The Republic of South Sudan

Ministry of Agriculture, Forestry, Cooperatives and Rural Development

Ministry of Livestock and Fisheries Industries

Comprehensive Agricultural Development Master Plan

Final Report

Annex III

Development Options Analysis 2014

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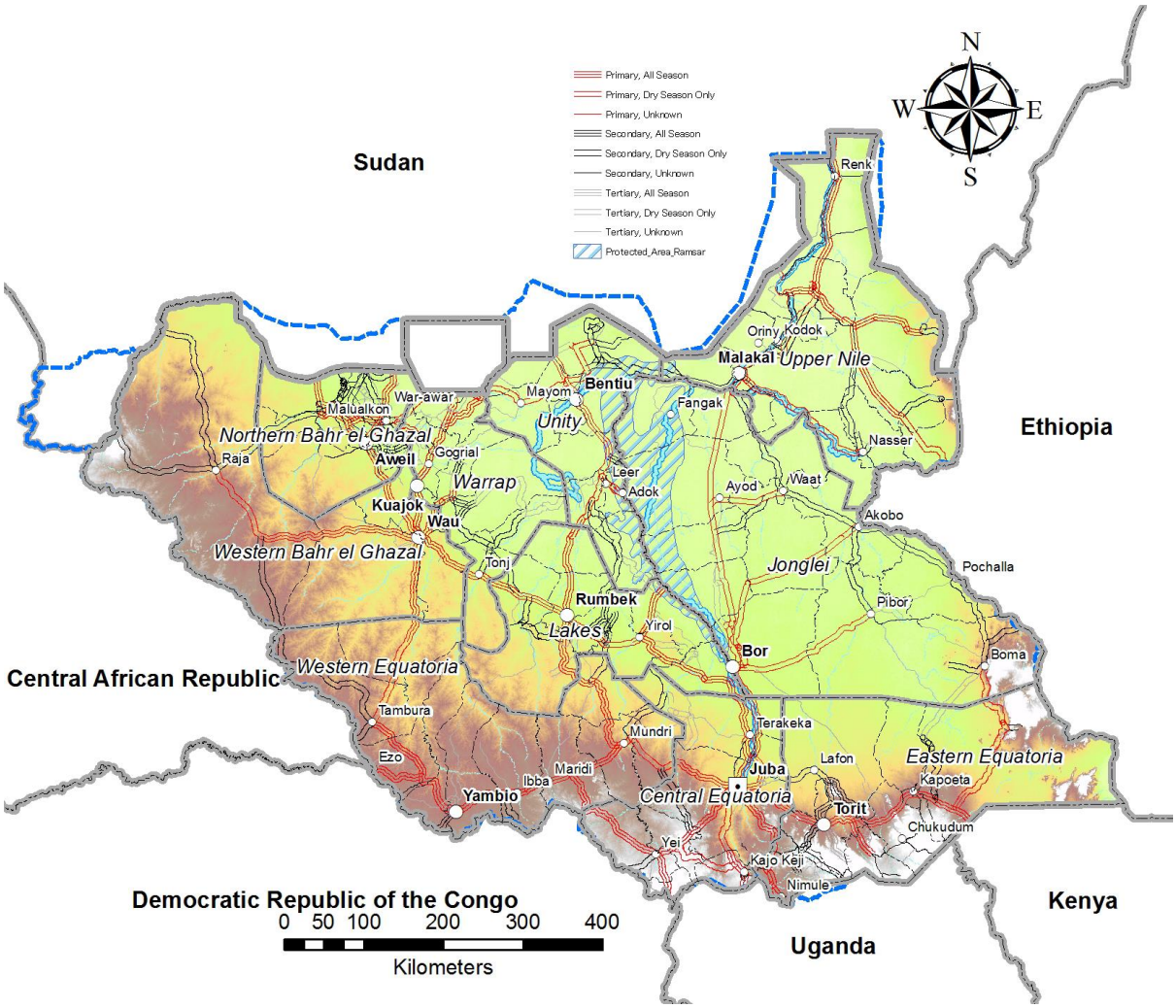
Map of South Sudan



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

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Abbreviations

ABSS	Agricultural Bank of South Sudan
ACP	The African, Caribbean and Pacific Group of States
AEO	Agricultural Extension Officer
AfDB	African Development Bank
AGRA	Alliance for a Green Revolution in Africa
API	American Petroleum Institute
ASAL	Arid and Semi-arid Land
ASARECA	Strengthening Agricultural Research in Eastern and Central Africa
ASPF	Agriculture Sector Policy Framework
CAADP	Comprehensive Africa Agriculture Development Programme
CAHW	Community Animal Health Worker
CAMP	Comprehensive Agricultural Development Master Plan
CANS	Civil Authority of New Sudan
CDO	Community Development Officer
CES	Central Equatoria State
CFR	Central Forest Reserve
CFSAM	Crop and Food Security Assessment Mission
CPA	Comprehensive Peace Agreement
CSO	Civil Society Organisation
CTC Yei	Crop Training Centre Yei
DP	Development Partner
DVS	Directorate of Veterinary Services
FAO	Food and Agriculture Organization of the United Nations
FARM	Agribusiness and Rural Markets (Project)
FBOs	Farmer Based Organisations
FY	Financial/Fiscal Year
GDP	Gross Domestic Product
GIS	Geographic Information System
GoSS	Government of Southern Sudan
GRSS	Government of the Republic of South Sudan
HACCP	Hazard Analysis and Critical Control Points
HRD	Human Resource Development
HPF	High-level Partnership Forum
IAA	Integrated aquaculture agriculture
ICRISAT	International Crops Research Institute of Semi-Arid Tropics
ICT	Information and communication technology
IDP	Internally Displaced Person
IFMIS	Integrated Financial Management Information System
IGAD	Intergovernmental Authority on Development
IITA	International Institute of Tropical Agriculture
IMAC	Inter-Ministerial Appraisal Committee
IMF	International Monetary Fund
JFM	Joint Forestry Management
KCB	Kenya Commercial Bank
LAPSSET	Lamu Port-South Sudan-Ethiopia Transport
LVFO	Lake Victoria Fisheries Organisation
MAFCRD	Ministry of Agriculture, Forestry, Cooperative and Rural Development
MAFTARFCRD	Ministry of Agriculture, Forestry, Tourism, Animal Resources, Fisheries, Cooperative and Rural Development
MARF	Ministry of Animal Resources and Fisheries
MDTF	Multi-Donor Trust Fund
MEDIWR	Ministry of Electricity, Dams, Irrigation and Water Resources
MLFI	Ministry of Livestock and Fisheries Industries

