficient and effective. The reasons contributing to this deplorable state include: (a) low collection capacity; (b) poor accounting and failure by revenue collection staff to remit what little is collected to the GRSS or state treasury; (c) confusion about who actually has responsibility for revenue collection; (d) lack of coordination among the collection entities; (e) unrealistically low prices, fees, and rate levels that were set and that failed to consider the cost elements related to management, production/protection, transportation, and product processing; and (f) the lack of clarity on how revenues were to be shared among the actors[492].

Interviews with producers, traders, timber dealers, wholesalers, and retailers indicate that they do not receive any public services nor experience a better business environment as a result of their fee payments. Their perception of poor accountability by the government, unfair rates and fee collection, and an excessive list of items for fee collection are likely to hamper development of productive, fair and competitive forest products industries and markets.

Table 12-8: Rates schedule for forestry products in Western Equatoria State

Category	Range of rate
1. Building pole	
1.1 Teak pole (small to heavy)	6 to 12 SSP/pole
1.2 Pole of various tree species (small to heavy)	3 to 10 SSP/pole
2. Fencing pole	
2.1 Fencing pole of teak (light to heavy)	4 to 8 SSP/pole
2.2 Fencing pole of cassia (light heavy)	4 to 8 SSP/pole
2.3 Fencing pole of various tree species (light to heavy)	3 to 6 SSP/pole
3. Forked pole	
3.1 Forked pole of various tree species (Light to heavy)	5 to 8 SSP/pole
4. Charcoal and fuelwood	
4.1 Charcoal (bag)	2 SSP/bag
4.2 Fuelwood (bundle to full lorry)	1 to 60 SSP/bundle to full lorry
5. Furniture	
5.1 Table (tea table to large tables)	1 to 15 SSP/piece
5.2 Chair (reclining chair to executive chair)	3 to 30 SSP/piece
5.3 Bed (local bed to double bed)	5 to 25 SSP/piece
5.5 Cupboard (single to double cupboard)	10 to 20 SSP/piece

[492] World Bank. 2010. A legal and institutional policy framework for sustainable management of forest resources in Southern Sudan - a policy note. Washington DC: World Bank.

Category	Range of rate
5.6 Door and window frame	10 to 15 SSP/piece
5.7 Other locally manufactured wood products (cloth stands, mortars, bee hives, wooden bowls, etc.)	1 to 10 SSP/piece
6. Timber	
6.1 Timber to be transported within the State	2 to 4 SSP/piece
6.2 Timber to be transported out of the State	3 to 5 SSP/piece
7. Non-wood products	
7.1 Natural honey	1 to 15 SSP/bottle to jerry can
7.2 Lulu (shea butter)	1 to 20 SSP/bottle to jerry can
7.3 Palm oil	1 to 5 SSP/bottle to jerry can
7.4 Bamboo	2 SSP/10 pieces
7.5 Wild fruit, basket, mats, reed, roofing, papyrus, etc.	1 to 2 SSP/unit
8. Installation of sawmills	
8.1 Registration for sawmills	2,000 SSP/sawmill
8.2 Renewal fees every year	1,000 SSP/sawmill
9. Acquisition of chainsaw	
9.1 Registration for chainsaw	1,000 SSP/chainsaw
9.2 Renewal fee every year	500 SSP/chainsaw

Source: Directorate of Forest, West Equatoria State Government. 2013.

12.6 Public forest reserves

12.6.1 Categories of public forest reserves

Currently two categories of public forest reserves are recognized: Central Forest Reserves (CFRs) formerly owned and managed by the Government of Republic of the Sudan (GRS) before CPA; and Provincial Forest Reserves (PFRs) formerly owned and managed by the provincial governments of the Republic of the Sudan before CPA. The establishment and management of CFRs and PFRs are determined by Central Forests Act 1932 and Provincial Forests Act 1932, respectively. However, the Forest Policy 2013 of the GRSS introduced a new decentralized system of public forest reserve management, and legislation relevant to the Policy for the operationalization of the new system are expected to be approved by the GRSS and state governments soon.

The Forest Policy 2013 provides ownership and management responsibilities of public forest reserves throughout South Sudan. As shown in Table 12-9 four categories of permanent forest estates (PFEs) publicly owned and managed are recognized as public forest reserves by the Policy in addition to privately held forests. The Policy determines the conversion of all previously determined Central Forest Reserves (CFRs) and Provisional Forest Reserves (PFRs) to National Forest reserves (NFRs) owned by GRSS and State Forest Reserves (SFRs) owned by state governments. The Policy also grants power to establish County Forest Reserves (new CFRs) to counties and Community Forests (CFs) to payams and bomas. GRSS, state governments, counties, payams, and bomas are able to delineate and gazette forests as NFRs, SFRs, CFRs and CFs to achieve 20% of land area being covered by forests.[493]

Table 12-9: Categories of permanent forest estates (PFEs)

No.	Current category	New categories of PFEs recognized by Forest Policy 2013	
		New category	Delineation, ownership and management
1	Central Forest Reserve (CFR)	National Forest Reserve (NFRs)	• Previously gazetted CFRs will be converted to NFRs. • NFRs are to be delineated, gazetted and owned by GRSS. • NFRs can be spread across state boundaries. • NFRs are to be managed by GRSS in partnership with State governments and other stakeholders.
2	Provincial Forest Reserves	State Forest Reserve (SFR)	• Previously gazetted PFRs will be converted to SFRs. • SFRs are to be delineated, gazetted and owned by state governments. • SFRs are to be managed by state governments with technical support

[493] MAFCRD. 2013. Forest Policy 2013. Juba: GRSS. p. 31.

No.	Current category	New categories of PFEs recognized by Forest Policy 2013	
		New category	Delineation, ownership and management
	(PFR)		and supervision by GRSS. • State governments have responsibility for implementing the relevant policy, legal and regulatory frameworks of SFRs.
3	does not exist	County Forest Reserve (new CFR)	• New CFRs are to be delineated, gazetted and owned by county councils. • New CFRs are to be managed by county councils with technical support, capacity building and supervision from state governments and GRSS • State governments will set forest policy for new CFRs to be administered by county councils.
4	does not exist	Community Forest (CF)	• Communities will delineate and gazette forest in their communal land to be managed as CFs at the boma and payam levels of governemnt. • Designation will be done pursuant to the requirements of the Land Act 2009 for designating community lands including lands for forestry, agriculture and other uses. • CFs are to be managed by communities with technical support and supervision from state governments and GRSS. • GRSS will develop the policy framework and regulations governing CFs. • State governments will have the primary responsibility of enforcement of laws and regulations governing CFs.
5	Privately held forests	Privately held forests	• Privately held forests shall be governed by legislation and regulations set by the state government. • State governments will have primary responsibility to enforce conservation requirements and other standards applying to privately held forests.

Source: MAFCRD. 2013. Forest Policy 2013. Juba: GRSS. pp. 32-33.

12.6.2 Community Forests (CFs) and enabling legal environment for their establishment

Designation of Community Forests (CFs) can be done following the requirements provided in the Land Act 2009. According to the provisions of the Land Act 2009, traditional authorities[494] and rural communities are given rights to claim ownership of land which is less than 250 feddans (105 ha) whereas for land larger than 250 feddans the administrative authorities are given to the state governments. However, until 2012 no claim by states, traditional authorities or rural communities was made. A USAID supported project, implemented in Western Equatoria began campaigning to notify communities that such rights existed. According to a lawyer[495] one of the challenging issues for drafting related legislations for the establishment and management of CFs, is the multiple levels of government authorities involved. Since there are six government and administrative layers, the establishment of appropriate mechanisms to handle CFs requires careful assessment of the social, economic, and cultural dimensions of South Sudan. It was also noted by the CAMP Task Team that the fundamental legal challenges is the way the Transitional Constitution defines the devolution of power to the state governments; therefore, the GRSS is considering constitutional amendments to address this and is hoping to have an new policy by 2015.[496]

12.6.3 Central Forest Reserves

Currently CFRs and PFRs are existing categories of publicly owned permanent forest estates (PFEs). Due to better availability of primary and secondary information on CFRs than PFRs, results of the situation analysis on CFRs are presented in this report. Since records and accounts regarding PFRs are scarce at GRSS, state and local government levels, further investigation on PFRs is needed.

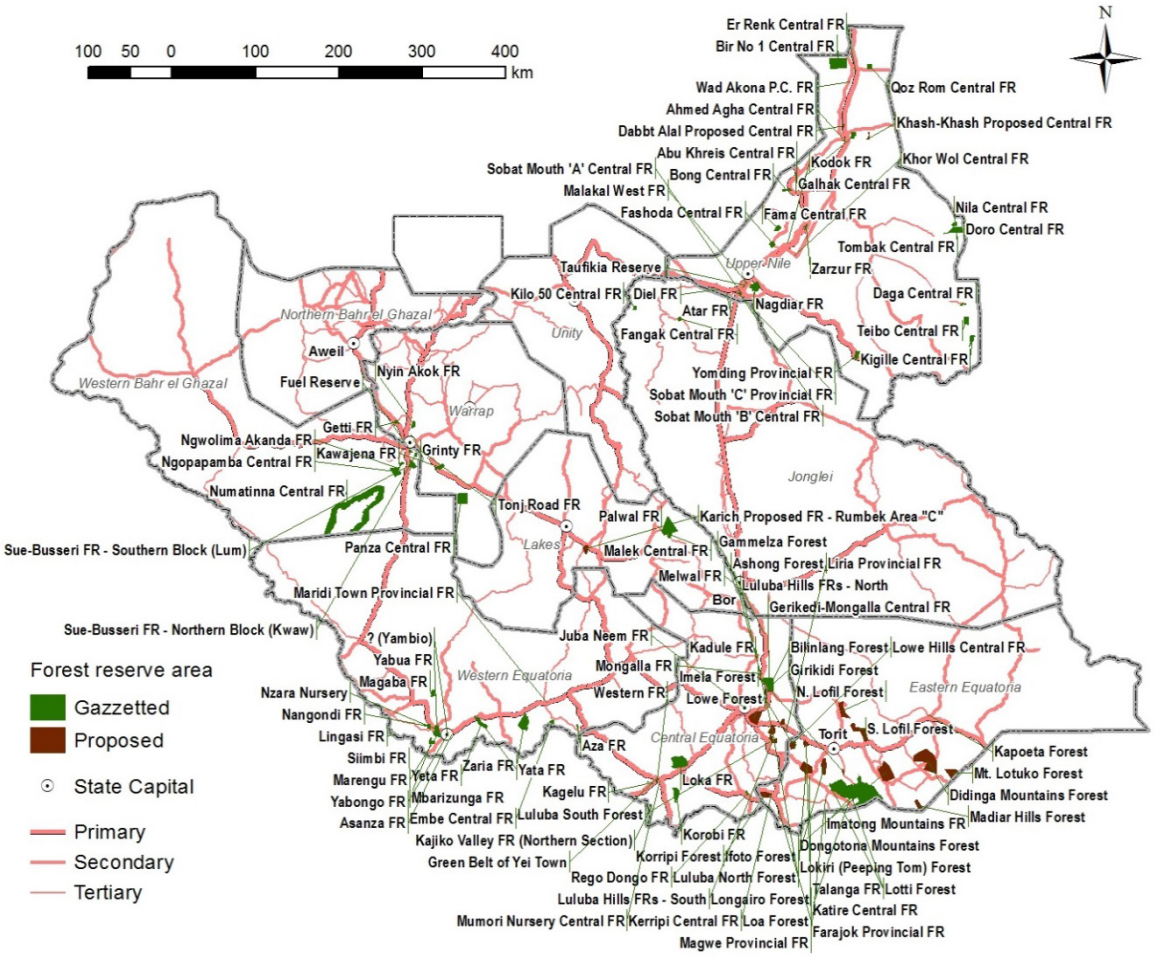
[494] "Traditional Authority" means a body of traditional community with administrative jurisdiction within which customary powers are exercised by traditional leaders on behalf of the community as stipulated in Articles 166 and 167 of the Transitional Constitution of the Republic of South Sudan.

[495] Interview conducted during the CAMP Situation Analysis

[496] Based on an interview held with a land lawyer in September 2012.

All public forest reserves were gazetted by the governments of Anglo-Egyptian Sudan (1899 - 1955) and the Republic of the Sudan (1956 - 2005) before the signing of the CPA. The first public reserve forest was gazetted in 1918.[497] To understand the current situation of the CFRs, the lists of CFRs and forest plantations found in the annexes of the Forest Policy 2013, and the preliminary inventory information in the form of the geographical information system (GIS) dataset obtained from the Land Resource Survey and Information Centre (LRSIC), were examined. Based on the dataset Figure 12-3 was constructed to indicate the locations of the CFRs. Field visits to selected CFRs and plantations by CAMP TT team contributed to understanding the seriously depleted resource base and lack of management of CFRs.

Figure 12-3: Locations of Central Forest Reserves in South Sudan



Source: Land Resource Survey and Information Centre (LRSIC), MAFCRD. 2013. GIS dataset. Juba: GRSS.

[497] Interview with officials of Kagelu Forestry Training Centre. September 2012.

Table 12-10: Reserved Forests within the category of Central Forest Reserve

State / County	Name of forest reserves (FRs)[*1]	Gazetted date	Gazette number	Area (Feddan)	Area (Ha)	Note
Upper Nile						
Renk	Ahmed Agaha (Ahmed Agha Central FR)[*5]	(TBC)	(TBC)	1,242	522	
Renk	Renk C.R. (Er Renk Central FR)	15/11/1957	914	234	98	
Renk	Goz-Rom (Qoz Rom Central FR)	18/06/1968	914	234	98	
Manyo	Bir C.R. (Bir No 1 Central FR)	(TBC)	970	59,499	24,990	
Manyo	Wad Akona (Wad Akona P.C. FR)	15/11/1957	980	627	263	
Fashoda	Kodok C.R. (Kodok FR)	15/02/1963	980	123	52	
Melut	Abu Khries (Abu Khreis Central FR)	(TBC)	(TBC)	3,356	1,410	
Melut	Zar-zur C.R. (Zarzur FR)	15/08/1950	819	3,874	1,627	
Maban	Khor Tumbak (Tombak Central FR)	15/01/1953	1004	22,500	9,450	
Baliet	Khor-wol (Khor Wol Central FR)	15/05/1959	433	12,800	5,376	
Panyikang	Malakal West (Malakal West FR)	15/01/1953	851	250	105	
Panyikang	Tawfigia (Taufikia Reserve)[*5]	15/01/1953	851	2,365	993	
FRs count	12		Sub-total	107,104	44,984	
Jonglei						
Canal (Khor Fulus)	Atar C.R. (Atar FR)	15/01/1953	851	238	100	
Canal (Khor Fulus)	Diel C.R. (Diel FR)	15/11/1957	851	254	107	
Canal (Khor Fulus)	Sobat (A) (Sobat Mouth 'A' Central FR)	15/12/1957	815	156	66	
Canal (Khor Fulus)	Sobat (B) (Sobat Mouth 'B' Central FR)	15/12/1957	913	3,224	1,354	
Canal (Khor Fulus)	Sobat (C) (Sobat Mouth 'C' Provincial FR)	05/02/1961	(TBC)	4,170	1,751	
FRs count	5		Sub-total	8,042	3,378	
Unity (no record identified)						
Warrap (no record identified)						
Northern Bahr el Ghazal (no record identified)						
Western Bahr el Ghazal						
Jur River	Gette (Getti FR)[*5]	15/10/1950	821	5,289	2,221	
Jur River	Khor-Abong[*5]	15/03/1951	827	11,888	4,993	
Jur River	Khor-Grinty (Grinty FR)	15/10/1950	821	8,285	3,480	
Jur River	Kuajena (Kawajena FR)	12/12/1955	889	10,869	4,565	
Jur River	Nyin-Akok (Nyin Akok FR)[*5]	15/10/1950	821	8,485	3,564	
Jur River	Tonj No.1 (Tonj Road FR)[*5]	15/12/1951	837	3,225	1,355	
Bagave	Dokorongo[*5]	12/12/1954	873	4,100	1,722	
Bagave	Namatina (Numatinna Central FR)	15/06/1953	856	610,236	256,299	
Bagave	Ngohalima/Akanda (Ngwolima Akanda FR)	15/10/1930	811	10,645	4,471	
Bagave	Nyalero[*5]	15/12/1954	873	17,300	7,266	
FRs count	10		Sub-total	690,322	289,935	
Lakes (no record identified)						
Western Equtoria						
Tambura	Riwa- 1	(TBC)	(TBC)	848	356	
Tambura	Riwa- 2	(TBC)	(TBC)	(TBC)	(TBC)	
Nzara	Ringasi (Lingasi FR)	15/10/1953	847	6,700	2,814	ETC (2012)[*3]
Nzara	Magada (Magaba FR)	15/10/1950	821	5,564	2,337	ETC (2012)[*3]
Nzara	Mbari-zunga (Mbarizunga FR)	15/03/1951	837	19,900	8,358	ETC (2012)[*3]
Nzara	Nangundi (Nangondi FR)	15/10/1952	947	(TBC)	(TBC)	ETC (2012)[*3]
Nzara	Nzara (Nzara Nursery)	15/10/1950	821	10,020	4,208	
Nzara	Simbi (Siimbi FR)	15/10/1952	847	17,700	7,434	
Nzara	Yabua (Yabua FR)[*5]	15/12/1950	824	10,189	4,279	ETC (2012)[*3]
Ezo	Bangangai	(TBC)	(TBC)	(TBC)	(TBC)	
Ezo	Marunyo	(TBC)	(TBC)	1,040	437	
Yambio	Asanza.C. (Asanza FR)[*5]	15/10/1950	821	497	209	BLL (2009)[*4]

Table 12-10: Reserved Forests within the category of Central Forest Reserve (cont.)

State / County	Name of forest reserves (FRs)[*1]	Gazetted date	Gazette number	Area (Feddan)	Area (Ha)	Note
Yambio	Marangu (Marengu FR)	15/10/1950	847	13,550	5,691	
Yambio	Yabongo.C. (Yabongo FR)[*5]	15/12/1950	824	843	354	BLL (2009)[*4]
Yambio	Yatta.C. (Yata FR)[*5]	15/03/1953	851	19,500	8,190	
Ibba	Zaria (Zaria FR)[*5]	15/12/1950	824	41,774	17,545	BLL (2009)[*4]
Ibba	Zumbi	(TBC)	14774	14,774	6,205	SEL (2009)[*2]
Maridi	Azza (Aza FR)	15/03/1950	811	1,763	740	
Maridi	Embe (Embe Central FR)[*5]	10/02/1959	(TBC)	8,270	3,473	
FRs count	19		Sub-total	172,932	72,631	
Central Equatoria						
Terekeka	Kadule (Kadule FR)	15/11/1951	(TBC)	335	141	
Juba	Girikidi (Girikidi Forest)[*5]	(TBC)	(TBC)	20,680	8,686	
Juba	Jebel Korok	15/02/1964	(TBC)	250	105	
Juba	Lulubo North (Luluba Hills FRs - North)	15/10/1956	(TBC)	10,768	4,523	
Juba	Lulubo South (Luluba Hills FRs - South)	15/10/1956	(TBC)	10,200	4,284	
Juba	Mangalla (Mongalla FR)	15/11/1948	(TBC)	1,134	476	
Juba	Rejaf East	(TBC)	(TBC)	10	4	
Lainya	Loka West (Loka FR)[*5]	15/01/1950	(TBC)	54,078	22,713	CETC (2008)[*6]
Yei	Kagelu (Kagelu FR)[*5]	15/01/1950	(TBC)	2,305	968	
Yei	Kajiko North (Kajiko Valley FR)[*5]	15/12/1953	862	11,678	4,905	CETC (2008)[*6]
Yei	Korobe (Korobi FR)[*5]	(TBC)	(TBC)	5,055	2,123	CETC (2008)[*5]
Yei	Momury (Mumori FR)[*5]	15/07/1952	844	220	92	
Morobo	Kajiko South[*5]	15/04/1965	862	13,340	5,603	
Kajo Keji	Kajo Kaji (Kajo-Keji FR)[*5]			4,660	1,957	
FRs count	14		Sub-total	134,713	56,579	
Eastern Equatoria						
Torit	Immella (Imela FR)[*5]	15/08/1955	3150	884	371	
Torit	Lerwa (Lowe Forest)		176	(TBC)	(TBC)	
Ikotos	Imatong/Gilo (Imatong Mountains FR)[*5]	15/03/1952	304-207	840	353	
Ikotos	Katire (Katire Central FR)[*5]	15/08/1951	31	833	350	
Magwi	Kereppi (Kerripi Central FR)	(TBC)	500	713	299	
Magwi	Palwak	(TBC)	182	(TBC)	(TBC)	
Magwi	Shukole (Shukoli FR)[*5]	(TBC)	2447	(TBC)	(TBC)	
Magwi	Vukadi	(TBC)	25	(TBC)	(TBC)	
FRs count	**8**		**Sub-total**	**3,270**	**1,373**	
Total FRs count	**68**		**Total area**	**1,116,383**	**468,881**	

Note: 1) Forest reserve names indicated in the Forest Policy are presented, and names in parentheses are used by Land Resource Survey and Information Centre (LRSIC), Directorate of Forestry, MAFCRD. 2) Concession on teak plantation management was granted to Sercham Equatorial Limited (SEL) in 2009. 3) Concession on teak plantation management was granted to Equatoria Teak Company (ETC) in 2012. 4) Concession on teak plantation management was granted to Blue Lakes Limited (BLL) in 2009. 5) Visited by CAMP forestry subsector team during situation analysis. 6) Concession on teak plantation management was granted to Central Equatoria Teak Company (CETC) in 2008. 6) Land Resource Survey and Information Centre (LRSIC), Directorate of Forestry, MAFCRD.

Source: Ministry of Agriculture, Forestry, Cooperatives and Rural Development. 2009. *Forest Policy 2013*. Juba: GRSS and LRSIC. 2013. GIS dataset. Juba: GRSS.

Table 12-11: Under Reservation forests within the category of Central Forest Reserve

State / County	Name of forest reserves (FRs)[*1]	Gazetted date	Gazette number	Indicative area[*1] (Feddan)	Indicative area[*1] (Ha)	Note
Upper Nile						
Renk	Dabbt Alal Proposed Central FR	proposed		1,767	742	
Renk	Galhak Central FR			10,999	4,620	
Renk	Khash-Khash Proposed Central FR	proposed		4,654	1,955	
Manyo	Bong Central FR			7,266	3,052	
Fashoda	Fama Central FR			11,248	4,724	
Fashoda	Fashoda Central FR			9,169	3,851	
Maban	Doro Central FR			1,502	631	
Maban	Nila Central FR			7,065	2,967	
Maiwut	Kigille Central FR			11,404	4,790	
Maiwut	Teibo Central FR			13,461	5,654	
Longochuk	Daga Central FR			4,553	1,912	
Ulang	Yomding Provincial FR			11,813	4,961	
Panyikang	Nagdiar FR			22,767	9,562	
FRs count	13		Sub-total	117,668	49,421	
Jonglei						
Fangak	Fangak Central FR			4,644	1,951	
Fangak	Kilo 50 Central FR			5,269	2,213	
Bor South	Melwal FR			343	144	
FRs count	3		Sub-total	10,257	4,308	
Unity (no record identified)						
Warrap						
Tonj South	Panza Central FR			48,300	20,286	
FRs count	1		Sub-total	48,300	20,286	
Northern Bahr el Ghazal (no record identified)						
Western Bahr el Ghazal						
Jur River	Sue-Busseri FR - Northern Block (Kwaw)			3,858	1,620	
Jur River	Sue-Busseri FR - Southern Block (Lum)			14,738	6,190	
Wau	Fuel Reserve			3,041	1,277	
Wau	Ngopapamba Central FR			20,167	8,470	
FRs count	4		Sub-total	41,804	17,558	
Lakes						
Rumbek East	Karich Proposed FR - Rumbek Area "C"	proposed		13,157	5,526	
Yirol East	Malek Central FR			7,672	3,222	
Yirol East	Palwal FR			58,260	24,469	
FRs count	3		Sub-total	79,090	33,218	
Western Equtoria						
Yambio	? (Yambio)			254	107	
Yambio	Yeta FR			20,214	8,490	
Maridi	Maridi Town Provincial FR			644	270	
FRs count	3		Sub-total	21,111	8,867	
Central Equatoria						
Terekeka	Gammelza Forest	proposed		976	410	
Juba	Ashong Forest	proposed		848	356	
Juba	Bilinlang Forest	proposed		42,020	17,648	
Juba	Gerikedi-Mongalla Central FR			40,110	16,846	
Juba	Juba Neem FR			322	135	
Juba	Liria Forest	proposed		432	182	
Juba	Liria Provincial FR			172	72	
Juba	Luluba North Forest	proposed		15,398	6,467	
Juba	Luluba South Forest	proposed		13,090	5,498	
Juba	Malogan Forest	proposed		7,821	3,285	

Table 12-11: Under Reservation forests within the category of Central Forest Reserve **(cont.)**

State / County	Name of forest reserves (FRs)[*1]	Gazetted date	Gazette number	Indicative area[*1] (Feddan)	Indicative area[*1] (Ha)	Note
Yei	Eastern FR			607	255	
Yei	Green Belt of Yei Town			305	128	
Yei	Mumori Nursery Central FR			229	96	
Yei	Western FR			643	270	
Kajo Keji	Rego Dongo FR			4,969	2,087	
FRs count	15		Sub-total	127,943	53,736	
Eastern Equatoria						
Torit	Ifoto Forest	proposed		22,757	9,558	
Torit	Imela Forest	proposed		2,991	1,256	
Torit	Lokiri (Peeping Tom) Forest	proposed		35,759	15,019	
Torit	Longairo Forest	proposed		9,097	3,821	
Torit	Lowe Hills Central FR			15,853	6,658	
Torit	S. Lofil Forest	proposed		38,343	16,104	
Torit	Talanga FR			11,691	4,910	
Torit	Torit Town FRs			540	227	
Lopa	N. Lofil Forest	proposed		31,694	13,311	
Kapoeta South	Kapoeta Forest	proposed		199	84	
Budi	Didinga Mountains Forest	proposed		114,392	48,044	
Budi	Mt. Lotuko Forest	proposed		32,009	13,444	
Ikotos	Dongotona Mountains Forest	proposed		68,628	28,824	
Ikotos	Madiar Hills Forest	proposed		18,200	7,644	
Magwi	Farajok Provincial FR			86	36	
Magwi	Korripi Forest	proposed		16,699	7,014	
Magwi	Loa Forest	proposed		311	130	
Magwi	Lotti Forest			4,251	1,785	
Magwi	Magwe Forest	proposed		357	150	
Magwi	Magwe Provincial FR			80	34	
FRs count	20		Sub-total	423,936	178,053	
Total FRs count	**62**		**Total area**	**870,109**	**365,446**	

Note: 1) Areas of forest reserves are calculated from polygon data and are not accurate measurements.

According to the Forest Policy 2013 there are 121 CFRs with a total area of 1,205,686 ha. CFRs include 72 Reserved Forests and 49 Under Reservation forests with a total area of 726,778 ha and 442,908 ha, respectively.[498] Reserved Forests and Under Reservation are the sub-categories of CFRs. Details of Reserved Forests are shown in Table 12-10 and those of Under Reservation are presented in Table 12-11. Against the numbers mentioned in the Forest Policy 2013, 72 Reserved Forests and 49 Under Reservation forests, 68 of the former and 62 of the latter were identified from the sources from LRSIC. There are one proposed CFR in the category of Reserved Forest and 24 proposed CFRs in the category of Under Reservation forest.

Examination of such information sources indicates the inconsistency and incompleteness of the CFR inventories maintained by MAFCRD. It was noted that access to the inventories of forest reserves in South Sudan maintained by the Government of the Republic of the Sudan (GRS) was limited. Inconsistencies and missing information, such as the name of CFRs, gazetted dates and numbers, precise locations and areas, and detailed descriptions of each CFR were partly consequences of the limited access to the reserve forest inventories kept by the GRS.

[498] Total number of Reserved Forests and Under Reservation forests cited in the Forest Policy is 76 and 49, respectively, whereas the identified total numbers of Reserved Forest shown in Table 12-10 and Under Reservation forests shown in Table 12-11 are 68 and 62, respectively. These totals are not reconciled and therefore further collection of and examination on information regarding CRFs will be required.

12.6.4 Forest plantations in Central Forest Reserves

Table 12-12 summarizes forest plantations occurring in South Sudan. The main references used to construct this table are the annexes of the Forest Policy 2013 which also identifies teak (*Tectona grandis*) as a major plantation species. By cross checking with other information sources, errors identified in the annexes were corrected. The Policy indicates that the total teak plantation area is 70,160 ha of which 20,000 ha is considered to be good quality. In contrast, the cross checked data presented in the table provides the total teak plantation area as 36,548 ha. Because the forest plantation inventory dataset seems to be prone to errors, further verification of the dataset is recommended to establish a consistent, complete and accurate set of information representing the current situation of forest plantations.

12.6.4.1 Brief historical background and breakdown of CFR management

The establishment of teak plantations began in 1945[499] by the Anglo-Egyptian administration in Sudan. Plantation development was continued by the government forestry administration, and by the mid-1970s, plantations totalled around 16,000 ha of hardwoods and 500 to 600 ha of softwoods in the Republic of the Sudan. Most of the remaining plantations are found in Central, Eastern and Western Equatoria States in South Sudan. Main plantation species are teak plus coniferous species in the higher elevations of the Imatong Mountains.[500]

In the 1980s management of teak plantation in Southern Sudan had deteriorated due to the escalation of the Second Sudanese Civil War. For example, a GIZ (then GTZ) supported forestry project managing the teak plantations in Yei River County was shut down in 1987 due to the intensification of the civil war. During the civil war, all of the teak plantations were subject to uncontrolled felling and export to Uganda. It was said that the entire process was managed in the informal market by foreign-owned logging companies.[501] The management of CFRs, as well as the forest plantations in the CFRs severely deteriorated; the forests and plantations became subject to illegal harvesting and charcoal production, encroachment, and deforestation. As shown in Table 12-12 most of CFRs in Western Bahr el Ghazal were destroyed and encroached.

With the establishment of the Ministry of Agriculture and Forestry, GOSS, the ministry ordered a review of commercial logging activities. The review committee found that all of the issued contracts were illegal and that logging companies did not conform to best forestry practices. This prompted the ministry to issue a decree annulling all the contracts and banning logging in both the teak plantations and natural forests. This ban did not hold beyond 2006 due to the need for foreign currency and construction timber in (then) Southern Sudan.[502]

Despite the efforts made, since independence, by GRSS and state and local governments to control illegal logging in teak plantations and natural forests, these activities are still difficult to contain due to the limited forest management capacity of these governments. For example, in June 2013, the authority of Yei River County issued an order banning all illegal timber dealings in the county. Under the ban companies found logging or exporting timber without proper documents will have their timber confiscated and pay the same taxes and charges that legal businesses pay.[503] However, the Forestry Subsector CAMP Task Team members, who visited Yei River County in April 2013 assessed that county-wide uniform application of this ban requires a significant number of forestry officers and forest guards, and close collaboration with revenue authorities; and that, actual implementation of the ban

[499] Interview with officials of Kagelu Forestry Training Centre. September 2012.
[500] UNEP. 2007. Sudan post-conflict environmental assessment. Nairobi: UNEP. pp. 198-199.
[501] UNEP. 2007. Sudan post-conflict environmental assessment. Nairobi: UNEP. pp. 198-199.
[502] UNEP. 2007. Sudan post-conflict environmental assessment. Nairobi: UNEP. pp. 198-199.
[503] http://www.radiomiraya.org/news-202/south-sudan/11447-yei-authorities-ban-illegal-logging.html#gsc.tab=0

would be sporadic and ineffective in controlling widespread illegal activities due to the limited implementation capacity of the county.

Table 12-12: Forest plantations established in the Central Forest Reserves

State / County	Name of forest reserves (FRs)[*1]	Gazetted date	Gazette	FR area (Ha)	Plantation area: Species planted	Plantation area: Area (Ha)	Note
Upper Nile (no record identified)							
Jonglei (no record identified)							
Unity (no record identified)							
Warrap (no record identified)							
Northern Bahr el Ghazal (no record identified)							
Western Bahr el Ghazal							
(county TBC)	Kpanza[*7]	1964	(TBC)	20,700	T. grandis	210	
(county TBC)	Pongo Nuer[*7]	(TBC)	(TBC)	13,440	T. grandis	575	100% destroyed
(county TBC)	Gette Extention[*7]	(TBC)	(TBC)	20,160	T. grandis	(TBC)	100% destroyed
(county TBC)	Wau Town[*7]	1953	(TBC)	1,121	T. grandis	(TBC)	100% destroyed
Jur River	Gette (Getti FR)[*5]	15/10/1950	821	2,221	T. grandis	1,428	100% destroyed
Jur River	Khor Abong[*5*7]	1951	(TBC)	793	T. grandis	793	100% destroyed
Jur River	Khor-Grinty (Grinty FR)	15/10/1950	821	3,480	T. grandis	1,504	100% destroyed
Jur River	Kuajena (Kawajena FR)	12/12/1955	889	4,565	T. grandis	1,377	
Jur River	Nyin-Akok (Nyin Akok FR)[*5]	15/10/1950	821	3,564	T. grandis	1,512	50% destroyed
Jur River	Tonj No.1 (Tonj Road FR)[*5]	15/12/1951	837	1,355	T. grandis	1,354	50% destroyed
Bagave	Dokorongo[*5*7]	1954	(TBC)	1,722	T. grandis	1,377	100% destroyed
Bagave	Ngohalima/Akanda (Ngwolima Akanda FR)	15/10/1930	811	4,471	T. grandis	2,932	100% destroyed
Bagave	Namatina (Numatinna Central FR)	15/06/1953	856	256,299	T. grandis	1,377	50% destroyed
Bagave	Nyalero[*5*7]	1954	(TBC)	7,266	T. grandis	1,377	100% destroyed
					Sub-total	**14,439**	
Lakes (no record identified)							
Western Equtoria							
Tambura	Banambiro[*7]	(TBC)	(TBC)	(TBC)	T. grandis	4	
Tambura	Riwa I & II[*7]	(TBC)	(TBC)	(TBC)	T. grandis	404	
Tambura	Zangia[*7]	(TBC)	(TBC)	(TBC)	T. grandis	2	
Najro	Bakiri[*7]	(TBC)	(TBC)	(TBC)	T. grandis	1	
Najro	Duma[*7]	(TBC)	(TBC)	(TBC)	T. grandis	2	
Najro	Mapiso[*7]	(TBC)	(TBC)	(TBC)	T. grandis	5	
Nzara	Ringasi (Lingasi FR)	15/10/1953	847	2,814	T. grandis, etc.	647	ETC (2012)[*3]
Nzara	Magada (Magaba FR)	15/10/1950	821	2,337	T. grandis, etc.	383	ETC (2012)[*3]
Nzara	Mbari-zunga (Mbarizunga FR)	15/03/1951	837	8,358	T. grandis, etc.	375	ETC (2012)[*3]
Nzara	Nangundi (Nangondi FR)	15/10/1952	947	(TBC)	T. grandis, etc.	251	ETC (2012)[*3]
Nzara	Nzara (Nzara Nursery)	15/10/1950	821	4,208			
Nzara	Simbi (Siimbi FR)	15/10/1952	847	7,434	T. grandis	7,125	
Nzara	Yabua (Yabua FR)[*5]	15/12/1950	824	4,279	T. grandis, etc.	208	ETC (2012)[*3]
Ezo	Bangangai	(TBC)	(TBC)	(TBC)	T. grandis	640	
Ezo	Marunyo	(TBC)	(TBC)	437	Mixed spp.	520	
Ezo	Nagbagi[*7]	(TBC)	(TBC)		T. grandis	20	
Yambio	Asanza.C. (Asanza FR)[*5]	15/10/1950	821	209	T. grandis	185	BLL (2009)[*4]
Yambio	Marangu (Marengu FR)	15/10/1950	847	5,691			
Yambio	Saura Council[*7]	(TBC)	(TBC)		T. grandis	5	
Yambio	Yabongo.C. (Yabongo FR)[*5]	15/12/1950	824	354	T. grandis	316	BLL (2009)[*4]
Yambio	Yatta.C. (Yata FR)[*5]	15/03/1953	851	8,190	T. grandis	325	Area corrected
Ibba	Zaria (Zaria FR)[*5]	15/12/1950	824	17,545	T. grandis	640	BLL (2009)[*4]
Ibba	Zumbi	(TBC)	14774	6,205	T. grandis	10	SEL (2009)[*2]
Maridi	Azza (Aza FR)	15/03/1950	811	740	T. grandis	2	
Maridi	Embe (Embe Central FR)[*5]	10/02/1959	(TBC)	3,473	T. grandis	510	
Maridi	Maridi[*7]	(TBC)	(TBC)		T. grandis	50	
Maridi	Gazan[*5*7]	(TBC)	(TBC)		T. grandis	2	
					Sub-total	**12,632**	

Table 12-12: Forest plantations established in the Central Forest Reserves (cont.)

State / County	Name of forest reserves (FRs)[*1]	Gazetted date	Gazette	FR area (Ha)	Plantation area: Species planted	Plantation area: Area (Ha)	Note
Central Equatoria							
Terekeka	Kadule (Kadule FR)[*5]	15/11/1951	(TBC)	141	Cassia, etc.	141	
Juba	Girikidi (Girikidi Forest)	(TBC)	(TBC)	8,686	T. grandis, etc.	8,272	
Juba	Jebel Korok	15/02/1964	(TBC)	105			
Juba	Lulubo North (Luluba Hills FRs - North)	15/10/1956	(TBC)	4,523	T. grandis	4,523	
Juba	Lulubo South (Luluba Hills FRs - South)	15/10/1956	(TBC)	4,284	T. grandis	4,284	
Juba	Mangalla (Mongalla FR)	15/11/1948	(TBC)	476	T. grandis, etc.	476	
Juba	Rejaf East	(TBC)	(TBC)	4	T. grandis, etc.	4	
Lainya	Loka West (Loka FR)[*5]	15/01/1950	(TBC)	22,713	T. grandis	1,045	CETC (2008)[*6]
Yei	Kagelu (Kagelu FR)[*5]	15/01/1950	(TBC)	968	T. grandis	918	
Yei	Kajiko North (Kajiko Valley FR)[*5]	15/12/1953	862	4,905	T. grandis	750	CETC (2008)[*6]
Yei	Korobe (Korobi FR)	(TBC)	(TBC)	2,123	T. grandis	50	CETC (2008)[*5]
Yei	Momury (Mumori FR)	15/07/1952	844	92	T. grandis	30	
Yei	Yei Council[*5*7]	(TBC)	(TBC)		T. grandis	2	
Morobo	Kajiko South[*5]	15/04/1965	862	5,603	T. grandis	90	
Kajo Keji	Kajo Kaji (Kajo-Keji FR)[*5]	(TBC)	(TBC)	1,957	T. grandis	1,957	
					Sub-total	**22,542**	
Eastern Equatoria							
Torit	Immella (Imela FR)[*5]	15/08/1955	3150	371			
Torit	Katire (Katire Central FR)[*5]	15/08/1951	31	350			
Torit	Lerwa (Lowe Forest)[*5]	proposed	176	(TBC)			
Ikotos	Kateri[*7]	(TBC)	(TBC)		T. grandis	350	
Ikotos	Imatong/Gilo (Imatong Mountains FR)	15/03/1952	304-207	353	T. grandis	353	
Ikotos	Immella[*5*7]	(TBC)	(TBC)		T. grandis	371	
Magwi	Kereppi (Kerripi Central FR)	(TBC)	500	299	T. grandis	299	
Magwi	Palwak[*5]	(TBC)	182	(TBC)			
Magwi	Shukole (Shukoli FR)[*5]	(TBC)	2447	(TBC)			
Magwi	Vukadi[*5]	(TBC)	25	(TBC)			
					Sub-total	**1,373**	
Total area[*8]						**50,987**	
Total Teak (T. grandis) plantation[*8]						**36,548**	
Estimated area of teak plantation with good quality						**20,000**	

Note: 1) Forest reserve names indicated in the Forest Policy are used and names in parentheses are used by Land Resource Survey and Information Centre (LRSIC), Directorate of Forestry, MAFCRD. 2) Concession on teak plantation management was granted to Sercham Equatorial Limited (SEL) in 2009. 3) Concession on teak plantation management was granted to Equatoria Teak Company (ETC) in 2012. The areas of teak plantations underlined are adjusted figures based on an environmental assessment document prepared by ETC. 4) Concession on teak plantation management was granted to Blue Lakes Limited (BLL) in 2009. 5) Visited by CAMP forestry subsector team during situation analysis. 6) Concession on teak plantation management was granted to Central Equatoria Teak Company (CETC) in 2008. 7) Forest reserves not listed in Table 1 through 6 of Annex 1 of the Forest Policy. 8) Totals do not match with the totals indicated in the Forest Policy 2013.