MLLTC	Marial Lou Livestock Training Centre
MoFCEP	Ministry of Finance, Commerce and Economic Planning
MoFEP	Ministry of Finance and Economic Planning
MSY	Maximum Sustainable Yield
Mt	Metric ton
MTEF	Medium-term Expenditure Framework
NaFIRRI	National Fisheries Resources Research Institute (Uganda)
NALEP	National Agriculture and Livestock Extension Policy
NATTC	Nzara Agriculture Technology Training Centre
NBS	National Bureau of Statistics
NGO	Non-governmental Organisation
NLA	National Legislative Assembly
NPA	Norwegian People's Aid
NRSWG	Natural Resources Sector Working Group
PARC	Palotaka Agricultural Research Centre
PFM	Public Financial Management
PFMS	Public Financial Management System
QGDF	Quarterly Government-Donor Forum
SAIIA	South African Institute of International Affairs
SAR	Situation Analysis Report (an appendix to this report)
SDG	Sudanese Pound
SSARP	Southern Sudan Agriculture Revitalization Program
SSDP	South Sudan Development Plan 2011-2013
SSFC	South Sudan Forestry Commission
SSP	South Sudanese Pound
SSPF	South Sudan Partnership Fund
SWG	Sector Working Group
TBD	To Be Developed
TT	Task Team
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USD	United States Dollar
VSF	Vétérinaires Sans Frontières
WB	World Bank
WES	Western Equatoria State
WFP	World Food Programme
WHO	World Health Organization
YARC	Yei Agricultural Research Centre
YATC	Yei Agricultural Training Centre

1. Introduction

1.1 Situation analysis and CAMP framework development

The situation analysis was carried out to develop CAMP framework as a basis for the elaboration of a 25-year agriculture sector development scenarios.

The CAMP framework, which will be consolidated in the later stage of CAMP development in 2014, is expected to have the following elements:

1) Objectives of CAMP, guiding principles of CAMP implementation, assumptions and short-, medium-, and long-term qualitative and quantitative targets;
2) Programme and project selection and evaluation criteria;
3) Investment plans;
4) Implementation mechanism including an institutional arrangement to identify and mobilise resources for CAMP implementation.

The development of CAMP framework relies on a fact-based approach where primary and secondary sources of information on the status of the agriculture sector in South Sudan is collected and analysed. The results will form the analytical foundation of CAMP development.

Through the situation analysis, past and present status, and issues and opportunities of the agriculture sector were examined by the team from cross-cutting and subsector perspectives, local, national, and regional market perspectives. Preliminary agriculture sector development scenarios were identified for the institutional, crops, livestock, forestry and fisheries subsectors. These are presented in this report to facilitate discussions among the concerned ministries, state governments and stakeholders, on setting sector and subsector goals; identification of public intervention instruments; timing of their application; expected costs and impacts; and implementation framework. Public interventions are those made by the government; the expectation is that they will be supported by the development partners (DPs) and that they will promote private sector investment.

The results of these discussions will achieve the following objectives:

1) To propose future sector development scenarios for the period 2015-2040;
2) To develop investment plans;
3) To determine the priority, location, timing and size of public interventions; and
4) To design the CAMP implementation mechanism.

This interim report mainly deals with the development of the 25-year agriculture development scenarios. To support the scenarios, with their emphasis on private sector-led agriculture development for food security, poverty reduction and economic growth, and sector transformation, it is imperative to understand the agriculture sector dynamics involving private and public sector actors. This report describes these dynamics and underlining mechanisms based on the situation analysis results in order to establish the validity of the development scenarios.

To address the issues and opportunities identified by the situation analysis, the findings and analyses summarised in this report will be used in 2014 to develop and assess the priorities, locations, timing and size of public interventions. Sets of subsector and crosscutting interventions in the forms of programmes and projects will be assembled to form investment plans consistent with the spatial and temporal planning framework of CAMP. To formulate interventions that meet long-, medium-, and short-term targets of the development scenarios, the expected impacts of the interventions will be assessed based on a firm understanding of the underlying mechanisms.

1.2 Structure of report and key concepts applied

The report consists of Part I and Part II, and the situation analysis report as Annex. Part I is the main section of this report dealing with 1) background, sector performance, and factors necessary to characterise the socioeconomic and physical environment of private and public sector players, 2) private sector players and markets as instruments of agriculture development, 3) public sector players as service providers, 4) discussion of the 25-year subsector development scenarios as the synthesis of the situation analysis. Key concepts relevant to CAMP formulation such as food security, agriculture sector transformation and development scenarios are defined in this part. The private and public sector actors and constraints found will be examined to understand: reasons for food insecurity, underinvestment in agricultural production, constrained but performing markets and agribusinesses, financial and technical service institutions; and macro and regional characteristics of the national and agriculture economy. Part II briefly touches on the elements of the CAMP framework and how the framework will be developed in 2014.

1.2.1 Factors affecting agricultural development

Background, sector performance and factors affecting agricultural development are introduced as initial conditions and constraints of the sector. The issues identified by the situation analysis are also introduced as conditions to be addressed by the implementation of CAMP. The analysis of constraining factors includes: definition and categorisation of constraints; assessment and characterisation of the constraints in terms of their expected effects on agricultural development; and, discussions on possible measures to handle such factors. The background and factors are categorised into four types: natural and physical conditions; socioeconomic conditions; institutional arrangements including rights, power, and responsibilities assigned outside the jurisdiction of CAMP implementing agencies; and, infrastructure. The natural and physical conditions cannot be controlled, but their effects are predictable and partially manageable, or susceptible to improvement or management through delivery of public services. The socioeconomic conditions and their future change can be used as indicators to set targets for CAMP interventions that influence the agriculture sector. The institutional arrangements can be improved through inter-organisational and stakeholder coordination mechanisms. Infrastructure can be developed and controlled through proper planning and coordination within the government and with the private sector, even though it is outside the jurisdiction of CAMP implementing agencies.

1.2.2 Private sector actors and markets as instruments for development

For the private sector analysis, the economic behaviour of private sector actors will be examined with respect to their functions and level of participation in agricultural markets. Characteristics of the actors and their participation in agricultural markets will be explained based on market types set by the CAMP team. Markets are classified into four types based on the geographical extent of the value chain of goods and services concerned: 1) subsistence production; 2) local market (rural to rural transaction); 3) domestic market (rural to urban transaction); 4) regional market (trans-boundary international transaction among neighbouring countries); and 5) global market (international transaction). The private sector analysis will also attempt to gauge gains and impacts of public interventions by CAMP implementation against the issues identified. The key concepts necessary to describe the private-sector actors will be defined; preliminary discussions on the required public interventions to boost private sector activities and markets will also be presented.

1.2.3 Public sector as service providers

For public sector performance analysis, the relationship between public services and their impact on the private sector actors will be discussed based on the results obtained by the situation analysis. The effectiveness and efficiency of public service delivery can be improved by better spatial and temporal planning, implementation strategies, organisational

arrangements, and human capacity. Well-coordinated and motivated actions of service providers are susceptible to uncertainties stemming from poor information sharing and transparency, corruption, and the weak legal and financial framework provided by the government. The public sector analysis employs these views to conduct a simple capacity gap assessment with respect to expected levels of public service delivery. Preliminary discussions on the expected levels of performance improvement and necessary steps, timing, and contents of capacity development programmes and projects will be presented.

1.2.4 Agriculture and subsector development scenarios

Based on discussions on the private and public sector players, their social and physical environment, and identified issues and opportunities of the agricultural sector, the agriculture and subsector preliminary development scenarios for 25 years starting from 2015 (FY 2015/16) up to 2040 (FY 2040/41) are developed. The scenarios consider the on-going, pipeline, and future public interventions financed by domestic and external sources. They employ quantitative and qualitative indicators (e.g. subsector wise GDPs and their growth rates), which the government uses to represent the expected dynamics and development of the agricultural sector and its subsectors. Therefore, the scenarios are not only forecasts, with some degree of uncertainty, but also represent the governments' visions and policies, which guide and define the objectives of CAMP. Experiences from other countries similar to South Sudan may be employed to guide development of the scenarios. The scenarios are subject to regular monitoring and periodical monitoring and evaluation, and review methods will be developed as a part of the implementation framework.

Public interventions are categorized and managed during the 25-year CAMP implementation period by setting up three impact generation time frames: 5-year short-term, 10-year medium-term, and 15-year long-term. All programmes and projects are classified into one of these three categories. Outputs, outcomes, and impacts of the interventions will be monitored and evaluated annually under the PFM framework and every three years under the government's medium-term expenditure framework (MTEF), while taking into account their impact generation time frames. Meaningful feedback in the form of decision-making and resource allocation will be generated as a result of these activities.

It can be argued that the 25-year period is sufficiently long enough to expect agricultural transformation to occur. The scenarios are able to show transformation by setting targets and indicators. Transformation will be shown by changes in agricultural production, distribution and consumption modes plus increases in labour productivity and returns on capital. It will also be indicated by 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 a healthier and better-educated labour force in rural areas.

1.2.5 CAMP framework for agriculture development

Identification of the preliminary 25-year development scenarios based on the synthesis of the situation analysis is the major task of this report. The CAMP framework will be developed in the later stages of CAMP development in 2014.

2. Factors affecting agriculture development

This chapter discusses factors that cannot be directly controlled by CAMP implementation agencies but significantly affect the strategy and performance of CAMP intervention. Some of these factors are external to the agricultural sector and thus uncontrollable by CAMP, while others may be managed by CAMP to a certain extent, through measures that will mitigate their possible negative impacts or positively contribute to CAMP. Nevertheless, it is important to understand the dynamic context of these factors in which CAMP is to be planned and implemented. First, these factors are categorised and defined, and then, major factors possibly affecting the strategy and performance of CAMP are examined in terms of their possible negative impacts on CAMP and mitigation measures.

2.1 Definition of factors

Factors that can significantly affect agricultural development and public intervention in the sector, more specifically CAMP implementation, are categorised into the four types as shown in Table 2-1. The table also defines the characteristics and factors in each category. The discussion that follows introduces more important factors in each category that need to be taken into account in CAMP formulation, particularly with a view to mitigating their possible negative impacts.

Table 2-1: Categories of external factors possibly affecting CAMP implementation

	Category	Characteristic	Factor
1	Natural and physical conditions	Uncontrollable but predictable to some extent by employing various scientific models and technologies. Manageable by public intervention and service delivery.	Topography, climate/weather, geology, soils, hydrology and water resources, vegetation, land resources, agro-ecology, etc.
2	Socioeconomic conditions	Mostly uncontrollable but can be partially made favourable for agricultural development through inter-organisational coordination and/or CAMP implementation.	History, culture, ethnicity, gender, politics, macroeconomic environment, world economic situation, security, etc.
3	Legal and institutional frameworks (outside the jurisdiction of CAMP institutions)	Mostly uncontrollable but can be partially consolidated or improved through inter- organisational coordination and/or CAMP implementation.	Government, legislation, justice, policies, public finance, education, health services, land tenure, etc.
4	Infrastructure	Developable and controllable through proper planning and inter-organisational coordination.	Transport, communications, market facilities, animal health facilities, etc.

Source: Elaborated by the CAMP Task Team.

2.2 Natural resources and physical conditions

Natural and physical conditions include topography, climate/weather (factors: temperatures, rainfall, humidity, sunshine duration, wind speed and direction, cloud amount, visibility, , etc.), geology, soil types, hydrology and water resources, vegetation and other natural conditions that influence the patterns and performance of agricultural production, market transactions, and consumption. Differences in these conditions are reflected in the diversity of these human activities. The natural conditions, in combination with socioeconomic and technological factors, primarily determine "agro-ecology",[1] which should be taken into

[1] Agro-ecology has been defined in various ways. In the early 1980s, Altieri defined agro-ecology as the application of ecological principles to agriculture (Alrieri, Miguel A. 1983. Agroecology, the Scientific Basis of

account, particularly in taking a holistic approach to development. Natural conditions in a dynamic context, such as climate change, land degradation, loss of biodiversity and desertification, may constrain agricultural activities, though they can also be seen as consequences of agricultural development.

Natural conditions are generally uncontrollable but predictable to some extent by employing various scientific models and technologies. They can also be managed and coped with through measures to be taken by individuals, groups and organisations in both the private and public sectors. In fact, agriculture itself is a practice to obtain food and other products necessary for human beings through adapting to and controlling the natural environment. Some of the unfavourable changes in natural conditions as mentioned above can also be avoided or minimised by appropriate management and conservation of natural resources.