12.6.5 Field observations of Central Forest Reserves and forest plantations

Twenty nine Central Forest Reserves (CFRs) indicated in Table 12-10 and in Table 12-12 five states were visited by the forestry subsector CAMP TT. The current state of the CFRs is disastrous. A major effort is needed to restore law and order and proper CFR management regimes in conformity with the Forest Policy 2013, which emphasizes decentralized forest management, and subsequent establishment of necessary legislation and its implementation. It was confirmed that there was/is: 1) low presence of GRSS and state governments at the CFRs, 2) inadequate CFR management capacity for proper management at all levels of government, 3) encroachment and land grabbing of CFR areas by governments, farmers, and local elites, 4) overexploitation of plantation forests particularly those of teak during the civil wars, 5) continuing illegal logging and unsustainable harvest of forest resources, and 6) very limited investment in forest plantation establishment and maintenance.

The CFRs visited can be categorised into two groups: a group of in the Greater Upper Nile and Greater Bahr el Ghazal regions, and another group in the Greater Equatoria region. The first group (or Northern CFR Group) was severely affected by the second civil war. I is

located in a semi-arid climate receiving annual average rainfall of less than 1,000mm. the second group (or Southern CFR Group) is in higher elevation areas with the annual average rainfall of more than 1,000mm. This group is located in an area better suited for forestry than the Northern CFR Group.

Table 12-13 summarises the observations from the visits to the 2 groups. Based on information collected through interviews and comparisons between the two groups, the Southern CFR Group has better institutional capacity, although the capacity of both Groups is still far below the level it is supposed to be. Officers of both Groups believe that formally approved national and state policies, and laws and regulations are non-existence. Since the new Forest Policy 2013 was only approved by the Assembly recently (July 2013), and Forest Law is not yet approved, this belief reflects the serious status of institutional arrangements for the management of CFRs.

The Assistant Commissioner of Forestry at Yei River County said that there is no adequate legislation to control, manage, and impose levies on forestry activities and products. He said that to manage this legal vacuum, laws and regulations adopted during the pre-CPA and the Southern Sudan Autonomous Region are improvised to administer forestry activities in their jurisdiction. Day-to-day duties can also be regulated by issuing administrative orders at the county level. However, if it comes to a prosecution of a person allegedly committing an offence, the legitimacy of the legal arrangement becomes an issue, which makes prosecution difficult in the local court.

County forest officers (i.e. Assistant Commissioner in charge of forestry) of both CFR Groups consider the involvement of the GRSS in forest administration very limited. Currently management responsibility for CFRs is given to the state Directorates of Forestry; there is limited communication between the national Directorate of Forestry, (former) MAFCRD and the state directorates. The Southern CFR Group is slightly better endowed with financial, human and physical resources and equipment. However, with respect to their responsibilities, allocated resources are far from sufficient. There are almost no management and extension activities carried out by the Northern CFR Group, whereas low-level forestry and extension activities are carried out by the Southern CFR Group. Partly due to weak CFR management capacity in the Northern CFR Group, traditional authorities play an important role in controlling illegal cutting and encroachment of CFRs in some areas.

In South Sudan teak is the major, and most productive and valuable plantation species. There are other species such as eucalyptus, acacia, cassia, coniferous species, and bamboos that are planted but on a limited scale. Teak plantations in the Northern CFR Group were heavily harvested during the second civil war and most of the good teak plantations were lost.

Although heavily harvested during the war, most of the remaining teak plantations are found in the Southern CFR Group. These plantations were illegally logged even after the CPA and this continues. There has been inadequate silvicultural treatment of young and mature teak plantations resulting in stagnant growth rates in mature teak plantation older than 30 years. Silvicultural treatment of coppice stands established on the stumps of logged teak trees also needs improvement to achieve better quality and growth of teak.

Agroforestry is widely practised among farmers on the fringes of the Southern CFR Group. In this area, so-called "out-growers," who are farmers or private investors growing mainly teak on their own land, are commonly observed.

Table 12-13: Management status of Northern and Southern CFR Groups visited

Group	Northern CFR Group	Southern CFR Group
Regions	Central Forest Reserves in Grater Upper Nile and Grater Bahr el Ghazal Regions	Central Forest Reserves in Greater Equatoria Region
Name of CFRs visited during field study	• Nagdiar CFR, Panyikang C., UNS • Tawfigia CFR, Panyikang C., UNS • Khor Abong CFR, Jur River C., WBGS • Nyin Akok CFR, Jur River C., WBGS • Karich CFR, Rumbek East C., LKS[*1]	• Embe CFR, Maridi C., WES • Yatta CFR, Yambio C., WES • Zaira CFR, Ibba C., WES • Kadule CFR, Telekeka C., CES • Kajo Keji CFR, Kajo Keji C., CES • Katire CFR, Torit C., EES
1. County forest office responsible of management of CFRs		
(1) Overall organizational capacity and presence	• Very limited capacity and limited presence	• Relatively fair capacity and fair to good presence
1.1 Policy, legal framework, and reporting		
(1) National and state policies, and laws and regulations	• Not existing	• Not existing
(2) Involvement of GRSS and its coordination function	• Very limited	• Limited; it was said that GRSS is not aware of a concession arrangement for management of Yatta CFR granted by the State Government.
(3) Annual, monthly, and other reports	• Two out of five (40%) CFRs produced terminal reports	• Three out of six (50%) CFRs produced terminal reports
1.2 Financial resources		
(1) Investment and operation budget	• No allocation and execution	• Limited
(2) Tax and fee collection	• Ad hoc forestry related fee collection	• Ad hoc collection of taxes and fees are carried out by forestry officials; limited investigation capacity over allegedly illegal forestry activities
1.3 Human resources	•	
(1) Overall status of human resources	• Very limited	• Limited but better than the capacity of northern states
(2) Number of officers	• 1 to 3 officers	• 1 to 3 officers
(3) Number of temporary workers	• 0 to 7 workers	• 8 to 76 workers
(4) Staff capacity/labour issues	• Very limited/salary arrears	• Limited capacity and training received
1.4 Physical resources and equipment		
(1) Office, accommodation and storage facility	• Inadequate condition	• Dilapidated to moderate condition; sometime temporary office structures without accommodation facilities
(2) Transportation	• Not owned	• Not owned
(3) Equipment, machinery, and tools	• Not owned	• Not owned
1.5 Forestry activities		
(1) Management of Central Forest Reserves	• Almost no management of CFRs by GRSS and state government. • In the areas where traditional authority (chief) is responsible for management of a CFR illegal cutting and encroachment are somewhat contained.	• Moderate; operation of state owned sawmills, small-scale teak plantation establishment, tending, and other forest management activities are sporadically practiced whenever funds are available from revenue collection activities.
(2) Tree nursery operations	• Low level of tree nursery operation due to no funding and high cost of animal problems	• Small scale tree nursery operations are common for tree seedling production, distribution, and sale.
(3) Agroforestry extension activities	• No activities	• No extension activities. Out-growers are rarely visited by forestry officials.

Table 11-13: Management status of Central Forest Reserves visited (cont.)

Group	Northern CFR Group	Southern CFR Group
2. Status of Central Forest Reserves		
2.1 Status and technical issues of plantation forest		
• Access to CFR	• Poor to good, dependent on location of CFR	• Poor to good dependent on the condition of roads and bridges.
• Staff deployment, office and equipment at CFR site	• Approximately 0 to 1 forest guards • No office facilities or dilapidated office	• Approximately 2 to 4 technical staff deployed • Few forest guard deployed • Approximately 2 to more than 50 casual labour employed • Old or new office building without accommodation
• Main plantation species	• Teak, acacia, cassia, neem for timber and fuel	• Teak dominating, and eucalyptus, pines, bamboo, and other species planted on small-scale.
• Quality of plantation forest	• Teak plantations have been heavily logged and no good quality plantations left	• Severely logged to good condition
• Technical issues regarding planting and tending	• Coppiced teak is continuously harvested for pole production • Re-demarcation of reserve forest needed	• No silvicultural treatment of teak plantation • Over mature teak plantation with small annual growth rate • Poor quality teak stands in the logged areas • Coppiced teak is cut continuously for pole production
• Disease, pest, animal browsing and other problems	• Frequent forest fires	• Some diseases and pests for teak plantations are recognized
2.2 Illegal activities in and around CFRs		
• Illegal felling of trees in and around CFR	• Heavy logging of teak plantations during the second civil war by soldiers • Heavy tree felling for timber and charcoal production	• Heavy logging of teak plantation by SPLA during the second civil war period • Severe illegal logging of teak plantations for timber production and natural forest for timber and charcoal production
• Encroachment and/or land grabbing	• Heavily encroached by state authorities, communities, IDP, and people from Darfur • Alleged land grabbing by local elites is common	• Limited degree of encroachment for agricultural production by communities and by county authorities. In some areas local elites are alleged to carry out land grabbing.
3. Community and farmers		
• Agroforestry	• Timber production through agroforestry practice is not common.	• Widely practiced with teak for timber production. • Exotic tree species are introduced for agroforestry practices.
• Willingness to be involved in CFR management	• In most cases CFRs are not recognized and appreciated by local communities	• Communities are interested to become involved in CFR management through, for example, concession agreement between government and company concerned. If such agreement fails, the communities are likely to carry out illegal harvesting activities
• Social and economic factors	• Some settlers are well-organized under their chief	• Some communities fled to town due to Lord's Resistance Army in 2009.

Note: 1) Karich Central Forest Reserve is a proposed Central Forest Reserve

12.7 Concession forest management

Since 2008 three concessions have been granted to the Central Equatoria Teak Company (CETC), Equatoria Teak Company (ETC), and Blue Lake Limited (BLL). Table 12-14 shows the CFRs and teak plantation areas where the three companies have responsibility for timber production, re-afforestation and protection. ETC is responsible for managing five CFRs in Western Equatoria State. The total areas managed are more than 17,000 ha of CFRs and 1,864 ha of plantations. Also in western Equatoria State, BLL is responsible for the management of three CFRs with a total area of 18,000 ha and plantation of 1,141 ha. Due to unknown reasons, CETC halted its forestry management operations in 2009 immediately after the concession to manage three CFRs and plantations in Central Equatoria State was granted by the GRSS and the Government of Central Equatoria State[504]. Another company which may be granted a concession to manage Zaira CFR and its teak plantation is Sercham Equatorial Limited. However, Zaira CFR is currently under the concession of BLL which needs clarification.

Table 12-14: Concessionaires and CFRs and plantations under their management

State / Cocessionaire name / County	Name of Central Forest Reserves (CFRs)[*1]	Gazetted date	CFR area (Ha)	Plantation area: Species planted	Plantation area: Area (Ha)
Western Equatoria State					
Equatoria Teak Company (ETC)/Maris Capital (Concession was granted in 2012)					
Nzara	Ringasi (Lingasi FR)	15/10/1953	2,814	T. grandis, etc.	647
Nzara	Magada (Magaba FR)	15/10/1950	2,337	T. grandis, etc.	383
Nzara	Mbari-zunga (Mbarizunga FR)	15/03/1951	8,358	T. grandis, etc.	375
Nzara	Nangundi (Nangondi FR)	15/10/1952	(TBC)	T. grandis, etc.	251
Nzara	Yabua (Yabua FR)[*2]	15/12/1950	4,279	T. grandis, etc.	208
Total area			17,788		1,864
Blue Lakes Limited (BLL)/Sercham Equatorial Limited (SEL) (Concession was granted in 2009)					
Yambio	Asanza.C. (Asanza FR)[*2]	15/10/1950	209	T. grandis	185
Yambio	Yabongo.C. (Yabongo FR)[*2]	15/12/1950	354	T. grandis	316
Ibba	Zaria (Zaria FR)[*2]	15/12/1950	17,545	T. grandis	640
Ibba	Zumbi	(TBC)	6,205	T. grandis	10
Total area			24,313		1,151
Central Equatoria State					
Central Equatoria Teak Company (CETC) (Concession on CFRs was granted in 2008)					
Lainya	Loka West (Loka FR)[*2]	15/01/1950	22,713	T. grandis	1,045
Yei	Kajiko North (Kajiko Valley FR)[*2]	15/12/1953	4,905	T. grandis	750
Yei	Korobe (Korobi FR)	(TBC)	2,123	T. grandis	50
Total area			29,741		1,845
Grand total area			**71,842**		**4,860**

Note: 1) Forest reserve names indicated in the Forest Policy are used and names in parentheses are used by Land Resource Survey and Information Centre (LRSIC), Directorate of Forestry, MAFCRD. 2) Visited by CAMP forestry subsector team during situation analysis. 3) Currently Zaira CFR is under the concession granted to BLL. The current status of SEL concession needs to be confirmed.
Source: CAMP TT Team

Management of the CFRs by concessions was introduced after the CPA and still is considered to be in the process of improvement. From the point of view of investors, the business environment in South Sudan is still risky. There is no clarity in property rights or in the rights of forest fringe communities; transportation, equipment and maintenance costs are high; plus there are multiple taxes and fees, and weak public services. All this can negatively affect business operations. Thus, only production and marketing of commodities, like teak wood, which are able to fetch a high price in the international market and assure returns, can

[504] An concession agreement was signed by GRSS and the concerned state government and the concessionaire.

be considered for private sector investment. In this section operations of the two existing concessionaires are described for further discussion on development of forest products industries.

12.7.1 Equatoria Teak Company

According to the plantation management and development agreement dated 28 June 2006, Equatoria Teak Company (ETC) undertakes the management of five CFRs, namely Magada, Mbari-zunga, Nangundi, Ringasi, and Yabua in Western Equatoria State for 32 years from August 2006.[505] ETC's investment capital is about 5 million USD. Although the concession agreement was reached in 2006, ETC only began its logging, sawmilling and plantation development operations recently. Sawmilling and timber processing plants were recently installed.

ETC has three departments and employs 130 staff members. Names of the departments, employees' job titles, numbers, and level of qualification in terms of recruitment in the international or local labour markets are indicated in Table 12-15. In terms of employment creation in the local labour market, this size of forestry industry investment would create over 100 permanent and casual jobs. Casual workers are all recruited from the area of operation. There are 12 highly skilled positions kept for international recruitment. It is envisaged that these positions can be filled with locally recruited specialists in the future as the local labour markets develop and mature.

Table 12-15: Organization and staffing of Equatoria Teak Company (ETC)

Department	Qualification level		
	International	Local	Total
1. Managing Director	1		1
2. Finance Administration			
Finance and administration	1	3	4
General worker		3	3
Sub-total	1	6	7
3. Forestry and Nursery			
Lead forester	1		1
Forest worker		10	10
Security		14	14
Nursery		5	5
Casual worker		25	25
Sub-total	1	54	55
4. Sawmill and Engineering			
Operations engineer	1		1
Saw doctor	1		1
Mechanic	1	3	4
Heavy equipment driver	6		6
Sawmill supervisor		1	1
Security		4	4
Casual worker		50	50
Sub-total	9	58	67
Total	12	118	130

Source: Equatoria Teak Company. 2013. Nzara

[505] Equatoria Teak Company (ETC) in 2006 entered into a management and development agreement with the GOSs, ministry of Agriculture and Forestry, GOSS, and Ministry of Agriculture, Environment and rural Development, Government of Western Equatoria State. The concession is managed in accordance with the law of Sough Sudan and the provisions of the agreement. (Source: Equatoria Teak Company. 2012. Forest Management Plan. section 1.1.3)

ETC's sawmill plant began timber production in June 2013. ETC installed generators (about 500kW capacity) which supply power to run the plant consisting of band-saws, wood dry kilns, timber yards and storage, grab wood machines, trucks and cars. All workers are provided with protective gear.

12.7.1.1 Processing demands and log supplies

Forestry operation relies on existing and future growth; productive stocks of tree stands need to be established through plantation and tending activities. An estimation of current volume and value of the teak plantations managed by ETC would indicate an approximate yield for sustainable forest management. Because teak is mature for harvest after 28 to 32 years (much faster than other indigenous timber species in natural forests), teak and other fast growing tree species can be considered for plantation establishment by ETC.

ETC's sawmill is designed to process 1,000 logs/day. Based on the following estimation, this installed capacity must be too large to source logs only from the teak plantations under ETC's management in a sustainable manner. To operate the sawmill with full capacity, ETC must also source teak logs form out-growers. However, the future prospect of supplies from out-growers seems to be limited ETC may need to consider significant investment to establish large-scale teak plantations in its CFRs.

As shown in Table 12-16 the total volume of teak plantations managed by ETC is about 275,000m^3. Assuming that volume recovery rate of sawn timber from log is 30%[506] and that sawn timber would fetch 500USD/m^3 at Kampala in Uganda, the value of the teak plantation measured at the price in Kampala is about 41 million USD as shown in Table 12-17. Further assuming that, on average, the annual growth rate of the teak plantation were 2%, which should be conservative growth rate for such teak plantations, the annual allowable harvest is about 5,500m^3 of log equivalent. This means that annually 24ha of clear cutting of teak plantation needs to be done to process 1,651m^3 of timber valuing 825,000 USD at Kampala. If ETC operates 200 days a year, daily sawn volume of logs harvested from their teak plantation would be 28m^3 which produces 8m^3 of timber valued 4,000 USD at Kampala price.

ETC's sawmill is designed to process 1,000 logs/day which is equivalent to 140m^3/day of logs ETC expects about 40m^3 to 50m^3/day of sawn timber volume recovery rate of about 30%. At the time of the field visit in July 2013, ETC was processing 600 logs/day (87m^3/day) to produce 20m^3 of sawn timber, which is a yield 23%, lower than the 30% expected by ETC. ETC's target is to process 140m^3/day of logs whereas the estimated allowable daily log harvest from the ETC managed teak plantation in the CFRs is 28m^3. For sustainable forestry, the balance of 112m^3/day must come from outside the plantations. Although the estimate of allowable daily harvest from the plantations is conservative, to meet this balance logs need to be sourced from teak plantations established by out-growers. Under the current concession, logs from out-growers are needed to sustain this size of wood processing businesses. However, whether the log supply of 112m^3/day from out-growers in the surrounding areas is sustainable is unknown. Further study is needed to determine whether the supply of teak wood to the sawmill is sustainable.

[506] Equatoria Teak Company. 2012. Forest Management Plan. Section 7.2. Recovery rate of 30% is considered to be low. It can be improved by introduction of better and efficient milling operation and marketing.

Table 12-16: Volume and average height and diameter in teak plantations managed by ETC

Teak plantation	Ha (ha)	Average volume/ha (m^3/ha)	Total stand volume (m^3)	Average height (m)	Average diameter (cm)
Yabua	593.0	199.5	118,309	20.7	22.2
Mborizanga	280.5	279.7	78,450	23.8	23.9
Nangondi	316.6	205.3	64,992	21.4	22.1
Magaba	23.5	285.7	6,714	20.3	21.7
Ringazi	35.0	189.9	6,645	19.0	21.0
Total/average	1,248.6	232.0	275,111	21.0	22.2

Source: Equatoria Teak Company. 2013. Nzara.

Table 12-17: Estimated allowable production from teak plantations managed by ETC

Estimation items	Estimated values	
Estimation of the total value of teak plantations at 500USD/m^3 Kampala price		
a) Timber equivalent of total stand volume at recovery rate of 30% (a=275,111*30%)	82,533	m^3
b) Value of teak plantation (b=a*500)	41,266,643	USD
Estimation of annual allowable harvest at 500USD/m^3 Kampala price		
c) Annual growth at annual growth rate of 2% (c=275,111*2%)	5,502	m^3
d) Annual average harvesting area (d=c/232)	24	ha
e) Timber equivalent of annual growth at 30% recovery rate (e=c*30%)	1,651	m^3
f) Value of timber equivalent of annual growth (f=e*500)	825,333	USD
Estimation of daily allowable harvest at 200day/year operation at 500USD/m^3 Kampala price		
g) Daily allowable volume of log harvest (g=c/200)	28	m^3
h) Daily allowable timber production at 30% recovery rate (h=g*30%)	8	m^3
i) Value of daily allowable timber production (i=h*500)	4,127	USD

Source: Equatoria Teak Company. 2013. Nzara. and CAMP TT

12.7.1.2 Teak plantation establishment and Forest Stewardship Certificate

New teak plantations are to be established annually to secure future timber supplies in a sustainable manner. ETC is managing a tree seedling nursery to establish 38 ha of new teak plantation. It is planned that 24,700 teak seedlings will be raised to establish 38 ha of new plantation with 2 by 2 meter spacing (i.e. 650 teak/ha). The plantation establishment is the investment part of forest management necessary to manage forests in a sustainable manner. Due partly to the plantation activities, ETC recently obtained the Forest Stewardship Certificate (FSC)[507] for sustainable forest management, providing ETC with international recognition when exporting their products.

12.7.1.3 Challenges

It was recognized by ETC that there are a number of challenges for its operation to be sustainable and profitable. They are: 1) issues of security, 2) poor infrastructure particularly

[507] Forest Stewardship Certificate (FSC) is a system allows certificate holders to market their products and services as the
result of environmentally appropriate, socially beneficial and economically viable forest management. The certificate can be granted to any management unit involving forest management if the criteria under the following ten principles set by FSC are met: 1) compliance with laws, 2) workers' rights and employment conditions, 3) indigenous peoples' rights, 4) community relations, 5) benefits from the forest, 6) environmental values and impacts, 7) management planning, 8) monitoring and assessment, 9) high conservation values, and 10) implementation of management activities.

roads, and 3) competition between timber dealers and ETC for the purchase of logs from out-growers. Due to security reasons, ETC conducts logging operation within confined areas of the CFRs. Locations with widespread illegal operations are dangerous to log as the illegal loggers and timber dealers are armed. The GRSS and state governments are doing very little to stop these illegal operations even if they are reported to them. The governments have no forest laws to prosecute these illegal activities. The number of governments forest guards is limited and not adequately armed. Lack of good road infrastructure for exporting products is another major constraint, for example, the cost of transporting timbers from ETC's sawmill in Nzara to Kampala is ten times higher than from Kampala to Mombasa, Kenya.

12.7.2 Blue Lakes Limited

Blue Lakes Limited (BLL) was established in 2008 and became operational in 2011. According to the concession agreement between the GRSS, the Government of Western Equatoria State and BLL, BLL was given the concession to manage Asanza CFR and Yabongo CFR in Yambio County, and Zaria CFR in Ibba County. The latter CFR is not managed by BLL yet. The concession agreement specifies the responsibility of BLL for the development of a forest management plan which is subject to review every 5 years. It also specifies management of the CFRs for 30 years and the need to annually establish teak plantations of 38 ha. BLL is about to obtain the Forest Stewardship Certificate (FSC) for management of Asanza CFR and Yabongo CFR. The sawmill uses teak logs produced from the CFRs and out-growers in and around Yambio, and produces block teak timbers for export.

12.7.2.1 Community participation

Community participation in forest management is stipulated in the concession agreement. The forest fringe communities near Asanza CFR and Yabongo CFR were asked to form community forest associations. BLL offers job opportunities to the communities which are also allowed free access to forest resources in the CFRs. The community associations are given 200,000 USD to implement community works such as building community centres and schools. The company employs approximately 80 staff members, of which 16 and 20 are permanent staff members from South Sudan and Kenya. The rest of the employees, over 40 workers or 60% of the total, are casual labourers recruited from the local communities. BLL also provides scholarships to selected community members to Kagelu Forestry Training Centre for diploma and certificate courses.

12.7.2.2 Timber export, conservation, plantation activities

The export price of teak timber in Kampala, Uganda is approximately 500 USD/m^3. The rate varies depending on the quality of the timber, market conditions and destination of consignments. The best market is Europe and America where FSC certification is required for teak timber imports. China and India are bulk export destinations but the prices are relatively low. BLL pays 100USD/m^3 to the Western Equatoria State Government and 10 USD/m^3 to the communities for timber export. BLL is mandated to protect endangered species such as African mahogany, and biodiversity in high conservation areas in its CFRs. Since 2011 BLL has established managing units or compartments and planted 75 ha of teak plantations in Yabongo CFR.

12.7.2.3 Challenges

One of the problems is very poor road conditions which makes operations costly. High costs of transportation are not only a result of time- and fuel-consuming transportation, but also of the frequent occurrence of traffic accidents involving casualties and damages to consignments. In addition, frequent tax collections en route add to the high cost of transportation. Additionally, costs of operation are also high. For example, obtaining sawmill

spare parts is costly because there is no supplier in South Sudan and spare parts are obtained from foreign dealers.

The future supply of logs from the CFRs and out-growers is of concern; it is felt that reforestation activities by out-growers are rare after mature teak trees are harvested from their plantations. They also do not manage coppicing properly, diminishing the future value of their teak plantations. To manage this situation, BLL is planning establish new teak plantations of 208 ha and 354 ha of teak in Asanza CFR and Yabongo CFR.

Currently BLL is operating in Yabongo CFR but not in Asanza CFR due to insecurity caused by armed illegal loggers and log dealers. BLL believes that this problem of illegal activities must be handled carefully because the governments do not have an adequate legal framework and law enforcement capacity to control and prosecute such activities[508]. In addition to the insecurity BLL reported that they were competing with timber dealers who did not have proper offices, were difficult to trace and came with cash to make on the spot deals for teak logs. They also said that the high market value of teak logs increased illegal logging with the aim of getting quick money.

12.7.3 Central Equatoria Teak Company - legal problem

Central Equatoria Teak Company (CETC) was a company owned by a South African who made a concession agreement in 2008 with both the GRSS and the state governments to manage CFRs for thirty two years. The original concession agreement included seven CFRs: Loka CFR, Kajiko North CFR, and Korobe CFR in Central Equatoria State, and Magada CFR, Nangundi CFR, Yabua CFR, and Yata CFR in Western Equatoria State. Because of the absence of forest laws and regulations the governments concerned had no authority to clarify the transfer of ownership to the company leading to the non-performance of the concession agreement as described below.

In the three CFRs in Central Equatoria State CETC did not start operations as it encountered problems with the local communities. The GRSS had to intervene forming a committee to review the agreement and progress made by the company with respect to the provisions of the agreement. The provisions included CETC's obligation to support the communities in establishing schools and community centres, and in providing employment opportunities. The South African owner of CETC sold the company to a London-based British investment company. It is not known when this deal took place; according to an official the deal was alleged to be illegal and carried out without the knowledge of the GRSS. Details of the CETC ownership transfer and subsequent establishment of ETC as responsible for the management of five CFRs in Western Equatoria State as the successor to CETC is unknown to the GRSS.

The 32 year concession was granted to Central Equatoria Teak Company (CETC) in 2008 for the management of Loka CFR, Kajiko North CFR, and Korbe CFR in Central Equatoria State. Based on the concession agreement, CETC constructed a community centre and primary health care centre, and renovated the forest management office near Loka CFR with revenues from its teak harvest and sales. However, it was reported that CETC no longer managed these CFRs for unknown reasons, and that operations by CETC, particularly those of teak plantation management in the three CFRs, were halted in 2009. Currently there is no CETC presence at the site of the CFRs. Workers once employed by the government, who became employees of CETC at the time of the concession agreement, are still staying in the CFRs as they are unsure about their employment status. The forest fringe communities, which are part of the stakeholders identified in the agreement, blame the GRSS for not doing

[508] Without approved forest laws there are no illegal activities. However, according to the government official perception, activities are illegal with respect to previous laws and regulations adopted by the previous governments of Sudan and Southern Sudan.

enough to force CETC to adhere to the agreement, which includes profit sharing with the communities. It was reported that teak plantations as well as natural forests in Loka CFR were severely logged by disgruntled community members, and that cancellation of the concession is under consideration.

12.8 Forestry and agroforestry by out-growers

Common farming practices in South Sudan are usually associated with tree stands and temporary or permanent patches of forest and/or shrub land with a low density of tree cover. There are also communally managed forests reserved for agriculture use or production of forest products under the auspices of the traditional authorities. This is likely a natural socioeconomic consequence of the agricultural production system, in a place like South Sudan, characterised by low population density, non-mechanised agriculture and more land available for agriculture than people can farm. However, the cases introduced here are slightly different from the production system described above, partly because the farmers involved understand the economic returns of tree plantations, if they invest. In this case they select trees according to future returns, either tree species with a relatively long maturity period but with high market value (e.g. teak), or with a relatively short maturity period with low market value (e.g. eucalyptus). In this sense agroforestry practice done by out-growers is best considered as commercial plantation forestry. Particularly in Greater Equatoria Region, farmers and other investors have adopted agroforestry or plantation forestry with teak for its high economic potential. If there were more public support more farmers will practise it and generate more value. In the northern areas of the country, teak may be substituted by eucalyptus to meet demand for charcoal, fuelwood, and timber and avoid further rapid forest degradation.

Some positive impacts by the out-growers were, 1) they secured their land for teak plantations through inheritance, 2) loans can be obtained using the teak plantation as collateral, and 3) out-growers gained popularity through establishing plantations.

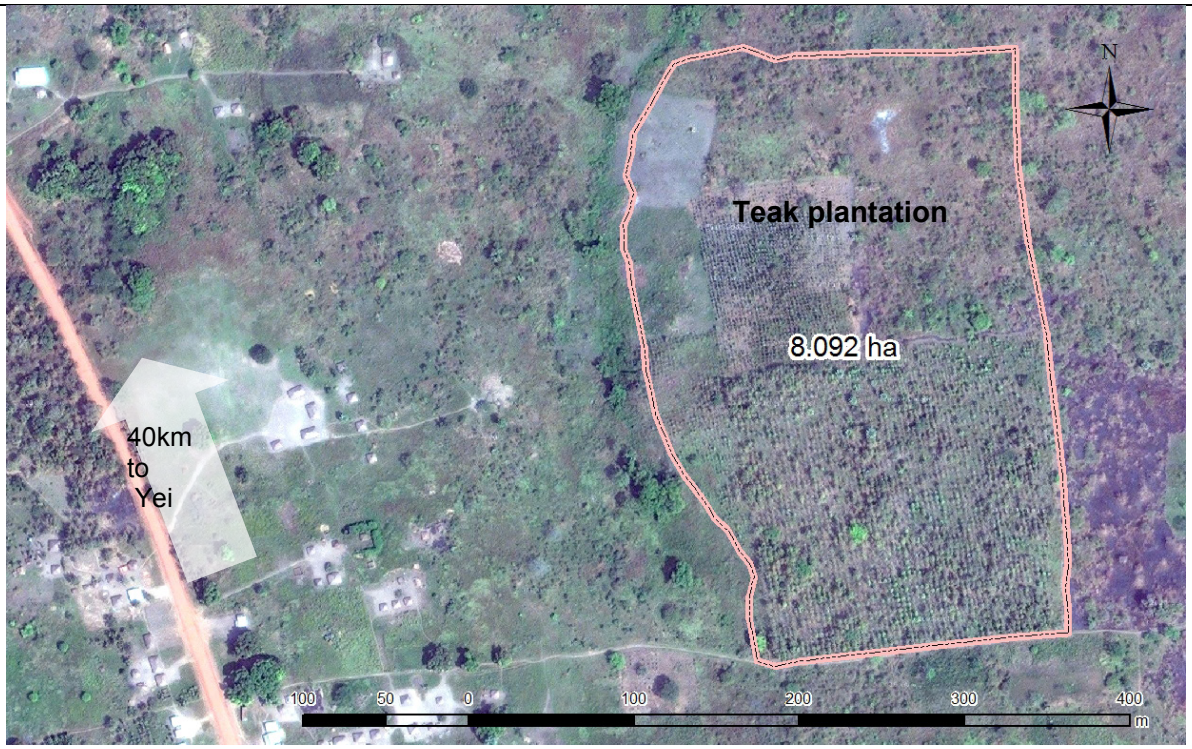
Box 12-1: A case of out-growers in Yei River County

In 1988, an out-grower began establishing a teak plantation shown in Figure 12-4 in Yari Boma, Mugwo Payam, Yei River County. The out-grower owns a hotel and shops in the outskirts of Yei town. Profits from these businesses have been used to invest in the teak plantation. He said that hotel business was declining due to the paved Juba-Nimule road (i.e. Juba-Yei road lost its importance). According to the Assistant Commissioner of Forestry in Yei River County, there are about 45 out-growers in the county.

The plantation is situated between two clans and the land serve as a buffer zone between the two clans. The land is considered no-one's land, and thus it was given to him by the elders of the two clans. The out-grower has never experienced conflict with others over his use of the land. The first teak planting was carried out in 1998 applying 3x3m spacing. The management objective was to produce teak logs. The second planting was conducted in 2003 with the spacing of 2x2m, and the last planting was in 2010 with the same spacing. In the same year a pine species (*Pinus petula*) was also planted, but failed due to termite attack and diseases. Currently his total plantation area is 8ha.

He used to purchase seedlings from a government nursery. For the 2010 planting he produced teak stamps from naturally regenerated seedlings in his plantation. Most of his labour for planting and tending work were Ugandans living in Uganda. Quality of labour from Uganda is better and payments to them are lower than those to locals. He spends 2,000SSP to 3,000SSp per year for labour. The reason that he became an out-grower was the influence of other out-growers in his boma.

Figure 12-4: Teak plantation established by an out-grower in Yei River County



A number of technical issues were observed regarding the plantation. For example, the plantation is lacking silvicultural operations; thinning is required in a part of the plantation to boost annual volume growth and secure income from sales of thinned trees. Also the spacing for the first plantation is too large (3m) to conduct thinning operation when it is necessary to do so. Fungal infections to young teaks at the edges of the plantation are evident and finally inadequate technical support to improve the capacity of the farmer and the quality of his plantation. He also says that there is no teak log market due to no vehicles and the long distance to Yei Town. However, no illegal logging was observed.

Another out-grower, who is a farmer, established plantations approximately 1.5 km south of the first out-grower. This farmer possesses two plantation plots with areas of approximately 2.2 ha and 1.0 ha. The larger plantation is a mixture of teak and pine, and the smaller is mixed species of *Gravillia robust*, *Cacia siamia*, and *Tectona grandis.* According to him these plantations are established in his ancestral land and there were no land conflicts. Planting began in 2004. He knows that, although the forest business needs a long time to obtain return on investment, planting right the species and exercising good management should yield sustainable income flows in the future.

He expects the governments to offer him a long-term loan to promote plantation development in their area, and to provide technical support and training in the field of forestry through NGOs and projects. He also hopes that government officials often visit out-growers, and that his plantation activities will contribute to the mitigation of climate change. Particularly for him as a farmer, unlike the first out-grower, the initial cost of land preparation and planting was difficult to obtain, and that financial support is essential to expand his plantations. He has used family labour to plant teak seedlings, and he said that capital and labour were the only constraints for the utilization of the large amount of land available for forest plantations.

Source: Google and CAMP TT

12.9 Forest products market, trade, and consumption

12.9.1 Forest products and food security, poverty reduction, and income growth

Based on the results of field studies a summary of characteristics of major forest products from the point of view of contribution to food security, economic growth, and agriculture sector transformation is presented in Table 12-18.

In the table characterization of the major forest products are conducted by identifying their extent of markets indicated by assumed length of value chains and spatial extent of movement of goods and products. The extent of market comprises of the following five categories: (1) subsistence production; (2) local market (rural-rural transaction); (3) domestic market (rural-urban transaction); (4) regional market; and (5) global market.

Because the most of major forest products are not edible and do not contribute directly to food security, it is assumed that their contribution is coming from value added through market transactions in their value chains. The existence of their markets and consideration of opportunity costs secure that value added is equivalent to a creation of additional money income which can be used to purchase additional foodstuffs if markets of such foodstuffs exit. This discussion implies that if we are able to observe or infer the existence of markets of the major forest products in the areas having experienced food insecurity in the past it can be said that enhancement of the markets would yield positive impacts on food security of the areas. However, an examination of opportunity cost needs to be done to complement this hypothesis. The results of the filed study indicate that markets of the major forest products are in existence and functioning, but are with significant room for improvement in their efficiency.

Table 12-18: Forest products and food security, poverty reduction, and income growth

Extent of market	Forest products (FPs)							Characteristics of value chain and value added[*2]	Expected impact on food security by value transfers through value chain, economic growth (poverty reduction and income growth) through labour productivity increase and increase in capital returns[*3], and agriculture sector transformation[*4] through capital accumulation, commercialization and industrialisation
	Fuelwood	Charcoal	Teak logs	Teak products	Gum acacia	Shea butter[*1]	Minor local FPs		
(1) Subsistence production	++					+	++	• No value chain • Intra household value transfer • Substitution of market goods by own production	• No significant effect on food security except substitute effects on availability of food items • Labour productivity diminishes as population density increases due to closed economy. Limited room to increase labour productivity. • Little or no capital accumulation by the informal sector and no room to increase capital returns.
(2) Local market (rural-rural transaction)	+		++	+		+	++	• Short value chain with small value added • Inter household value transfer within a locality	• Household-wide food insecurity can be addressed through inter household value transfers. • Labour productivity can be increased by education. • Small-scale capital accumulation mainly by the informal sector, and limited room to increase capital returns.
(3) Domestic market (rural-urban transaction)	+	++	+	+	+	+	+	• Medium value chain with medium value added • Inter local value transfer within South Sudan	• Local-wide food insecurity can be addressed through domestic value transfers. • Labour productivity can be increased by education and technology investment from accumulated capital. • Medium-scale capital accumulation mainly by the formal sector and increase in capital returns through adoption of advanced technologies.
(4) Regional market	+	++	+	++	++			• Long value chain with high	• Nation-wide food insecurity can be addressed through regional value transfers.

Extent of market	Forest products (FPs)							Characteristics of value chain and value added[*2]	Expected impact on food security by value transfers through value chain, economic growth (poverty reduction and income growth) through labour productivity increase and increase in capital returns[*3], and agriculture sector transformation[*4] through capital accumulation, commercialization and industrialisation
	Fuelwood	Charcoal	Teak logs	Teak products	Gum acacia	Shea butter[*1]	Minor local FPs		
								value added • International value transfer in the region	• Labour productivity can be increased by education and technology investment from accumulated capital. • Large-scale capital accumulation by the formal sector and increase in capital returns though adoption of advanced technologies and scale of economy.
(5) Global market			+	++				• Long value chain with high value added • International value transfer in the world	• Region-wide food insecurity can be addressed through global value transfers. • Labour productivity can be increased by education and technology investment from accumulated capital. • Large-scale capital accumulation by the formal sector and increase in capital returns though adoption of advanced technologies and scale of economy.
Current market	(1) (2)	(3) (4)	(2) (3) (4) (5)	(4) (5)	(4)		(1) (2)		
Future target market[*4]	(2) (4)	(3) (4)	(2) (3)	(4) (5)	(4) (5)	(5)	(3)		

Notes: 1) Production and consumption of shea butter (lulu in the South Sudanese language) are observed to be very small compared to those in West African countries such as Nigeria. 2) Opportunity costs for capital and labour inputs should be accounted for the estimation of value added. 3) Labour productivity and returns of capital input should be accounted for in measurement of increase in the productivity and returns. 4) Definition of agriculture sector transformation is given in Section 1.4.1

Based on the field observations and secondary source information the domestic actors involved in the value chains of the major forest products are summarised in Table 12-19. In terms of the perceived current extent of market and the actors involved, forestry products are roughly categorized into the following three groups.