Table 2-2: Changes in natural and physical conditions and their negative impacts

Factor	Previous or ongoing instance	SAR*
Changes that have short-term or temporary impact		
Drought	Areas bordering Sudan and Kenya have lower precipitation and are frequently affected by drought. Cattle, goats and sheep are almost entirely raised in natural rangelands across the country where they are vulnerable to drought	3, 10, 11
Delay in rains	National cereal production was estimated to decrease from 695,200 tons in 2010 to 562,600 tonnes in 2011 due to the delay in rainfall. It is the most important natural shock affecting South Sudanese households in recent years.	7, 10
Floods	Frequent flooding affects crop production, particularly in the Flood Plains zones. Floods displaced over 260,000 people across the country in 2012.	7, 10, 11
Changes that have long-term or permanent impacts		
Climate changes	Climate change will increase the frequency and intensity of extreme weather events such as droughts, floods and heat waves. Prolonged and severe droughts are known to have caused severe water shortage and crop failure.	3
Deforestation	The country has lost some of its forests since the 1950s due to cutting trees for firewood, charcoal, logs and timber. Deforestation is ongoing, particularly in areas around Yambio, Yei, Wau, Aweil, and Bor.	3, 12
Land degradation	Land degradation due to cattle rearing has also been widely observed in the country. Soil erosion is occurring in the Imatong region due to less rainfall.	3
Loss of biodiversity	The country has experienced rapid degradation of biodiversity resources due to widespread illegal and uncontrolled exploitation of such resources.	3, 12

Source: Elaborated by the CAMP Task Team based on the Situation Analysis.
Note (*): For further information, see the indicated chapters of the Situation Analysis Report (SAR) attached to this report.

In South Sudan, natural and physical conditions are largely favourable for farming, livestock rearing, forestry and fisheries. These favourable conditions offer huge agricultural potential (see SAR Chapters 3 and 10-13). However, changes in these conditions have adverse impacts on the performance of agricultural production, marketing, and consumption. With almost all of the country's agriculture being rain-fed, rainfall variability is a major factor determining crop performance in the short as well as in the long term. There can be considerable variation in rainfall from year to year, and also from location to location. In many lowland areas, flooding is a common occurrence, while long dry period is common in

Alternative Agriculture. Div. of Biol. Control, U.C. Berkeley, Cleo's Duplication Services). Twenty years later, agro-ecology was enlarged to the whole food system linking production with the food chain and consumers. In the late 2000s, agro-ecology has become a concept of action that includes a scientific discipline, agricultural practice, or political or social movement (Bram Moeskops. 2012. "What is agro-ecology?" *Agro-Ecological Innovation*. http://agro-ecoinnovation.eu). In CAMP, it is defined as the agricultural system linking production with market transactions and consumption determined by natural, socioeconomic and technological conditions.

other areas, especially those towards the north of the country. Impacts of longer-term changes, such as deforestation and land degradation, have still to be assessed; some unfavourable situations are reported in SAR.

2.3 Socioeconomic conditions

Socioeconomic conditions include history, sociocultural factors (e.g., culture, ethnicity, language, literacy, gender, etc.), politics, economic environment (e.g., growth, economic structure, exchange rate, inflation, employment, regional integration, etc.), and security. These conditions, like natural conditions, influence the agriculture sector's performance. They are mostly uncontrollable but can be partially changed and made favourable for agricultural development through inter-organisational coordination and/or CAMP implementation.

2.3.1 Historical background

Underdevelopment of South Sudan is deeply rooted in Sudan's modern economic system that emerged during the colonial era and survived the subsequent civil war. Therefore, future agricultural development, as part of the economy, is inevitably influenced by past economic events and trends, and these factors cannot be changed retroactively. In many cases, development efforts are severely constrained by the outcome of 100 or more years of neglect and destruction, e.g., the absence of infrastructure, legal and institutional frameworks, education, training, and research, discontinuity of economic activity, illiteracy, poor health, protracted conflicts and insecurity, etc. However, the former Southern Regional Government, with or without DPs' support, attempted various agriculture and rural development projects, particularly during the peace period (1972-1983). A prime example is the Zande Scheme, started in the mid-1940s under the British colonial administration, whose activities included crop cultivation, agro-processing, agricultural research and training, an agro-industrial complex in Nzara, fisheries development, and forest plantation (see SAR Chapter 2). The existence of agro-industries and expansion of forest plantations for commercial timber production in the early 1980s indicate the potential of agriculture-based development in the country. The potential demonstrated by these projects, as well as lessons learned, would help in formulation of a realistic agriculture development plan.

2.3.2 Macroeconomic environment

A stable macroeconomic environment is essential for sound agricultural development, but South Sudan's volatile macroeconomic situation, together with poor infrastructure and weak institutional framework, has a negative impact on the growth of the agricultural as well as other sector in the following ways:

1) The national economy is significantly affected by fluctuations in oil prices and revenues. The country achieved moderate economic growth during the period 2008-2011, but it was mainly brought about by oil revenues that accounted for around 60% of GDP and, therefore, the growth slowed down when oil GDP declined (see SAR Chapter 2).
2) A large inflow of foreign currency from oil exports makes the local currency stronger, which reduces the prices of imported goods and services. The competitiveness of domestically produced goods, including agricultural products, is reduced, resulting in increased general imports and decreased non-oil exports and further contracting the already limited domestic productive capacity.
3) A marked increase in public expenditures, almost entirely financed by the vast oil resources,[2] has caused high inflation, which became noticeable late in 2010 and accelerated after independence. Given the limited domestic productive capacity, the expanded public expenditures resulted into an increase in the demand for imported

[2] The approved budget surged from SSP3.4 billion (equivalent) in 2006 to SSP5.9 billion after independence in 2011 (World Bank. 2013. *Public Expenditures In South Sudan: Are They Delivering?* South Sudan Economic Brief Issue No. 2. Washington, D.C.: World Bank. p. 1. Also see SAR Chapter 2.

goods and services. This has, in turn, led to a depreciation of South Sudanese pound (SSP) on the parallel market,[3] which fuelled inflation through higher import prices converted at the parallel market exchange rate. The situation worsened when oil production was closed down in January 2012 and the SSP continued to depreciate in the parallel market.

4) Other key drivers of inflation were, on the supply side, trade restrictions on the northern border, import bottlenecks on the southern border, poor transport infrastructure and security challenges within the country and a decline in food production; and, on the demand side, increased demand for imported food and other essential goods due to a massive influx of returnees.
5) The inflation seems to have hit most severely the poor through reduced purchasing power, and the northern states where price increases were generally larger than in the southern states, due to their distance and inaccessibility from the south. Even in rural areas, many households were affected by inflation because they did not produce enough for their own consumption but relied on imported food, which heightened food insecurity nationwide.

It appears that South Sudan was suffering from the Dutch disease that makes non-oil exports less competitive[4] and leads to a stronger local currency, all of which had a negative impact on the export of agricultural products for some time before independence. As described above, however, the high inflation associated with currency depreciation after independence seems to have even more negative impact on the overall performance of the agricultural sector. The general increase in prices is transferred to domestically produced goods (including agricultural products) through higher living and labour costs, which occurs even in rural areas because of the high dependency on imported food and other essential goods.[5] The inflation and currency depreciation also raised the prices of agro-inputs, almost all of which are imported, and transport costs due to higher fuel costs. It is reported that various agricultural products were exported to Uganda but such export, at least with respect to formal trade, more or less ceased after independence.[6] Though inflationary pressures were curtailed by mid-2013, inflation is anticipated to recur during FY2013/14 as a result of the expected increases in public expenditure from January 2014.[7] These events imply the importance of incorporating measures to overcome negative macroeconomic impacts into CAMP framework.

In addition, the regional and world economic situation can have a significant influence on the course of agricultural development, through changes in the macroeconomic environment or directly. For example, the global financial crisis and the corresponding decline in international oil prices from late 2008 to mid-2009 (Figure 2-1) contributed to the 2010 economic slowdown in South Sudan, particularly in the oil sector (see SAR Chapter 2).

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[3] It is partially because the Bank of South Sudan held foreign currency to build up its reserves, creating an imbalance in the demand for and supply of foreign currency (World Bank. 2013. *Public Expenditures In South Sudan: Are They Delivering?* South Sudan Economic Brief Issue No. 2. Washington, D.C.: World Bank. p. 3).

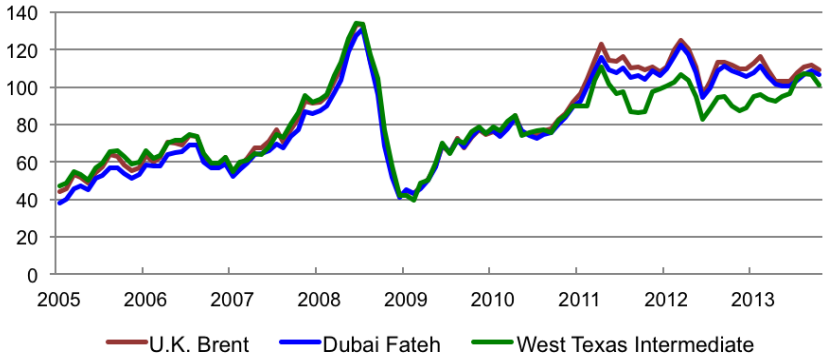
[4] In the 1960s, the Netherlands experienced a vast increase in its wealth after discovering large natural gas deposits in the North Sea. As a result, the Dutch guilder became stronger and non-oil exports less competitive. This syndrome has come to be known as "Dutch disease." Although the disease is generally associated with a natural resource discovery, it can occur from any development that results in a large inflow of foreign currency, including a sharp surge in natural resource prices, foreign aid, and foreign direct investment. Source: Ebrahim-zadeh, Christine. 2003. “Dutch disease: too much wealth managed unwisely”. *Finance and Development.* Volume 40, Number 1. Washington, D.C.: IMF.

[5] Farm labour is expensive and it is difficult to hire workers without providing food. See SAR Chapter 10.

[6] Nimule Customs Office, interviewed by CAMP fisheries subsector team, 8 March 2013, CAMP Situation Analysis.

[7] Ministry of Finance and Economic Planning. June 2013. *Draft National Budget Plan Financial Year 2013/14*. Juba: GRSS. pp. 9-10.

Figure 2-1: Trend of global oil prices (Jan. 2005 – Oct. 2013) (monthly; USD/barrel)



Source: IMF Primary Commodity Prices (http://www.imf.org/external/np/res/commod/External_Data.xls) (Accessed 13 November 2013)
Note for the prices: U.K. light, Brent Blend 38^{o} API, spot price, FOB U.K. ports; Dubai, medium, Fateh 32^{o} API, spot price, FOB Dubai; U.S., West Texas Intermediate 40^{o} API, spot price, FOB Midland Texas

2.3.3 Sociocultural factors[8]

In general, sociocultural factors have a significant influence on development activities and can be major constraints to their effectiveness and sustainability. Language differences and illiteracy can impede communication and coordination unless they are taken into account. The degree of gender disparity along cultural lines can influences women's access to land and participation in decision-making and agricultural activities (see SAR Chapter 8). Under-representation of women in the service delivery force, such as extension officers, means that the needs of women at the farm level may not be adequately addressed. Cultural differences among farmers, as well as differences in their resource endowments (land, labour, etc.) available for production, need to be taken into account. In particular, these differences are related to land-use and farming systems. Different strategies other than those provided to permanent agriculturalists are required to provide services to migratory pastoralists. The resource endowments of different categories of farmers, such as subsistence farmers and market-oriented farmers, affect technology adoption levels, which will require different approaches to public intervention.

2.3.4 Security and conflicts

The legacy of war in the form of insecurity and violence in South Sudan significantly undermines steady development of the agricultural sector. In the crop subsector, insecurity and tribal conflict disrupt cultivation and displace farmers from their homes. Livestock often destroys crops. These incidents cause serious food insecurity in many areas (see SAR Chapter 10). In the livestock sector, insecurity and conflict, including cattle raiding and rustling, disrupt livestock rearing activities, which sometime 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 (see SAR Chapter 11). In some areas, insecurity has reduced livestock populations and deprived people of their livelihoods, leading to aggravated food insecurity and poverty. Insecurity also adversely affects public service delivery. Inter- and intra-communal conflicts have severely hindered movements and economic activities of the people in certain states. The security situation, as a possible constraining factor, needs to be taken into account in CAMP formulation and implementation.