(1) Forest products with regional and global extent of market: Teak logs
Teak products
Gum acacia
Shea products
(2) Forest products with domestic and regional extent of market: Charcoal
(3) Forest products with subsistence and local extent of market: Fuelwood
Minor local forest products

12.9.2 Forest products with regional and global markets

Teak logs, teak products and gum acacia are products with regional and global market potential. If future potential markets are considered, shea products can be included in this group. Teak logs, teak products and gum acacia have been marketed globally with buyers from South Sudan, Uganda, Kenya, India, China, Europa and North America reported. In the case of gum acacia, the access to the global market is mainly done through buyers from

Sudan[509], and confirmed by a trader interviewed in Northern Bahr el Ghazal[510]. Regarding the future target markets, teak logs should be processed to produce teak products within South Sudan and future target market should be local and domestic markets. Whereas the target markets of teak products should continue to be regional and global markets. Although shea nuts and its derivatives such as shea butter, soup and cooking oil are not commonly observed in the local market, the potential for finding regional and global markets for these products is high. Production and international marketing done by NGOs and private entities are reported. (Further descriptions on teak logs, teak products, and gum acacia to be added)

Table 12-19: Major domestic actors for production and trade of forest products

Major domestic actors	Forest products (FPs)						
	Fuelwood	Charcoal	Teak logs	Teak products	Gum acacia	Shea butter	Minor local FPs
Public sector							
Forest departments	Rate collection	Rate collection	Rate collection	Rate collection	Rate collection	Rate collection	Rate collection
Central Forest Reserves			Supervision	Supervision			
Private sector							
Concessionaires			Log production	Milling			
Small-scale sawmills and wood products manufacturers			Milling Production	Milling Production			
Log and timber traders			Trading	Trading			
Log and timber retailers			Retailing	Retailing			
Small-scale producers/farmers	Production Consumption	Charcoal production	Log production		Gum production	Butter production	Production Consumption
Charcoal traders		Trading					
Charcoal retailers		Retailing					
Fuelwood traders	Trading						
Fuelwood retailers	Retailing						
Other traders					Trading	Trading	Trading
Other retailers						Retailing	Retailing

Source: CAMP TT

12.9.3 Forest products with domestic and regional market

Based on NBS data analysis and field observations, charcoal is determined to be a member of the forest product group with domestic and regional markets. Estimated per state, urban and rural, and household annual charcoal consumption in 2009 is shown in Table 12-20. Average charcoal prices by state, urban and rural areas are indicated in Table 12-21.

It is estimated that a total of 107,537 tonnes of charcoal is consumed annually in South Sudan. Seventy nine percent of this total was consumed in urban areas whereas 21% was consumed in rural areas, which indicates that charcoal is the major energy source for urban populations. The urban areas of Central Equatoria State (i.e. Juba and surrounding areas) consumed 45% of the national total followed by the urban areas of Upper Nile State (i.e. Malakal areas) which consumed 14%. These two sets of areas also show the highest per household charcoal annual consumption of 854kg and 461kg. Although charcoal is considered the main energy source for urban populations, 11% of the national total was consumed in the rural areas of Upper Nile State where per household annual consumption

[509] Multi Donor Trust Fund-National Technical Secretariat. 2007. MDTF-National Sector Policy Note Export marketing of Sudanese Gum Arabic. Khartoum: World Bank. and USAID. 2011. Gum acacia assessment phase I report. p.5.

[510] CAMP situation analysis.

was 106kg which is exceptionally high among rural areas. During the period of May-June in 2009 87%, 64%, 68% of urban households in Upper Nile State, Western Bahr el Ghazal State, and Central Equatoria State, respectively consumed charcoal when the national average was 55%. In the same period 25% of households in rural areas of Upper Nile State consumed charcoal when their national average was 4%. Since 2009, when the household survey was carried out, it should be assumed that consumption of charcoal particularly in urban areas, has increased due to the rapid increase in population in some areas.

Table 12-20: Estimated annual charcoal consumption in urban and rural areas in 2009

State	Per state and rural and urban consumption						Per household consumption		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	All
	(ton/year)			(% to national total)			(kg/year)		
Upper Nile	15,495	11,517	27,012	14%	11%	25%	461	106	190
Jonglei	2,504	1,836	4,340	2%	2%	4%	161	10	23
Unity	1,049	1,172	2,222	1%	1%	2%	87	20	31
Warrap	2,673	485	3,158	2%	0%	3%	205	3	19
Northern Bahr el Ghazal	2,169	4	2,172	2%	0%	2%	263	0	16
Western Bahr el Ghazal	8,692	1,966	10,658	8%	2%	10%	335	60	182
Lakes	858	3,118	3,976	1%	3%	4%	132	36	43
Western Equatoria	1,990	1,351	3,341	2%	1%	3%	130	13	29
Central Equatoria	48,104	450	48,554	45%	0%	45%	854	4	271
Eastern Equatoria	1,869	235	2,104	2%	0%	2%	143	2	14
Total/average	85,404	22,133	107,537	79%	21%	100%	428	20	82

Note: Consumption values are estimated from 30-day consumption information obtained from sampled households during the period of May - June 2009.
Source: National Bureau of Statistics and CAMP TT

In these high charcoal consumption areas charcoal prices are moderate or relatively low. For example in urban areas of Upper Nile State and Central Equatoria State the estimated average prices of charcoal are in the moderate range of 108% and 112%. These moderate prices in the large consumption areas may be attributed to well-established production and market mechanisms which will be confirmed by field observations. (TBD) On the other hand, the estimated average price in the urban areas of Western Bahr el Ghazal is 80% of the national average. This could be attributed to well-established production and market mechanisms including large charcoal production forests nearby. However, according to accounts from interviewees conducted during the situation analysis, these areas have experienced widespread, uncontrolled, and illegal charcoal production and this could also be a reason for the situation. Urban areas in Warrap State and Lakes State, and rural areas of Jonglei State have high charcoal prices. This may be caused by costly transportation due to bad road conditions at the time of survey in 2009. Examinations of the field observations are needed to explain this. (TBD)

Table 12-21: Average charcoal prices by state and urban and rural areas

State	Average price			% to all national average price		
	Urban	Rural	All	Urban	Rural	All
	(SDG/kg)			(%)		
Upper Nile	0.79	0.68	0.76	108%	94%	104%
Jonglei	0.59	1.00	0.60	81%	137%	83%
Unity	0.87	0.80	0.85	119%	111%	117%
Warrap	1.24	0.30	1.11	170%	42%	152%
Northern Bahr el Ghazal	0.57	1.00	0.58	79%	137%	80%
Western Bahr el Ghazal	0.58	0.20	0.58	80%	27%	79%
Lakes	0.98	0.83	0.95	134%	114%	131%
Western Equtoria	0.51	0.45	0.50	70%	62%	69%
Central Equatoria	0.81	0.61	0.81	112%	84%	111%
Eastern Equatoria	0.76	0.55	0.75	105%	76%	103%
National average	0.74	0.67	0.73	101%	92%	100%

Note: 1) Prices are estimated from 30-day consumption information obtained from sampled households during the period of May - June 2009. 2) Sampled locations without charcoal price information are marked with black triangles.
Source: National Bureau of Statistics and CAMP TT

12.9.4 Forest products with subsistence and local markets

Fuelwood and other minor local forest products belong in this group. Based on the results of National Baseline Household Survey data analysis, fuelwood is produced and consumed by the same households, and also marketed locally.

12.9.4.1 Fuelwood consumption

Fuelwood consumption and sources in urban and rural areas in the period of May-June 2009 are presented in Table 12-22. In contrast to charcoal, fuelwood is mainly used in rural areas where fuelwood is collected mainly by the users[511]. Sixty two percent (62%) of rural households (approximately 687,000 households) in the country used fuelwood as a source of energy during the period of May-June 2009. On the other hand 39% of urban households (77,000 households) consumed fuelwood in the same period. On average 83% of rural households consumed fuelwood collected by them. In contrast 50% of urban households consumed fuelwood collected by them. Although in both urban and rural areas the ratios of household consumed fuelwood vary location by location, generally the more wood resources are available, the more fuelwood is collected by users, particularly in rural areas of Western Bahr el Ghazal, Western Equatoria, and Eastern Equatoria states. If cash is scarce and the opportunity cost of collecting fuelwood is low in rural areas, then self-collection saves scarce money to be used otherwise.

[511] Fuelwood collection can be done by less skilled labour than labour necessary to produce charcoal. Often a charcoal producer is considered as an occupation which requires knowhow and skills to produce charcoal with quality and quantity, whereas fuelwood collection is considered the unskilled task of women and children.

Table 12-22: Fuelwood consumption and sources in urban and rural areas in May-June 2009

State	Fuelwood consumption in urban areas						Fuelwood consumption in rural areas					
	Sources of fuelwood consumed			Fuel-wood not consumed	Households (HHs) total		Sources of fuelwood consumed			Fuel-wood not consumed	Households (HHs) total	
	Collected	Purchased	HHs Sub-total				Collected	Purchased	HHs Sub-total[*1]			
Upper Nile	7%	38%	45%	55%	100%	33,613	49%	21%	70%	30%	100%	108,825
Jonglei	31%	16%	47%	53%	100%	15,565	53%	5%	58%	42%	100%	176,859
Unity	54%	16%	70%	30%	100%	12,120	67%	14%	80%	20%	100%	59,994
Warrap	15%	15%	30%	70%	100%	13,070	32%	22%	54%	46%	100%	156,435
Northern Bahr el Ghazal[*2]	5%	26%	31%	69%	100%	8,255	5%	5%	10%	90%	100%	125,308
Western Bahr el Ghazal	9%	19%	28%	72%	100%	25,932	86%	10%	97%	3%	100%	32,759
Lakes[*2]	0%	0%	0%	100%	100%	6,476	28%	7%	35%	65%	100%	85,847
Western Equtoria	57%	17%	73%	27%	100%	15,280	71%	1%	73%	27%	100%	101,056
Central Equatoria	14%	12%	26%	74%	100%	56,357	63%	18%	81%	19%	100%	122,714
Eastern Equatoria	29%	20%	49%	51%	100%	13,072	88%	4%	92%	8%	100%	140,779
% to total	19%	19%	39%	61%	100%	199,740	51%	11%	62%	38%	100%	1,110,576
Total % to sub-total	50%	50%	100%				83%	17%	100%			

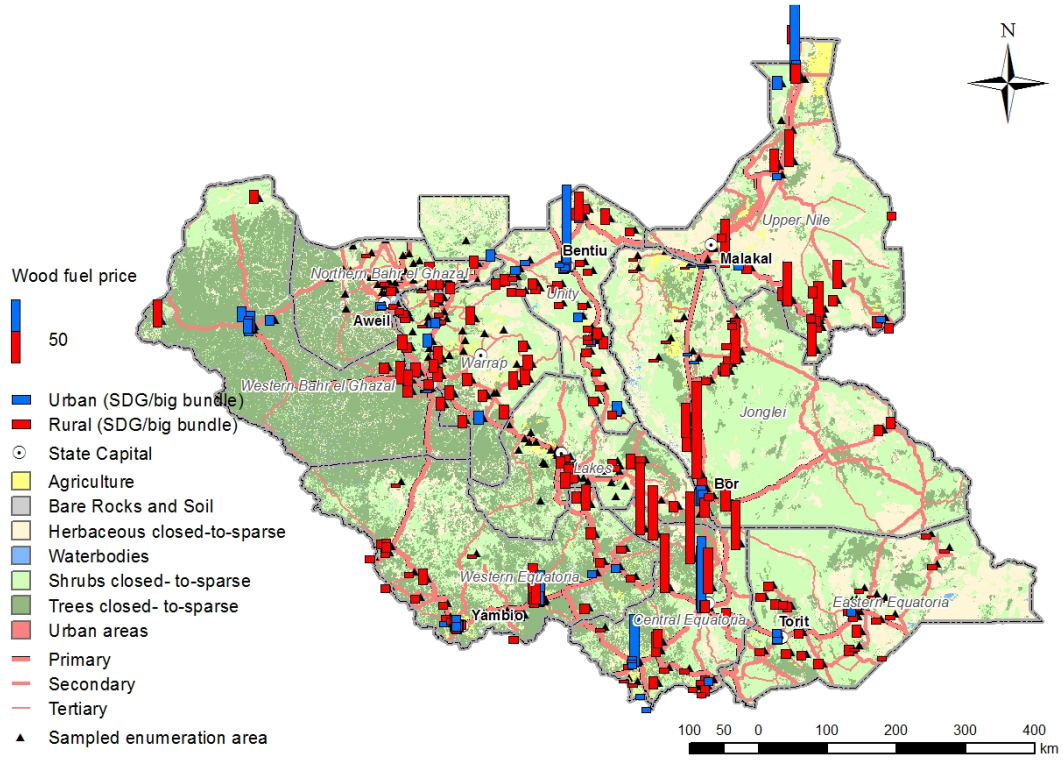
Note: 1) Numbers of households consumed fuelwood past 30 days in rural areas seem to be under estimated. 2) Fuelwood consumption in rural areas in Northern Bahr el Ghazal State and urban areas in Lakes State may be underestimated. 3) Consumption values are estimated from 30-day consumption information obtained from sampled households during the period of May - June 2009.
Source: National Bureau of Statistics and CAMP TT

12.9.4.2 Fuelwood production and deforestation

The spatial distribution of prices of fuelwood estimated by participants in the National Baseline Household Survey in the period May-June 2009 is shown in Figure 12-5. During this period, high prices of fuelwood were observed in the localities of Upper Nile, Jonglei, a part of Unity, Lakes, and Central Equatoria states. Since the extent of the fuelwood market is considered to be local (or subsistence), the market price of a particular locality likely signals supply and demand in the locality; therefore, observed prices varied depending on local market conditions. In the areas showing high fuelwood prices, a high demand for fuelwood, including for the production of charcoal in relation to other locations can be assumed. Although it requires further verification with data and accounts collected from the field, the higher prices may also indicate a higher rate of forest degradation and deforestation. According to an estimate, the per capita annual consumption fuelwood in Sudanese area is approximately 0.68 m^3 [512]. Since the population in 2009 in South Sudan was 8.26 million, the total fuelwood consumption could annually be 5.6 million m^3 (4.3m^3/household) including the wood equivalent to make charcoal (verification needed). This required consumption is large with respect to scarce forest resources particularly in semi-arid zones. Due to this assumed large demand for fuelwood in South Sudan as well as a large demand from Sudan, the deforestation and degradation of natural and plantation forests has been steady increased in South Sudan for many decades[513].

[512] United Nations Environment Programme. 2007. Sudan post-conflict environmental assessment. Nairobi: UNEP. p. 201.
[513] United Nations Environment Programme. 2007. Sudan post-conflict environmental assessment. Nairobi: UNEP. Chapter 9.

Figure 12-5: Spatial distribution of perceived fuelwood prices in May-June 2009



Note: Prices are estimated from 30-day consumption information obtained from sampled households during the period of May - June 2009. Surveyed prices were perceived prices by subjects of the survey and were not prices actually realised at the time of market transaction.
Source: National Bureau of Statistics and CAMP TT

12.10 Forestry education, research, training, and extension

For enhancement of economic and environmental services provided by the forestry subsector long-term investment for human resource development, and knowledge creation and dissemination is the key. Currently, Kagelu Forestry Training Centre, the Faculty of Forestry of Juba University and Upper Nile University (TBD) are institutions involving such activities.

12.10.1 Kagelu Forestry Training Centre

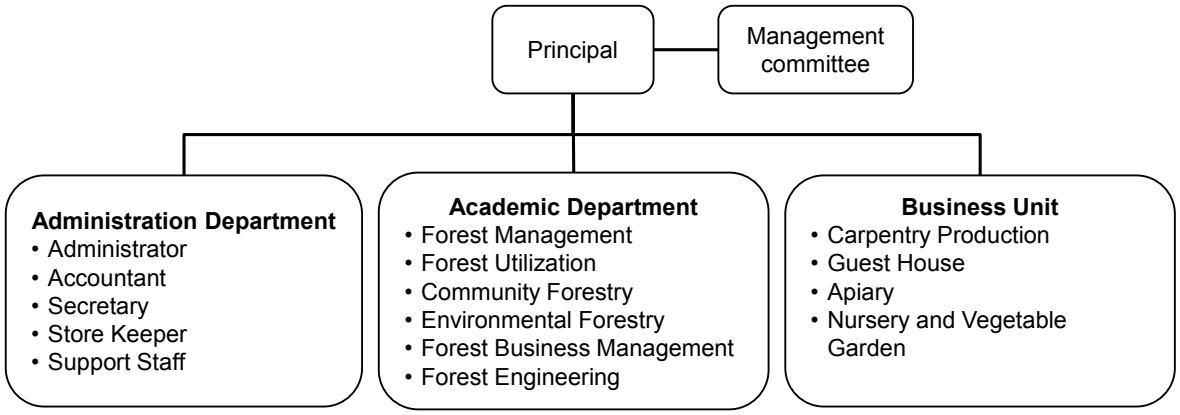
Background

Kagelu Forestry Training Centre (KFTC) was established in 2003 by the SPLM Secretariat for Agriculture and Animal Resources (now MAFCRD) to provide practical training to the forestry sector. It is located at Kagelu in Yei River County in Central Equatoria State. Its mandate is to serve the training needs of the forestry subsector in Southern Sudan as a whole. The Centre was established through the Forestry Training Centre Act 2004 with functions and mandates clearly specified in the Act along with institutional arrangements, management set-up and other arrangements for management of the Centre.

12.10.1.1 Organization and teaching facilities

KFTC at the national level falls under the direct supervision of the Directorate of Training and Research of MAFCRD. As shown in Figure 12-6, KFTC comprises the Principal, Management Committee, Administration Department, Academic Department and Business Units. Although the curriculum requires 14 teaching staff with different qualifications, there are currently nine teaching staff consisting of the principal, six tutors and two assistant tutors.

Figure 12-6: Organization of Kagelu Forestry Training Centre



Source: Kagelu Forestry Training Centre

The capacity of KFTC in terms of annual intake of students is 20. There is a dining room for 60 students, three classrooms (2 for the certificate course and one for the diploma course), and 3 dormitories and 1 flat where a total of 100 students can be accommodated.

Table 12-23: Expenditure and budget of KFTC for fiscal year 2010/11 and 2011/12

Budget item	2010/11 out turns		2011/12 budget	
	(SSP)	(%)	(SSP)	(%)
Income				
Carryover from 2006/7	33,153	12%	33,439	15%
Grants for core expenses (USAID, STEP and others)	99,981	36%	0	0%
Training Fees from MAF/States for certificate training	57,691	21%	60,000	26%
Training Fees from MAF for refresher training	0	0%	10,000	4%
Other training fees (private sector self sponsoring)	0	0%	5,000	2%
Income from guest rooms and conference	5,294	2%	5,000	2%
Income from consultancy contracts	3,182	1%	3,000	1%
Carpentry Production Unit revenue	17,766	6%	17,000	7%
Other income	186	0%	2,000	1%
MAF Salaries	62,338	22%	92,435	41%
Total Income	**279,592**	**100%**	**227,874**	**100%**
Expenditure				
Vehicle Expenses	28,689	12%	20,000	9%
Administration Costs	49,527	20%	45,000	20%
Travel Expenses	6,405	3%	6,500	3%
Personnel Costs	92,435	38%	92,000	40%
Training Expense	29,849	12%	30,000	13%
Board Expenses	10,166	4%	10,000	4%
Carpentry Unit	16,695	7%	17,000	7%
Bank charges	2,061	1%	2,061	1%
Fixed assets procurement	10,118	4%	5,000	2%
Total Expenditure	**245,944**	**100%**	**227,561**	**100%**
Balance	**33,648**		**313**	

Source: Kagelu Forestry Training Centre

12.10.1.2 Budget

In Table 12-23, KFTC's expenditures and budget for fiscal years 2010/11and 2011/12, amounts of incomes and expenditures are presented. The amount of income generated by KFTC itself in each of the two fiscal years was less than 20% of the total income. The amount was generated by the business unit of the training centre. The core budget of the

centre was expected from MAFCRD and DPs. Funding from USAID as the main donor ended in 2008 and MAFCRD was to lobby DPs to support the centre. The operation of KFTC is not easy work and the identification of financial resources to maintain training activities is challenging.

12.10.1.3 Training courses and other services

Under the Southern Sudan Agricultural Revitalization Program (SSARP) supported by USAID KFTC developed and provided training courses in: 1) tree seedling production, 2) business skill development, 3) beekeeping, 4) agroforestry, and 5) carpentry and joinery targeting community members. Before the termination of SSARP in 2008, the curriculums for a two-year forestry certificate course and a one-year forestry diploma course for forest professionals, and short courses (2 weeks, one month, three months, six months and nine months) of refresher training for forestry and extension officers were developed. These courses commenced in 2006 except the diploma course which began in 2013.

The two-year certificate course was attended by government officials who were sponsored by the central government for two years. This sponsorship lasted for three years to finance the training costs of two batches of trainees, and thereafter, the sponsorship became the responsibility of state governments. However, due to the tight fiscal condition of state governments, the current course attendants sponsor themselves. There were eight first-year and four second-year students attending the forestry certificate course in 2012. The curriculum for the two-year diploma course includes 42 training modules in the fields of: 1) Forest management, 2) Forest utilization, 3) Community forestry, 4) Environmental forestry, 5) Forest engineering, and 6) Business management.

KFTC provides training, facilitation, consultancy, and research services to various clients including FAO, Southern Sudan Program of the Norwegian Peoples Aid (NPA), MDTF, RIPS (JICA), GIZ, GOAL Ireland, Mercy Corps (an international NGO), USAID, Sudan Traditional Environmental Program (STEP), United States Development Agency (USDA), ZOA (Netherlands NGO), and other NGOs. Apart from training, KFTC provides teak seeds and seedlings obtained from plus trees, and stamps from natural regenerations are provided to farmers in and around Yei free of charge to enhance private and community forestry and agroforestry in order to reduce human pressure on plantation and natural forests.

12.10.1.4 Challenges

It was reported that the fluctuation in the number of students and trainees, the limited budget from the government, and deteriorating laboratory facilities are some of the challenges that need to be addressed. Other needs include training of teaching staff; establishment of science and computer laboratories, a library and an arboretum; and strengthening of transportation facilities.

12.11 Activities of development partners and NGOs

Not many activities of development partners (DPs) and NGOs in the forestry subsector are recognized. An NGO promotes shea butter production and distribution in support of a women's group. A small-scale nursery operation by the Assistant Commissioner of Forestry in Yei River County, and a county in Eastern Equatoria State were supported by international and local NGOs. As mentioned before, Kagelu Forestry Training Centre (KFTC) has been in collaboration with USAID, GIZ, and other DPs and NGOs. A number of studies on forest resources and products were financed by FAO, UNEP, and USAID but all before the independence of South Sudan. Among these activities, the establishment and operationalization of the Land Resource Survey and Information Centre (LRSIC), through technical cooperation between the GRSS, the Government of Norway and the Norwegian Forest Group is the most significant example.

LRSIC was established in 2007 within the Directorate of Forestry of the Ministry of Agriculture and Forestry under the Southern Sudan Forest Sector Program started in 2007 for three years. The program was supported by the Government of Norway and the Norwegian Forest Group (a group of private sector forestry businesses), and was extended by a year until 2011. The total budget allocated by the Government of Norway is reported to be USD 4.3 million. The objective of program was to establish LRSIC for the management of forest resource data to contribute to the rehabilitation and sustainable management of the forest resources in the country. The program consisted of four components: 1) GIS database development, 2) forest resources assessment, 3) forest conservation to develop guidelines and a template agreement between the government and private sector, and 4) capacity building of national and state government forest officers.

12.12 Investment

Private investment in the forestry subsector is still in the early stage of development. Significant investment has been made by the two concession holders in West Equatoria State, in the order of a few million US dollars in each case. There have been investments to begin and run micro- and small-scale forestry products businesses by numerous formal and informal entrepreneurs. However, almost all forestry products small-scale businesses recognised the need for obtaining loans from formal sources but that it was difficult. A war veteran we interviewed in Awail town market is an example of emerging entrepreneurs of such businesses. The war veteran invested his retirement money in his timber and forest products retail business at a market enclosure managed by the State Government. In the case of out-growers interviewed, major sources of their investment in teak plantations was from surplus yielded from, for instance, hotel and retail businesses or sales of crops. The field study reveals that the major sources of initial capital and investment for forestry and forestry products businesses are still people's own money or from informal sources.

13. Fisheries

13.1 Overview

The most significant feature of the fisheries of South Sudan is that there is very little accurate data on any aspect of them. Most figures for production or trade are based on subjective observation or conjecture and cannot be regarded as reliable.

South Sudan has a significant capture fishery in its major rivers and wetlands, concentrated on the Sudd swamps (between Malakal and Bor). They lie between 6°N and 9°30′N, and from 30°W to 32°E, with a maximum water surface area in excess of 30,000 km² during the rainy season. Other floodplains and riverine systems also contribute in areas away from the main Nile and Sudd wetland areas.

The fishery is largely undocumented. CAMP has attempted to clarify what is happening and using ANLA and NBS data has calculated that the consumption of fish in South Sudan is far higher than generally recognised at about 17kg/person/year, comparable with neighbouring countries. To supply this consumption level the catch must be in the order of 140,000 tonnes. More than 1.7 million people depend directly on fisheries for livelihood, food security or income, far more than previously thought and many more through consumption of purchased fish products.

The potential catches for the country are unknown, and estimates vary widely. It is impossible at this time to accurately predict the Maximum Sustainable Yield that might be possible from the capture fisheries, but it probably exceeds 200,000 tonnes/annum, worth at current Juba market prices at least USD800 million.

For all intents and purposes the wild fishery in South Sudan is an open access one, with no controls on numbers of fishers or entry. Open entry is an undesirable management regime, and always leads eventually to overfishing and the collapse of fish stocks.

Aquaculture has great potential, but currently there is little aquaculture being undertaken in the country. Areas for commercial and subsistence level aquaculture of significant size are available, but they have not been accurately mapped and assessed. Other constraints to aquaculture development include land tenure uncertainty, a lack of hatcheries, no feed mills and a shortage of skills. Technology and skills transfer from neighbouring countries such as Uganda and Kenya is probably the best way to advance the sector in the short term, though Integrated Agriculture Aquaculture is very appropriate for village level introduction, as is already happening in parts of the Green Belt, but in the future development efforts will have to be more targeted with support to clusters of entrepreneurial farmers operating around towns.

Much of the catch is dried, despite the demand for fresh fish being high. This is because there is no ice availability in most of the country and also the transport system is not well developed. Dried fish is however a very appropriate product when the consumers lack refrigeration in their homes, it keeps well and does not need rapid transport from the landing site to the consumer. Smoked fish is also produced in areas where there is sufficient firewood, and feeds an ever increasing urban population.

Large amounts of fish are being imported to South Sudan from Uganda, mostly in smoked form, and some fresh Tilapia and Nile Perch is also coming up from Lake Victoria. Small pelagic fish from eastern Uganda are also an important import. Previously, there existed a significant export of fresh fish from Jonglei, Lakes, Unity and Upper Nile States of fresh fish to Khartoum (this has practically ceased with the closure of the border).

The Directorate of Fisheries and Aquaculture Development (DoFAD) in MARF is the national government directorate responsible for fisheries, but under the Constitution, management of the fishery in the States is delegated to the states. The financial, management and skills capacity of the states at all levels of the administrations continues to be very weak in fisheries, and indeed DoFAD is itself institutionally weak. Efforts in the short term will have to be made on building capacity and strengthening institutions throughout the sector, in national government, the states and the private sector. Only once the skills necessary have been acquired, the institutions created or strengthened, the staff recruited and the necessary recurrent and development budgets allocated, will it be possible to fully realise the potential of the sector. This may take some considerable time.

It is the responsibility of the government to manage the exploitation of renewable natural resources properly, so that future generations will be able to enjoy their benefits as do those now charged with their husbandry. For this reason DoFAD will have to diligently apply the FAO Code of Conduct for Responsible Fisheries in which is contained the "Precautionary Approach" to the development of capture fisheries. This will include management of the resources of the country through: 1) involving those that use the resources in a participatory manner (co-management), 2) monitoring and enforcing regulations, and 3) ensuring compliance with conservation and management measures agreed with the resource users.

Similarly the development of Aquaculture is also covered by the FAO Code of Conduct for Responsible Fisheries, as are Post Harvest Practices and Trade, and again DoFAD will have to follow the FAO Codes of Practice for Aquaculture and other guidelines laid down, until its own laws, codes of practice and guidelines can be prepared.

13.2 Key issues and challenges

Key issues and challenges are all too apparent from the survey work done by the CAMP fisheries subsector Task Team.

These issues and challenges can be divided into two broad areas "Management" and "Production and Marketing". Broadly "Management" is the responsibility of the government at national and state levels, and "Production and Marketing" is the responsibility of the private sector, though of course under regulations and oversight of government.

For government, the key issue to be tackled is the lack of skills, coordination and finance within the administrations involved in fisheries. Currently most government bodies involved in fisheries are not sufficiently active, and do not contribute to the good management nor development of fisheries in South Sudan. Until this lack of capacity is addressed, it will be difficult for the government to carry out its role, and bring in necessary legal and regulatory management measures, as recognised in its own policies and strategies.

The private sector is quite capable of improving production and post harvest in fisheries by itself, without government assistance (but necessarily under government regulatory supervision). The private sector however faces several challenges, greatest amongst them being poor transport and communications, the high cost of energy and utilities, a lack of skills and informal taxation.[514] All of these could be alleviated by direct government interventions.

[514] Formal taxation is an involuntary fee backed up by some form of legal sanction, whereas informal taxation is any tax or tax-like payment collected outside of statutory legal frameworks. In other words informal taxes are illegal payments. In South Sudan informal taxes are generally collected by government employees and include: the part of taxes kept for their own use by tax collectors and administrators, sometimes by means of false receipts; payments to avoid formal taxation; unauthorised charges for services, such as inspection services, passing through a checkpoint etc.

Major cross cutting issues not only affecting fisheries are also important, such as general health provision, education in fishing communities and poor security. As an example, the looming HIV epidemic is a hidden threat to fisheries and will hit the sector badly unless action is taken quickly.

13.3 Policy framework

The Constitution[515] is the overarching policy document for South Sudan. The constitution places emphasis on the sustainable use of the natural resources of South Sudan, wise environmental management and involvement of local communities in decision making on the exploitation of natural resources in their areas. The Constitution also gives significant powers to the states to manage their natural resources.

Traditional authority is recognised in the constitution in matters affecting local communities, which would presumably include management of local fisheries.

There are available a series of other high level planning documents, including the Vision 2040; South Sudan Development Plan 2011-2013; the South Sudan Development Initiative (SSDI) 2012; and the Millennium Development Goals, though these provide no specific guidance on fisheries.

13.3.1 MARF Policy Framework and Strategic Plans 2012-2016

The MARF Policy Framework and Strategic Plan is a document produced in May 2012 by MARF to fill the policy gap that had become apparent since Independence. The document covers all directorates in MARF.

The structure gives a preface and introduction which explains the origins and need for the document and an organogram of MARF is given. A summary budget precedes Policy Frameworks and Strategic Plans for each of the 9 directorates of the ministry.

Each directorate section contains an Introduction, indicating the primary responsibilities of the directorate, a Vision, derived in each case from the Vision of MARF and a mission statement. The Functions and Responsibilities of the directorate are then laid out.

Each department in each directorate is then listed, each with its goal and functions.

Each directorate has a Strategic Planning and Implementation Matrix, with Strategies, Activities, Indicators and Outputs given for each Strategic Objective. It is not clear in some cases exactly from where the individual strategic objectives are derived for they do not necessarily follow on in a logical manner from the preceding sections.

At the beginning of the policy document there is a caveat which states that *"The "MARF Policy Framework and Strategic Plans 2012-2016", is intended to be the reference MARF document, upon which the MARF policies will be further reviewed and developed, and Directorate and Departmental Annual Work Plans elaborated".* Although the policy notes the Paris Declaration on Aid Effectiveness, the Accra Agenda for Action and the Comprehensive Africa Agriculture Development Programme (CAADP) of the New Partnership for Africa's Development (NEPAD) there are many other international and regional agreements, protocols and treaties which are not included, even in the texts of policies of the individual departments. Despite this, HIV, gender issues and the environment are covered in the document, even if not related to regional or international agreements which bind the GRSS and the Ministry.

[515] GRSS. 2011. *The Transitional Constitution of the Republic of South Sudan, 2011*

The contents of the Constitution are noted, at least in that the responsibility for the management and development of the livestock and fisheries resources is acknowledged to lie with the States, but the document itself only pays lip service to this important principle.

It is safe to say that the document resembles a series of strategies more than a policy framework. This is acknowledged in the name of the document: That said, very few of the objectives or strategies in the document are SMART.[516] Even those with measurable indicators or quantified objectives often lack a statement of the present situation or starting point. Objectives and strategies presented are mainly just vague goals.

Overall the MARF policy is sufficient for short term planning purposes, but needs to be sharpened up by the various directorates as time goes on, so that it better reflects international, regional and internal overarching policy in animal resources and fisheries. Each of the strategies mentioned need to have an implementation plan for the activities under it, in far greater detail that given in the document. Additionally some fisheries related areas, such as research, training, aquaculture and capture fisheries need to have master plans of their own; the ones in the MARF Policy Framework for research and training cover the whole of MARF.

In fisheries the document is specifically aimed at the commercial sector, indeed the Executive Summary states that the overall goals are aimed at *"transforming the livestock and fisheries sectors into vibrant productive and commercialised sectors".* Most of South Sudan's fisheries is subsistence level, and this is not sufficiently addressed.

The document launches the concept of SUDAFISH, a parastatal organisation which it is hoped would attract private sector investment. This parastatal is not mentioned in the subsequent Strategic Planning and Implementation Matrix, nor in the budget, so it can be assumed to be currently unfunded. Canning factories, mentioned elsewhere in MARF presentations as an investment possibility, do not appear in the MARF Policy Document.

In general this policy needs to be realigned with international obligations, realities in the field, and subsistence fisheries should be emphasised more. A budget for aquaculture would also be a useful addition.

13.3.2 Fisheries and Aquaculture Policy 2012-2017

The policy, written at the beginning of 2012, is generally complete in that it covers everything that ought to be in a fisheries policy, though it is constrained in its scope as it does not go beyond identifying strategies derived from the objectives given in the policy.

The overarching principles contained in the FAO Code of Conduct for Responsible Fisheries permeate the document, including the precautionary principle and ecosystems approach to fisheries management. This is a response to the limited data available on the fisheries of South Sudan.

The policy is generally compliant in that it is aligned with overarching policy and international and regional fisheries agreements, which are identified. The principles and policies derived from overarching documents from the GRSS, such as the Transitional Constitution, Vision 2040 and South Sudan Development Plan 2011-2013, are included. The policy includes sections on:

- the need to manage natural resources sustainably;
- involving communities in decisions relating to the exploitation of natural resources; and

[516] An acronym for - Specific, Measurable, Achievable/attainable, Realistic, and Time bound

- emphasis on the development of the private sector.

The document identifies shortcomings in background data on fisheries in South Sudan and proposes that the "Precautionary approach" should be followed until such time as more data is collected; it also acknowledges the need for further development of master plans in training, research, capture fisheries and aquaculture.

The policy itself is not particularly useful if the ideas in it are not bought to the next stage of implementation, with sensible budgets, detailed work plans, and milestones. This is the next challenge, which is acknowledged in the document, and is covered to some extent in the MARF Policy Framework and Strategic Plans 2012-2016 [517].

13.3.3 Legal framework

The constitution is the highest legal document which mentions natural resources. The constitution lays down some important overarching guidance on management of natural resources and delegates much power for their management to the states.

The law in South Sudan regarding fisheries is completely lacking. Currently the "law" as it is, is that of the Sudan, and was enacted many years ago[518]. This is barely useful, being out of date, covering what is now a different country, and which in itself has serious shortcomings partly because it does not acknowledge the rights of the users of the resources to manage the resources, a plank of modern fisheries management. This law is still being used as a basis for control of the fishery, particularly by the states' extension officers, since there is no other. Regulations were also promulgated under this law, and like the law, are in urgent need of revision to bring them up to date. A new law[519] is in preparation, issued in draft as the 2012 version (but is only a draft 2006 version with the date changed). This draft is completely unsuitable for a whole host of reasons and must be abandoned. Efforts are being made by DoFAD to obtain technical assistance to draft a completely new law, incorporating the ecosystems approach, the precautionary approach and other important principles of fisheries management. The sooner this is done the better; as there is a danger that the states will begin to develop their own legislation and regulations, as has already happened in Jonglei State, and it is essential that these state laws and regulations are consistent with those of GRSS.

13.4 Fisheries Institutions

13.4.1 GRSS MARF

The GRSS Ministry of Animal Resources and Fisheries (MARF) is the organisation charged with the development of the sector in South Sudan. According to the policy of the MARF[520]

"The role of the Ministry of Animal Resources and Fisheries in the Republic of South Sudan is to guide, regulate, promote, facilitate and document sustainable increases in production and productivity in the livestock and fisheries sectors through the provision of services to livestock producers and fisher-folk, encouraging increased commercialization of livestock and fisheries enterprises, promoting improved quality and value addition to livestock and fisheries products, facilitating access to credit and local and international markets, with the aim of harnessing the vast wealth of livestock and fisheries resources in the Republic of

[517] See above Section 12.3.1

[518] Republic of Sudan 1954 *The Freshwater Fisheries Act 1954.* Vol 4 Chapter 54 of the Laws of the Republic ofSudan

[519] GRSS MARF. 2012. *The Laws of South Sudan The Fisheries and Aquaculture Development Bill 2012* (DRAFT)

[520] GRSS. 2012. *The Ministry of Animal Resources and Fisheries. Policy Framework and Strategic Plans 2012 - 2016.*Juba: MARF 2012

South Sudan to support improved food security, poverty alleviation and socio-economic development of the people of South Sudan."

The approved budget for MARF in 2012-2013 was SSP27,581,541.

13.4.2 Areas of competencies

The MARF is divided into 9 directorates as below

(i) Directorate of Planning, Statistics and Documentation (DoPSD), with departments of Planning and Policy Analysis, Statistics and Documentation, and Gender Analysis and Mainstreaming
(ii) Directorate of States and Special Projects Coordination (DoSaSP) with two departments, State Affairs and Special Projects
(iii) Directorate of Finance and Human Resource Development with departments of Administration, Finance, Procurement and Human Resources Development
(iv) Directorate of Investment, Marketing and Supplies. Departments of Investment, Marketing and Supplies
(v) Directorate of Animal Production and Range Management (DAPRM).Departments of Animal Production and Range Management
(vi) Directorate of Fisheries and Aquaculture Development, with departments of Capture Fisheries and Aquaculture
(vii) Directorate of Veterinary Services (DVS) with 6 departments
- Veterinary Public Health and Food Safety
- Disease and Vector Control
- Epidemiology and Disease Information System
- Diagnostic Laboratories
- Wildlife and Aquatic Diseases
- Livestock Production and Range Management

(viii) Directorate of Livestock and Fisheries Extension (DoLFE) with the departments of Veterinary Extension and Fisheries and Aquaculture Extension
(ix) Directorate of Animal and Fisheries Research and Development (DAFRD) with 4 departments, Central Research Laboratory, Livestock Research Centre/Station, Fisheries Research Centre/Station and Satellite Laboratories

13.4.3 Organisation

The directorates with responsibility for fisheries include the administrative ones, Directorate of Planning, Statistics and Documentation and Directorate of Finance and Human Resource Development who look after administration, with Fisheries and Aquaculture Development leading the development activities, though with training, research and extension being the responsibility of other directorates or departments. This is a very cumbersome and illogical way of organising the delivery of services, with all of finance, planning, extension, training and research not being part of, and under the direct control of, the DoFAD. Even the relationships between the various directorates in MARF are unclear, with overlapping responsibilities and needs. The whole system seems designed to create barriers to the smooth delivery of services to the sector.

13.4.4 GRSS MARF Directorate of Fisheries and Aquaculture Development

The Directorate of Fisheries and Aquaculture development is "responsible for the overall coordination, provision of policy and regulatory framework, aimed at creating a conducive environment for fisheries sector growth and investment in the country".

The approved programme budget for DoFAD for 2012 - 2013 was SSP1,543,935. This is 5.6% of the MARF budget for 2012 - 2013.

The directorate claims competency in the following areas:

- Management and conservation of fishery resources.
- Promotion of aquaculture development.
- Promotion of fish quality control and preservation techniques.
- Enhancing good fish marketing.
- Development and enforcement of fisheries laws and regulation.
- Development of research, training and extension services.
- Strengthening the institutional framework.
- Conducting surveys on fisheries stocks and potential and sharing data on production.
- Supporting the States in institutional and human resources development (training and provision of fishing gear and equipment).
- Formation of strong linkages with states governments to ensure effective management of fisheries resources.

Unfortunately there is neither long term nor day to day plans of activities. This means that the staff come to work without an assignment for the day, week or month ahead, and what plans have been made receive inadequate funding, so cannot be implemented.

As a general rule it can be said that the staff are under qualified to carry out their assigned roles, have no equipment, have recently received no budget, and are, unsurprisingly, unmotivated as a result.

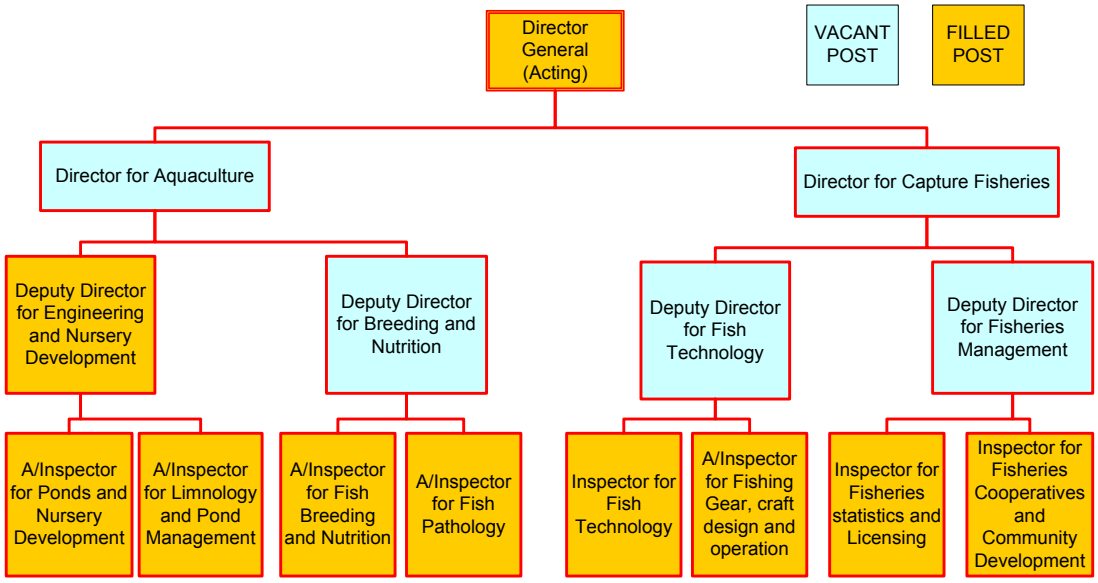
13.4.5 Organisation, staffing, and facilities

The staff structure of DoFAD is in the organogram (Figure 13-1). Of the 15 posts, 5 are vacant (33%).

Apart from the office space at MARF Gudele[521] office the directorate has no facilities. There is no research station, field station nor any vehicle with budget assigned to the directorate. No operating budget is provided to the directorate for day-to-day activities nor development work; though salaries are paid regularly, and most of the staff usually attend the office on working days. Needless to say this situation is demoralising for the staff. The one long term DP funded project, the EU funded SPCRP, which included the Fisheries Production and Marketing Project (FDMP), finished in 2012. No other long term fisheries DP funded projects are being implemented out of MARF, except for the CAMP formulation project, which covers Fisheries and Livestock planning only.

[521] A suburb to the west of Juba

Figure 13-1: Organogram of the Directorate of Fisheries and Aquaculture Development



13.4.6 Fisheries training

The directorate responsible for human resources in MARF is the Directorate of Finance and Human Resource Development. Nearly all other directorates in MARF have training roles (as stated in the MARF Policy), and both the Directorate of Livestock and Fisheries Extension and the Directorate of Fisheries and Aquaculture Development have responsibility for developing fisheries training.

In the past the MARF training plan was to categorise the staff into four categories related to the specialisation of the individual and so as to respond to the needs of the MARF. Medium and long term courses plus management courses were arranged, and there were arrangements with higher institutions in foreign countries for professional and management courses. This was all stopped by executive decision and training was not given priority. For the last 3 years there has been no budget in MARF for training activities. As a result there is no operative mechanism within MARF for proper in-service training for the staff.

The Padak Fisheries Training Centre, near Bor in Jonglei State, is the institution where most fisheries training is carried out. The centre used to be controlled by MARF but the facilities have now been passed over to the Dr John Garang University of Science and Technology. The training centre has 5 senior staff, 16 support staff, and one part-time staff. The staff, previously on the MARF payroll, have had problems getting paid since the transfer of ownership of the Padak Fisheries Training Centre to the University, due to a confusion as to who is responsible, the University or MARF, which has affected the staffs' morale and effectiveness in 2012 and 2013.

Reconstruction and repairs to the Padak centre have recently been funded by a variety of donors, including the Texas A&M University (USA) and through USAID and courses have been funded by AECOM, Sudan Bridge, World Vision and Catholic Relief Services. Unfortunately the centre still has no net loft, no laboratory, no library and no staff dining hall.

The last course run at the centre in 2013 ended in June 2013 and there is no money for any more courses. The centre cannot afford to run the generators and in effect is becoming moribund due to lack of funding and support from donors.

Some training in aquaculture has been done in Yei Agricultural Training Centre and in Yambio on an ad-hoc basis, funded by FAO, MARF, the erstwhile SPCRP and NGOs.

Some DPs and NGOs run training courses in the states, often without any direct inputs from DoFAD, and sometimes without reference to them at all. The fisheries inputs to much of this training and development activity is normally justified under non-fisheries grounds, such as conflict resolution, food security, or livelihoods. As examples: UNIDO has an extensive training programme in Upper Nile State (UNS) which includes fisheries, justified as part of the Sustainable Food Security and Water Harvesting Project; Oxfam in UNS also undertook fisheries training as part of the Food Security and Livelihood Project 2011-2012 in Malakal town, UNS; AECOM in 2012 and 2013 ran a fisheries development project with a lot of training in Jonglei and UNS for conflict resolution purposes, rather than as a fisheries project.

Despite a dramatic skills shortage within the fishing industry and in aquaculture, within State Ministries of Animal Resources and Fisheries (SMARFs) and in the GRSS MARF itself, there is no long term program of staff development training at Padak (or elsewhere) for MARF or SMARF fisheries workers, nor to respond to the needs of the private sector. Additionally there is no master plan for staff development in the MARF Fisheries Department, nor in the Directorate of Finance and Human Resource Development, which is responsible for Human Resource Development in MARF. There is no recurrent funding available for any staff development at Padak, nor in MARF, nor the States.

Many of the MARF Fisheries Directorate staff have benefited from overseas training in a variety of institutions[522].Unfortunately, beneficial as this type of training is to the individual, the process of selection and choice of course is often not ideal, and certainly does not fit in to any long term plan (no long term plan exists). The courses are offered on an ad-hoc basis by donors or institutions, and people are often sent on the courses for all the wrong reasons (patronage, length of service, next in queue, only one available at the time, “needs the per diems”, etc.). Almost never are staff sent on an overseas course because the course is what is needed for them and the country and they are the right candidates for it. This approach to staff development does not have a significant effect on the overall performance of the directorate.

The fact that these is no fisheries training officer, responsible for overall management and planning of staff development in DoFAD is a telling one.

To summarise - the training of the government staff, and that available to the private sector, is not enough and insufficiently planned. This is a serious constraint to overcoming the challenges ahead in the sector.

13.4.7 Fisheries research

Research is the responsibility of the MARF Directorate of Animal and Fisheries Research and Development (DAFRD).

Much research needs to be done, on both capture fisheries and on aquaculture. There is no dedicated research centre for either capture fisheries or aquaculture. Unfortunately there is no funding for research being made available, and indeed there are no properly qualified staff available to do the research that is required. Currently, there is no needs assessment in the area of fisheries research to guide the MARF and DoFAD.

As a result of the above there is no research currently being carried out in the sector, despite the desperate needs.

[522] See section on DPs interventions Section 12.7.1

13.4.8 Fisheries planning

The MARF Directorate of Planning, Statistics and Documentation (DoPSD) is responsible for planning in the ministry.

DoFAD does not have a proper long term plan. The plans, such as they are, are contained in the MARF Policy Framework and Strategic Plans[523], and the Fisheries Policy[524]. Neither of these are complete documents. They do however give a generalised framework for the future which is very useful and gives guidance as to how the MARF intends to proceed. Neither take the generalised plans to a detailed implementation stage, with specific budgets, logical frameworks, time frames and milestones.

13.4.9 Fisheries extension

Fisheries Extension is the responsibility of the Directorate of Livestock and Fisheries Extension (DoLFE).The Directorate has no separate plan for fisheries. No fisheries extension work is done by the directorate. The directorate hopes to produce a National Extension Policy.

35 extension officers, 10 of them from fisheries departments (2 each form Lakes, WBGS, NBGS, WES and WS), were trained in 2012 under the SPCRP project. The directorate wishes to expand this to the 5 remaining states whose extension officers did not receive training under the SPCRP. 30 extension officers from Livestock and Fisheries were been trained in 2009-2010 jointly with the Animal Health and Livestock Directorates funded by the MTDF. Although the directorate has plans for the future the big problem is apparently funds.

Although 10 extension workers have been trained recently, the CAMP survey did not show any extension work being done in the 8 states visited, which included 4 of the 5 states where extension workers were trained. The Fisheries Department itself does some extension work in aquaculture, and the staff travel to states to provide advice and assistance to SMARFs. The staff also travel to the field to support individual projects and programmes in fisheries if funds are made available.

13.4.10 Investment and marketing

The Department of Investment and Marketing is responsible for investment in the sector. It has produced a guide to investment in the livestock and fisheries sectors in South Sudan[525].In fisheries three major priority areas are identified:

A. A fishing parastatal called SUDAFISH, which will "strive to increase out of fish catches in a sustainable manner by taking measures such as manufacture of better boats, canoes and nets that enable sustainable fishing practice and construction of landing sites, ice plants and cold storage and processing facilities for fish in the main production sites. SUDAFISH will also establish a fleet of refrigerated boats and refrigerated lorries/vans to enable correct preservation and transportation of fresh fish to major market centres throughout South Sudan".

B. Investment in a fish canning factory, to be located either in Bor or Malakal. Canning is suggested because it is a "… good way to preserve fish".

C. Investment in aquaculture, which is not elaborated on in great detail.

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[523] GRSS. 2012. *The Ministry of Animal Resources and Fisheries. Policy Framework and Strategic Plans 2012 - 2016.*Juba: MARF 2012

[524] Prepared with assistance from EU ACP Fish II

[525] GRSS. 2012. *Investment Opportunities in Livestock and Fisheries Sectors in South Sudan*. MARF, Department of Investment and Marketing.

There is no justification given for establishing SUDAFISH except "profitable exploitation of the fisheries resources of South Sudan", and that its establishment will persuade the private sector and cooperative fishing groups to "come on board". This is insufficient justification for the establishment of SUDAFISH. The whole concept of a state run corporation exploiting fisheries resources as presented requires rethinking. The private sector in South Sudan is very adept and could easily do everything that SUDAFISH is intended to do. The government should address the reasons why the private sector are not doing these activities, rather than supporting the establishment of a subsidised state competitor to the private sector.

Canning is not an option for fish preservation in South Sudan. There are considerable technical and financial constraints that have not been considered. In that the private sector is expected to do the investment, and has specific technical knowledge, it is reasonably certain that this development will not happen.

Aquaculture is a different matter, but the greatest short term opportunity in aquaculture is probably Integrated Agriculture Aquaculture (IAA) which is aimed at entrepreneural cultivators and farmers, clustered around towns and is not a "commercial" opportunity for outside investors.

Large scale commercial aquaculture, although superficially attractive, is unlikely to be initiated in the short term, partly because of land issues, but also due to the necessity to import all inputs. The example of aquaculture in Uganda is pertinent, where production remains at less than 15,000 tonnes/year after many years of effort, and the industry is only now starting to develop rapidly.

13.4.11 States

States' MARFs (SMARFs) are similar in structure to GRSS MARF, though in some cases the overall structure of the SMARF is slightly different, and they tend to have fewer directorates. The fisheries departments and/or directorates in SMARFs are usually small and reflect the states' limited financial and human resources.

The states' fisheries departments responsibilities are similar to those of GRSS MARF but usually not so well elucidated.

As an example in Northern Bahr el Ghazal the ministerial mandate for fisheries[526] is shown in Box 13-1.

Box 13-1: Ministerial mandate for fisheries in Northern Bahr el Ghazal

The ministry is responsible for production of policies for the sustainable utilisation of water bone resources and fisheries in consultation with authorities responsible for natural resource and environment protection and maintenance of ecological balance.

The ministry is responsible for the issuance of licenses for the commercial harvesting of fish and other water bone resources

The ministry is responsible for production of regulations to control stream bank cultivation and other forms of human activity that increases siltation of rivers and in the end kill marine resources

The ministry is also responsible for the non-consumptive utilisation of rivers in Warrap[527] State for recreation and tourism

[526] Council of Ministers NBG State Aweil, signed by the Governor dated 18 July 2012

The Ministry is responsible for the control of pollution of rivers and waters in the state as this is detrimental to water bone resources

This gives the Aweil based NBGS Fisheries Directorate a very wide brief, to control and manage the fisheries of the state, including some powers over tourism, crops and pollution. Interestingly the mandate does not specifically cover aquaculture.

Box 13-2: CAMP Fisheries Report on Field trip to Upper Nile State

The director has two deputies and each of them have 2 deputy directors, under whom are fisheries inspectors. Further staffs are deployed in the counties. Additionally in Upper Nile State, there are a very large number of people on the payroll who are not "employed" by fisheries, but exist to receive their salaries. The number of these supernumeraries is unknown, but it exceeds 300.

Despite the majority of the effective staff being present, and being paid, no development or even much routine work is actually being carried out. Although budgets are prepared annually the State does not release any funds to fisheries department for operational costs, nor for development work, and without vehicles for transport, fuel and other materials nothing at all gets done.

The department collects taxes, but the taxes deposited with the Finance Ministry (as opposed to the taxes collected) do not cover the costs of the salaries paid to staff to collect them. Even when deposited the taxes raised do not go to fisheries work. Development efforts by NGOs or DPs are nominally supported by the fisheries department, but not financially.

13.4.12 Areas of competencies

SMARFs are longer established than GRSS MARF, and some of the staff have long experience in their positions. However, the capabilities of the states to run and administer fisheries development projects are insufficient, since very few of the states have managed to implement any development programmes on their own since the CPA. There are many reasons for this but a complete lack of development funding provided to the states' fisheries departments is the main reason, coupled closely with staff inadequately trained to do any development work, a lack of vision from the top of the management tree in the states and no tools of the trade - vehicles, boats, equipment or institutions suitable for extension work. These failings were noted by the CAMP fisheries subsector team in nearly all states visited. Without serious overhaul of the organisations throughout the states, from top to bottom and right across their mandates and staff lists, it is difficult to see how they can possibly be made effective.

Additionally the CAMP subsector team found during visits that most SMARFs tend to rely almost completely on NGOs and some international donors to not only fund all development activities that occur, but to initiate the programmes too; indicating a failure in forward planning and design of development inputs. Only in Jonglei State was the state actively involved in initiating and funding development activities, and the effectiveness of some of these inputs was not as great as hoped.[528]

[527] This is presumably meant to say "Northern Bahr el Ghazal"

[528] See Section 12.8

13.4.13 Organisation, staffing, and facilities

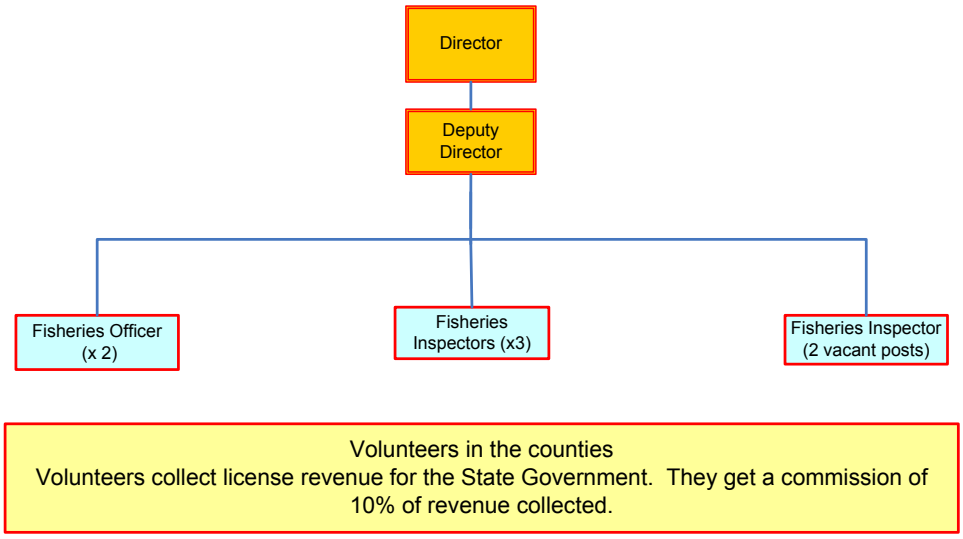
Directorates of Fisheries in the states have simple but easily understandable staff structures. Generally the small number of staff employed is appropriate to the size of the state and the amount of fisheries activity that should be going on in the state.

A Director of Fisheries usually has one or two deputies and beneath them either deputy directors or fisheries inspectors. Typically both aquaculture and capture fisheries will have a deputy director and inspectors and assistant inspectors. Post harvest issues are generally not graced with any staff at all.

In the counties there are county level fisheries staff, usually one for each county, though in many areas the country staff are in the state capital or absent from post. These are appointed by the counties. Furthermore there may be other officers at payam level. No real control from the centre is applied to these lower officers and they are normally used only for tax collection; not fisheries development or extension work.The training of staff in the states fisheries departments is typically insufficient, with the staff completely lacking in the basic technical skills necessary for them to carry out their jobs. The CAMP subsector team was unable to find a realistic human resources development plan in any fisheries department in the states. Many departments did not seem to have an up to date list of all training undertaken by all the staff on the payroll.

Figure 13-2 is the structure of Aweil State [529] Fisheries Department

Figure 13-2: Organogram of the Fisheries Department, Northern Bahr el Ghazal State



The Department also has unclassified 8 staff;
1 labourer, 2 fish guards, 2 messengers and 2 cleaners

13.4.14 Sectoral development

The states' fisheries directorates are generally starved of any funds and equipment. Although budgets may be prepared and basic development plans created there are no financial means to carry them to fruition. In recent years only in one state has substantial state funding been made available for development activities and these were seriously ill-advised, due to a lack of technical skill to plan and carry the projects to fruition. Even some of the donor funded programmes have suffered from inappropriate inputs and poor quality training.

[529] Kindly provided to CAMP by the Director of Fisheries in Aweil State.

13.4.15 Fisheries management

There is no active fisheries management carried out by the states' governments. There is no biological or catch data robust enough to form a basis for management decisions, and the Code of Conduct for Responsible Fisheries, including the precautionary approach to fisheries and the ecosystems approach, as promulgated by the FAO, are not widely known or understood.

Some fisheries management based on local traditions and taboos is enforced in some fishing communities. Examples are the banning of small mesh nets and the enforcement of closed areas. On occasion the basis for these measures is misguided, but it does show a local knowledge that resources must be protected for future generations and that overfishing is a bad thing. It also shows a sense of ownership and guardianship of the resources; so is a base to build upon when introducing community based management schemes. On occasion local ownership disputes cause conflict within fishing communities.

13.4.16 Fisheries Investment by states

Only one state, Jonglei, has made any significant state investments into fisheries initiated by the Fisheries Department, though many states have benefited from donor largesse to build fisheries centres to a larger or smaller degree (three Fisheries Centres, with associated buildings, were constructed by the SPCRP in Terakeka, CES; Nyang, Lakes State; and Adok, Unity State). Several states have constructed fish markets, separate from or designated for fish, in towns and landing sites.[530] Municipalities have also constructed dry fish markets in the larger towns of some states.

Jonglei has purchased a chill store (with no associated generators) which is in Bor town, and a cold store on a barge, which has recently been re-configured. The intention was to move fish to Juba. The barge is supposed to be operated by a private sector investor, with a share of the profits going to the state government. Neither of these are working as intended and the project is severely delayed. Some fish is now being moved to Juba through these interventions (August 2013). Meanwhile the private sector continues to move large amounts of fresh fish on ice and dried fish from Jonglei to Juba by boat and road.

13.4.17 Fisheries associations and co-operatives

In general fisheries associations exist where there is a reason for them to be formed, usually to access aid in one form or another. In many other areas fishermen have formed associations, only for the structure to either collapse or become moribund, in the light of no material benefit being forthcoming.

Where DPs or NGOs have operated or continue to operate, there are large numbers of associations and in some cases co-operatives. The fishing communities at Terekeka in CES are a good example: close to Juba, so accessible and thus popular with DPs and MARF staff. Over the years a large number of associations and two co-operatives have been set up or established themselves. The SPCRP/GIZ project (2009 - 2012) was instrumental in much of this activity and set up (or strengthened) 25 associations in the 4 locations where it operated.

Table 13-1: Number of fisheries associations set up by the site (2009-2013)

Location[531]	No. associations	No. members
1. Terakeka	7	305
2. Shambe	7	207
3.Yirol/Payii	2	135

[530] See Section12.8

[531] Data from unpublished records of the GIZ Fisheries Production and Marketing Project (2012)

Location[531]	No. associations	No. members
4. Adok	11	515
Totals	25	1,162

Source: GIZ unpublished report 2012

Since the GIZ project ceased much of the activities of the associations listed above has slowed down, except in Terekeka, which continues to receive significant DP assistance and where associations remain a useful conduit for skills enhancement and general development activities. DPs and NGOs like working through fisheries associations and co-operatives, so they have a raison-d'être in these situations.

Elsewhere in the country (UNS and Jonglei State for example) the CAMP subsector team came across co-ops, associations or formalised fishing groups in several locations, but the lack of reported benefits from being a member was a constant reminder that fisheries associations or cooperatives cannot thrive in a vacuum, and will wither and die without a clearly defined purpose and benefits for their members. Co-operatives have generally not been a success in fisheries in South Sudan. One in Terekeka, held up initially as a model, has tended to be plagued by disputes. It is not successful in its main objectives. Another in Terekeka has functionally collapsed, though is being revitalised.

13.5 Production

It must be understood that all the statistics for catches, resources, consumption and trade in fish in South Sudan are in considerable doubt and it is unwise to place too much reliance on them.

13.5.1 Capture fisheries

The catch from South Sudan waters is imprecisely known but may be as much as 143,381 tonnes per annum[532], worth at least USD510 million at today's' retail prices. Fish are sold fresh, dried and salted throughout the country in retail markets in towns and villages. The numbers of fishermen is unknown, but is probably in the order of 220,000, most of these subsistence, with possibly 12,000 "commercial" fishermen, though nearly all of these commercial fishermen have alternative sources of income.[533] Possibly 1,731,208 individuals in South Sudan are living in households where someone fishes, and are thus directly dependent in some way (livelihood, income or food security) on the capture fisheries of the country. The role of fish in food security has generally been greatly underestimated and CAMP data indicates that per capita consumption of fish is estimated at 17kg/year (fresh fish equivalent) in South Sudan.[534]

Much of the fish produced is dried as it is impossible to get the fish to market fresh, due to low availability of ice and poor roads and transport. Dried fish is distributed throughout the whole country. It is a robust product and can be kept for long periods without special storage, and is popular with consumers.[535] There are serious problems with beetle infestations on dried fish which has been stored for too long, reducing nutritional value and retail price. Smoked fish tends to suffer less, and there have been repeated attempts to introduce Chokor fish smokers to fishing communities. Large amounts of smoked fish are imported from Uganda.

[532] See section 12.5.5

[533] See Fisheries appendix 9 where the results of a household survey by CAMP are given in detail.

[534] Data from the NBS National Baseline Household Survey 2009. Analysed by NBS / CAMP Task Team.

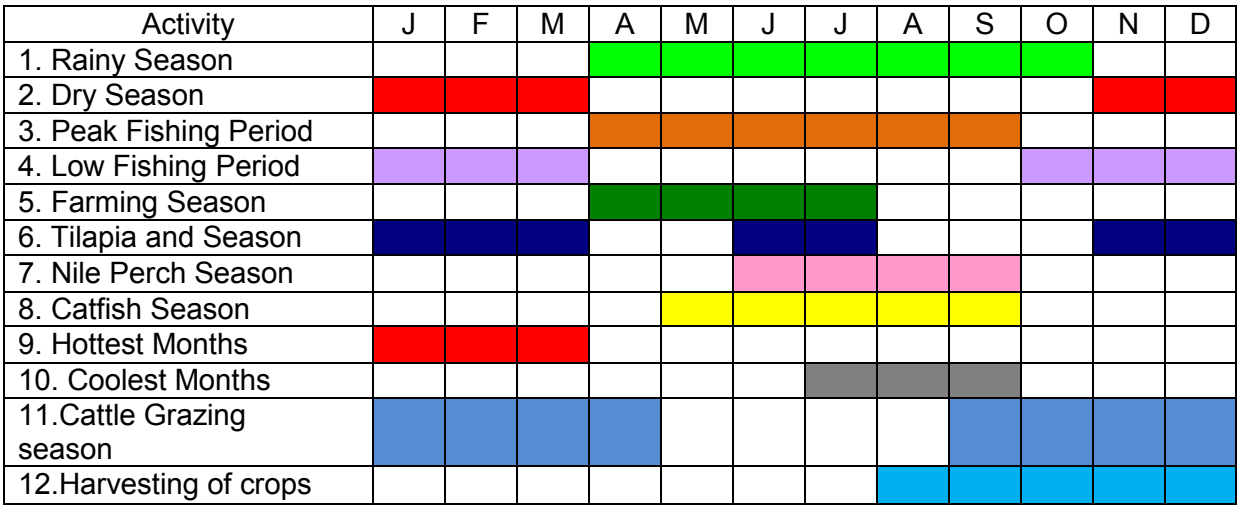
[535] Fisheries appendix 5 lists the preserved types of fish found in South Sudan

The main fishing gear is the gill net, with cast nets, spears, cover pots and long lines common, depending on the area being fished.[536]A variety of boats and canoes are involved in fishing and transport of fisheries products, though un-motorised planked and dugout canoes are the most common, powered either by paddles or poles, depending on the locations.[537]Outboard motors are rare for fishing but extensively used to transport fresh and dried fish.[538]

Most fishing households do not fish as a full time activity, and they are also involved in animal husbandry and farming. This influences the fishing activities through the year. Generally speaking the best fishing season in flowing waters is the wet season and immediately afterwards, when the "toic"[539] is flooded and it is during this period that people living near the Nile and its associated rivers fish the most and catch the most. In the dry season, people fishing the static waters, oxbow and lakes, are at their most active (having been planting during the wet season).

Seasonality of fishing and other major activities is given in Figure 13-3[540].

Figure 13-3: Fishing season of South Sudan



Source: GIZ unpublished reports (2012). See also GRSS 2011 *Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA). Technical Assistance on fisheries assessment.* Report prepared for the Government of South Sudan by The Food and Agriculture Organization of the United Nations, Juba 2011; which gives detailed seasonality information for individual fish species.

13.5.2 Resources

There is no reliable estimate of the fisheries resources of the South Sudan. FAO on its website[541] gives between 75,000 - 140,000 (Max) tonnes/year as the possible size of the

[536] Fisheries appendix 2 gives a list of all fishing gears found by CAMP during surveys in 2012 and 2013.

[537] Fisheries appendix 1 gives a list of the types of boats likely to be encountered in fisheries in South Sudan

[538] See also GRSS 2011 *Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA). Technical Assistance on fisheries Assessment.* Report prepared for the Government of South Sudan by The Food and Agriculture Organization of the United Nations, Juba 2011. This gives the result of frame surveys carried out in 2009 in Terekeka and elsewhere.

[539] Toic = the area that floods during the wet season but in the dry season retains enough water to provide pasture for livestock. A Dinka word.

[540] Table from GIZ Fisheries Production and Marketing Project (unpublished) 2012

[541] FAO. © 2004-2013. Fishery and Aquaculture Country profiles. Sudan. Fishery and Aquaculture Country Profiles. In: *FAO Fisheries and Aquaculture Department* [online]. Rome. Updated 1 February 2008. http://www.fao.org/fishery/countrysector/FI-CP_SD/en

potential fisheries resources of the "Sudd region and adjacent areas". Assuming[542] another 60,000 tonnes/year for those areas outside the "Sudd and adjacent areas" a Maximum sustainable Yield (MSY) of about 200,000 tonnes/year is probably realistic.[543]

A widely quoted figure for the potential maximum sustainable yield from the fisheries of South Sudan is 100,000 tonnes - 300,000 tonnes per year[544].This is apparently contained in an FAO document somewhere, but exactly where is not ever elucidated, nor how the total was reached. Earlier FAO work indicated an MSY of 92,000Tonnes -128,000 tonnes for the Sudd.[545]

Often only the maximum of 300,000 tonnes/year is quoted, as a definite potential MSY in the future. This form of misrepresentation of the resource potential is unprofessional, reckless in the extreme and very unhelpful for planning in fisheries, since it gives the impression:

(i) That the potential yield is known with accuracy, which it is not,

(ii) That 300,000 T/yr is a target that can be aimed at with safety, which is certainly untrue, due to lack of data on the stocks,

(iii) That great opportunities are being missed by not immediately capitalising fisheries to achieve it - which is certainly not proved.

In any case there are major problems with using a single potential yield figure for the whole country for planning purposes:

(i) The management structures that will be put in place for the fisheries of the country will be based on local decision making by local management groups. Each area will be distinct from the next. A country-wide Maximum Sustainable Yield is not a good management tool for local management systems, even for stocks extending over several management areas. Monitoring and reacting to Catch Per Unit Effort (CPUE) changes is more appropriate; but this requires regular data collection.

(ii) There is no proper biological information on many of the species in the catch. Life cycles, growth rates, age at maturity, age the species enters the fishery, etc. are just not known. Nobody can know how the target species will react to increasing fishing pressure. Some may be resilient to fishing, while stocks of other species may collapse rapidly.

(iii) The South Sudan Fishery is a multispecies one. Complex interactions between species and between fish and the ecosystems in which they live are not known.

(iv) The country is constrained by the constitution, its own policy, and the FAO Code of Practice for Responsible Fisheries [546] to manage the fisheries responsibly, giving decisions to the users of the resources and, in the case of the FAO code, through applying both the "Precautionary Approach" and the "Ecosystems Approach". This precludes a "generalised" approach to exploitation of multispecies stocks.

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[542] By the CAMP Fisheries Specialist, based on subjective opinion influenced by observations and data collected by CAMP, GIZ, NBS and others

[543] This is the figure that CAMP has used in the absence of alternative figures (which are universally based on little more than wild guesswork).

[544] A 2012 FAO report on the fish trade included an estimate that the potential from Capture Fisheries was 350,000 - 450,000 tonnes/year; this based on conductivity of samples of Nile water from the Sudan. Another 150,000 to 250,000 tonnes was expected from Aquaculture.

[545] R.G. Bailey, 1989. *An appraisal of the fisheries of the Sudd wetlands, River Nile, southern Sudan.* Aquaculture and Fisheries Management 20 (1): 79-89.

[546] FAO. 2012. *Code of Conduct for Responsible Fisheries (and accompanying guideline*s) http://www.fao.org/docrep/005/v9878e/v9878e00.HTM

(v) The fishery in some areas is for juvenile and immature fish, which does not fit into a MSY management regime.

(vi) The size of the largest water body, the Sudd and surrounding wetlands, varies considerably from year to year and also in response to long term rainfall patterns.

Box 13-3: Example of a misconception about fisheries in South Sudan

"It is estimated that South Sudan has a potential freshwater fish production capacity of about 300,000 MT annually, of which currently only 40,000 MT are being harvested."
"If exploited optimally, this is a premium export revenue earners [sic] for the economy considering the immense global demand…."
Example of hyperbole about fisheries potential, based on unsubstantiated estimates of potential and current yields, and optimistic returns; this time from the GRSS 2013 *Annual Needs and Livelihood Analysis 2012/2013*

It is therefore necessary to proceed with extreme caution when developing fisheries in South Sudan.
Methods for monitoring catches, biological parameters of the stocks and species, and the state of the environment need to be established before any large scale investments are made or licensed.

13.5.3 Existing fishing areas and catches

The catch in South Sudan is unknown. The estimates of catch seem to rely on what is known about the commercial fisheries, and this is generally quoted as being about 30,000 tonnes (from FAO Country Profile for 2006, but actually from much earlier work), but nobody is counting the fish, nor has anyone for many years, or possibly ever.

GRSS recently (2011) stated in a project newsletter[547] that "fish production", (though in reality this refers to the commercial catch), in South Sudan was:

"at present, fish production in South Sudan is estimated at some 30,000 MT. With perhaps one-third of this going to North Sudan, some 20,000 MT remain for markets in the South."

However, the final report of the project[548] did not attempt to make any estimation for the whole country's catches, concentrating on areas where the project had worked, and even then noting that survey work was difficult due to informal taxation making the fishermen unwilling to answer survey questions.[549] The subsistence sector, probably the largest part of fisheries in South Sudan was not covered at all in this data.

This is similarly the case with the numbers of fishermen. The GIZ project again gives some information, but it only covers commercial fishermen and does not give proper distributions, and its provenance is unknown. This concludes that there are somewhere near 12,000 "fishermen" in the country, presumably commercial ones.

CAMP has used secondary sources of data to try to assess numbers of fishermen and catches. The Annual Needs and Livelihood Analysis (ANLA)[550] carried out between UN agencies and GRSS covers numbers of households reporting as fishing, and the numerous

[547] GOSS. 2011. *Newsletter of the Government of South Sudan (GOSS) Department of Fisheries Ministry of Animal Resources and Fisheries,* GOSS. Assisted by GIZ Fisheries Production and Marketing Project, Juba, South Sudan. Technical Note#2 February 2011

[548] GIZ 2012 *Fisheries Production and Marketing Report. Final technical and financial report. 29 March 2008 – 28 September 2012* STABEX-SPCRP 02 Livestock/03 Irrigation/04 Fisheries. Programme Coordination Office Juba. September 2012

[549] CAMP also encountered a reluctance to answer surveys or be interviewed.

[550] GRSS 2012 *Annual Needs and Livelihoods Analysis 2011/2012*

SPCRP/GIZ technical reports on fish catches, coupled with some informed guesswork, allows an assessment of possible numbers of fishermen and catches including the subsistence sector. [551] It must be acknowledged that the assumptions are somewhat speculative. This gives a total fishing population, including commercial and subsistence, based on one fishing person per household[552] that reports itself as "fishing" to the ANLA, as 221,782 individuals.

Taking figures from SPCRP/GIZ for fish catches per commercial fishing unit, along with an assumed figure for catch per subsistence fisherman, the total catch is calculated to be 86,485 tonnes/year. Assuming a potential for the whole country of about 200,000 tonnes/annum (140,000 tonnes for Sudd region and adjacent areas and plus an estimate of 60,000 tonnes/annum for areas outside the Sudd and adjacent areas), this particular estimate of catches indicates that the fishery is capable of more than a doubling of total catches over the whole country.

Even using these figures, the catch from the subsistence sector may well be seriously underestimated, and the CAMP household survey data on its own was insufficiently comprehensive to provide accurate figures on annual catches. It is possible, however, extrapolating from the ANLA database (2012), to derive that 1,731,208 individuals in South Sudan are living in households where someone fishes, and is thus directly dependant in some way (livelihood, income or food security) on the wild fisheries of the country. This out of a population of about 10 million (17.3%)[553].The importance of the sector, when looked at this way, is far greater than generally acknowledged. Many more are dependent on the products of fisheries as a food source, through commercial trade.

13.5.4 Fish consumption and food security

FAO gives the supply of fish in Sudan per capita in 2003 (pre South Sudan independence) as 1.7kg/person/year. This figure is surprisingly low, even by the standards of North African countries with similar climates, and it would appear that the consumption of fish in the southern part of pre-separation Sudan was not measured accurately at that time.

The NBS database (2009)[554] which was analysed by CAMP in 2013, gives figures which indicate that consumption of fish in the country is far greater than assumed, and derived from the consumption figure, that the catch itself is probably far more than generally recorded.

The NBS database indicates that consumption of fresh fish in South Sudan is 59,031 tonnes for the whole country, based on a population of 8,262,647, or 7.145kg per capita/year. Additionally the NBS database gives consumption figures of 4,616 tonnes of Feeshi'ck (a wet salted product) and 19,933 tonnes of dried (79,732 tonnes fresh fish equivalent). Together the dried and fresh consumption adds up to 143,381 tonnes per year or 17.36kg/capita/year.

[551] in Fisheries appendix 4

[552] CAMP Data would indicate that often more than 1 person per household fishes but the dataset is very small.

[553] Estimate in the ANLA report

[554] Data from the NBS National Baseline Household Survey 2009. Analysed by NBS / CAMP Task Team.

Table 13-2: Fish consumption South Sudan

Product	Tonnes	Kg/year/cap	Comment
Feeshi'ck	4,618	0.56	Feeshi'ck is a wet salted product
Dried fish	79,732	9.65	as wet fish equivalent
Fresh fish	59.031	7.15	
Total	143,381	17.36	

Source: Data from the NBS National Baseline Household Survey 2009. Analysed by NBS / CAMP Task Team.

This is higher than the regional norms of 8 - 14 kg per capita/year[555], and high compared to most of inland Africa, but in line with global norms. Given that fish is one of the primary sources of protein in the diet in South Sudan, there is a lot of water in South Sudan, fish is cheaper than alternatives, and is widely available (dried without the need for refrigeration) this figure is not necessarily surprising, and what is surprising is that the lower figure has not been questioned earlier.