[8] This sub-section is based on: Peterson Warren. 1997. "Chapter 3 - The context of extension in agricultural and rural development." In Swanson, Burton E., Bentz, Robert P., and Sofranko, Andrew J., eds. *Improving agricultural extension: A reference manual*. Rome: FAO.

Political shifts at the national level may result in changes in public sector management, policies and programmes particularly at higher levels. These changes are seriously undermining experience and continuity in leadership and programme implementation

2.4 Legal and institutional frameworks

Legal and institutional frameworks including a system by which community is governed, legislation, justice, policies, public finance, and land administration are outside the jurisdiction of CAMP. These frameworks have a significant influence on the course and outcome of agricultural development by promoting or limiting activities in the sector. Most of them, particularly government and public finance, are important instruments for agricultural development. They can be partially consolidated or improved through inter-organisational coordination and/or CAMP implementation

Government systems: To minimise transaction costs, CAMP's implementation arrangements must be fully aligned with the existing government systems. The country's five-tier decentralised system (nation, state, county, payam and boma) is of prime importance to CAMP not only because of the government's decentralisation policy but also because of the localised nature of agriculture. Almost 20 years after its introduction, institutional, human and physical capacity () remain a major challenge at all levels (see SAR Chapter 6).[9] Most states face serious public finance management (PFM) problems, characterised by weak financial accountability and reporting, ineffective controls and lack of transparency. This problem is compounded by the complex governance structures, with weak inter-ministerial and inter-governmental coordination. Each state has its own legislative council and authority to levy taxes in addition to one levy by the national government, which makes it difficult for the national government to monitor the states' budget utilisation and revenue mobilisation. Since the overall government capacity and institutional arrangements are likely to improve but only slowly, it is necessary to include components in CAMP to cope with the situation, e.g., national-state coordination mechanisms and capacity development.

Land tenure: Access to land, tenure security and land use is a key factor of agricultural development. However, lack of a strong institutional and legal framework for land classification, land uses and ownership has led to unsustainable uses and inequitable distribution of land resources.[10] Land rights are not secured for socially vulnerable people, such as women, returnees and IDPs (see SAR Chapter 8). Despite the adoption of the Land Act in 2009 and the Land Policy in 2013, land administration systems for public, private and community land are weak due to the absence of: a comprehensive land classification map, enforcement of land use plans according to the existing land law, an audit and monitoring system, and clear procedures for land acquisition. As a result of the civil war, customary laws have been weakened and are no longer effective in securing equal land rights for every community member. Since the limited access to land is currently one of the most serious constraints on agricultural investment in South Sudan, close collaboration with related institutions, such as the South Sudan Land Commission, would be needed in CAMP implementation.

2.5 Infrastructure

Infrastructure, particularly transport and communication, significantly affects the overall capacity to move people, inputs and output, and to send and receive information in the agricultural sector. Infrastructure development itself is outside the jurisdiction of CAMP Implementing agencies, but it is developable and controllable through proper planning and

[9] Also see African Development Bank Group. February 2010. Sudan Country Brief 2010/2011. Tunis: AfDB. p. 3.

[10] Ministry of Agriculture, Forestry, Cooperatives, and Rural Development. 2012. Agriculture Sector Policy Framework (ASPF): 2012-2017. Juba: GRSS. p. 42.

coordination within the government and with the private sector. Moreover, certain kinds of infrastructure, such as marketing and animal health facilities, can be developed under CAMP, although the public sector's role needs to be defined with regard to the private sector's roles.

Transport: Weak transport infrastructure has been a major obstacle to food security and agricultural development in South Sudan.[11] There are many areas that cannot be reached by road particularly during the rainy season, and transport vehicles are in short supply. Farmers under these conditions are difficult to reach with improved technology. It also serves as a disincentive for farmers to produce surplus crops, as farmers find it expensive and very difficult to transport surpluses to the markets. The results of the situation analysis indicate that transportation cost is by far the largest cost component of food marketing, because of the poor state of transport infrastructure; they accounts for 15-50% of marketing costs depending on the commodity (see SAR Section 5.4). Such a situation was also pointed out by FAO/WFP 2008 mission, which concluded that the need for a concerted effort of rehabilitating/building feeder and trunk roads cannot be overemphasised.[12]

Communication: Poor communication infrastructure imposes additional constraints on agricultural development in South Sudan. Not only farmers, but also government staff's, access to mass media, such as publications, radios, or television, and to ICT is limited; this limits their knowledge and information on options available for technology, production, marketing and other activities (planning, monitoring, reporting, etc.). The recent development of communication by mobile phone, however, seems to have greatly improved communication throughout the country. Information available via mobile phones, such as market prices and weather forecasts, would help farmers gain higher profits, prevent crop losses, and mitigate effects of natural calamities,[13] and allow government staff to take necessary measures more quickly and report more efficiently. The agriculture-related information services can be strengthened under CAMP in coordination with other government agencies.

[11] For example, this problem was repeatedly reported by FAO/WFP's Crop and Food Security Assessment Mission since the 1990s. Also see SAR Chapter 7.

[12] Food and Agriculture Organization of the United Nations and World Food Programme. December 2008. *Crop and Food Security Assessment Mission to Southern Sudan Special Report*. Rome: FAO and WFP. p. 4.

[13] World Bank. November 2011. ICT in Agriculture Connecting Smallholders to Knowledge, Networks, and Institutions. e-Sourcebook. Washington, D.C.: World Bank. p. 5.

3. Private sector actors and markets as instruments for development

For development and implementation of CAMP, markets are considered as major instruments of public interventions to achieve food security and agricultural development.

Originally the country was suffering from the Dutch disease (negative consequences arising from large increases in a country's revenue from natural resources, foreign aid, etc.). The currency inflows led to currency appreciation, making the country's other products less price competitive, both domestically and in the export market. It also led to: an increase in imports; the movement of labour from pre-existing productive activities, such as agriculture, to other activities, such as service industries (construction, transport, trade, etc.), and to the new booming industries (oil, new government/UN/NGO jobs, etc.); and increases in wages and prices.

More recently, after the oil shutdown, the currency has depreciated on the parallel market and inflation has continued fuelled by higher government expenditures and an increased demand for imported goods and services due to a large numbers of returnees. The inflationary situation has been detrimental to the agricultural sector because farmers suffer, as producers, from increased prices of inputs and labour and, as consumers, from increased prices of food and other necessities.