Assuming that the imports of dried and salted fish into the southern part of South Sudan (from Uganda, DRC and CAR) are roughly equivalent (in fresh weight) to the exports of fish out of the northern part of South Sudan (to Sudan and Ethiopia) then this leaves a fish production and consumption figure for South Sudan of 143,381 tonnes per year, already more than 75% of the estimated MSY (200,000 tonnes/year) suggested by CAMP based on estimates from FAO (2006).[556]

To summarise,

- The potential catch is unknown but probably in the order of 200,000 tonnes/year and also the present catch is unknown, partly because much of it is subsistence and thus difficult to measure.
- Estimates of catch by the erstwhile SPCRP project of 30,000 tonnes are an underestimate because they concentrate on the "commercial" fisheries only. The subsistence sector is far larger.
- Estimates made by CAMP using data extrapolated from the 2012 ANLA give a catch of about 86,485 tonnes, with 1,731,208 individuals in South Sudan living in households where someone fishes.
- Estimates made by CAMP using the NBS (2009) data indicate that the total consumption of fisheries products may be as much as 143,381 tonnes with an annual per capita consumption of fish and fisheries products of 17.36kg.

13.5.5 Potential for the development of fisheries

The potential of development of fisheries is significant, though not in the way that many anticipate. Suggestions for development have been put forward in a variety of documents, including the MARF Policy 2012-2017. These proposals are almost always based on the supposition that the resources are vastly underexploited, that the MSY is 300,000 tonnes or more[557], that the country is missing out on a huge economic benefit in exports and that there

[555] FAO (2008) *The State of World Fisheries and Aquaculture 2008*.FAO Fisheries and Aquaculture Department, Rome, 2009

[556] The repercussions of this finding are significant, and the application of the precautionary principle to all fisheries development in South Sudan is thus paramount.

[557] The largest potential future yields in the literature are 350,000-450,000 tonnes/year from capture fisheries with another 150,000- 250,000 tonnes/year to come from Aquaculture, a potential maximum of 700,000 tonnes/year. In: FAO (2012) *Country Report Juba, South Sudan.* Regional Trade on fish and Fish Products Project TCP/RAF/3308.

is no downside to a rush to commercialise the fishery. It also assumes that the business would be profitable, which has not been proved.

MARF has suggested a parastatal, SUDAFISH, to commercialise fisheries, based on the several landing areas on the Nile river, with processing, freezing and chilling facilities, exporting to Juba and overseas. No detailed economic justification has been presented. Investors are being sought to bring this venture to fruition. Similarly suggestions to build two or three canneries have been mooted.

It is likely that the catch can be increased from its present levels. There is no reason why increasing the catch should not be a long term objective of the MARF Fisheries Directorate and the States' Governments. However the following are constraints to large scale commercialisation of the fishery:-

Table 13-3: Constraint and effect of fisheries commercialisation

Constraint	Effect
The obligation to manage the resources in a participatory manner, involving communities in the management of the natural resources they currently exploit	The national government cannot implement countrywide commercial private/public investments without the go-ahead from all stakeholders, states, counties, payams, bomas and the present users of the resources.
The obligation to manage the resources in a precautionary manner and observe the ecosystem approach to fisheries management	Until systems are set up in MARF and elsewhere, it will be impossible to comply with these obligations. The lack of data on fisheries is the first great hurdle, and means that a precautionary approach must be implemented. (Most commentators do not currently know what a precautionary approach is).
There is no legal framework for fisheries in South Sudan	The allocation of use-rights must take place within a legal framework (this includes licenses to fish). There is no legal framework for monitoring control and surveillance of the fishery. There are no regulations for the control of the fishery
The traditional authority of the people has to be respected (from the constitution)	Historic rights and economic dependencies on fisheries resources must be respected.
Already at least 17%[558] of the population is in some way dependant directly on fishing for livelihood, food security or income. This is likely to increase as time passes due to better security, increased population and better transport links.	Commercialisation of the fisheries resources of the country will adversely affect the large proportion of the population that relies on fisheries for livelihood, food security or employment. These people will not take kindly to their resources being exploited by and taken away by commercial interests.[559]

Source: CAMP Situation Analysis.

13.5.6 Economic considerations for fisheries development

The economics of the exploitation of the fisheries resources of South Sudan is a topic not widely examined in the literature.

Beyond the hyperbole found in some proposals, little thought has been given to the economics of actually commercialising the fishery, or even of getting the local subsistence fishermen to increase their catches. Commercial efforts assisted by government have been limited to a single EU funded development programme (SPCRP/GIZ) with a fisheries component, and some limited commercial investments by the state government in Bor, Jonglei State, neither of which have managed to reach planned targets of production.

[558] "It is estimated that some 15-25 percent of the population depends on fishery products as part of their nutritional needs". GOSS (2013) ANLA

[559] They also have automatic weapons so are formidable opponents if there is an argument

MARF supported SUDAFISH, a parastatal has been suggested without a detailed economic analysis, merely with the assumption of large profits, which is unfortunate.

There is a constant stream of plans for commercial investment in fisheries in South Sudan, in CES, Lakes State and Jonglei State. To date these have proved to be merely ideas and nothing has happened.

No figures from the private sector exist except those collected by CAMP[560], which are from small and medium scale fish traders. These show that the private sector can and does invest if a profitable activity is available. The large numbers of private traders, (some with a large investment in Bor, Shambe and Juba, moving fish, dried and fresh, from the producing areas to the consuming areas) shows the willingness of the private sector to take advantage of opportunities that present themselves.

Since the private sector is ultimately going to be the engine for growth in fisheries and aquaculture in South Sudan, it is perhaps advisable if the government decides early on that it will not involve itself in the commercial production side of fisheries and aquaculture. The private sector can then make its own commercially based decisions as to whether to invest or not.

13.5.7 Aquaculture

Aquaculture is a subsector that is said to have huge potential, though this potential has singularly failed to be realised in recent years. The principle argument to support the claims of great potential is that the "Greenbelt"[561] has year round water supplies, suitable terrain (many clay soil areas and gravity fed water supplies) and an almost ideal climate for aquaculture. Additionally the main species to be cultured (*Clarius sp* and *Oreochromis niloticus* -the nile tilapia) are both technologically suitable and native species to South Sudan. Further north, in the great floodplains and flatlands, conditions do not appear to be so ideal, certainly for subsistence aquaculture.

Table 13-4: Number of fish ponds in 2013

State	Number ponds established	Number of ponds operating
CES		
Yei County	34	9
Lainya County	12	5
Juba	1 Large investment by an Egyptian Group in a Tilapia farm near Juba temporarily halted due to land acquisition problems	1 (experimental/demonstration)
WES		
Yambio County	28	20
Ego County	2	2. Just stocked
Iba County	1 fish farmer (2 ponds ?)	0. Not yet stocked
Mundri East	1 fish farmer	0. Not yet stocked
Jonglei State	1 - demonstration	At the Padak Fisheries Training Centre at Bor
WGBState, Wau	WFP are supposed to be building 30 ponds for food security Private sector investment occurring	I private sector pond not yet stocked

[560] See also ACP Fish II. 2012. Final Technical Report. *Study On the Regulatory Framework for small and medium enterprises in fisheries in south Sudan.* Project ref. N° EA-4.2-B20.July 2012

[561] Stretching across Southern Greater Equatoria

Upper Nile State	1in Malakal 1 in Longchuk County	Experimental/demonstration Status unknown
NBG State, near Aweil	1	Still under construction by a private individual

Source: CAMP Situation Analysis.

13.5.8 Existing aquaculture

Aquaculture is not particularly well developed though in CES and WES great efforts have been made to introduce village level aquaculture. Much of this is through NGOs which have provided technical support to groups, though the groups provide labour, land and some limited funds. Table 13-4 gives the numbers of ponds established as at July 2013.

Presently aquaculture is concentrated in CES and WES, near Yei and Yambio. These are village level enterprises usually run by groups or associations. Although on paper there are a significant number of ponds problems still beset the farmers, such as supply of fry, lack of nets for harvest, and feed problems. Basic husbandry techniques are not fully understood and the NGOs involved have been remiss in not providing continual support in some areas. DoFAD at MARF is not sufficiently funded to support CES and WES, and are not involved in some NGO/DP initiatives in other areas.

13.5.9 Potential for the development of aquaculture

13.5.9.1 Subsistence Aquaculture

Integrated Agriculture Aquaculture (IAA) is perhaps one of the greatest opportunities for increasing production in the fisheries sector in South Sudan without accompanying serious ecological and social problems. IAA is merely an extension of subsistence fish farming, but taking advantage of agricultural inputs for fish rearing and the water in the pond for things other than growing fish.

Box 13-4: IAA explained

"*The basic principle of IAA is to grow fish in water bodies that are closely integrated into household farms, and intentionally make use of the resource flows such as animal and plant by-products from the diverse on-farm enterprises. The major aim is to convert agricultural wastes and manure into high quality fish protein; to use the nutrients generated in the pond as fertilizers for growing crops in order to reduce the need for off-farm inputs."*
J. Nagoli, et al. 2009. *Adapting Integrated Agriculture Aquaculture for HIV and AIDS-Affected Households: The case of Malawi.* Working Paper 1957. The WorldFish Center, Penang, Malaysia.

Elsewhere in Africa IAA farm families have achieved a range of benefits including increased farm productivity, increased household incomes, improved adaptation and resilience to erratic climatic conditions; improved food and nutritional security through increased production and consumption of fresh fish and food crops grown around the fish ponds[562]. In some countries IAA has been used to mitigate the effects of HIV and AIDS in farming communities by providing extra protein to the families affected. It is however pertinent to point out that this type of aquaculture development has failed to have the impact expected in African countries, and on re-examination of progress FAO has concluded that the approach is not correct, and the emphasis has to move away from subsistence and move towards "entrepreneurship", with larger farms, based in clusters round towns which provide supplies and markets for outputs.[563]

[562] J. Nagoli, E. M. Phiri, E. Kambewa, D. Jamu 2009. Adapting Integrated Agriculture Aquaculture for HIV and AIDS-Affected Households: The case of Malawi. The World Fish Center Working Paper 1957. The World Fish Center, Penang, Malaysia.

[563] Moehl, J et al. 2006.*Guiding Principles for promoting Aquaculture in Africa: benchmarks for sustainable development.* Food and Agriculture Organization of the United Naitons, Regional Office for Africa, Accra, Ghana, 2006

IAA can easily be adopted by go-ahead settled farming families throughout the country, where there is suitable water available and land available (mostly in the “Green belt” of CES and WES).

IAA, particularly if based on entrepreneurial activities in clusters, will have a major impact on food security and livelihoods wherever it can be practiced, and can also provide some income to the communities involved through the sale of fish surplus to immediate requirements.

13.5.9.2 Commercial aquaculture

Large scale commercial aquaculture is a completely different proposition from the sale of surplus fish from essentially subsistence ponds or IAA. Commercial aquaculture is profit motivated.

13.5.9.3 Economic Considerations for Commercial Aquaculture Development

The major considerations in South Sudan are fivefold:

(i) The difficulty in getting access to community owned land. For a large investment such as a commercial fish farm, security of tenure on land is a necessity.

(ii) Costs of inputs - in South Sudan in the short term all inputs to the farm, except land and water, including feed, skilled personnel, farm equipment, and processing equipment will need to be imported. The largest by far of these inputs is feed (up to 80% of all costs), which will have to come from Uganda or Kenya for the next few years until a feed industry is built up in South Sudan. Additionally hatcheries will have to be built to provide seed, which initially at least, will be relatively expensive, though costs of seed should reduce rapidly. It is difficult to see South Sudan having a competitive advantage in commercial fish farming over neighbouring countries (or indeed Southeast Asian countries) in the short term.

(iii) Competition from wild caught fish in the market place - South Sudan is blessed with a considerable fish resource, and in time this will lead to better supplies of fresh fish entering the markets of the larger towns. This fish will compete with aquacultured fish. Generally where there are large amounts of fresh wild caught fish available, aquaculture does not compete unless the products of aquaculture are aimed at a remunerative niche market.

(iv) Competition from imported aquacultured fish is a problem in many African countries (e.g.: Malawi, Zambia) where imported fish from Vietnam and China is cheaper than the locally produced fish. In South Sudan fish from Vietnam and China is already competing with the wild caught fresh fish available, is generally better quality, and in some cases is cheaper.

(v) Finance, which until there is a developed banking system in South Sudan, will have to come from overseas.

(vi) The need for policies and a legal structure that protects the investor covering, *inter alia,* feed quality, bio-security, export standards and pollution of water sources.

Large scale commercial aquaculture in South Sudan has up to now been just talk. It is not an activity for the national government nor states to engage in, and until they have developed their own legal and regulatory environment, they should regulate the industry and ensure

that companies follow the FAO guidance [564] contained in the Code of Conduct for Responsible Fisheries.

The example of Uganda is pertinent, where it is only recently that commercial aquaculture has begun to become profitable and attract major investment.

13.6 Marketing and trade

Internal marketing of fish is done by the private sector, which is very diverse and adept. Fish traders travel to fishing camps and landing sites and buy fresh fish from fishermen and smoked or dried fish from processors and take it by whatever means are available, bicycle, motorbike, truck or boat, to the large urban markets where they either sell it themselves or (more usually) sell on to retailers who sell the fish in the markets in the town. Some fishermen trade their own fish, fresh or processed, to the urban areas. Large amounts of fish is moved to Sudan (more when the border is open), and large amounts of fresh and smoked fish comes north from Uganda to South Sudan.

The main problem with monitoring this activity is the large number of landing sites, traders and the diversity of destinations of the fish. Additionally, only in a few places are fish sold by weight, normally it is by the piece or heap, and the size of heaps can vary immensely.

The size of the fish trade is very large, and its importance for food security, employment and livelihoods is generally not acknowledged.

13.6.1 The local distribution chains

On a more specific basis the in-country trade can be divided into several segments.

i. The transport of large amounts of sun dried (and sometimes slightly salted) fish from Jonglei (predominantly), UNS, Lakes and Unity States to Juba by river transport, and throughout the country by road from Nile landing sites. The product is well preserved, though subject to severe beetle and beetle larvae infestation if kept for a long time. The beetle is *Dermestes maculatus*, a common pest of stored products. Additionally in the wet season drying can be a lengthy affair and the product is subject to blowfly attack, and then bacterial action, as the fish cannot be dried in time to stop it. Salt is sometimes added to try to stop this deterioration but there is some wastage.

   The product keeps for up to 8 months but has generally deteriorated significantly due to the beetle attack after about 3 months leading to significant losses in nutritional value. The beetle action also makes the product taste bitter, so the combined effect is to reduce its value with storage time. There are a variety of ways to deal with beetle attack, but none of them are likely to be adapted in South Sudan due to costs. Rapid movement of the product from processing site to market and on to consumer is the best and most applicable method, reducing time of storage to a minimum. It is impossible to stop the processed fish getting infested with the beetle.

   The size of this trade[565] to Juba "fishport" market alone, is approximately 450 tonnes per year coming by boat to the wholesale markets, and then passing on by road across all of Greater Equatoria, though a great proportion is consumed within the greater Juba area and adjoining counties. The fish is processed by fishing households and sold to consolidators who transport it first to Bor (or other large towns on the Nile, if not from Jonglei) and then to Juba. The fish, sold in plaits, sells

[564] FAO Technical Guidelines for Responsible Fisheries compliment the FAO Code of Conduct for Responsible Fisheries, and cover many aspects of Aquaculture.

[565] Estimates based on a market survey done in Juba by CAMP in 2013

in Juba at between SSP12/kilo to SSP48/kilo wholesale and 24 to SSP62/kilo retail in Juba markets[566] (being sold by the piece the actual price/kg varies considerably). There are no figures available for the total production of dried fish from the Sudd and adjacent areas. The trade is very diverse with many producing areas, many traders and many destinations. Dried fish comes to Juba from as far away as Nassir on the Sobat river in UNS. CAMP was able only to monitor the Juba main port market (before it was closed down in June 2013).Some of this dried fish is exported to Sudan from Unity, Lakes, Jonglei and UNS states.

There are reports of a powdered white insecticide locally called "Budra"[567], normally a pyrethrum based insecticide, sold in bags in towns throughout the country being used to kill *Dermestes maculatus* in fish. This insecticide is not particularly toxic to humans in the amounts encountered though its use may account for some reports of bad tasting fish, and it may be implicated in poisoning of rivers to catch fish, since fish are particularly sensitive to pyrethrums.

ii. The transport of fresh fish from Jonglei State (Bor) to Juba. Fresh fish is transported in large insulated boxes by boat from Bor to Juba and sold to hotels (mostly) and other local markets. Additionally (2013) 10 substantial pickup trucks are carrying approximately 800 kilos/load, (with old domestic freezers on the back) up to 3 times a week by road to Juba, mainly to markets but also to hotels and the catering trade. CAMP, though its Juba market survey has estimated that the trade by boat as no more than 2 tonnes per week, or 100 tonnes per year (2013), but that the trade by road can be up to 25 tonnes a week for short periods at peak season (Dec - April) and but is normally 7-10 tonnes a week, perhaps 1000 tonnes/year.[568]The ice is sourced in Juba as there is no ice production in Bor. (Ice is in 30 - 40kg blocks at SSP0.50/kg, wholesale, in Juba[569]. The retail price of ice is roughly SSP0.85/Kg). Additionally there are significant supplies of fresh fish coming to Juba from Terekeka, but it has been impossible to estimate accurately the quantities. Ice is sourced in Juba as the ice machine provided by GIZ in Terekeka has not been commissioned. In the markets the fishermen use old domestic freezers to keep the fish, buying ice from local ice retailers. Some fresh fish come to the market at Gudele in Juba from rivers to the east of Juba, but only in very small quantities.

iii. The transport of smoked fish from (mostly) the Terekeka area of CES to Juba. This heavily smoked fish is well preserved and keeps for several months. It is very tasty. In fishing camps near Terekeka the SPCRP Fisheries Programme introduced improved "Chokor" fish smokers to reduce firewood use for smoking. The fish when it leaves the fishing areas is of very good quality, but suffers from breakages and beetle infestation, which both in time reduce both its aesthetic and nutritional value.

The size of the trade is unknown, but it is significantly smaller than the dried fish trade, partly due a shortage of firewood in the swamp and toic further north of Terekeka in the Sudd. Smoking fish also requires investment in semi-permanent smoking installations, and for good quality product, great care and attention. Some of this fish is sold on to smaller wholesalers who take it to other towns in Greater Equatoria.

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[566] CAMP Countrywide Fish Market Survey 2013.See Fisheries appendix 7

[567] "powder" in Arabic.The bags of insecticide are made up out of bulk plastic drums of the insecticide, so as to be of an appropriate unit size for retail sales.

[568] Information from interviews with fish traders in Juba markets

[569] See Fisheries appendix 8 for details of ice machines in Juba

The price in Juba retail markets is SSP19-SSP62 depending on species and quality. Wholesalers sell to retailers for roughly 20% less than the retail price. The product is sold by the piece, not weight.

iv. Local fresh and processed fish supplies. Around every large town in South Sudan there are fishermen who are catching fish and selling it locally in the market, or selling to middlemen at landing sites, who take it to market and sell it, either by boat or road. Similarly there are fishermen who process surplus fish and retain it to sell later at market in the town or to wholesalers. Additionally traders travel to Juba or the large towns and buy supplies of dried and smoked fish, which they then take to their local small town and sell on in the market. These are a vital part of the food supply in many towns. The web of supply is very complex and there are many permutations. Suffice to say that the system is well organised, efficient at getting the fish to the consumer at a suitable price, and keeps many people employed. Mobile phones are becoming ever more important in fresh fish marketing in South Sudan, with fishermen being in contact with traders, and traders using the mobile phone to sell the fish on to customers, often in advance of collecting the fish from the fishermen.

13.6.2 Import and export products and markets

13.6.2.1 Imported Smoked fish from Uganda

The trade in smoked fish from Uganda is far larger than is generally reported. The Nile Perch fishery in Lake Victoria is large, and now almost totally unregulated. This means that large numbers of undersized fish are being caught and processed by hot smoking and then exported to neighbouring countries, notably DRC and South Sudan.

This fish enters the country through any of the 6 main crossing points from Uganda[570].

CAMP has been unable to ascertain the exact figures for imports of smoked fish from Uganda. CAMP found that at least 1500 tonnes/year enters through Oraba and passes to Yei in CES, where there is, in addition to the routine trade, a large weekly market dedicated to smoked fish from Uganda. Fish is bought by wholesalers in large packages and further distributed throughout CES and WES, and North to NBGS, Lakes (Rumbek) and Warrap State and to WBGS where it is found in all the retail markets in towns.

Probably, as much again, or even more, passes through Nimule, though in smaller units, with the primary destination being Juba. Every market in Juba has a dried and smoked fish section that has large quantities of Uganda origin smoked Nile perch. This fish is also bought by sub-wholesalers and distributed further north into the country. As a general rule the further from Uganda the less is available in the market.

The other border crossing points into South Sudan are assumed to also to be conduits of this kind of fish into South Sudan but CAMP was unable to visit them and verify flows. It is likely that at least 4,000 tonnes of smoked and dried fish is entering South Sudan from Uganda every year, and this may well be an underestimate. (2013 - CAMP estimates, equivalent to about 16,000 tonnes of fresh fish).

The Customs Department of South Sudan does not classify smoked fish as a distinct category, it being included in “Various” and attracting a tax of only 2% (which is variously collected or not).This means that there is no statistics collection that shows the official quantities and values of the smoked fish being imported. The fish is sold by the heap. The price is highly variable depending on the weight of the fish in the heap, averaging about

[570] http://www.eac.int/migration/index.php?option=com_content&id=146:ports-of-entry-a-border-points

SSP50/kg but with a range of SSP46 to SSP62/kg[571]. The product is often eaten in "soup" since a small amount of fish goes a long way in soup, which in turn flavours a large amount of carbohydrate.

13.6.2.2 Imported dried and salted fish from Uganda

A small pelagic Cyprinid fish, *Rastrineobola argentea*, the "Silver cyprinid", is harvested in large numbers from Lake Victoria in Uganda. This is dried and bagged in large ~ 100kg bags, and transported all over East Africa, usually under the generic name of "Daga'a"[572].This fish is sold, usually by women, all over markets in the southern parts of South Sudan. The unit of sale is a variable volume "measure", either large basin size, medium size equating to about 2 litres, and a "small" container which is about 300 - 400ml. Costs in Juba are SSP15-SSP20/kg, significantly cheaper than other fish protein.

The size of this trade is unknown, as the product escapes detection at customs and is generally bought in one sack at a time mixed with other goods (beans, fruits and vegetables, or other staples), and is recorded by Customs as "various". That said, in Yei there are dedicated traders who bring in whole truck loads of daga'a and sell on to retailers who buy one sack at a time. Godowns in Yei serve as stores for this product. From here the fish is distributed all over the western areas of South Sudan.

Salted fish from Uganda also appears on the market throughout the greenbelt and to Rumbek, but the quantities are small and there is no estimate as to the total size of the trade. The fish are usually catfish and Nile perch. The product is surprisingly good quality. In Juba retail markets salted fish is SSP33-SSP45/Kg.

A large amount of dried small pelagic fish from the west of Uganda is transported up to NBGS and WBGS and is made into "mandesha", a crushed, compacted and slightly fermented fish product much liked by pastoralists and even urban dwellers in the northern parts of South Sudan, though not seen often in the southern areas. This is probably *Nebola bredoi* and *Brycinus nurse* from Lake Albert and surrounding area. It comes by road, through either Nimule or Yei but is not seen in the markets of the green belt. Mandesha costs SSP40/Kg in Aweil.

13.6.2.3 Fresh fish imports from Uganda

Nile Tilapia (*Oreochromis niloticus*) and Nile Perch (*Lates niloticus)* are traded up from Uganda (Entebbe, Kampala area and Jinga) to Juba in chilled small lorries of up to 5 tonnes capacity. The fish is fresh gilled and gutted and kept on ice. This is sold to traders at the "Uganda" market in Konyo Konyo in Juba and the "Uganda" market in Jebel Market; and then sold on to retail buyers. Some is sold directly to hotels and restaurants. Typically two lorries carrying 3 tonnes each will arrive in Juba every week, making a total import of roughly 300 tonnes/year. The importers are an organised group of 7 traders who have formed an association. In the "Uganda" market at Konyo Konyo the 27 retailers, who also have formed an association, use old domestic freezers to keep the fish as do retailers in the Jebel Market though there are only 3 traders, all Ugandans, there. The ice (flake) comes with the fish from Uganda, and if extra supplies are required then locally sourced blocks are available in the market. The conditions where the "Uganda" markets are situated leave much to be desired, but the fish is generally of acceptable quality, though subject to contamination from ice and the general unhygienic surroundings. The importers sell to the retailers at SSP20/Kg and the retailers sell to the public for SSP22/Kg. The mobile phone is becoming important in marketing of this fish, as the traders like to have buyers waiting and a guaranteed sale,

[571] See Fisheries appendix 7 for price data in markets in South Sudan

[572] A name also applied to small *Limnothrissa miodon*, the Lake Tanganyika Sardine, which is similarly traded widely in East Africa.

which they can achieve by use of a mobile phone. This trade used to be much larger in the late 1990s, with 25 trucks engaged in the trade. A major problem for the traders is a failure by hotels and restaurants to pay for product sold on credit.

13.6.2.4 Dried fish imports from Sudan

A significant quantity of small pelagic fishes is imported from Kosti in Sudan to WBGS, NBGS and Warrap State to make "mandesha". The full extent of the trade is not known exactly. In Aweil (NBGS) in 2013 this fish was still being imported dispite the border being "closed".

13.6.2.5 Fish imports from Kenya

An unknown amount of dried and smoked fish enters South Sudan through the border with Kenya in EES. This seems to be consumed in EES.

13.6.2.6 Fish imports from Democratic Republic of Congo (DRC)

An unknown amount of smoked fish enters South Sudan through the border with DRC in WES. This fish can be seen in Yambio market competing with locally produced smoked fish from Terekeka, and Uganda smoked fish which has come from Uganda via Yei.

13.6.2.7 Other imported fish products (Prices mid-2013)

- **Canned fish**. A variety of canned fish products are available in the stores and supermarkets of South Sudan. The cheapest is Philippines produced sardines in a rather lurid coloured tomato sauce, costing SSP5 for 125gms tin, weighing 90gms drained. This is equivalent of USD13.2/kilo drained weight. Other more expensive products include canned tuna, sardines in oil, and more arcane products aimed at the luxury markets. It should be remembered that canned fish should not be compared to fresh fish, in that canned fish requires no refrigeration, is very convenient and keeps for years. Neither, gustatorily, is it considered to be a comparable product to fresh fish by the consumer.

- **Frozen Pangasius fillets (Vietnam).** Pangasius is a catfish farmed mainly in Vietnam. Frozen fillets arrived in the stores in Juba in mid 2013. At SSP35/kg for skinned, boneless, Individually Quick Frozen (IQF) fillets in a 1kg shatter pack they are very competitive with local fish in the Konyo Konyo market, and far more convenient, requiring no further processing at home. It remains to be seen how long before this cheap fish, which has already found its way into the restaurants, hotels and domestic kitchens of the world, becomes a major competitor to any aquaculture or wild capture products that may be produced in South Sudan. Some people complain that Pangasius is not particularly tasty and has a dry, unappealing texture.

- **Frozen Tilapia fillets (China).** These have been available since 2012 in Juba. They are an aquacultured product from China. Presented as individual fillets vacuum packed and Carbon Dioxide (CO) treated they are sold by the kilo at SSP70/kilo, making them very expensive[573], and out of reach of the average consumer. Given that it is possible to buy and transport frozen whole Chinese IQF ~300gm gutted and scaled tilapia in 20 kg cartons of 1kg shatter packs to Mombasa for a mere USD1.66/kilo[574] it will not be long before these start appearing in Juba, competing directly with the local wild and aquaculture product. (The tax on imported fish products is only 2%).This is a major long term threat to the commercial aquaculture industry in South Sudan.

- **Frozen Tilapia Fillets (Uganda).** These are available in supermarkets in Juba. The presentation is poor, being a frozen lump of 500gms of fillet in a vacuum pack bag. They

[573] This reflects the rapacious greed of the supermarket owners.

[574] R Lindley - personal information

are also very expensive at SSP84/kg, about twice the cost of a fillet produced from a locally caught or imported (Uganda) fresh tilapia, but less bother to prepare. Consumers report that they taste better than the Chinese vacuum packed product.

- **Frozen Nile perch fillets (Uganda)**. These are available in many supermarkets in Juba. These come up from the Nile perch fishery on Lake Victoria. The packing is in cardboard cartons of 500grammes.The quality suffers due to poor temperature control and the cheap inadequate packaging. These are SSP60/kg. Mostly purchased by expatriates, hotels and restaurants.

Other more esoteric products are now (October 2013) available from wholesalers (no shopfront) for the hotel and catering trade.[575]

13.6.3 Fish product exports

The amount of fisheries exports from South Sudan to neighbouring countries is unknown with any accuracy.

It is generally reported that at least 10,000 tonnes[576] of fresh fish was transported from Nasser, Ulang, Sobat and Fangak in Upper Nile state to Khartoum by boat and truck (using ice made in Khartoum and Kosti). Additional trucks used to visit Bentiu and other areas along the Nile River and collect fresh fish to take north and to western areas of what is now Sudan. Khartoum (particularly) and what is now Sudan generally was considered to be an insatiable market for fresh fish from Upper Nile, Jonglei, Unity and Lakes States. Some of the larger *Lates niloticus* (Nile perch) were onward traded to Libya, Saudi Arabia and Egypt by air. With the closure of the border in 2012 this trade virtually stopped.

CAMP conducted extensive interviews with fish traders in UNS in 2013. A slightly different picture appeared from that given above. A large number (up to 35 operating at a time) of vehicles came South from Sudan to UNS and Unity State, including to landing sites on the Sobat River. These went wherever there was access to fish. Additionally up to 15 boats from South Sudan and Sudan travelled up the Sobat as far as Nasser, and the Nile as far as Bor. Fresh fish was purchased by the traders from landing sites everywhere who then returned to the North, sold the fish and returned to South Sudan with ice from Khartoum (or Kosti, where the ice is more expensive).The vehicles carried 3-5 tonnes[577] per trip and the boats 10-15 tonnes per trip. Some of the traders used satellite phones to keep in touch with buyers in Khartoum.

The size of this trade would therefore have been more than previously estimated and may have been as much as 16,000 tonnes/ year when the border was open. Khartoum can apparently absorb as much fresh fish as there is supply.

When the border permanently re-opens the trade will restart in earnest, but even with tension continuing the fish trade continues, with much dried fish passing through Ethiopia and clandestinely both dried and fresh fish cross the border to Sudan.

Of note is that this trade, over a considerable distance, was conducted with only the use of ice as a cooling medium and in insulated boxes. No chill stores, freezing units or cold stores were necessary. It is undoubtedly a model that could be followed for moving fish around South Sudan, to Juba and other urban destinations from the major producing areas in Jonglei, Lakes, Unity and Upper Nile States.

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[575] An example of what is available is given in Fisheries appendix 7.

[576] SPCRP. 2012. *Fisheries Production and Marketing Report. Final technical and financial report. 29 March 2008 – 28 September 2012* Fisheries Production and Marketing Project STABEX-SPCRP 02 Livestock/03 Irrigation/04 Fisheries. Programme Coordination Office Juba. September 2012

[577] Anecdotally they could get up to 8 tonnes into one of these trucks

A large amount of dried fish also found its way north into what is now Sudan. Most of this was dried and/or salted fish, presented as plaited strings and split gutted fish[578], though Mandesha[579], a compacted mass of small fish in a wicker basket, is popular with nomadic pastoralists as it is very compact and can be transported easily[580].This trade amounts to at least 1000 tonnes per year[581].Some of the fish used to make Mandesha in NBGS and WBGS is imported from Kosti in Sudan, though the majority is from Uganda (with some locally produced in NBGS & WBGS and from Bentiu and Wau). With the closure of the border the fish trade up the Nile stopped but the trade in Mandesha northwards continued, for the northern border in the Western part of South Sudan is notoriously leaky.

Apparently, and it has been impossible for CAMP to verify this due to security problems, there is a large trade into Ethiopia from Pibor, Nasser and Akobo of dried and salted fish, as well as some fresh product[582].Anecdotally much of this just goes round the Sudan/South Sudan border and enters Sudan from Ethiopia, thus avoiding the presently closed border. The majority of the trade is thus in reality to Sudan, not Ethiopia. Fish traders from Sudan are a common sight in these north eastern areas of the country.

Historically (before the start of the second Sudanese civil war) there was a very significant trade in dry fish from the central Sudd region down to Juba and then on to DRC through Yambio. This trade has all but stopped, though the product can be found in all towns in Greater Equatoria, and it would be presumed that some still makes it way over the border.

13.6.4 Fish market prices

Fresh fish market prices[583] in South Sudan are relatively low in places near to rivers and lakes and higher the further away from the source, except in Juba, where high demand and low supplies makes fresh fish prices high all the time. The cost and unreliability of transport, along with informal taxation, is a major influence on the increase in fish prices away from the source. In Juba a constant supply of fresh Tilapia and Nile Perch from Uganda, whole gutted and chilled on ice puts a baseline limit on fresh fish prices, at SSP22/kg in 2013, and fresh fish therefore is generally less than this price (in Juba fish is sold by the piece or heap, so prices vary by as much as 20% on the same stall). Even when fresh fish can be got to market, the conditions in the markets are generally unhygienic and unappetising to the consumer. Modern markets have been built in some places, such as in Terekeka (by the SPCRP GIZ project), and in Rumbek but much more requires to be done.

Box 13-5: Four major constraints to fresh fish marketing

i. Poor roads and expensive transport
ii. Ice availability and cost
iii. Informal taxation
iv. Poor retail markets

In many of the towns in South Sudan fresh fish is available only in the late afternoons and evenings and the demand is such that supply is inadequate. Customers queue to buy and prices are relatively high, compared to the smoked and dried fish that is always available in South Sudanese market towns. In Juba fresh fish is displayed in the mornings and put away in old freezers with (insufficient) ice during the day, to be displayed again in the evening.

[578] See Fisheries appendix 5

[579] Also spelt “madesha”

[580] FAO (2012) *Country Report Juba, South Sudan.* Regional Trade on fish and Fish Products Project TCP/RAF/3308

[581] Pat Murphy, 2013, AECOM. *Pers Comm*

[582] Figures given in the FAO (2012) report for exports to Sudan and Ethiopia are insufficiently robust

[583] Prices for fish, dried, fresh and smoked, throughout the country are given in Fisheries appendix 7, which gives the prices for fish throughout the country where CAMP took measurements.

Near sources of supply the fish price reduces considerably, as supply is so much greater. Dolieb Hill in UNS is such a location, with large numbers of fishermen on the Nile and Sobat rivers, demand reduced due to the closure of the border with Sudan and the main market in Malakal is more than 20 miles away. Here fresh fish are relatively cheap, compared to alternatives, or elsewhere in the country at SSP7-SSP10/kg depending on species.

Smoked and dried fish is far cheaper than fresh fish (on a per kilo of fresh fish equivalent basis), and is far more widely available to the general public. Every small market in the country has stalls selling dried or smoked fish in one form or another. Prices vary considerably, depending on how far the fish has been transported. In Juba town smoked fish and dried fish is more expensive than in most other places.

13.6.5 Post-harvest losses

Post-harvest losses have been studied by FAO and others. Estimates as large as 50% of the catch[584] have been published, but it seems that these are vast overestimates. Losses occur, primarily if fish is caught which cannot be sold fresh or processed (dried) due to the weather. Losses due to insect infestation can be high in dried and smoked fish products that are stored for long periods, and some smoked fish is brittle and so suffers from losses due to breakages. There is no doubt that post-harvest losses exist and all post-harvest losses are greater than would be ideal, but they should be kept in perspective, as a small, but undesirable proportion of the total production. The increasing mobile phone use by traders and fishing communities offers opportunities to reduce post harvest losses by ensuring that the market for fish exists before it is caught.

13.6.6 Potential for the fish trade

Once the border with Sudan reopens then the fresh fish trade to the north will begin again. The private traders are adept and adaptable. It can be anticipated that the volumes sent previously to the North by the private sector will soon be re-established and possibly increased. This is not an activity suitable for direct government intervention.

Internally there is a large market for fresh fish in all the larger towns. The problem for the private sector has been, and continues to be, getting the fish to market and short term storage. Other problems include poor and expensive roads and transport, informal taxation, poor retail markets, and no ice availability. These are the key constraints to marketing fresh fish in South Sudan; until they are overcome then the market for fresh fish in the towns will continue to be poorly served. Fresh fish is a far more valuable product than dried or smoked fish, and per kilo offers a potentially much higher return to the fishermen and traders, so it is desirable to aim to provide as much as possible fish as “fresh fish” to the consumer. As general conditions improve it will be possible to develop cool chains for frozen fish and produce added value products for a rich urban elite, currently served by imports.

Dried fish continues to be greatly appreciated by the consumer, partly because it requires no refrigeration and only a small amount is needed. The dried product is also appropriate since the fishermen do not require refrigeration in the landing sites and villages, it is within the fishermens financial and skills capacity to produce, and there is no particular hurry to sell the product, so it is possible to get it to market in sellable condition despite the poor road and transport network. With time the dried fish trade can be expected to decline as the fish distribution network improves and the consumers begin to buy fridges to keep fresh produce, but in the short term the dried fish trade will remain the backbone of fish trading in the country. There is nothing fundamentally wrong with this, and the common assumption that dried fish is a somewhat “primitive” way of processing fish needs to be dismissed.

[584] 50% is a catastrophic loss. Post harvest losses were not a problem noted at all during CAMP household survey work. No fisherman mentioned it. Catastrophic losses would have been mentioned.

Frozen fish is not a suitable product for distribution at the moment, because there is no low temperature cold chain in South Sudan, the consumers have no freezers, and electricity supplies are irregular in most of the country. Frozen fish requires a significant investment in ice machines, freezing units, cold stores and refrigerated transport which does not now exist.

Value added products, beyond gilled and gutted whole fish, require a processing industry and cold chain far more sophisticated than anything that is currently installed in the country.

For the next few years South Sudan will be unable to export fish to lucrative markets in the USA, EU or Middle East. There is no Competent Authority (CA) to regulate and oversee such exports, and it will take years to setup the necessary inspection and certification systems. Trained staff are insufficient also. HACCP[585] is not applied currently in any fisheries establishment. It is not clear that the investment required to make high grade exports of this sort possible would be desirable in the short term, given the other pressing problems in the industry, and the large local and regional demand for fish. Exporting fish can also have serious negative consequences for local consumers, as has occurred in Uganda with the Nile Perch export industry on Lake Victoria. Export will remain a long term objective for fisheries, particularly if large scale aquaculture takes off.

13.7 Services

13.7.1 Development partners

A large number of Development Partners (DPs), NGOs and agencies make inputs to fisheries development in South Sudan. The largest are probably FAO, the EU and USAID, who both support programmes implemented by NGOs and MARF, as well by the States.

Among the numerous programmes and institutions supported by USAID are Padak Training Centre; the USAID South Sudan Transition Conflict Mitigation project (SSTCM) through fisheries by AECOM International in Nasser (UNS) and Akobo (Jonglei State) and in a fishery program in Panyijiar County (Jonglei State) in 2013 through a local NGO; and the establishment of fish ponds and support to fish farmers in CES and WES, again through NGOs. Most of these inputs to fisheries are justified as livelihood orientated or conflict mitigation; not just fisheries.

FAO has made a series of inputs to fisheries and in 2009 undertook a survey of several areas of the country to map fishing activity and survey fishing villages.[586] FAO has also funded some training courses, notably on boatbuilding, post-harvest and fishing gears (mostly though NGOs & other DPs), provided money for fishing gears for distribution and undertaken some studies and workshops, notably on post-harvest losses through the Smartfish programme, which aims to improve regional counties capacities to implement fisheries management and food security plans.

The Agriculture and Food Information System (AFIS) is a three year project (2013-2015) implemented by FAO and funded by the European Union, which will support the institutionalization of robust food security information systems at both the national and state levels in South Sudan; this should lead to better statistics on the fishery in the country.