In South Sudan, wages for agricultural labour have increased as described above. However, the productivity of labour has not increased to match these increases, so it is uneconomic for farmers to employ additional labour. The input productivity of agricultural labour is low.

Markets regulate production and consumption by market participants, and facilitate adjustment of prices and movement of goods among businesses; they also store and release excess supply of goods, and provide opportunities to rural households to achieve food security and income growth. Government's role is to nurture and regulate the development of fair and competitive markets to prevent market failures. Markets include labour, land, technology and capital markets, and there is an agriculture output market. Understanding these markets, from the point of view of market failure and efficiency, is necessary to identify shortcomings and opportunities for efficiency gains. With well-designed public interventions based on this understanding, government will be able to play a dual role of effective and efficient regulator, and of facilitator of the markets in order to protect vulnerable households, prevent and correct market failures and promote private sector investment in the agriculture sector. Market behaviours are a collective representation of numerous market players; markets and their players are inseparable for understanding their dynamics. Therefore, markets and their players and are treated concurrently in this section.

3.1 Market types and their characteristics with respect to agricultural development

Markets are classified into five types as: 1) subsistence production; 2) local market; 3) domestic market; 4) regional market; and 5) global market. The markets concerned include input markets, such as land, labour, capital (or technology) markets, and output markets. Table 3-1 summarises the market types and their characteristics. It also shows the expected impacts for each market type in the achievement of food security, economic growth and agricultural transformation. These will be used to develop the indicators necessary for monitoring and evaluation during CAMP implementation.

Table 3-1: Market types and their characteristics

Market type and spatial extent	Characteristics of value chain and value added[1]	Expected impacts on food security, economic growth[2], and agriculture sector transformation
(1) Subsistence production (intra-household transaction)	• 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 in rural economy)	• 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 in national economy)	• Medium value chain with medium value added • Inter locality 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 (transaction in regional economy)	• Long value chain with high value added • International value transfer in the region (East Africa)	• 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 (transaction in global economy)	• 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.

Notes: 1) Opportunity costs for capital and labour inputs should be accounted in the estimation of value added. 2) Economic growth is indicated by increase in labour productivity and returns on capital input which could be used as indicators.

3.2 Rural households and labour markets

. Households are assumed to make decisions on how to use land, labour and technology inputs for agricultural production based on the market for agricultural produce and other external conditions. Technology is treated as part of the capital market as the application of technology requires capital. Fertile land and rural labour are available, but households still do not produce enough and are vulnerable to food insecurity. The questions are: why is food insecurity still an issue; and why are households still dependent on household manual labour, which limits expansion of arable land for production. The land and labour would seem to be sufficient, but for some reason, the agriculture sector has not eliminated food insecurity in South Sudan.

It was estimated that about 78% of households were engaged in subsistence agriculture and pastoralism. The 2008 Population Census estimated that 63% of those aged 15 and above were employed in agriculture, animal husbandry, forestry, fisheries and mining. Eighty nine percent of rural households were engaged in cultivation and 24% in fisheries; 80% of them

owned livestock in the same year. The rural households exhibit widespread practices of production diversification. The observations indicate that rural households are major practitioners of subsistence farming involving multi-sector production, trading and consumption. Therefore, an in-depth understanding of household behaviour regarding their production assets and labour input is necessary to develop sensible and achievable long-term scenarios for agriculture development, to achieve food security, income growth and economic development, plus transformation of the agriculture sector.

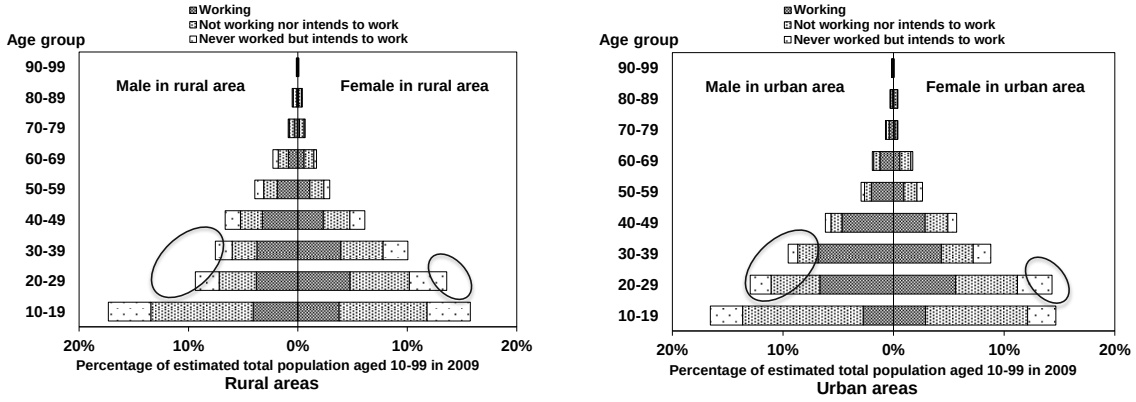
The concepts of food security and income growth are in the realm of household economics. Even though economic growth and agriculture sector transformation are normally driven by business and production actors, the supply of an educated labour force and capital from households to these actors must be critical. To achieve non-oil sector GDP growth, an understanding of the dynamics of rural households would contribute significantly to the efficiency and effectiveness of the impacts generated by public interventions. In this section an attempt is made to describe and analyse characteristics of rural households based on the observations obtained through the situation analysis. Despite the professionals' belief that there is abundant and productive land and favourable agro-climatic conditions in South Sudan, the data obtained for the analysis of household characteristics does not match this view. Due to high wage rates and labour scarcity agriculture in South Sudan cannot make land as productive as supposed to be.

3.2.1 Out-migration

One of the production inputs influencing households' decision-making is their labour. The observed population structure is a result of the cumulative effects of households' decisions regarding their labour allocation; it provides useful information to forecast the future dynamics of households' production and consumption.

Figure 3-1 shows the working status of the past 7 days by age group in rural and urban areas in all 10 states[14]. Although urbanisation of the country should be considered at an early stage, signs of out-migration from rural areas to urban areas are apparent. The circled areas of male age groups of 20-29 and 30-39 seem to be shifted to the circled areas of the same age groups in the urban areas. Similarly, the circled area of the female age group 20-29 years in rural areas seems to be shifted to the urban areas. However, females' out-migration from rural areas is less significant than that of males'.