FAO is also working with South Sudan and other countries in the region to build a more competitive and efficient fish trade in the region through a regional project in partnership with

[585] Hazard analysis and critical control points, is a systematic preventive approach to food safety

[586] GRSS 2011 *Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA). Technical Assistance on Fisheries Assessment.* Report prepared for the Government of South Sudan by The Food and Agriculture Organization of the United Nations, Juba 2011.

the Intergovernmental Authority for Development (IGAD).A report[587] on fish marketing in South Sudan was produced in 2012, as part of this project. FAO also provided 20,000 pieces of fishing gear to residents of Boma and two other towns affected by the outbreak of conflict in Pibor and Likuangole in Jonglei State in December 2011. FAO has also made some progress in aquaculture in WES. The Country Framework Programme 2013-2017 which is being implemented, will provide a secure basis for future cooperation between MARF and FAO.

The EU, through the SPCRP, funded the Fisheries Production and Marketing Project (FPMP), implemented by GIZ. It was one of three model projects in the SPCRP programme from 2009 through September 2012. The FPMP project was implemented in Central Equatoria, Lakes and Unity States and focused on capacity building for fisherfolk and government fisheries staff, construction of infrastructure and fish marketing for fisheries development. There were problems with the implementation of the project, but despite all the problems a significant amount was actually done.[588]Some fisheries officers received training under the project. Various NGOs have been supported in aquaculture in WES and CES. The ACP Fish II project has implemented three short term projects in South Sudan in 2012 and 2013, a project to help DoFAD write a Fisheries Policy, a mission to look at constraints facing SMEs in Fisheries, and a training programme on Socioeconomic Analysis and Monitoring in Fisheries. ACP Fish II is also, though a regional project, looking at Commercial Aquaculture opportunities in South Sudan. EU contributes greatly through its wide ranging programmes to other aspects of fisheries.

JICA Egypt has been implementing a Third Country Training Program (TCTP) in Egypt since March 1985.Several South Sudanese have benefited from this training which in this case has been in Warm Water Fish Production in Egypt, the most recent in 2012.

The Netherlands has a fellowship programme in conjunction with the University of Wageningen to which a fisheries officer is sent in most years. One went in 2012 and one is going in 2013.

Other DPs also make contributions to fisheries development, such as WFP, who are promulgating fish farming in WBGS as a livelihood and food security option; Oxfam conducted fisheries training in Malakal as a livelihood improvement tool. CAMP is funded by JICA, and IDMP, a sub-programme of CAMP, will also benefit fisheries in the long term. SNV, a Dutch NGO, has also developed the Producing for Urban Market Project (PUMP) in CES at Terekeka, concentrating on marketing fish to Juba. This is funded by the EU. Many of these smaller inputs by donors and NGOs, particularly local distribution of gears[589], may not even get reported to DoFAD in MARF, so details remain very hazy.

13.7.2 Educational establishments

Apart from Padak Fisheries Training Centre in Bor there are several other institutions that host courses related to fisheries.

Degree courses are offered in fisheries at the Faculty of Animal Production, Upper Nile University in Malakal. In 2012 activities at the university were severely curtailed due to a shortage of money, and some student unrest, but the University is now operating normally

[587] FAO (2012) *Country Report Juba, South Sudan.* Regional Trade on Fish and Fish Products Project TCP/RAF/3308

[588] SPCRP. 2012. *Fisheries Production and Marketing Report. Final technical and financial report. 29 March 2008 – 28 September 2012* Fisheries Production and Marketing Project STABEX-SPCRP 02 Livestock/03 Irrigation/04 Fisheries. Programme Coordination Office Juba. September 2012

[589] a favourite amongst donors, as it is cheap and easy, though completely un-necessary in most cases, since gear can be bought in any major town in South Sudan.

again. Courses used to be taught in Arabic but since separation English has become the main language of tuition. Many of the government fisheries officers at MARF and in the states attended Upper Nile University. The course is a generalised fisheries course, the first two years being generalised "animal production" with options for the second two years, one being fisheries. This course has recently been extended to 5 years. The course is mostly classroom based with limited field work. Numbers graduating from the fisheries course vary from year to year. The University of Juba, now fully based in Juba, has a Faculty of Fisheries which offers undergraduate and postgraduate courses in fisheries. The job opportunities available to graduates are limited, and few remain within the sector.

Generally, staff of DoFAD continues to look to Europe and the US, or even regional universities for post graduate education, and the major problem is funding, since few donors will cover the full costs of such long term education.

13.7.3 Private sector

The private sector provides supplies to the fishing industry. This includes ice from the ice factories in Juba (five ice factories exist in Juba, one inoperative, with a capacity of more than 60 tonnes/day)[590] and Malakal (one small ice factory), appropriate fishing gears which are available throughout the country[591], and transport and marketing for the catch, both fresh and dried. Outboard motors, transport, ice boxes, fishing gear and fuel are also provided by the private sector and are essential for the industry.

All of these are provided without any support from the government, and indeed through the ubiquitous informal and formal taxation systems, the governments' influence is more malign that benevolent.

13.7.4 Formal credit institutions

Banks and savings institutions worldwide generally avoid fisheries due to a perceived high risk and lack of knowledge of the industry.

The CAMP household survey did not find any fishing household with a bank account, and none had managed to obtain a loan from a formal credit institution.

Apparently some funds have been raised for larger scale investment in fisheries by non-South Sudanese investors, but the details of either the schemes or the funding are difficult to obtain, and in at least one case the funds were raised from outside the country. There is little evidence on the ground of these schemes.

Traders operating into South Sudan, such as those providing fresh fish on ice from Uganda, raise investment funds in their home country from formal credit institutions to fund investments like the insulated vehicles that they use.

13.7.5 Informal credit services

Nearly every settled fishing household in South Sudan has access to informal credit. If money needs to be raised then it can be, through loans from other members of the family, from savings or the sale of assets (usually livestock) owned by the family.

The CAMP survey of fishing households found that 79% of the fishing households stated that they had access to funds if needed, usually from relatives, savings or the sale of

[590] See Fisheries appendix 8, which describes the working ice factories in Juba.

[591] See Fisheries appendix 2

livestock.[592]. These figures are very similar to other surveys, such as the GIZ project in the Terekeka area of CES in 2012, and the FAO frame survey of 2009.

13.8 Infrastructure

Modern infrastructure specifically for fisheries production and marketing does not exist in South Sudan, with extremely rare exceptions. Fisheries tends to rely on infrastructure provided for other sectors and activities, such as roads, jetties and wharves all of which have other applications and users. There is no permanent "fisheries wharf" or jetty in the country, though decent wharves exist at Shambe (Lakes State) and Juba from which fishers and fish traders are excluded. Fishermen and traders land to landing sites on the banks of the river or in creeks close to it. The absence of decent landing stages, not only for fisheries, points to serious underinvestment in infrastructure in the past.

The GIZ implemented SPCRP constructed three fisheries extension centres in Terekeka, CES; Nyal, Lakes State; and Liap/Adok, Unity State. Additionally offices, accommodation and kitchen/dining hall were fully furnished. In 2013, these are nbow primarily used for accommodation and occasional workshops and training courses. A floating landing stage is installed in Terekeka. An improved fish market was also built by SPCRP at Terekeka; to which an ice machine was supposed to be installed, but this has not happened, though the ice machine has been delivered. A gear shop (bush shop) was also built but has already fallen into disrepair. Additionally a fish processing area was constructed but is not operating.

Ice machines are run and managed by the private sector in Malakal (UNS), and in Juba. The ice is very expensive and this limits its use in fisheries. Ice is taken from Juba to Bor by boat for the preservation of fish destined for Juba, and similarly to Terekeka. Ice is taken from Khartoum to Nasser, Ulang, Shambe, Bor and Adok when the export of iced fish to Khartoum is allowed. There are no chill stores for the storage of fish stored on ice, except in Bor, where there is no power supply to run it. Chilled fish is kept in insulated boxes, though most of these are old domestic freezers, unsuitable to the task. Fish coming from Uganda by refrigerated lorry comes with its own ice, and is stored in old domestic freezers.

There is (except for high class supermarkets in large towns) no trade in frozen fisheries products, so there is no cold store devoted to fisheries in the country. It will be some time before such installations will be necessary, since development efforts in the short term should concentrate on chilled fresh product, and improvements to traditional dried and smoked fish production and marketing. In the case of markets, segregated fish markets exist in nearly all towns and cities in South Sudan, but the facilities are basic, unhygienic, and need to be bought up to modern standards. The majority of stalls are just wooden and bamboo structures covered with a basic tin roof. No ice is used and surfaces cannot be cleaned. There is no hygienic waste disposal. In many markets fish products are displayed on the ground. Most markets are open to the elements, with earthen floors. In some of the major towns, and in Terekeka in CES, better markets have been constructed.

Fisheries has continued to expand over the years without any dedicated infrastructure. This has been because of the inherent robustness of most of the products of the sector that do not need much public infrastructure, dried and smoked fish. Dried and smoked fish are stable food products, and thus can tolerate poor transport, rough handling and inadequate storage without catastrophic losses. As the industry develops, and the demand for, and

[592] Full details of the results of the Household Survey are in Fisheries appendix 9. See also: GRSS 2011 *Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA). Technical Assistance on Fisheries Assessment.* Report prepared for the Government of South Sudan by The Food and Agriculture Organization of the United Nations, Juba 2011, which has detailed frame survey results from selected areas of South Sudan.

supply of fresh chilled products increases, the needs for dedicated infrastructure, such as ice machines, wharves and jetties, chill stores and chill transport vehicles will increase. Improved shared infrastructure, paved roads and bridges, electricity supplies, reticulated "WHO quality" water and municipal markets will also be necessary to realise the subsectors' potential. This of course still lies in the future.

13.9 Important cross cutting issues

13.9.1 HIV and AIDS

Fishermen and workers in fisheries related industries are far more likely that the general population to be affected by HIV. This is mostly related to mobility, making fishing communities and freight transporters more vulnerable to infection with HIV. The results of HIV infections are devastating. Fishing households in which one or more people are affected by AIDS have reduced income, spend their savings on medical care, sell their productive assets (such as fishing equipment and cows) and withdraw their children from school. Their poverty deepens, their food security decreases and their general vulnerability increases.

Box 13-6: Case study - AIDS Lake Victoria

"Fishermen are five time more likely to die of AIDS-related illness than farmers in the Lake Victoria region, where seroprevalence rates in lakeshore towns and villages in Kenya, Tanzania and Uganda are thought to have reached levels as high as 30-70% during the late 1990s."
FAO (Undated) *Impact of HIV/AIDS on Fishing Communities. Policies to support Livelihoods, Rural Development and Public Health.* DFID/FAO Sustainable Fisheries Livelihoods Programme (http://www.sflp.org)

It is not only the fishing communities that are affected: as in fisheries departments, firms, and agencies, HIV may reduce management capacity, decrease productivity and efficiency, and divert fishery development resources into HIV prevention and AIDS mitigation efforts. The overall impacts are likely to result in increased incidence of poverty and a reduced likelihood of sustainable exploitation of resources. Recent data for South Sudan[593] indicates that the rate of infection (based on antenatal care reports) is only 2.6%.The infection rate is 6,000 every year with 153,000 people living with HIV in South Sudan. This is acknowledged as an underestimate. The most affected states are WES 6.8%, EES 3.9% and CES 3.8%. In northern states the rate of infection is much lower.

Current prevention programmes are:

- HIV and AIDS awareness in companies with large workforces, such as UNMISS, who concentrate mainly on their own staff, particularly peacekeeping forces, and are very active in this area.
- Through UNMISS targeting ex-soldiers going through the Disarmament, Demobilization and Reintegration (DDR) process.
- General counseling and testing.
- Distribution and education on the use of condoms.
- Targeting truck drivers in border areas (an NGO is assisting).
- Focusing on sex workers in Juba.[594] On a day to day basis 2,600 girls are trading sex but on Friday and Saturday numbers can reach 3,500 per night.

There is no specific data on HIV or AIDS in fishing communities nor in the fisheries administration of GRSS or the SMARFs. The only guidance for fisheries is the example of

[593] Provided to CAMP by the National Aids Council, Juba 2013.Note that the "New Nation" newspaper in its 25-28th 2012 edition in article quote the NAC as saying that the number of people living with HIV and AIDS in South Sudan as 300,000.
[594] According to" The Citizen" newspaper in early 2012, 12,000 sex workers have come to Juba from Uganda and Kenya.

what has happened in neighbouring countries in the past. This is not reassuring. In South Sudan there is also a worrying trend of alcohol becoming available to fishing camps, and particularly where those camps are made up of men away from their families, risk taking behaviour can be widespread.

The CAMP team has found that within GRSS MARF and SMARFs there is widespread ignorance of HIV. Additionally CAMP fisheries subsector household survey data, where fishing households were questioned on HIV awareness, showed that the majority of fishing households (more than 90%) had not received any visits from health care professionals related to HIV or AIDS, though more were aware of the disease but had no specific knowledge about it. Padak Training Centre courses for fishermen do not include any specific advice on HIV. This is a very unsatisfactory state of affairs and bodes ill for the future of the fishing industry in South Sudan. GRSS MARF and the SMARFs should cooperate with all concerned government, NGO and DP agencies on HIV and AIDS and mitigation measures should be included in all development activities undertaken by any agency, and within the government itself. GRSS MARF is currently incapable of implementing strategies on its own due to lack of financial resources and insufficient skills amongst the staff.

13.9.2 Gender and child labour in fisheries in South Sudan

Within South Sudan there is wide variation between tribal groups that defines the roles of men, women and children in fisheries. Generally men do most of the fishing except those using methods that can be done by women accompanied by children. Men thus go out in boats using gill nets and long lines, use spears and cast nets. Women use cover pots, collect by hand and use traps, often in groups. Male children use small imitations of the adult gear, and also use pole and line as a recreational and food gathering activity after school (or instead of school). Female children accompany their mothers and assist as far as they can in any fishing operations.

Marketing of the fresh catch is generally done by the fisherman himself, either directly from the landing place or he may travel to a central landing place where buyers come to purchase the catch. What is required for the family pot is retained. Women, who fish on the other hand, tend to retain the catch for home consumption, and only if there is a large catch above what can be consumed by the family group is it sold. Children who fish almost invariably take the catch home for consumption. Many women are involved in the sale of fresh fish (not in Juba) and in many markets are involved in the sale of processed fish.

In areas of large catches where there is often a surplus the catch may be dried or smoked. In both cases the majority of the work is carried out by men,[595] though in times of great surplus, women may also help, and children too. It is often said that the women do the processing in fishing camps, but in many camps women are absent, and even when women are present it is often the men and male children who do the processing. Once again the traditions and customs of the main tribal groups and sub-groups vary. There is no obvious reason why DPs or the government should attempt to overturn the traditional roles of men and women in fishing communities.

Although children of both sexes assist at all stages in fishing, processing and marketing of fish this cannot be described as exploitative. Children generally go to school in areas where there are schools, and fishing communities are staunch supporters of child education, making every effort to ensure that their progeny get as good an education as possible. The CAMP household survey[596] showed that for fishing households, their children's education

[595] Camp Fisheries subsector survey work 1n 2013 showed that in 60% of households men only do the processing, in 18% of households men and women do the processing and in 18% of households women only did the processing. See survey results in Fisheries appendix 9.

[596] See Fisheries appendix 9

was one of the priority items of expenditure of income generated by fishing. In this way fishing households in South Sudan are similar to nearly all family groups worldwide. It is also natural that children should accompany their elders when fishing[597] if they have nothing else to do or no school to go to: in some cases this is the only education the child will get.

Child labour is thus not currently a problem in fisheries in South Sudan.

13.9.3 Security

Poor security is locally a problem, though generally this is a feature of a traditional form of insecurity, cattle raiding, which is a large problem in many areas, notably in Jonglei State, but it also occurs in other places. The use of automatic weapons makes cattle raiding a very dangerous activity.

There are occasionally conflicts between neighbouring tribal groups on fishing rights, in that a resident group will not allow interlopers to fish in "their" area. These are generally settled without bloodshed, through negotiation. It demonstrates a strong sense of ownership of the fisheries resources by the users of those resources.

From a fisheries point of view this form of insecurity is not something that can be tackled easily, except by providing livelihood alternatives to cattle raiding which make it not desirable for young people to go cattle raiding as they can earn a decent living from fishing, and not risk injury or death cattle raiding. This is the approach used by AECOM in their efforts to improve security in UNS and Jonglei/Akobo, with reported success in the limited area where it has been tried. Unfortunately cattle raiding is very traditional, and there is also long group memory amongst the cattle owning peoples, which stretches back generations. As a result past cattle raiding activities cannot be easily forgotten or forgiven, and reprisals can occur long after the original incidents.

Since the CPA in 2005 there have been increasing reports of banditry, particularly along roads, and particularly against vehicular traffic. Dacoits and miscreants rob travellers of their possessions and steal vehicles and cargo. Although this affects fish movements it is no greater problem for fisheries than it is for other sectors that rely on the arterial roads for transport of goods.

13.9.4 Taxation

All traders and transport operators complain of taxation. Whilst import taxes at border posts is an accepted part of life, and indeed the tax rate for importing fish to South Sudan is negligible, at 2%, and easily reduced by bribes, the level of informal taxation is extremely onerous and greatly resented. This became apparent during interviews by the CAMP fisheries subsector team during the situation analysis wherever fishing households or traders were questioned about marketing fish. Margins on fish trading around are slim, and the imposition of these taxes is a great disincentive to business in any form, and particularly fisheries, where the fish may have to travel many kilometres to reach markets, and be taxed time and time again. It also has the effect of greatly increasing the cost of the product paid by the consumer.

Box 13-7: Case study of informal taxation

Informal Taxation. Terekeka. (July 2013). A trader using a motorbike moving smoked fish from Terekeka to Juba Town pays 200 SSP total in informal taxes to three sets of officials on each trip. This is about 10% of the final price the consumer pays.

[597] Children's or adolescents' participation in work that does not affect their health and personal development or interfere with their education is generally regarded as being something positive.

Of great concern is that many of the taxes raised do not get deposited with the revenue office in the appropriate county or state. In one state visited by the CAMP fisheries subsector team, the revenues deposited did not cover the collectors' salary, though the monthly revenues raised through the taxation paid by one individual fish trader alone [598] are greater than the amount deposited annually in the revenue collection office. One can surmise therefore that very large amounts are going missing. Some payments made by fish transporters and traders are never intended to be, nor are disguised as, government revenue activities, being straight bribes to government officials, police or security officers. For fisheries to thrive this "taxation", little better than banditry, will have to be stopped.

13.9.5 Transport and fisheries

The CAMP fisheries subsector team's visits, surveys and data collection activities revealed that transport problems are one of the most complained about issues in fisheries today in South Sudan.

The complaints cover:

- Bad roads
- Expensive fuel
- Formal and informal taxation on transport - multiple checkpoints etc.
- Security on roads

This leads to expensive road and river transport. Since transport affects the price of everything in South Sudan, the price of transport ultimately affects the price the consumer has to pay.

13.9.6 Private investment

Government investment has not generally been successful in fisheries in South Sudan. The private sector, on the other hand, has made significant funds available to develop fisheries, and is the backbone of the industry; as it should be.

Private investment into fishing is significant. Every fisher has made a personal investment in gear, sometimes a boat, and other equipment for fish processing, storage and sometimes in transport. There is also a significant on-going contribution in labour which is uncosted. Larger operations, such as those moving iced fresh fish from Bor to Juba have made significant investments, which include the ice boxes (and the vessels to transport the insulated boxes). Additionally the cash investment in stock and ice is significant, since the fish is generally bought for cash (though occasionally on credit in hard times).This can add up to a significant sum.

The investment in stock of both dried and smoked fish is immense. Similarly the trade in UNS, Jonglei, Lakes and Unity State, northwards to Khartoum has involved a lot of investment, both in Sudan and in South Sudan. The more than 30 chilled and insulated vehicles used in the trade, together with the 15 motorised vessels is a considerable investment, and the ice machines in Khartoum, where the ice is sourced for the trade, are also expensive. Ugandans have made investments, some with loans from Ugandan financial institutions, in trucks and stock to transport fresh fish to Juba by road in insulated vehicles. In Juba, other Ugandans in the "Uganda" market have made investments in old freezers and basic equipment.

Service industries to fisheries are also investors. The ice machines in Juba and Malakal are extremely expensive to buy, maintain and run (ice is a huge user of electricity or diesel). The ice machines also serve the rest of the community, mainly for the chilling of drinks, in a

[598] interviewed by CAMP fisheries subsector team

society with irregular or absent electricity supplies. Similarly fishing gear and outboard engine suppliers have large stocks of gear available to the public. It is very difficult to put a figure on the private investment in fisheries in South Sudan, due to it being so spread out geographically and amongst so many fishermen, gear suppliers, processors and fish traders. Little of it is raised by formal credit means through local financial institutions; as it is not accurately recorded, there are no formal records. The continuing insufficient utilities, land tenure problems, shortage of local skills, poor transport links and insecurity are not conducive to future large scale investment in aquaculture or fisheries.

13.9.7 Public investment

Public investment in fisheries is very low, and fortunately so, since the development of fisheries production is not really an appropriate use of public funds. When public money has been diverted to fisheries it has not been successful. A shining example of the futility of a state government attempting to enter the fishing business is the fish barge in Jonglei State, which is not a good intervention, and has failed so far to produce any significant return on investment.

Fresh fish markets in towns have benefited from improvements in many places; generally these have been justified on public health grounds .GIZ built a very fine market in Terekeka in 2011.Most fish markets in the country are still in a lamentable condition; commensurate with the absence of funding available to improve them. Modern wharves have been constructed in South Sudan along the river Nile, notably in Juba and Shambe. Fishermen are banned from using them. Recently the dried fish market in Juba was evicted from the wharf area, with no substitute site being provided.

Padak Training Centre, supported now mainly by USAID, FAO and NGOs, and originally funded by DFID, is the sole training institution dedicated to fisheries, and is not functioning well, due to shortage of funds. The costs of establishing, maintaining, renovating and running Padak are unknown. GRSS MARF has a proposal for a parastatal company SUDAFISH, but to date no funding has been forthcoming to establish it. This is not an appropriate proposal, since the government is not the right organisation to invest directly in the fish trade. Governments' job should be limited to management of the resources and regulation and oversight of the private sector.

14. Key issues and challenges in the agriculture sector

As introduced in Section 1.5.1, the objectives of the situation analysis are: 1) to understand the past and present status, issues and opportunities of agricultural service delivery, 2) to understand the past and present status, issues and opportunities of the agriculture sector; 3) to analyse the mechanisms and processes of agricultural transformation; and 4) to identify information useful to estimate the expected impact of public service delivery. These objectives are set to answer the questions of i) how CAMP can be integrated into the government system, ii) how a devolved CAMP implementation mechanism can be designed, and iii) how changes in the behaviour of beneficiaries such as producers, traders and investors can be promoted. This Progress Report mainly covers the first and second objectives, describing the current situation and issues identified of service delivery and the agriculture sector. Accordingly, preliminary conclusions presented in this section are mainly concerned with these two objectives. Tasks to achieve the third and fourth objectives are still in progress and conclusions will be presented in the Interim Report.

14.1 Agricultural service delivery: private sector-led development

High-level development strategy and sector policies are already in place in South Sudan. However, the subsector policies, laws and regulations necessary to guide day-to-day public service delivery are still in the early stage of development. The overall development vision, development goals and strategy of South Sudan are articulated in the South Sudan Development Plan (SSDP) and its successor, the South Sudan Development Initiative (SSDI). The Agriculture Sector Policy Framework 2012-2017 provides overall policy guidance to the then MAFCRD, and the Policy Framework and Strategic Plans 2012-2016 defines the principles of service delivery by the then MARF. None of the subsector policies have been approved by the National Legislative Assembly (NLA).

The current legal frameworks of the agriculture sector are in urgent need of revision or establishment of new laws. No new laws and regulations have been established since independence and laws regarding crops, livestock, forestry and fisheries subsectors are lacking. The "laws" currently applied are those of the Sudan and were enacted many years ago. They are out of date and some parts of them are inconsistent with the Transitional Constitution. For example, the old fisheries law does not acknowledge the rights of users of resources to manage them. These laws are still used by the GRSS, state governments and local governments since there are no other laws to rely on. When it comes to legal disputes, the courts usually do not recognise the old laws. Similarly, there are no regulations established after independence. The early stage of development of a modern legal system is a constraining factor, but customary laws, as part of the legal system of South Sudan, should be adopted as conflict mitigation mechanisms and applied wisely to accelerate CAMP implementation.

Public sector human and financial resources, infrastructure and instruments for service delivery are very limited compared to the huge demand for public services. It is arguable that the government is able to mobilise oil revenues for the development of the country once the oil production is resumed. However, the situation analysis has revealed symptoms of the Dutch disease (negative consequences arising from large increases in a country's revenue from natural resources) throughout the country, suggesting a need for the prudent use of oil resources and strict economic management. State and local governments are seriously constrained by very small budget allocations for operating costs and investment, and weak institutional and human capacity. In addition, inappropriate devolution of power to levy taxes and fees, nepotism, inadequate exercise of political and administrative powers, and other institutional problems seriously hamper effective and efficient service delivery. Evidence

from other countries indicates that a government can deliver services, even with scarce resources, if it functions in a transparent and accountable manner.

There are also a number of issues external to the agricultural sector but that shape it. The government's overdependence on oil revenues leads to fiscal uncertainty and inefficiency in public services which are already expensive with respect to their impacts. Poorly developed roads and public utilities, such as electricity, transport and water supply, hinder the development of the sector. However, telecommunications are rapidly expanding among urban and rural populations, and there is an opportunity to utilise them for service delivery.

The formulation and implementation of CAMP should be guided by the principle of small government and private sector- and market-led agricultural development. CAMP formulation is a challenging task because the above issues are all real; ways to mitigate them must be designed in a practical manner. To realise effective and efficient service delivery under the existing constraints, it is essential for the government to recognise and support the efforts of the private sector.

14.2 Understanding the behaviour of the market and the private sector

To design and construct mechanisms to deliver agriculture services which could encourage private sector- and market-led development with minimum public sector resources, an in-depth understanding of the behaviour of farmers, traders and agro-industries is needed. Therefore, the situation analysis was conducted to answer the question how changes in the behaviour of beneficiaries could be promoted. Case studies and data analyses were conducted to see the effect of various public interventions, such as taxation and fee collection, goods and monetary transfer, investment and inputs support, and DP-supported emergency measures, programmes and projects. In this section the important findings relevant to the option of private sector- and market-led development are summarised. Detailed issues and challenges facing the private sector are presented in Section 13.3, and more detailed reports of these issues and challenges can be found in the preceding chapters.

The development of markets for agriculture, livestock, forestry and fisheries products and their value chains is constrained by poor road conditions, very limited support services, and stiff competition with imported goods from neighbouring countries. However, the situation analysis has also revealed the existence of vibrant rural-to-rural and rural-to-urban market economies. For example, a large part of sorghum consumption is met by supply from local markets, even in the areas where sorghum is grown as the main crop. Rural populations, particularly those in the Eastern and Western Flood Planes and Pastoral livelihood zones, are vulnerable to erratic climatic conditions, but their coping mechanisms are well-developed and incorporate crop, livestock, forestry and fisheries production in an efficient fashion. Farmers relying on one type of livelihood are rare, and most of them combine various means of agricultural production and off-farm employment to limit the risks of food insecurity.

While vibrant private sector activities need to be nurtured, the situation analysis has revealed that uncontrolled and unregulated production and marketing hamper the development of a fair, competitive and efficient market. The uncontrolled and unsustainable harvest of logs depletes forest resources quickly; and if market demand for fish increases, overfishing is likely to exhaust the wild stock rapidly. Consumer health can suffer from inappropriate agricultural chemical use and slaughterhouse management. Sanitary and phytosanitary issues, for which private sector players are responsible, are also reported.

Many market players, including producers, traders, wholesalers and retailers, perceive that taxes and fees collected either enrich the people who collect them, or become part of government revenues; no services are provided in return for their payments. On the other hand, government officials perceive that private sector activities promote corrupt practices

and deprive subsistence farmers, artisans and consumers of their scarce resources. The lack of trust between the public and private sector players is a serious problem hindering productive synergy. Since the relationship between the public and private sectors can be reciprocal, a change in behaviour is required of both public and private sector actors.

14.3 Crosscutting and subsector issues and challenges

14.3.1 Crosscutting issues and challenges

(1) Access to land: Access to land and land use is a key factor of agricultural development, but land rights are not secured for many people in South Sudan, particularly for returnees, Internally Displaced Persons (IDPs) and women. Procedures for large-scale land acquisition have not been clarified nor properly followed. The absence of an audit and monitoring system reduces transparency and accountability in statutory land administration. As a result of decades of civil war, customary laws were weakened and are not effective in securing equal land rights for every community member.

(2) Food security: The food security situation has deteriorated in recent years due to a large number of returnees, refugees from Sudan and IDPs, natural population growth, a reduced harvest (in 2011) and food price inflation caused by greater demand and tight foreign reserves following the oil shutdown. The GRSS and DPs have been providing food assistance to vulnerable groups, and it could be necessary to continue such services for some time. The impact of food assistance should be examined within the context of long-term agricultural development in terms of linkages with markets and behaviour changes of food aid recipients.

(3) Coping mechanisms: The diet becomes insufficient and less nutritious during the pre-harvest period, especially in dry lands. Household food security in the country traditionally depends on a complex system of food production, livestock, seasonal migration, informal trade, fishing and the collection of wild fruits, which was severely disrupted by the war. Activities to cope with this seasonal food scarcity might include selling livestock, charcoal and other homemade products and providing labour for cash or food. Introducing an appropriate number of livestock would be particularly helpful since they are more drought-resilient than crops and can supply food as well.

(4) Support to returnees and IDPs: The influx of over two million returnees and IDPs since the signing of the CPA has placed pressure on communities across the country and has increased competition over scarce resources and worsened living conditions among vulnerable groups. The agricultural production of returnees and IDPs is considerably smaller than that of non-returnee farmers. More systematic support regarding access to land, farming and other income generating activities is needed to facilitate the reintegration process and thus to ensure their long term economic independence.

(5) Gender equality: There are significant gender disparities in ownership of land and other property, education, health and human rights protection. Since women play important roles in agricultural production and marketing, it is essential to improve their living and work environment and enhance their capacity for agricultural development. Equal land rights should be given to women by strengthening land administration and accelerating implementation of the land laws. Support to female-headed households, who are among the poorest, is urgently required.

(6) Security: The legacy of insecurity and violence significantly undermines steady development of the agricultural sector. Further disarmament is expected to reduce armed incidents, mitigate conflict damage and contribute to agricultural development, as

demonstrated in the attempts by the GRSS and DPs. Since conflicts over scarce resources tend to occur during the dry season, a drought management system could be established as a conflict mitigating measure.

14.3.1.1 Institutional development

(1) Institutional and human capacity building: Public sector capacity for administration and financial management is weak, particularly at the state and local levels. Inadequate professional knowledge and skills and poor coordination between the GRSS and the state governments hinder performance at all levels. Low governance, accountability and transparency are reported throughout the system. Many of the issues identified by the four subsectors are also directly or indirectly linked to the weak public sector capacity for service delivery. Capacity development should be an integral part of CAMP for its effective and efficient implementation.

(2) Funding: Inadequate funds for operating costs and capital investment, together with limited institutional capacity, severely affect public investment and service delivery, especially at the lower levels of government. It would be necessary to secure external funds for CAMP implementation, through project support, earmarked funding, pooled funding or budget support. Whatever the funding modality may be, the ministries concerned at the national and state levels would be required to follow properly prescribed procedures for budget execution, control and monitoring. This also implies a need to strengthen their management capacity.

(3) Service delivery: Public services are not effectively and efficiently delivered to target groups with respect to location, timing, size and content. Among these, timeliness is critical to agricultural support services because of the seasonality of production activities. The government relied heavily on NGOs for service delivery and failed to establish sound service delivery systems during the CPA period. It is vital to design a simple but effective system for agricultural service delivery through the CAMP formulation and deliver it in CAMP implementation.

14.3.2 Subsector-wise issues and challenges

14.3.2.1 Crops

(1) Agricultural production: The gross cereal yield has stagnated at a low level since 2009, approximately from 0.8 t/ha to less than 1.0 t/ha due to rain-fed farming, use of traditional varieties, low quality seeds, limited inputs (e.g., fertilisers and agro-chemicals) and damage by pests and diseases. Likewise, cereal area harvested per capita is small, about 0.1 ha, since 2009 because land reclamation, ploughing, seeding, weeding, harvesting, and postharvest handling are mainly done manually by family labour. These two aspects (i.e. yield and area harvested per capita) have lead to serious food insecurity in 2013. The estimated cereal deficit in 2013 is approximately 370,000 tons, which could be filled by food aid and cereal imports. Even farm households face food insecurity. Due to favourable rainfall, temperature and soil conditions, some areas are suitable for cash crop production (e.g., vegetables, fruits, tea, coffee and oil seeds); however, this potential is not fully exploited.

(2) Costs of production: Compared to neighbouring countries, labour costs are high due to a strong South Sudanese currency affected by oil exports. Prices of agricultural inputs are relatively high since they are imported. South Sudan is a landlocked country so import costs tend to be higher. Domestic transport costs are high due to poor road conditions and high fuel prices. Higher costs of production reduce agricultural competitiveness in international markets. A large volume of agricultural products is formally and informally imported from neighbouring countries such as Uganda, Kenya, Ethiopia and Sudan.

(3) Infrastructure: Interstate and primary road networks are not well maintained; some areas are inaccessible during the rainy season. This makes transportation costs high. Since the condition of feeder roads is very poor, collection of products from production areas is difficult and expensive. Only a limited number of farmers own irrigation facilities, although large parts of the country have substantial water resources. Large and medium scale warehouses for storing and shipping cereals and drying yards for postharvest activities are not developed. Public electric services are not provided in rural areas, and only minimally in urban areas, so most businesses are using generators for electricity, which makes electricity expensive.

(4) Security: Due to insecurity some farmers fail to cultivate crops. When farmers escape from inter-communal or tribal conflicts and become IDPs, they can lose the opportunity to cultivate crops, which causes serious food insecurity in rural areas. Livestock accompanied by armed pastoralists often destroys farmers' crops. Fencing is an effective preventive measure, but it requires a large investment, which most farmers cannot afford.

(5) Service delivery to farmers: Both national and state governments are delivering very limited services to farmers. Agricultural Extension Officers (AEOs) are deployed at the payam level, but their number remains negligible. Therefore, farmers rarely get access to improved technical knowledge and skills. NGOs provide some technical services (e.g., training and extension), but the number of beneficiaries is limited. Public agricultural research institutes exist, but they rarely carry out research activities due to the lack of institutional, human and financial capacity. Thus, new technologies for crop production are little developed. Similarly, information and technology dissemination for extension officers and farmers is almost non-existent. Even though some farmers in the northern-eastern part of the country face serious damage to their crops from migratory pests such as quela birds, the government cannot carry out pest control. Likewise, they take no preventive measures for cassava mosaic and brown streak diseases. Rural financial services are not available except for some initiatives by NGOs, though farmers need capital to start new operations.

(6) Farmer Organisations: Farmers lack the capacity to gather their harvest into a large volume for sale, so traders tend to purchase products in bulk from neighbouring countries. Active farmer organisations, such as cooperatives and Farmer Based Organisations (FBOs), are few.

(7) Environment for investment: Land acquisition processes are often influenced by local politics and traditional arrangements. The high uncertainty of land acquisition is a serious factor adversely affecting investors' decision to make investments in the agricultural sector. Legal and illegal multiple taxation hinders investment. Illegal taxes (i.e., bribes) make transaction costs high. In addition, tax rates are often changed without prior notice. Basic infrastructure (roads, electricity, irrigation, potable water, ports, etc.) is not well developed.

14.3.2.2 Livestock

(1) Policy, legal and strategic framework: There is a lack of a comprehensive sector policy framework and subsectoral policies and lead institutions for the development of livestock-related industries. Current strategic frameworks are more focused on public sector issues than on the needs of the subsector. There is need to review the existing acts and bills and to institute mechanisms for their enforcement. An unclear and incomplete legal, policy and regulatory framework for land tenure has resulted in inconsistencies in implementation, adversely affecting land for livestock production, migration, marketing and processing in both rural and urban areas.

(2) Conceptual framework: The sub-sector potential is poorly understood and articulated as a result of lack of reliable livestock population data which has undermined strategy

development, planning, investment and coordination at all levels and across the stakeholders. Areas of comparative advantage at the state, national and regional levels have not been identified. Mutually beneficial linkages to the crop sector are not harnessed for an integrated approach.

(3) Institutional framework: Public sector institutions at the national and state levels do not have the necessary levels of staffing, in terms of number, qualification and capacity; neither do they have infrastructure and budgets to carry out their mandates. Coordination and communication within the public sector and with other stakeholders are poorly defined and resourced. Institutional arrangements to address natural resource issues are poorly developed; issues include water for production, rangeland management, drought and flooding, resource-based conflict, protection of key production and trade migration routes, and shared transboundary resources.

(4) Production and productivity: The subsector is dominated by subsistence producers who rely on indigenous breeds, knowledge and technologies and aim to produce for household consumption. There is scope for making initial substantial gains in filling the large production and productivity gaps and eliminating seasonality of production by using low-level technologies already in existence in the region and by organization of producers. There is also scope for diversifying both the species and production systems to utilise a broader range of resources and strategies.

(5) Animal health and food safety assurance: The prevalence of diseases due to the lack of facilities, human resources and investment impedes the delivery of animal health services. The impact of priority diseases is the largest on food security with losses in meat and milk production and related costs of treatment, amounting to hundreds of millions of USD. Hygiene standards for food of animal origin are inadequate and unenforceable due to lack of legal and regulatory frameworks, deterring private investment in meat and milk processing.

(6) Market development: Around 60-90% of livestock production is consumed within producing households, i.e., low integration into value chains. Domestic value chains are faced with stiff competition from regional and global actors and encumbered by high transaction costs due to poor transport infrastructure, conflict and insecurity, low product quality and poor sanitary and phytosantiary standards. Neighbouring countries might benefit from adding value to cheaper raw materials from South Sudan for their domestic markets or re-exporting to more lucrative markets.

(7) Taxation: Livestock and livestock products suffer from the multiple formal and informal taxes due to the lack of an integrated taxation framework with proper supervision on the ground. Production inputs such as day old chicks and feeds attract high taxes, which deters the growth of livestock inputs businesses and results in farmers and organisations purchasing them only on an ad hoc basis. Exports of hides and skins also attract high taxes.

(8) Investment: Public sector expenditure on the subsector is far below the stipulated Maputo Declaration allocation of 3% of the national budget, needed to improve food security, reduce poverty and stimulate economic growth. Development assistance to the subsector has been minimal and mostly short-term and/or emergency funding. Subsidies by NGOs and some government initiatives have a mixed effect on ownership, growth of business acumen and sustainability. Financing for the majority of sector value chain actors is not forthcoming, and they are unable to get access to innovative financing opportunities in the region.

(9) Training, research and extension: The four public universities offering training in animal production, animal health and veterinary sciences suffer from inadequate funding, limited qualified staff and weak capacity for practical training, and are not linked to regional university consortiums. Only one institution offers short-term training and refresher courses

for those who deliver services on the ground. There are no dedicated public livestock research facilities, with only minimal research being conducted by the universities. Without effective public extension services, farmers and other actors rely on NGOs, radio broadcasts, farmer-to-farmer exchange and the Internet for information, but the information is often not appropriate or complete.

(10) Security: Conflict and insecurity, including cattle raiding and rustling, disrupt livestock activities, resulting in loss of human lives and livestock, displacement of communities, inaccessibility to grazing and water resources and underutilisation of stock routes for production and marketing. In some counties, insecurity has reduced livestock populations and deprived people of their livelihoods; this has aggravated food insecurity and poverty.

14.3.2.3 Forestry

(1) Commercial forestry: While some agroforestry and small-scale plantations have been developed in the Greater Equatoria region, teak plantations and woodlots for sustainable production are not fully exploited. Traditional and micro- and small-scale enterprises oriented to marketing forest products and services dominate the subsector. Large-scale private investment can be found only in forest management under concession arrangements. A limited volume of a few specific products, i.e., teak timber and gum acacia, are exported to regional and global markets. This can be attributed to the lack of a legal framework, poor infrastructure, inadequate government technical and regulatory support and a speculative market environment. Further investment is necessary to explore market opportunities for other forest products and services.

(2) Community forestry and agroforestry: Although the concept of community forestry is defined in the Forest Policy 2013, the government does not have a legal framework consistent with varying customary laws and has insufficient expertise to deliver technical services for community forestry and agroforestry. The same issues arise with the collaborative management of Central Forest Reserves (CFRs) and other types of public forestry reserves involving forestry communities, private concessionaires, processors and traders. The legal framework and government expertise must be established to realise a community management regime.

(3) Conservation: The country has experienced rapid degradation of biodiversity resources due to the widespread illegal and uncontrolled exploitation of such resources. The current management of CFRs is extremely weak and its strengthening is urgently needed to avoid further uncontrolled exploitation of forest resources, and encroachment. The public sector is unable to implement conservation measures in an effective manner because of weak collaboration among authorities at the national and state levels to manage and conserve forest resources, and due to the inadequacy of legal frameworks, expertise and resources for communication and transportation.

(4) Institutional arrangements: A legal framework to clarify responsibilities and financial modalities of the national, state and local governments is under development. Coordination within the public sector is lacking, and low accountability, both upwards and downwards, is causing serious reporting and supervision problems. The viability of the South Sudan Forest Commission and Forest Development Consultative Forum, proposed in the Forest Policy 2013, in promoting private investment and decentralised forest management needs to be thoroughly analysed.

(5) Policy implementation: The government's delineation of responsibilities is inadequate for the implementation of the Forest Policy 2013. Key legal instruments such as the Forestry Law, related acts and other legal instruments are not in place or only partially implemented. Completeness, fairness and efficiency of forest revenue collection are neither achieved nor

can be achieved due to unrealistic administrative provisions with respect to the human and financial resources allocated. Impediments to forestry development include corrupt practices, distrust between the public and private sectors, poor coordination within the public sector and with the private sector and DPs, and insufficient fund allocation for human resource development, application of science and technology and knowledge creation activities.

14.3.2.4 Fisheries

These issues and challenges can be divided into two main areas, “management” and “production and marketing”. Generally, the former is the responsibility of the government at national and state levels, and the latter is the responsibility of the private sector, though of course under the control and oversight of the government.

(1) Management: For the government the key issue to be tackled is the lack of skills, coordination and finance within the administrations involved in fisheries. Currently most government bodies involved in fisheries are not sufficiently active, and do not contribute to the good management nor development of fisheries in South Sudan. Until this lack of capacity is addressed it will be difficult for the government to carry out its role, and implement necessary legal and regulatory obligations, as recognised in its own policies and strategies.

(2) Production and marketing: The private sector is quite capable of improving production and post harvest in fisheries by itself, without government assistance (but necessarily under government regulatory supervision). The private sector however faces several challenges, greatest amongst them being poor transport and communications, the high cost of energy and utilities and informal taxation. All of these could be alleviated by direct government interventions.

(3) Crosscutting issues: Major cross cutting issues, not only affecting fisheries, impact the whole sector, such as general health provision, education in fishing communities and poor security. As an example, the upcoming HIV epidemic is a hidden threat to fisheries and will hit the sector badly unless action is taken quickly.

Part 2: Situation Analysis 2015

15. Pests and diseases

The cultural and agro-ecological divide between the northern and southern provinces of the former Sudan led to a marked disparity in efforts devoted to understanding and overcoming the challenges posed to agricultural development by pests, diseases and weeds. From colonial times onwards very little research on pests and diseases took place in the former southern provinces of Sudan, other than some few records of plant diseases in the survey work of Tarr.[599,600] Most plant protection interest was focused on cotton and other cash crops in large irrigation schemes in the north, especially the Gezira. The main exception to this norm was the setting up by the UK Overseas Development Agency (now Department for International Development) of a Project Development Unit at Yei (Central Equatoria State) in 1982-86, which worked on pest problems as part of an applied crop research programme.

The only record of the pest management work carried out in Equatoria was summarized in 2005 by Robinson,[601] who reported 85 species or groups of related species of insects and other arthropods causing significant damage to crops. He also listed 45 plant pathogens or groups of related pathogens impacting 12 principal food crops. There is no similar information for plant parasitic nematodes, although in 1974 Yassin reported the occurrence of two root-knot nematodes (*Meloidogyne* spp.) on tomato and eggplant in Wau District (Western Bahr el Ghazal State).[602]

In late 2014 Southern Sudan acceded to the International Plant Protection Convention which requires the National Plant Protection Organization of each member country to produce two lists: 1) a list of pests and diseases of quarantine significance which are present in the country and 2) another list of those species that are deemed to be absent from the country.

The list of quarantine pests for Sudan is maintained by the European Plant Protection Organization. They are largely based on global distribution maps of many important pests published more than 30 years by CAB International. These maps show Sudan as a single country and often do not record the exact location of pest records within the country.

Hence in the newly independent country of South Sudan, one major obstacle to pest diagnosis and phytosanitary regulation is to determine whether a pest, such as the invasive fruit fly, *Bactrocera zonata*, which was reported to occur in the former Sudan, actually occurs in South Sudan or not. In many cases there are no records from South Sudan simply because no specimens have ever been collected and identified from the former Greater Bahr el Ghazal, Greater Upper Nile and Greater Equatoria regions, which comprise the present territory of South Sudan.

Updating Robinson's 2005 pest listing, which contains only a fraction of the likely pest fauna, along with the production of a list of the main crop diseases of economic and quarantine significance occurring within South Sudan and the surrounding countries, will require significant effort and regional collaboration over an extended period; neighbouring states have yet to publish such pest lists themselves.

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[599] Tarr, S.A.J. 1955. *The Fungi and Plant Diseases of the Sudan*. Kew, Surrey: Commonwealth Mycological Institute,.

[600] Tarr, S.A.J. 1963. *A supplementary list of Sudan fungi and plant diseases*. Mycological Papers No. 85. Kew, Surrey: Commonwealth Mycological Institute, pp 34.

[601] Robinson, J., 2005. Pests and integrated pest management in western Equatoria, southern Sudan. *International Journal of Tropical Insect Science.* Vol. 25, No. 4. pp. 224–235.

[602] Yassin, A.M. 1974. Root-knot nematodes in the Sudan and their chemical control. *Nematol. Medit. 1.* pp. 103-112.

South Sudan has been impacted, along with its neighbours (including Sudan, Uganda, Kenya, Ethiopia, Central African Republic and Congo) by a spate of accidental plant pest and disease introductions. In 2011 Satti listed 26 non-native insects of economic importance which have invaded Sudan (including areas now in South Sudan), mostly within the last century, usually as a result of unregulated movements of infested plant material; he identified a further ten species of quarantine pests posing an imminent threat of establishment.[603]

In recent years several important crop diseases, including banana xanthomonas wilt (BXW), cassava brown streak viruses (CBSVs) and maize lethal necrosis disease (MLND) have spread across East Africa and are now threatening, if not actually present, in Greater Equatoria. The mass movements of refugees and large shipments of unscreened food grains of varied origin through Uganda into South Sudan by humanitarian agencies to address or prevent large-scale food insecurity are likely to have introduced plant diseases into new areas. Unscreened commercial movements of staple crops such as cereals and cassava are also likely to have contributed to disease spread.[604] Currently there is no officially confirmed record of MLND, BXW or CBSVs in South Sudan, but they may be present.

Based on the earlier practice in Sudan, the Plant Protection Department of the Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD) considers crop pests to be of two categories: pests of national concern and those that are not. National pests include, locusts, weaver birds (quelea), armyworm and the sorghum bug or "dura andat". In the former Sudan these pests were considered to need direct intervention by the government for control.

The most serious national pest for large-scale sorghum production is a migratory colony-nesting weaver bird, the Sudan dioch or red-billed quelea (*Quelea quelea aethiopica*).[605] Quelea flocks may include millions of individuals and, especially in mechanised schemes in Renk County, the damage from quelea can be extremely serious. Pest control is regularly carried out in Sudan by aerial spraying organised by the Sudanese government,[606] but in South Sudan pest control measures have not been undertaken by MAFCRD in recent years. Due to serious damage from quelea in 2012, many sorghum farmers had very little harvest.

In 2012, South Sudan became a member of the Desert Locust Control Organization for Eastern Africa (DLCO-EA), a regional pest and vector management organisation established in 1962. This organisation is mandated to control migratory pests such as desert locust, African armyworm moth, quelea and tsetse fly.[607] Subsequently, in September 2013, MAFCRD requested DLCO-EA to provide aerial spraying against quelea nesting colonies in woodland close to large mechanised schemes in Upper Nile State. Surveys were undertaken in these areas and, where concentrations of quelea were found, spraying by fixed-wing aircraft was carried out in October 2013. MAFCRD procured 35,450 litres of Fenthion 600 ULV for this purpose from Kenya (manufactured in China). No data are available on the area

[603] Satti, A.A. 2011. Alien insect species affecting agriculture and natural resources in Sudan. *Agriculture & Biology Journal of North America*, 2(8). pp. 1208-1221.

[604] Once a phytosanitary law is in place it will be desirable, though extremely difficult in current political and economic circumstances, to prevent unregulated inter-state movements of crops potentially harbouring diseases and major pests within South Sudan.

[605] An account of this pest and its control in Sudan was given by Schmutterer. H., 1969. *Pests of Crops in Northeast and Central Africa with particular reference to the Sudan*. Stuttgart: Gustav Fischer Verlag. pp. 213-217.

[606] Aerial spraying is carried out in mechanised schemes in Sudan by the government, using Fenthion ("Queletox®").

[607] DLCO-EA. http://www.dlcoea.org.et/

of the colonies surveyed, the area sprayed or the effectiveness of the action (% quelea killed or post-spray crop losses to birds), nor whether any fenthion was left unused.

Spraying of organophosphates against quelea is becoming increasingly controversial on environmental grounds (see Box 15-1). There is unlikely to be support by development partners for continuation of such action under CAMP, owing to the difficulty of preventing severe impacts against non-target organisms, especially birds, and the proximity of the quelea infestation areas to major Nile Basin wetlands of international significance for biodiversity and bird migration.

Box 15-1: Environmental impacts of quelea control in Africa

Control of the red-billed quelea (*Quelea quelea aethiopica*) is carried out throughout Eastern Africa because of its status as a major pest of small grain cereals (sorghum, millet, rice and wheat). The standard control methods for quelea in Africa have either been by destruction of breeding colonies and night roosts by detonation of explosive mixtures of diesel and petrol, or by spraying them with organophosphate pesticides (fenthion).

The environmental impacts of quelea control using fenthion have been reviewed by McWilliam & Cheke (2004). Secondary poisoning of non-target bird species is common. They found that predatory and scavenging birds and mammals can be affected up to 20 km from a control site. Residues may persist in soil invertebrates for up to 42 days after spraying. Spraying over water also impacts aquatic organisms, especially crustacea. The study recommends an integrated pest management approach and rigorous assessment of impacts of spraying.

A recent study of soil contamination by fenthion sprays and petro-chemical explosions in Botswana and Tanzania (Cheke et al., 2012a) quantified the extent and duration of pollution and demonstrated long-term persistence and leaching back to the surface by rainfall months after extended periods during which no pesticide was detectable. Cheke et al. (2012b) demonstrated the impact of fenthion in depressing cholinesterase activity in non-target bird species by more than 80%.

A recent study (Elliott et al., 2014) has examined the viability of alternatives to the use of pesticides and explosives to control quelea. This demonstrated that use of mist-nets was effective in controlling quelea, while catching few non-target species. In areas where netting was carried out, quelea tended to abandon the nest site, leading to considerably reduced damage to neighbouring crops. Quelea are regarded as a nutritious and palatable human food resource in several countries in Eastern and Central Africa. In Tanzania trapping is licensed (and monitored) by the Ministry of Environment and only quelea may be taken by trappers.

Sources:

Mcwilliam, Andrew N. and Robert A. Cheke. 2004. A review of the impacts of control operations against the red-billed quelea (*Quelea quelea*) on non-target organisms. *Environmental Conservation* 31 (2): 130–137.

Cheke, Robert A et al. 2012. Soil contamination and persistence of pollutants following organophosphate sprays and explosions to control red-billed quelea (*Quelea quelea*). *Pest Management Science* 2013; 69: 386–396.

Cheke, Robert A. et al. 2012. Effects of the organophosphate fenthion for control of the redbilled quelea (Quelea quelea) on cholinesterase and haemoglobin concentrations in the blood of target and non-target birds. *Ecotoxicology* (2012) 21:1761–1770.

Elliott, Clive CH, Boaz N. Mtobesya & Robert A. Cheke. 2014. Alternative approaches to Red-billed *Quelea Quelea quelea* management: mass-capture for food, Ostrich: *Journal of African Ornithology*, 85:1, 31-37.

In addition to quelea, sorghum is also seasonally affected in some areas (mainly in Greater Equatoria) by swarms of the edible bush cricket (*Ruspolia differens*) which feeds on the milky stage grains of sorghum and on wild grasses.[608] In general sorghum is attacked by sorghum midge, head bugs (including the dura andat), shoot fly, stem boring moth larvae

[608] Confusingly the edible bush cricket is sometimes referred to as the “green grasshopper” in interviews and reports. The same name has also been wrongly applied to the variegated grasshopper (*Zonocerus variegatus*) which causes damage to cassava and to vegetables, especially at the seedling stage.

and a range of pathogens affecting seedlings, vegetative stages and panicles (grain head). Weed competition from grass weeds and especially the parasitic witchweed, *Striga hermonthica*, are also a serious constraint. Striga impact is worse in situations where cereals have been grown repeatedly over several seasons, owing to the build-up of long-lived seeds in the soil. Crop damage by locusts (desert locust and migratory locust) in South Susan is intermittent, but potentially of high impact to cereal crops if an upsurge in neighbouring countries should spread to South Sudan.

Vertebrate pests, such as monkeys, squirrels and rodents, have a negative impact on agricultural production, especially where smallholder fields adjoin areas of bushland that provide cover. Livestock kept by pastoralists sometimes causes serious damage to crops grown by local farmers which leads to tribal and inter-communal conflicts. However damage also occurs from animals kept by settled farmers themselves. Fencing is an effective prevention measure against livestock damage but local farmers cannot afford to fence their farmland due to financial constraints. In some areas, traditional conflict resolution mechanisms are working well to solve this issue, but not in all areas.

Maize is affected by several stem borers, fungal diseases, striga and a range of viruses, including maize streak virus. Recently maize lethal necrosis disease (MLND) has invaded much of East Africa and is still expanding its range. MLND results from a combined infection of maize plants by two viruses, the maize chlorotic mottle virus (MCMV) and any of the cereal viruses in the Potyviridae group, like the sugarcane mosaic virus, wheat streak mosaic virus or maize dwarf mosaic virus. The double infection of the two viruses, is now known as MLND, also referred to as corn lethal necrosis.[609] Any of these viruses may have some impact on maize yields, but MLND can cause total losses in maize fields and has already had a significant impact on food security in Kenya. For South Sudan MLND represents the most serious current risk to food security and food sovereignty.

MLND has been reported to be present in South Sudan as of May 2013,[610] based on the observed occurrence of severe symptoms. MLND is believed to have reached Greater Equatoria from Uganda with unscreened seed imports. However the presence of MLND is proving difficult to confirm by virology. A survey was conducted by the Food and Agriculture Organization (FAO) and MAFCRD in Yei and Morobo Counties of Central Equatoria in 2014.[611] A diagnostic examination of six maize samples collected, showing presence of typical MLND virus disease symptoms, was carried out by the UK Food and Environment Research Agency (FERA).[612] However the FERA analyses to date have failed to detect the presence of MCMV in any samples submitted from Central Equatoria.

MLND is locally spread by insect vectors, transmitting the disease from plant to plant and field to field. The most common vectors are maize thrips, rootworms and leaf beetles. Hot spots appear to be places where maize is being grown continuously.[613] The management of MLND is based on screening of germplasm to identify varieties with a degree of resistance or tolerance, and on controlling the vectors of the disease, which requires the use of insecticides.

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[609] FAO. 2013. *Maize Lethal Necrosis Disease: a snapshot*. Issued by Food Security and Nutrition Working Group (FSNWG), FAO. prepared by FAO Sub-Regional Emergency Office for Eastern & Central Africa (REOA).

[610] FAO. 2013. *Maize Lethal Necrosis Disease: a snapshot*. Issued by Food Security and Nutrition Working Group (FSNWG), FAO. prepared by FAO Sub-Regional Emergency Office for Eastern & Central Africa (REOA).

[611] following a similar survey in 2013.

[612] Diagnostic report sent to David Okot of FAO by Steven Bryce of FERA (FERA Reference 21417761-65) on 16/10.2014. Copy obtained from Atem Malual, Head of Crop Protection, MAFCRD.

[613] FAO. 2013. *Maize Lethal Necrosis Disease: a snapshot*. Issued by Food Security and Nutrition Working Group (FSNWG), FAO. prepared by FAO Sub-Regional Emergency Office for Eastern & Central Africa (REOA).

In South Sudan cassava is widely affected by cassava mosaic virus (CMV) disease and is now threatened by the more serious cassava brown streak disease (CBSD), especially in the Greenbelt zone, where it has been accidentally introduced from Uganda with unscreened planting materials. CBSD is caused by two closely-related strains of virus Ugandan cassava brown streak virus and Cassava brown streak virus (CBSV). CBSVs are highly variable and are thought to have arisen on one or more different (unknown) plant hosts in Africa before jumping to cassava.[614] In Central and Eastern Africa, CBSVs are believed to be vectored by white fly *(Bemisia Tabaci)* and spiralling Whitefly (*Aleurodicus dispersus*).[615]

There are currently no improved cassava varieties with resistance to CBSV but landraces are under evaluation by the International Institute of Tropical Agriculture to find resistance traits for breeding. Hence the current strategy for safeguarding smallholder cassava has rested on distributing clean material throughout the region.

A risk assessment carried out under the Great Lakes Cassava Initiative indicates that it is impossible to use visual inspection to rule out the presence of CBSVs in cassava plants in the field, since symptoms of disease are often weak or absent.[616] Virus testing using polymerase chain reaction methods is required. It is also suggested that the observed rapid spread of CBSVs in Eastern Africa may have been partly caused by the distribution of susceptible planting material through international research institutions and NGOs seeking to counter CMV. This may have narrowed the genetic diversity of cassava in East Africa, facilitating infection by CBSVs, as well as possibly distributing some CBSV-infected planting material.

Virus testing was performed on 330 leaf samples gathered during a survey for CBSD in four counties of Western Equatoria State (Yambio, Maridi, Mundri West and Mundri East) and three of Central Equatoria (Yei, Moro'bo and Juba) in May 2013. The presence of CBSD was confirmed in all sample fields, other than those in Mundri County.[617] It was associated with the variety TME 14, sourced from Uganda.

Cassava is also affected by pests (including green mite and mealybug), but the impact of these pests has not been assessed in South Sudan.

Rosette virus and leaf spot are serious diseases of groundnuts.[618] Groundnut is also affected by soil pests attacking the developing nuts and introducing secondary infections (which produce aflatoxins).

Fruits, including citrus and especially mangoes, are affected by fungal pathogens and by fruitfly larvae ("worms") which cause early fruit fall and render harvested fruit unfit for sale. Banana xanthomonas wilt (BXW) is a devastating disease caused by the bacterium *Xanthomonas campestris* pv. *musacearum*. It was first reported in 1968 in SW Ethiopia and was discovered simultaneously in 2001 in Central Uganda and the North Kivu province of the Democratic Republic of Congo.[619] The subsequent spread of BXW throughout the Great Lakes region, where banana forms a large proportion of the diet for about 25 million people,

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[614] Monger W.A et al. 2010. The complete genome sequence of the Tanzanian strain of Cassava brown streak virus and comparison with the Ugandan strain sequence. *Arch Virol*. 155 (3): 429-433.

[615] Smith, Julian & Derek Tomlinson. 2010. A Review on Cassava Brown Streak Disease and Movement of planting material in the Great Lakes Region of East Africa. FERA, UK. Unpublished.

[616] Smith, Julian & Derek Tomlinson, 2010. A Review on Cassava Brown Streak Disease and Movement of planting material in the Great Lakes Region of East Africa. FERA, UK. Unpublished.

[617] Tadu, G., Okao, G. and Mwale, C. Quick Survey of Major Pests and diseases in Central and Western Equatoria States of South Sudan. 2 pages + map. November 2014. Unpublished.

[618] FAO/WFP. 2013. *Crop and Food Security Assessment Mission to South Sudan*. Rome: FAO/WFP. p. 20.

[619] Smith JJ et al. 2008. An analysis of the risk from *Xanthomonas campestris* pv. *musacearum* to banana cultivation in Eastern, Central and Southern Africa. Bioversity International, Montpellier, France.

is posing a serious threat to household food security and income. It is probably spread via cross-border transport of infected suckers. The disease causes loss both through death of the plant and rotting of edible/marketable fruit. The presence of BXW in South Sudan is as yet unconfirmed, but is suspected.

Young stages of snails, identified in early literature as *Limicolaria kambeul* (Achatinidae), are considered to be a significant pest of vegetables, seedlings of all crops and even of mature maize in Western and Central Equatoria, because of their high numbers and their ability to hide by day in the soil and surrounding bushland and climb up into crops at night. Control by hand-picking is feasible but the nocturnal nature of the pest makes this problematic. There is as yet no use of molluscicides such as metaldehyde pellets or poisoned baits in South Sudan.

Although cumulative damage by pests and diseases is serious, including a range of new invasive species, the phytosanitary control of cross-border movements of seeds and plants is not provided by the government. The existing phytosanitary legislation of Sudan is not applied and no new legislation has yet replaced it. MAFCRD is acutely aware of the vulnerability of South Sudan to the ingress of invasive species by infected or infested plant materials but currently lacks capacity and resources to develop the necessary regulatory apparatus. It has however produced several relevant policy documents and has recently developed the first draft of a National Plant Protection Act.

Through interviews with farmers, it was found that most farmers do not use chemicals for pests and diseases. A few farmers sometimes utilise pesticides for destroying termite nests (*Macrotermes* sp.) because of termites causing lodging (plants falling over either due to breakage of the stalk at the ear or poor root systems) of mature cereal crops before harvest and also damaging the developing pods of groundnuts below ground. Input suppliers carry a very limited range of pesticides but have received some training from USAID in safety issues.

Despite playing only a limited role in direct management of pests countrywide, MAFCRD plant protection personnel conducted a four-day reconnaissance survey of crop pests in West, Central and Eastern Equatoria in July 2011.[620] Subsequently MAFCRD has procured some pesticides and distributed them to the state Ministries of Agriculture and Forestry. With the assistance of development partners, three short training courses on pest management and the safe use of chemicals have been held for some state extension personnel and national plant protection staff in 2007, 2011 and 2012.

[620] MAFCRD. 2011. Sampson A-Koi Binyason and Alfred Atem Malual, A Report on crop protection pests and diseases field assessment of the major crops grown in South Sudan (1st – 4th July 2011).

16. Private sector investment

In view of the state of development of the South Sudan economy, and on the basis of development best practice, priority should be placed by the government on growing the domestic private sector, whose growth will be propelled by the agriculture sector and agri-business development.

16.1 Situation of private sector investment in South Sudan

16.1.1 Micro, small and medium enterprises

The South Sudanese private sector is embryonic and substantial locally managed businesses are very limited despite government efforts to promote local entrepreneurial activities. At the policy level, it is the objective of the government to transform agriculture from a traditional subsistence system to a scientific, market-oriented, competitive and profitable one without compromising the sustainability of natural resources for future generations.[621] The implication of this policy is that the private sector has to play a significant role in developing the agriculture sector. The private sector component in the government's Vision 2040 [622] underscores the need for efforts to encourage and nurture local entrepreneurship, with a view to broadening growth and employment opportunities. Focus is also on changing the strong tendency of 'educated people' in South Sudan to see the public sector as the only possible reasonable employment.

With a few exceptions, almost all formal businesses in South Sudan are micro, small and medium sized enterprises (MSMEs). MSMEs dominate all sectors of the economy, including retail and wholesale trade, construction, hotels and restaurants, and transport and communication. MSMEs are highly diversified in terms of ownership, type of enterprise, number of employees, capital investment and stage of development (Table 16-1). There is, however, no record of MSMEs operating in the agriculture sector; although, the more than 70% of the population engaged in subsistence agriculture are essentially micro and small enterprises.

Table 16-1: Micro, small and medium enterprises definition

Business Type	No. Employees	Annual Turnover (SSP)	Capital investment (SSP)	Characteristics
Micro	1 – 4	Max. 20,000	Max, 19,000	Informal, family
Small	5 – 49	21,000 – 500,000	21,000 – 550,000	Formal, license, taxes
Medium	50 – 99	500,001 – 1 million	550,001 – 10 million	Formal, licenses, taxes, better management, accts
Large	100 and over	+1 million	Over 10 million	Formal, accounts, banking

Source: *Draft Private Sector Development Strategy*, Prepared by the Working Group established by the Ministry of Commerce, Industry and Investment to consider small business size: subject to future revision.
Note: Definition is subject to change or revision.

African Development Bank (AfDB) reports shows that the number of registered businesses in Juba has grown exponentially from 471 in 2006 to 8,894 in 2010.[623,624] This situation, however, is by no means representative of the country, as formal business activity outside

[621] GRSS, Ministry of Agriculture and Forestry's, (2012), Mission Statement from MAFCRD. 2012. *Agriculture Sector Policy Framework 2012-2017*. pp. 9-12. Juba: GRSS.

[622] GRSS. 2011. *Vision 2040: Towards Freedom, Equality, Justice, Peace and Prosperity for All.* Juba: GRSS.

[623] AfDB. 2012. *South Sudan - A Study on Competitiveness and Cross Border Trade With Neighbouring Countries*. http://www.afdb.org/en/documents/document/south-sudan-a-study-on-competitiveness-and-cross-border-trade-with-neighbouring-countries-33438/

[624] AfDB. South *Sudan Infrastructure Action Plan - A Program for Sustained Strong Economic Growth*. http://www.afdb.org/en/documents/document/south-sudan-infrastructure-action-plan-a-program-for-sustained-strong-economic-growth-full-report-33384/

the capital is reported to remain extremely limited.[625] There are numerous constraints for private sector development in South Sudan: political insecurity, weak government institutions, weak rule of law and high levels of corruption, lack of physical infrastructure, limited access to land, poor access to finance, multiplicity of taxes, lack of input and output markets, and a lack of skilled workers and well-educated managers.

16.1.2 Business environment and the state of competitiveness of South Sudan

Many South Sudanese depend on the public sector payroll in the absence of an appropriate environment for the development of business activities. Many service jobs, especially in Juba, are filled by expatriates from Intergovernmental Authority on Development (IGAD) countries due to lack of local capacity. Few South Sudanese are engaged in trade.

In Doing Business in Juba 2011, the World Bank and International Finance Corporation (IFC) ranked Juba as 159 out of 183 economies on the ease of doing business (Table 16-2).[626] While South Sudan's indicators for doing business exceed its peers significantly in some respects, overall these indicators point to constraints in the business environment. The overall ranking indicates that South Sudan has one of the most difficult business climates in the world. A number of key challenges emerged, including human and institutional capacity constraints, major infrastructure gaps, and overlapping legal and regulatory instruments. Clear, consistent enforcement of existing and new policies and laws to underpin good governance remains a major challenge.[627]

Table 16-2: Ease of doing business indicators

Doing Business Indicators (days)

Indicator	Juba South Sudan (days)	Khartoum Sudan (days)	Sub-Sahara Africa (days)
Starting a business	123	121	126
Dealing with construction Permits	49	139	117
Registering property	124	40	121
Getting credit	176	138	120
Protecting investors	173	154	113
Paying taxes	84	94	116
Trading across borders	181	143	136
Enforcing contracts	74	146	118
Closing business	183	183	128
Overall ease of doing business	159	154	137

Source: World Bank/IFC. 2011. *Doing Business in Juba 2011*. http://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Subnational-Reports/DB11-Sub-Juba.pdf

Despite the challenging context, some private sector actors were active in 2011 and 2012, particularly in the banking sector, real estate, information communication technology and agriculture. These developments were not fully captured in the Doing Business in Juba 2011 report. Companies registered increased from 470 to 12,000. Investors seem increasingly interested in the country's potential and intend to take advantage of being first.

The stabilisation of exchange rates, reduction of inflation, elimination of multiple taxes, are key to improving the competitiveness of the private sector overall, and for attracting all

[625] The Business Registry, Ministry of Legal Affairs and Constitutional Development, Government Data, December 2010.

[626] World Bank/IFC. 2011. *Doing Business in Juba 2011*. http://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Subnational-Reports/DB11-Sub-Juba.pdf

[627] Also refer to section 16.1.3 dealing with the legal framework in a more holistic manner.

categories of investment, from large to small. Evidence from post-conflict country experiences demonstrates that the improvement on all key doing business indicators is key to agriculture sector led private sector investment, ensuring improved governance and institutional capacities at both national and decentralised levels.

This must be accompanied by improvement in governance institutions, in terms of human resources and quality, in terms of enhancement of institutional (organisational) capacities at national and state levels, to create an enabling environment that attracts private sector investment in the agriculture sector.

16.1.3 Legal framework for private sector development

South Sudan's legal framework is characterised by a high degree of legal ambiguity.[628] Since its creation in 2005, the National Legislative Assembly has enacted laws covering a range of issues, but large gaps in the regulatory framework remain. Several policies have been developed but a large number of them have remained as drafts for a number of years and, as such, are still to be implemented. The few laws that do exist are poorly disseminated and under-enforced. These include the Land Act (2009), Draft Land Policy (2011), which supports the Land Act, the Local Government Act (2009) and the Investment Promotion Act (2009). Without adequate or sufficiently detailed rules to guide their activities, government institutions tend to function through a combination of discretionary decision-making and pre-existing practice. The lack of clarity often gives rise to power struggles among government institutions when high profile foreign investments are proposed.[629] It also has created a confusing environment for private sector investment. The situation is not improved by high levels of corruption, which the government is making an effort to tackle, with evidence of success yet to be realised.

Shortly after the signing of the Comprehensive Peace Agreement (CPA), state-level governments began using the provisions relating to decentralisation and grassroots empowerment in the CPA and the Interim Constitution of Southern Sudan, 2005 to claim the right to unilaterally manage land without involving the central government.[630] The resulting confusion over reporting lines and jurisdictions among government institutions introduced opportunities for private sector actors. Without regulatory oversight from the central government, investors were free to negotiate land leases with power brokers at the state level, thereby shielding themselves from national regulatory requirements. The fact that investments are managed almost entirely at the state level also contributes to an overall lack of transparency, since there is no central monitoring body responsible for keeping track of who is investing in what and where.[631]

Available information from cases of recent private sector investments by a number of foreign owned firms shows that South Sudan still has to address a number of challenges within its institutions, from national to state government levels. The Land Act[632] has a clause which states that community land may be allocated for investment purposes, but that the investment must reflect an important interest for the community and contribute economically and socially to the development of the local community. In the absence of strong governance systems with effective enforcement, there is evidence that point to a situation where a

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[628] Oakland Institute, 2011, *Understanding Land Investment Deals in Africa: Country Report: South Sudan,* California: Oakland Institute.

[629] Oakland Institute, 2011, *Understanding Land Investment Deals in Africa: Country Report: South Sudan,* California: Oakland Institute.

[630] GOSS. 2005. *The Interim Constitution of Southern Sudan*. Juba.

[631] Oakland Institute, 2011, *Understanding Land Investment Deals in Africa: Country Report: South Sudan,* California: Oakland Institute.

[632] GOSS. 2009. *The Land Act*. Juba: GOSS.

number of communities may be short-changed in the process. Particular individuals may be positioning themselves to benefit from private investments in land at the expense of communities, a situation which ought to be avoided.[633]

Despite the weak rule of law in South Sudan, the laws that have been enacted during the interim period encompass a number of key reforms, including: ceilings on land acquisitions,[634] limits on lease periods for foreign investments,[635] requirements for prior environmental and socioeconomic studies; requirements for prior community consultation; and prohibitions on non-consensual interference with pastoralist communities' grazing rights. If properly enforced, these laws can help South Sudanese to begin channelling foreign investment toward their own development priorities. Domestic laws such as these will also become increasingly important as a means of determining the reciprocal obligations when the government of South Sudan and private investors begin to use international arbitration as a means of resolving their disputes.

A clear and well-functioning regulatory framework is central to private sector promotion for South Sudan if the market is to work with enhanced predictability and reduced risk. This is central to creating an environment where the private sector, both large and micro, small and medium entrepreneurs are confident in investing in emerging economic opportunities. There is also lack of clarity among federal, state and county jurisdictions over business licensing, taxes, and customs. Although some progress was made in terms of drafting laws, addressing the infrastructure and institutional gaps will remain a major challenge. The development, (together with their enforcement) of specific laws, policies and strategies is central to stimulating agriculture centred private sector investment in South Sudan. Of great importance as well is the issue of consistency, ensuring that the behaviour and actions of all key players is in support of the established laws and policies. There is also the issue of dealing with errant members of the public sector, either through inaction or other ways that are likely to undermine set laws and policies.

With respect to lessons learnt internationally, despite land laws, land reforms and a range of legal, policy and regulatory measures being instituted in other East African countries, such as Kenya, Tanzania, Uganda and Rwanda, there are some challenges and contradictions still being encountered in many African countries. For example, access to land by large scale private investors remains an emotive and politically volatile issue. Critics of some large scale land investors have even gone as far as labelling investors as **'**land grabbers', and the notion of 'land-grabbing' has generated growing resonance with an increasing number of sympathisers and promoters in development circles in Africa and globally. For South Sudan, given the direction already taken with the Land Act and Draft Land Policy, it can only be hoped that the legal, policy and regulatory measures adopted thus far, and those that will be put in place in the future, would be managed in a transparent and professional manner; this would facilitate better understanding and cooperation between private sector investors and the country's population.

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[633] Recent studies, for example:case studies in Oakland Institute, 2011, *Understanding Land Investment Deals in Africa: Country Report: South Sudan,* California: Oakland Institute..

[634] The Land Act requires that state authorities provide approval for land acquisitions above 250 feddans (105 hectares) and calls for regulations to be put in place that prescribe a ceiling on land allocations. Land Act xx, ch.v , § 15 (5) (6).

[635] Although the Land Act allows for long-term leases of up to 99 years, the Investment Promotion Act explicitly limits foreign investments in agriculture and forestry to renewable terms of 30 and 60 years, respectively. Land Act, ch. I v , § 14; Investment Promotion Act, 2009 xx, Second Schedule (3).

16.1.4 Financial services

Banks are understood to be opening aggressively in South Sudan. The Association of Bankers was launched in July 2012, showing that the banking sector is getting more organised to engage in more substantial business than previously. The association represents 14 commercial and development banks, of various scale of operation. Significant regional or continental financial services providers have also entered the market since 2012. The total number of micro finance institutions operational in South Sudan increased from 4 in 2007, to over 10 in 2012, and to more than 15 by 2014. Data provided from the Southern Sudan Microfinance Development Facility shows that the average loan size was in the region of USD 200 per recipient, with repayments made weekly.[636]

Private sector banking operations are concentrated on trade financing. Difficulties relate to the increased scarcity of US dollars (USD) and the depreciation of the SSP on the informal market. A number of established commercial banks with headquarters in neighbouring countries, for example, Kenya Commercial Bank, Equity Bank, and Ecobank, have opened branches in Juba and other South Sudanese cities. Some of the largest banks (80 to 100,000 clients) are offering loans up to 3 years but cannot offer longer repayment terms as the law prohibits pledging collateral for a period exceeding 3 years. Most corporate loans are said to be cash collateralised, due to the lack of credit history and management capacity of borrowers.[637]

The World Bank funded, Multi-donor Trust Fund (MTDF) Project, has paid considerable attention to laying the foundation for improved financial services for the private sector, focusing on micro and small enterprises.[638] Efforts of other development partners have been mobilised in support of the endeavour. Despite these efforts, major challenges remain ahead, with inadequate financial services from both the formal commercial banking sector and within the micro-financial institutions (MFIs). The latter are still at an embryonic stage. In particular, there remain substantial bottlenecks regarding access to micro credit for smallholder farmers and producer cooperatives. There is very limited direct funding support to farmers to acquire technology or inputs. New institutions have been established in recent years, and the few established MFIs, such as Bangladesh Rural Advancement Committee (BRAC) and Rural Finance Initiative, have expanded their client base. However, the national coverage of MFIs, in terms of increase in access to credit by a growing number of MSMEs, in particular, those in the agri-business sector, remains very low.[639] Informal non-bank finance (savings and loans associations) in some countries have grown to be equally as strong if not more than the formal financial sector, e.g. Kenya's experience of Savings and Credit Unions.

16.1.5 Agro-input value chains and output markets

Given the widely recognised market failure in the agro-input value chain, within the framework of private sector investment support, there is need to improve the flow of agro-inputs to all categories of farmers, including smallholder farmers.[640] This would improve productivity and farmers' livelihoods. Opportunities to promote local manufacture of inputs, (fertilisers, seed, chemicals etc.) inputs should be explored, with a view to reducing unsustainable dependence on imported inputs.

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[636] World Bank. 2013. *South Sudan - MDTF South Sudan Private Sector Development Project*. Washington, DC: World Bank. http://documents.worldbank.org/curated/en/2013/03/17539288/south-sudan-mdtf-south-sudan-private-sector-development-project

[637] For more information on financial institutions see section 5.3.4.

[638] World Bank. 2013. *South Sudan - MDTF South Sudan Private Sector Development Project*. Washington, DC: World Bank. http://documents.worldbank.org/curated/en/2013/03/17539288/south-sudan-mdtf-south-sudan-private-sector-development-project

[639] For more information on financial institutions see section 5.3.4.

[640] See section 5.3.2 Agro-input dealers, 10.4.6 Private sector.

Fair competition is required in the provision of inputs, through facilitation of different sized agro-dealers, from small to large scale. On the basis of structures that have worked in other regions and African countries, there is potential for the support of establishment of linkages with agro-based MSMEs interested in the agro-input markets (agro-input dealerships), an area which needs to be explored and supported in the context of South Sudan.[641]

According to the World Bank, an area that is nine hours away from the market, for example, realises only 8% of its agricultural potential, compared to 46% for an area only four hours away from the market.[642] Less than 5% of the existing 7,171 km of primary roads are in good condition. Much of the road network is gravel, dilapidated and mainly inaccessible during the rainy season. Freight tariffs in South Sudan are very high and at least twice those found in the main African corridors and even in Sudan.

There is need to accelerate transportation and distribution of inputs to areas which have been inaccessible because of the undeveloped infrastructure. In view of the dilapidated nature of infrastructure, this requires construction of new access roads and bridges to access various areas. Collaboration with other government authorities, such as the Ministry of Roads and Bridges, to identify areas with high agricultural and private sector development potential is needed. The prioritisation of such projects is critical for agri-business based private sector investment. Better infrastructure would facilitate access to output markets, which is essential for MSMEs to sell their produce.

16.1.6 Labour markets and human capital

South Sudan has mismatches between demand and supply of labour in the market, with high levels of illiteracy[643] and unemployment, characterised by extremely limited choices for employment, especially amongst the youth. Agriculture is an unattractive employment option for youth who see it as unprofitable. Efforts should be made to encourage youth to consider primary production and value chain agri-businesses. In neighbouring countries youth development global players, such as the Young Men Christian Association (YMCA), and micro-finance institutions such as BRAC, are already key players in support of youth livelihoods and employment creation. Other activities could involve the establishment of youth agro-based internship training schemes, formation of young farmers clubs, farmer-field schools, and use of youth role models through a youth in agriculture/agri-business advocacy strategy. Through an MSME support strategy, more employment opportunities could be developed in the crop/fruit and vegetables, livestock, fisheries, honey, and forestry value chains.

There is urgent need to review the land tenure system, given that youth below age 30, constitute 72% of the population, and yet their access to land is a major challenge, with resource allocation structures that favour mature adults, and not young women and men.[644] Through new legal and policy reforms, central government, in collaboration with state authorities and community structures, can be mobilised to promote access to land by the youth and women and which is central for empowerment of young people.

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[641] The Draft Private Sector Development Strategy (2012), initiated by the Ministry of Commerce Industry and Investment points out that this is a potential area of investment that is identified in their proposed Small Business Promotion Project for South Sudan.

[642] World Bank. 2012. *Agricultural Potential, Rural Roads, and Farm Competitiveness in South Sudan*. Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/11885

[643] See section 8.1 Population, Communities and Households.

[644] The presumption is that youth gain access to land through their parents, which often does not hold.

There are high levels of poverty in the country, in particular, amongst the youth and women. Poverty which, nationally is recorded at 51%[645], is a major development concern, from both the broader and private sector development context. The poorer people are in any country, the more depressed the demand for goods and services generated in the economy, which is not good for private sector development.

16.1.7 Agriculture sector business development services

There is a lack of business development services to provide entrepreneurship, marketing, business management and mentorship training and capacity building; technology development; and, no value chain support for business activities in both the agricultural and allied sectors. As found in all subsectors, extension services are vital,[646] as are value chain linkages between medium and large scale agri-business actors and smallholder/MSME agri-businesses. This would allow informal subsistence producers to transition to more formal MSME businesses.

The South Sudan Chambers of Commerce, Industry and Agriculture are at a formative stages and lack experience and capacity to deal with complex issues. There is a need to mobilise MSMEs into effective and functional associations and organisational arrangements within specific sectors and across sectors.

16.2 Public-private partnerships

The use of public-private partnerships (PPSs) to support private-sector entities to provide commercially viable services and markets is becoming an essential component of sustainable rural development programmes. The promotion of PPPs in South Sudan should be based on lessons learnt, and what is considered by the key stakeholders as the best way forward. There are several examples in neighbouring countries of successful collaboration with development partners, such as the specialised UN agency International Fund for Agricultural Development (IFAD).

16.2.1 Case studies

Several models of successful PPPs are described in Partnering for Innovation: From Smallholders to Shareholders, for example the aggregator model (Box 16-1) and contract farming model (Box 16-2).[647]

Box 16-1: Coca-Cola: Localising and aggregating supply, Kenya

The Coca-Cola Company's 2020 Vision includes the ambition to triple sales of its juice business. To meet this goal, the company needed to secure sustainable supplies of fruit pulp to meet the projected production targets.
By getting into partnership with other stakeholders under the Project Nurture, in Kenya (which included the Bill and Melinda Gates Foundation and Technoserve), smallholder farmers were aggregated into Producer Business Groups (PBGs) of 30-50 farmers. Structured in this manner, the famers were able to attract investment, gain access to agricultural goods and services and access to markets for their products beyond just fruit. Over 42,000 farmers in 1,300 PBGs were engaged in the Project Nurture and were able to sell more than 36,000 metric tons of fresh fruit. The model is being replicated in other countries such as Zimbabwe, Mozambique and India.

[645] See Table 1-1 South Sudan's key indicators.

[646] See sections 10.8.3 Extension services, 11.9.1 Extension services, 12.10 Forestry education, research, training, and extension and 13.4.9 Fisheries extension.

[647] USAID/Fintrac. 2014. *Partnering for Innovation: From Smallholders to Shareholders – A Guide to Optimizing Partnerships with the Private Sector for Smallholder Impact.* http://www.partneringforinnovation.org/smallholders-shareholders.aspx

Box 16-2: PPPs in contract farming

Smallholder farmers in general, and in South Sudan, face a range of issues at the farm level: they produce limited quantities of low-quality commodities, lack capital, operate with limited access to markets, and often sell to informal buyers, often referred to as "middlemen", at low prices; through one-time transactions. This in turn reduces repeat sales, leaving future potential sales in doubt. Where options exist, purchasers up the value chain see little value in engaging these low volume, low quality supply sources.

Contract farming arrangements which involve a buyer contracting smallholder farmers or producers to directly source specific agricultural commodities can be beneficial in the South Sudanese agricultural development context. The concept involves large private sector buyers organising the supply chain from the top, including collections and processing services and provides critical inputs, specifications, training, and credit to its suppliers. The farmer provides assured volumes of crops of specified quality, on specified dates, and at agreed upon prices. There is evidence to show that contract farming arrangements have been successfully implemented in many African countries, in Eastern, Southern and West Africa, for example in Kenya, Uganda, Zimbabwe, Mozambique, amongst others.

IFAD has in the past entered into public-private partnerships through its projects and programmes, working with other organisations. The IFAD East and Southern Africa Division has a number of examples of successful partnerships with the private sector, through projects or through grants to trade associations (Box 16-3).

Box 16-3: Smallholder Cash and Export Crops Development Project

The ongoing Smallholder Cash and Export Crops Development Project in Rwanda was one of the first projects of its kind in which IFAD entered into a partnership with the private sector. The project aimed at rehabilitating a run-down government tea plantation at Nshili by developing 1,200 hectares of plantations and building the capacity of tea-workers associations to form a cooperative. However, there was no factory nearby to process the tea. Before making physical investments, the project facilitated the creation of Nshili Kivu Tea Factory, a joint venture company between private investors and the cooperative to operate a new tea factory that would process tea from its own plantation and from the smallholders. "It proved difficult to get a financial commitment from the private sector to finance the project," explains Claus Reiner, Country Programme Manager at IFAD. "IFAD persevered and it proved worthwhile in the end." The private partners financed US$ 2 million to construct a processing plant close to the plantation and contributed the required technical and marketing know-how, while IFAD provided US$ 5.2 million to upgrade the government plantation, which was then partly leased to the company and partly allocated to smallholders, and to establish new tea plantations and woodlots for smallholders. It also financed US$ 300,000 to buy the smallholders a 15% share in the company. As of this year, 2,500 small producers are selling tea from their own plots to the company and also work on the plantation. The price they receive has increased by about 60 per cent, and as shareholders they sit on the board and can ensure fair producer prices. As far as private investors are concerned, additional smallholder production allows use of the factory to be maximised. The IFAD project has started supporting another tea estate at Mushubi with a view to replicating the model in a similar public-private partnership.

Source: IFAD. 2008. *Progress in East and Southern Africa, Issue Number 9*. http://www.ifad.org/newsletter/pf/9.htm

In Uganda, a public-private partnership was established in 1998 for vegetable oil production, which has proved to be a successful venture.[648] IFAD provided a technical assistance grant of US$1.5 million to PhytoTrade, a trade association established to promote natural remedies based on the traditional knowledge of local farmers and to link micro-producers living in remote areas of the region to global consumers. In 2007, nearly 15,500 smallholder

[648] IFAD. 2008. *Progress in East and Southern Africa, Issue Number 9*. http://www.ifad.org/newsletter/pf/9.htm

producers sold more than 80,000 kg of raw or semi-processed natural products to PhytoTrade members (typically cosmetic and food companies in the natural products market).

In Mozambique, IFAD supported Rural Market Promotion Programme, has promoted commercial partnerships by introducing purchase contracts between existing agro-processing companies and smallholders.[649] It seeks to assist companies to share the cost of establishing a partnership, and at the same time help build capacity of farmers' organisations. In Malawi, the Rural Livelihoods and Economic Enhancement Programme concentrates on developing commodity value chains and provides matching grants to PPPs, consortiums and farmers' groups.[650] In Madagascar, using a Public Partnership model, the Rural Income Promotion Programme has helped small-scale agricultural producers introduce and commercialise new products by creating "partnership poles" (*poles de partenariats*).[651]

16.2.2 Review of PPPs in Kenya

This analysis draws from a study designed to appraise selected agribusiness PPPs in Kenya as a contribution towards an African-wide study on agribusiness PPPs commissioned by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with the United Nations Economic Commission for Africa. The appraisal seeks to develop practical guidance for technical officers in both the public and private sector for the successful development and implementation of agribusiness PPPs (Box 16-4).[652]

Box 16-4: Kenyan PPPs review

The case studies are concentrated in three main areas: commercialisation of a product, value-chain development and contracting. The main goals advanced by the PPPs include: increased employment, improvement in rural incomes and poverty reduction.

The Kenyan BIOFIX Project involved the commercialisation of a product, which involved the British Council providing a research grant to the University of Nairobi. It involved licensing of a private fertiliser company to undertake mass-production and marketing of a technological output from a public institution (University of Nairobi). Many times an international development partner is involved in the provision of funds to enable a public institution to carry out research and development, through to the commercialisation stage. The PPP exemplifies a model for deploying technologies from public research institutions that could spur agribusiness and create employment.

In the Striga Eradication Project, a consortium of public research institutions (international and local), NGOs and private companies (multinationals and a local company), put resources together to deploy technology from a collaborative project. This case study highlights how partnerships can evolve to cascade innovations which can optimise new opportunities or overcome emerging challenges in implementing PPPs.

Evidence show that the effectiveness of a given PPP was not only based on its implementation but also sustainability elements built in the PPP from the preliminary stages of its development. These included: an appropriate legal and regulatory framework, suitability assessment, selection of the PPP type, structure and design, agreement of the oversight body, funding, competitiveness of the procurement process and the actual implementation. Achieving effective partnerships requires strong political support and government's commitment through policy and supportive infrastructure development such as roads, ports, irrigation infrastructure, cereal banks, warehouses, acquisition of machinery

[649] Rural Markets Promotion Programme.
http://operations.ifad.org/web/ifad/operations/country/project/tags/mozambique/1423/project_overview

[650] Rural Livelihoods and Economic Enhancement Programme.
http://operations.ifad.org/web/ifad/operations/country/project/tags/malawi/1365/project_overview

[651] IFAD. 2008. *Progress in East and Southern Africa, Issue Number 9.*. http://www.ifad.org/newsletter/pf/9.htm

[652] FAO. 2013. *Agribusiness public-private partnerships – A country report of Kenya.* Kenya: FAO.

and others.

The agribusiness PPPs noted to have the most significant impact were in sub-sectors that have the potential for high value returns on their investment. The three priority sub-sectors for PPPs according to Kenyan stakeholders include: irrigation for high value crops; value-addition; and agricultural insurance. Development partners in Kenya also noted that early development of a conducive and consistent national legislative and regulatory structure greatly facilitates the identification, development and implementation of PPPs (Table 16-3).

Table 16-3: Main reforms for agribusiness development - Kenya

Policy/bill/act/strategic intervention	Relevance for agribusiness	Remarks
The Public Procurement and Disposal Act No.3 of 2005.	Outlines procurement procedures e.g. contracting and procurement.	Launched in 2005
Privatization Act No. 2 of 2005.	PPPs recognised as a means of privatisation; Establishes institutional structure for implementing PPPs – PPP Unit & Secretariat.	Launched in 2005
Public Procurement and Disposal (Public Private Partnership) Regulations, 2009.	Establishes a PPP Steering Committee and a secretariat charged with promotion & development of PPPs.	PPP Unit serves as the focal reference point for technical advice & approval of PPPs.
Economic Recovery Strategy for Wealth and Employment Creation.	Revival of selected agricultural institutions and investment in research and extension.	Launching pad for Strategy for Revitalizing Agriculture.
Strategy for Revitalizing Agriculture.	Policy, legal & institutional reforms, Enhanced market access (inputs, output & financial services), food security programmes	Transformation of agriculture from subsistence to commercial sector.
Agricultural Sector Development Strategy 2010-2020.	Revival of agriculture through well-coordinated partnerships, Establishment of Agricultural Sector Board under PPP Secretariat.	Agricultural Sector Board advices on priority sub-sectors for PPPs
Vision 2030	Identified flagship PPP projects to address productivity, land use, markets and value-addition challenges in agriculture.	Extension, R&D and value-addition takes centre stage.
Agribusiness Strategy	Prioritises value addition and commercialization.	Undergoing review by stakeholders
PPP Bill	Legal framework for PPPs.	At preliminary stages

Source: FAO. 2013. *Agribusiness public-private partnerships – A country report of Kenya*. Kenya: FAO.

17. Conflict and food security

17.1 Situation of current conflict

This section describes the situation as of mid-2014; the conflict is still continuing in May 2015. Since the outbreak of violence in Juba in mid-December 2013, which quickly spread to other parts of the country, South Sudan has been facing considerable challenges including insecurity, displacement of people, food shortages, outbreaks of disease such as cholera, and seasonal floods. The legacy of civil war, and chronic poverty and underdevelopment impacted heavily on the ability of the government to provide basic services to the people and respond to humanitarian needs, putting households in a crisis situation.

Agriculture is the main source of livelihood for refugees and returnees from neighbouring countries and internally displaced persons (IDPs), as well as the local residents in the country. Food security in the country has worsened due to the combination of widespread insecurity, low agricultural production and sharp increases in the price of agricultural commodities.

Thousands of people have been killed or wounded since December 2013, many of whom were targeted based on political affiliation with ethnic backgrounds. Initial fighting broke out among members of the Presidential Guard at the headquarters of Sudan People's Liberation Army/Movement (SPLA/SPLM) which split between forces loyal to the President Salva Kiir, a Dinka and those who supported former Vice President Riek Machar, a Nuer. Fighting moved rapidly to various military installations and into civilian neighbourhoods in Juba, and spread across the country by the end of December.

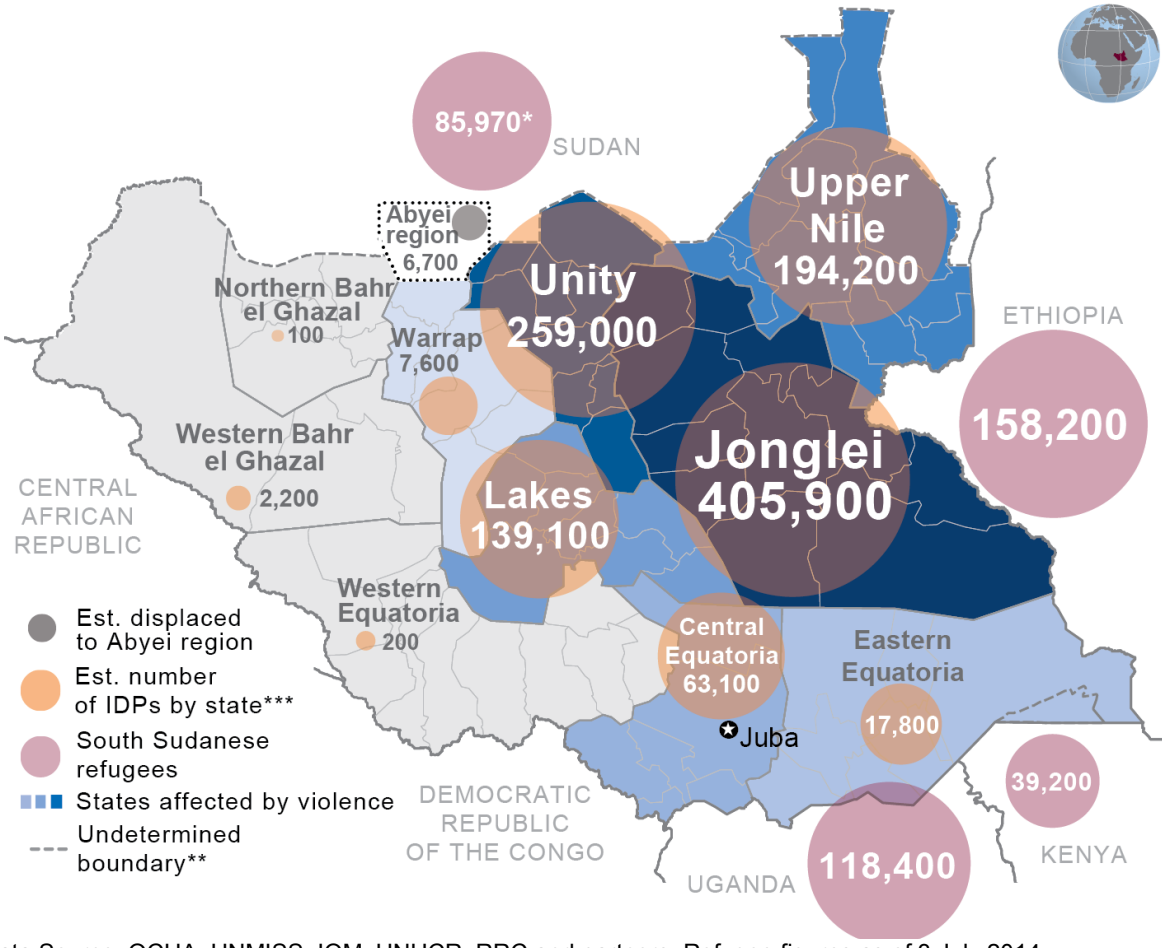
A Human Rights Report published by the United Nations Mission in South Sudan (UNMISS)[653] reveals that many soldiers of both parties conducted house-to-house searches, killing, looting, destruction, rape, abductions and arbitrary arrests. Churches, hospitals, schools and other social infrastructure were attacked and destroyed. Minority groups, including the Anyuak, Murle and Shiluk, and foreigners including Ethiopians, Eritreans, Kenyans and Ugandans, were also the subject of targeted attacks in Bor town in Jonglei State. UNMISS Bor base was also attacked. On 1 January, the President declared a state of emergency in Jonglei and Unity states, which was followed by a similar declaration for Upper Nile State on 17 January. Despite the signed agreements on the cessation of hostilities by both parties on 23 January and 9 May 2014, both side traded accusations of ceasefire violation immediately upon signing. The security situation in the country remains unpredictable and volatile. Incidents of random shooting and sporadic clashes continue to be reported in Jonglei State and Upper Nile State due to the long history of conflicts and availability of weapons in the region.

According to the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) and the United Nations High Commissioner for Refugees (UNHCR),[654] over 1.5 million people became displaced from their homes between December 2013 and June 2014, including over 400,000 people who fled to neighbouring countries such as Uganda, Kenya, Ethiopia and Sudan. Inside South Sudan, IDP were scattered over 186 locations and the number of people who fled to 8 UNMISS bases[655] was over 100,000. Displacement patterns are fluid and many IDPs were forced to flee several times. The influx of IDPs often

[653] UNMISS. 8 May 2014. *Conflict in South Sudan: A Human Rights Report*. Juba: UNMISS.
[654] UNOCHA. 3 July 2014. *South Sudan Crisis Situation Report. No.43*. *http://reliefweb.int/sites/reliefweb.int/files/resources/South%20Sudan%20Crisis%20Situation%20Report%20No.%2043.pdf*.
UNHCR. 23-27 June 2014. *South Sudan Refugee Situation, UNHCR Regional Update, 21.* Juba: UNHCR.
[655] Juba (Tomping and UN house), Bor, Malakal, Bentiu, Wau, Melut, Nasser and Rumbek

overwhelms host communities, leading to tensions and further movements. Tens of thousands of people sought shelter on small islands to protect themselves from attack without access to basic services. Most other displaced people were scattered in rural areas with limited information on their living conditions.

Figure 17-1: IDP and refugee map



Data Source: OCHA, UNMISS, IOM, UNHCR, RRC and partners. Refugee figures as of 3 July 2014.
Map Source: UNOCHA. 3 July 2014. *South Sudan Crisis Situation Report. No.43.* http://reliefweb.int/sites/reliefweb.int/files/resources/South%20Sudan%20Crisis%20Situation%20Report%20No.%2043.pdf

The displacement and insecurity has worsened already fragile food security in the country. According to the UN Crisis Response Plan of June 2014,[656] the planning figures for 2014 are: 3.9 million people facing acute food insecurity and 7.3 million people at risk of food insecurity. The livelihoods of millions of people are disrupted since they are unable to farm, access their normal food sources or migrate with their livestock. Food security has deteriorated most in Jonglei, Upper Nile and Unity States where 50-85% of the population are at acute risk. Even before the conflict, these states were the most food-insecure.

17.2 Historical background and causes of conflict

South Sudan has a long history of conflicts. The current conflict which erupted in December 2013 was caused by the mix of historical, political and ethnic contexts. Before independence in 2011, South Sudan fought two long civil wars against successive governments in the Sudan during 1955-1972 and 1983-2005.

[656] UNOCHA. 2014. *South Sudan Crisis Response Plan (revised June 2014).* https://docs.unocha.org/sites/dms/CAP/Revision_2014_South_Sudan_CRP_June_2014.pdf

The SPLA/SPLM was formed in 1983 under the leadership of John Garang and this was the beginning of the Second Sudanese Civil War. However due to internal disagreement within the SPLA/SPLM leadership several factions split along political and ethnic lines with the most notable being the SPLA-Nasir in 1991, led by Riek Machar.

At independence on 9 July 2011, the SPLA became the national army, while the SPLM became the ruling party and formed the majority of the new government. The chairman of the SPLM, Salva Kiir, who fought in both civil wars, became the President and Riek Machar, who rejoined the SPLM in 2002, was appointed as the Vice President.

Many difficult issues arose immediately after independence, including a power struggle within the SPLM leadership, lack of rule of law, lack of accountability, rampant corruption injustice, and inter-communal conflicts. Despite the dominant position of the SPLM/SPLM, the new government had a weak command and control system. This was because the SPLM/SPLA was formed out of loosely organised guerrilla groups who retained their own identities even after independence.

In addition, maintaining social cohesion in a country which has more than 60 ethnic groups and 80 linguistic groups is a big challenge. Disputes between pastoralists, settled farmers and river basin users over natural resources are common in most states. Particularly in Jonglei State, several groups have fought each other over livestock and grazing lands, leading to many losses and displacement. Ethnicity has often been manipulated to foster discord when it served political interest.[657] Once fighting starts in these areas the conflict continues and reoccurs regardless of its actual causes.

Moreover, after independence, political tensions between South Sudan and Sudan remained high due to the fact that key aspects of the 2005 Comprehensive Peace Agreement (CPA) have not been resolved, including border demarcation, agreement on assets, the political status of Abyei, and political settlements in the Southern Kordofan and Blue Nile states of Sudan. The tension between the two sides prompted Sudan to accused South Sudan of supporting the SPLA-N (rebel group in Sudan) and also South Sudan made similar accusations that Khartoum was supporting the militias fighting against the government in South Sudan. These accusations led to a deterioration in relationships; in January 2012 the South Sudan government decided to shut down oil production leading to national austerity measures, which worsened the economic situation and food security.

Together with these immense challenges, political rivalries and ethnic grievances put more pressure on the SPLM/SPLA senior leadership who had fundamental disagreements about the future direction of the party. The President dismissed almost the entire cabinet, including the Vice President, in July 2013, which increased tension. On 15 December, Riek Machar and other members did not attend the SPLM National Liberation Council and fighting broke out.

17.3 Peace and reconciliation initiatives

The current conflict has involved many countries in the region and beyond in various roles. Peace and reconciliation initiatives have been promoted at international, national and community levels. From 4 January 2014, the Intergovernmental Authority on Development (IGAD) led peace talks in Addis Ababa in Ethiopia and both parties signed agreements on 23 January on the cessation of hostilities and on the status of political detainees arrested in relation to the purported coup attempt. However, immediately after the signing, fighting broke out in Jonglei, Unity and Upper Nile Stales. The second agreement on the cessation of

[657] UNMISS. 8 May 2014. *Conflict in South Sudan: A Human Rights Report*. Juba: UNMISS.

hostilities and establishment of a transitional government of national unity was signed on 9 May 2014, but fighting still continued in some parts of the country.

The United Nations Security Council Resolution in May 2014[658] decided to extend the mandate of UNMISS until November 2014 and to increase UNMISS troop strength. It also decided to reprioritise its mandate towards the protection of civilians, human rights monitoring and support for the delivery of humanitarian assistance. UNOCHA prepared the South Sudan Crisis Response Plan 2014, which as of June 2014, had 258 projects to improve the humanitarian conditions.[659] The plan requires US$1.8 billion for its implementation. At a donor conference in Oslo in May 2014, 22 countries and intergovernmental organisations reaffirmed their commitment by pledging over US$600 million for the response. However, more funding is still needed.

In April 2014, church groups and civil society organisations came together to create the National Platform for Peace and Reconciliation as an independent body seeking to form a united platform to work for peace and reconciliation in the country. Under this platform, government bodies are included, such as the South Sudan Peace and Reconciliation Commission and parliament's Specialised Committee on Peace and Reconciliation. The platform has the task to link government bodies and communities. It includes civil society, youth, women's organisations, the international community and even the opposition forces, with the aim of hearing their voices in the peace and reconciliation process and developing an agenda for peace, healing and reconciliation.

In South Sudan, the churches play an important role, and their involvement in a peace platform is crucial. Throughout the decades-long civil war, they were the only stable institutions which had legitimacy, especially in remote areas of the country. The South Sudan Council of Churches has constituted the Committee for National Healing, Peace and Reconciliation to address conflict in the country. The committee is headed by the Anglican Bishop of South Sudan and supported by a number of bishops from the other denominations, such as the Catholic Church, Africa Inland Church, and Presbyterian Church. One of the successes of this committee was the resolution of the conflict in Jonglei which temporarily brought relative peace to the area.

Local leaders such as chiefs in boma, payam and county from the warring communities have been preaching peace and reconciliation among their communities, stressing the importance of coexistence among different tribes in their regions. Meetings within the community and with neighbouring communities have been held to explain that the war is political not ethnic, although it had taken ethnic lines. A peace process which is truly inclusive of the people on the ground and grass-roots level discussion on their future are key initiatives to stop the violence and build trust across social divides.

[658] United Nations Security Council Resolution 2155 (2014) adopted on 27 May 2014

[659] UNOCHA. 2014. *South Sudan Crisis Response Plan (revised June 2014).* https://docs.unocha.org/sites/dms/CAP/Revision_2014_South_Sudan_CRP_June_2014.pdf

18. Gender issues

18.1 Gender issues in agricultural production

South Sudan's land based economy relies heavily on subsistence farming for food security and economic development, most of which is small scale, private and predominantly family-based.[660] Women have been called the face of agriculture in South Sudan as they constitute 80% of all subsistence farming but their crucial role and contribution to food security is often unrecognised.[661] As a result of the conflict and outmigration of men to urban areas, a high proportion of households are headed by females, which means that the South Sudanese farmer is predominantly female.[662] It will be difficult for South Sudan to increase agricultural production and food security without involving women who are the majority of its farmers. As a result of their primary role in agricultural production, women also constitute a wealthy repository of indigenous knowledge on genetic varieties, natural resource management and conservation, food processing and preservation, and traditional medicines.

Women's production is, however, constrained by many factors, most of which stem from patriarchy and their subordinate status in the family and communities due to social customs and cultural practices. This results in their marginalisation from decision making in key socio-economic processes and activities. The National Gender Policy (NGP) 2013 affirms that South Sudan is a "highly unequal society" in terms of access, control, and ownership of resources between men and women.[663] Despite the provisions in the Land Act 2009[664] which accords equal rights to women and men, women`s land rights are still insecure, and even widows' land rights are often not respected. Land is generally owned and controlled by men.[665] The Comprehensive Country Gender Assessment 2012 shows that women in general have access to land but limited ownership and control over the key productive assets (Table 18-1).

Table 18-1: Access to and control, ownership of productive/economic assets

Resources	Access		Control		Ownership	
	Women	Men	Women	Men	Women	Men
Land	3	5	1	5	1	5
Labour	5	3	5	3	5	3
Food crops	5	4	5	4	5	4
Cash crops	2	5	1	5	1	5
Cows	2	5	1	5	1	5
Goats	2	5	1	5	1	5
Houses	2	5	4	5	1	5
Vehicles	2	5	2	5	2	5
Donkeys	3	5	1	5	1	5
Hoes	5	5	5	5	5	5

Note: Scale of 1 to 5 indicate low to high on access, control and ownership of asset.
Source: MOGC&SW. 2012. *Comprehensive Country Gender Assessment. Juba: MoGC&SW.*

A very few women in urban areas, especially the well-educated, can access, control and own any resource and asset of their choice through purchase. However, the situation is

[660] GRSS. 2011. *South Sudan Development Plan (SSDP) 2011-2013*. Juba: GRSS.
[661] Maina, Immaculata. 2011. *South Sudan Food Security: Gender Equity Scoping Report to CIDA South Sudan Programme.* Canada: Government of Canada.
[662] Maina, Immaculata. 2011. *South Sudan Food Security: Gender Equity Scoping Report to CIDA South Sudan Programme.* Canada: Government of Canada.
[663] MoGC&SW, 2013. *South Sudan National Gender Policy*. Juba: MoGC&SW.
[664] GOSS. 2009. *The Land Act*. Juba: GOSS.
[665] MoGC&SW, 2012. *Comprehensive Country Gender Assessment*. Juba: MoGC&SW.

different for women in rural areas who mostly access land belonging to their husbands or male relatives. Such gender disparities are more pronounced in rural than urban areas and among poorer women.

Other key constraints to women's production include access to agricultural inputs such as good quality seeds, skills, knowledge, technology, extension support, credit and markets. Where women have access to land, the use of traditional hand tools limits women's capacity to clear and cultivate large areas of land, especially where the households have no adult males or the men are unwilling to participate.

Extension workers in South Sudan are predominantly male, which creates constraints in face to face interactions with women producers in areas where there are strict taboos and social codes. This is confirmed in the World Bank, FAO and IFAD Gender in Agriculture Sourcebook[666] which notes that in some societies male extension workers are not able to have face to face contact with female farmers due to prevailing taboos. It was reported that women's absence in extension work was a result of low levels of literacy, the reluctance of the educated few to work in the rural areas and family commitments which made it difficult for them to move around. It noted that research and extension systems can become more effective in developing sustainable production systems, if they adopt a gender perspective and include the distinct roles, needs and opportunities for different members of the household, for example, gender responsive extension support. Ensuring that women benefit from research, extension and other elements of innovation and participation will require a significant shift in many agricultural services.

Access to credit is an important indicator of economic empowerment, since credit allows people to invest in business. South Sudan's financial infrastructure is underdeveloped and dominated by foreigners. Most women in South Sudan have few financial resources and do not have access to financial services due to lack of collateral, lack of information and decision making control.[667] A later gender assessment in 2013 showed that the majority of female respondents had never taken credit or loans from a financial institution.[668] Of those who had got credit or loans, they had obtained them mainly from their friends or microfinance institutions. Those who had never accessed any credit or loans indicated reasons such as high interest rates, lack of knowledge on procedures for borrowing, the stringent procedures involved in borrowing and lack of required collateral.

Access to markets allows people to expand agricultural production and increase their income through purchase of inputs and household supplies and sale of surplus products. Findings of the Country Gender Assessment (Table 18-2) in 2012 show that females tend to go to the market more frequently than males. The main reasons for not going to the market include shortage of money to purchase items, failure to identify need to go to the markets, poor transport worsened by heavy rains, long distances and bad roads. Recent conflict has destroyed many of these market routes.

Table 18-2: Access to market by gender

	% of respondents who go to the market					Number
	I don't go to the market.	Every day	Weekly	Monthly	Total	
Male	36.4	20.5	34.1	9.1	100	44
Female	6.4	51.1	34.0	8.5	100	47

[666] World Bank, FAO, IFAD. 2009. *Gender in Agriculture Sourcebook.* USA: World Bank.
[667] Maina, Immaculata. 2011. *South Sudan Food Security: Gender Equity Scoping Report to CIDA South Sudan Programme*. Canada: Government of Canada.
[668] Ravololonarisoa, Micheline. May 2013. *Gender Assessment of Sustainable Livelihoods and Private Sector Development in South Sudan.* Final Report to the Joint Donor Partners, South Sudan.

Total	20.9	36.3	34.1	8.8	100	91

Source: MOGC&SW, 2012 *Comprehensive Country Gender Assessment, Juba: MoGC&SW.*

Women's agricultural production is characterised by low inputs, low volume, low diversity, low yield, low technology and low output and hardly any income generating as most of the produce is destined for domestic consumption. Due to the low yields and post-harvest losses, harvests have to be supplemented by other sources of food, for example, fruits, vegetables, roots foraged from forests and other income generating activities such as weaving, grass cutting, charcoal and pottery, offering their agriculture labour for wages and food aid.

Women's disproportionate burden, for reproductive, household, productive and community roles, leaves little room for increased production. Some of the domestic roles are time consuming, for example, walking long distances to fetch firewood or forage for food from forests, and fetching water. Women have reported being overburdened by the introduction of development activities which do not take into account their existing workloads.

18.2 Roles and interests by gender

18.2.1 Crop

The World Bank, FAO and IFAD Gender in Agriculture Sourcebook notes that gender division of labour can sometimes be very complicated, with different fields being cultivated for different purposes by women, men and family groups,[669] with women and men growing different crops or different varieties of the same crop for different reasons such as yield, taste, convenience and type of benefit. Women would tend to grow more traditional crop varieties which may be low yielding, are hardier but taste better mostly for household consumption, while men would grow mostly cash crops destined for the market and income. As a result of their different roles and interests, women and men also have different knowledge and skills around crop production. Men also generally control profits from male crops and often a large portion of female crops and how income from sales is used.

18.2.2 Livestock

The livestock sector is characterised by cultural taboos, attitudes and values which prescribe ownership, control and gender division of labour for different livestock and livestock related tasks. The sector is generally dominated by men for the large animals, while women keep and may have control over small animals and ruminants which have lower value on the market, such as chicken, goats and pigs. Women's and men's reasons for keeping animals may also vary, with women keeping them for food and income, while men may keep them for status, bride wealth, social safety nets against disaster and income in times of hardship.

18.2.3 Forestry

Women and men usually have different connections and relationships with forests and other natural resources depending on their roles and socio-cultural values and taboos. For example, men may see forests as a source of animals to hunt, wood timber or charcoal while women will see forests as a source of fuel wood, food, fruit and medicines. Women also have a primary role in conserving and managing natural resources on which their communities depend, restoring woodlands and managing water supplies. Women and men are impacted differently by environmental degradation or changes in the ecosystem based on their different dependence on the environment.

18.2.4 Fisheries

The World Bank, FAO and IFAD Sourcebook notes that women and men often undertake different and changing roles in fishing depending on local norms in relation to resource

[669] World Bank, FAO, IFAD. 2009. *Gender in Agriculture Sourcebook.* USA: Word Bank

access, control, mobility, technology involved, and extent of commercialisation as well as the product. The report also notes that capture fishing is largely dominated by men while women are confined to fish processing (drying and smoking) and marketing, which are considered more appropriate given their reproductive roles.

18.3 Policy and legal framework for gender equality

The Transitional Constitution of South Sudan 2011 is the primary document through which women's rights are currently defined.[670] It espouses the principles of equality and non-discrimination (equality before the law and equal protection of the law regardless of sex - section 14). It includes a women's rights section in the bill of rights (section 16) where it accords women "full and equal dignity with men" (section 16.1). In section 16.2(a), it requires all levels of government to promote the participation of women in public life and prescribes a quota of 25% (affirmative action) for women's representation in the executive and legislative levels of government. It also affirms women's equal rights to education without discrimination (section 29) and to property and inheritance (section 16.5). It also directs enactment of laws to "combat harmful customs and traditions which undermine the dignity and status of women" (section 16.3).

Gender equality and socio-economic and political empowerment of women is one of the guiding principles of Vision 2040.[671] In section 3.2, it states that diversification in agriculture "will have advanced role of women in mainstream development". In section 3.7, it states that "no citizen will be disadvantaged because of gender, among other things, and that a future South Sudan will have eradicated negative social attitudes …and women will be free from all forms of sexual harassment and other prejudices". The strategies for delivery of the vision include promotion of gender equity and social change, mainstreaming of gender equality in all institutions of government and public life and adhering to constitutional provisions for women's representation.

The Land Act 2009[672] builds on the Transitional Constitution and prescribes women's rights to land on the basis of equality and non-discrimination (sections 8, 13.1, 13.2), rights to own and inherit land alongside the legal heir (section 13.4) and prescribes women's participation in land management structures (sections 45, 49) at the county and payam levels (but only one female representative which is less than the 25% prescribed in the Transitional Constitution). The South Sudan Vision 2040 acknowledges that the Land Act had not gone far enough to protect women's equal rights to land.

The South Sudan National Gender Policy 2013 provides guidelines for mainstreaming the principles of gender equality and the empowerment of women in the national development process, with the ultimate objective of making gender an integral part of all laws, policies, programs and activities of government institutions, the private sector and civil society. It adopts, as its guiding principles, commitment to the principle of equality as a human rights issue and subjecting traditional and cultural rights to human rights (Section 1.6.i and iii).[673]

The Agriculture Sector Policy Framework 2012 states that mainstreaming gender in agricultural policies and programs is essential for development success.[674] In includes gender specific commitments in key areas of the policy document, for example, policy choices and objectives (section 3.2), agriculture education and training (section 5.2), access to land, tenure security and land use (section 5.6), water resource development and irrigation, commercial agriculture production, value addition and marketing (Chapter 9 iii). It

[670] GRSS. 2011. *The Transitional Constitution of the Republic of South Sudan*. Juba: GRSS.
[671] GRSS. 2011. *Vision 2040: Towards Freedom, Equality, Justice, Peace and Prosperity for All.* Juba: GRSS.
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[674] MAFCRDS. 2012. Agriculture Sector Policy Framework (ASPF): 2012-2017. Juba. GRSS

also contains a chapter dedicated to gender empowerment (Chapter 11 - Policy Guidelines on Social Justice), which provides guidelines for mainstreaming gender in the sector. The policy statement in that section is to “facilitate the implementation of gender empowerment programs in the sector and influence the same in other spheres”. The policy also commits to eradication of gender based differences in social and economic activities, access to resources and decision making processes and “encourage cultural and traditional norms, social customs that enable women`s participation in decision making processes and their ability to engage in productive and social activities in rural areas”. The policy also commits to the development of a rural women’s empowerment program.

All these documents acknowledge the critical role of women in agriculture; and, the marginalisation of women from key production processes and decision making as a result of social customs and cultural practices, which limit their ability to participate and contribute meaningfully to agriculture. However, the approach to gender mainstreaming is generally fragmented and inconsistent and gender equality commitments are still weak. There is a need to revise and strengthen the policy framework, especially at the subsector level to explicitly state this commitment in key areas such as guiding principles, policy statements, objectives, strategies and plans.

Expanding women’s rights in farming requires comprehensive action at a number of different levels e.g. information and capacity building; organisational and empowerment measures; and, legal assistance and advocacy. Mainstreaming gender in agricultural policies and programs is essential for development success. Gender mainstreaming will require women’s and men’s equal participation in agricultural development activities, not only in terms of numbers (quantitatively) but effectively (qualitatively) in ways that improve the quality of that participation, transform and improve their lives, and allow them to benefit equally. Special attention will be needed to remove barriers to women’s and men’s participation, build their respective capacities and promote their equal partnership in the productive process. Special measures (affirmative action) will be required to ensure that there is equal participation and benefit. Gender responsive budgeting is an important tool for mainstreaming gender in policies and programs.

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