Figure 3-1: Working status of past 7 days by age groups in all states



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

[14] Survey data from Western Equatoria State is excluded from the analysis due to inconsistencies in the dataset.

Table 3-2: State-wise working status of past 7 days for 20-59 years age group

State	Male				Female				Total			
	Working	Not working nor intends to work	Never worked but intends to work	Male sub-total	Working	Not working nor intends to work	Never worked but intends to work	Female sub-total	Working	Not working nor intends to work	Never worked but intends to work	Total
Rural areas												
Upper Nile	53%	31%	15%	100%	35%	45%	20%	100%	43%	39%	18%	100%
Jonglei	25%	45%	30%	100%	15%	58%	27%	100%	19%	52%	28%	100%
Unity	50%	19%	31%	100%	41%	25%	34%	100%	45%	22%	33%	100%
Warrap	14%	43%	42%	100%	8%	45%	47%	100%	11%	44%	45%	100%
Northern Bahr el Ghazal	43%	43%	15%	100%	35%	47%	18%	100%	38%	45%	17%	100%
Western Bahr el Ghazal	91%	9%		100%	85%	14%	1%	100%	87%	12%	1%	100%
Lakes	62%	23%	14%	100%	59%	27%	14%	100%	60%	25%	14%	100%
Western Equatoria	41%	43%	17%	100%	32%	52%	16%	100%	38%	45%	17%	100%
Central Equatoria	75%	23%	1%	100%	61%	35%	5%	100%	67%	30%	3%	100%
Eastern Equatoria	41%	38%	22%	100%	28%	48%	24%	100%	34%	43%	23%	100%
All states	45%	34%	21%	100%	37%	40%	23%	100%	41%	37%	22%	100%
Urban areas												
All states	61%	27%	12%	100%	43%	38%	19%	100%	53%	32%	15%	100%

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

The results summarised in Figure 3-1 also represent household members' reporting of working status during the past 7 days at the date of interview (May-June 2009). Almost half of the adult male population in the rural areas, 20 years and older, were not working at the time of survey (i.e. beginning of the wet season) whereas more than half of the same segment of the population in urban areas was working. Traditionally homemaking is considered a women's responsibility in South Sudan. The survey excluded homemaking from working status; therefore the working status of women in both rural and urban areas was similar, with more than half of the women not working.

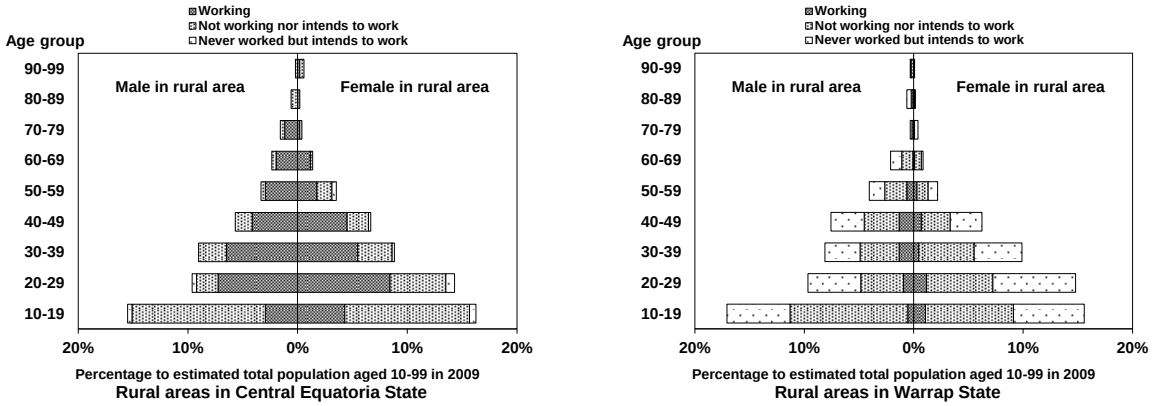
The significant finding indicated by the results in Table 3-2 and Figure 3-1 is the existence of a high level of non-working or excess labour (55% for males and 63% for females) within the productive population in rural areas. It is consistent with the nation-wide tendency that rural households with excess labour encourage their members in the age group of 20-59 years to migrate to urban areas; this reduces the opportunity cost of non-migration. An opportunity cost is the cost of a missed opportunity, in this case, the greater chance of working (or benefit) gained by migrating to an urban area. As shown in Table 3-2 the chance of working in urban areas is higher (61% for males and 43% for females) than in rural areas (45% for males and 37% for females). The difference between the chance of working in rural and urban areas for males is 16% (i.e. 61% minus 45%) which is the opportunity cost of not migrating. The opportunity cost for females is 6% (i.e. 43% minus 37%), which is significantly lower than for males. This interpretation is consistent with the observation that the magnitude of male out-migration is larger than female; in Figure 3-1 and Table 3-3 the dominance of females in rural areas and males in urban areas is apparent.

The policy implications of the above could be, for example, mobilisation of excess labour for generation of market values (GDP), and to lower the opportunity cost of non-migration through improvement of labour productivity in rural areas. However, it is still not clear why labour is not fully utilised in rural areas given the abundant and untapped fertile land resources.

3.2.2 Households' response to temporal and spatial conditions

The rural labour situation is not uniform within South Sudan. As shown in Table 3-2 the labour situation varies significantly among the states. The highest percentages of people working are found in Western Bahr el Ghazal State (87%) and Central Equatoria State (67%), and the lowest in Warrap State (11%) and Jonglei State (19%). Figure 3-2 shows the working status of the past 7 days by age group in the rural areas of Central Equatoria State (high working percentage) and Warrap State (low working percentage). Most males and females in the age group 20-59 years were working in Central Equatoria State, but only a limited number of the same age group in Warrap State were working. These household decisions of labour allocation can be attributed to differences in land and soil conditions (i.e. low land fertility resulting in low working opportunities for agriculture, and vice versa), seasonality (i.e. farming season in Central Equatoria and non-farming season in Warrap State), differences in market conditions, etc.

Figure 3-2: Working status of past 7 days by age groups in rural areas of two states



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

Table 3-3: Payment and work types for 20-59 years age group

Activity	Rural areas									Urban areas								
	Male			Female			Total			Male			Female			Total		
	Paid	Not paid or not known	Total	Paid	Not paid or not known	Total	Paid	Not paid or not known	Total	Paid	Not paid or not known	Total	Paid	Not paid or not known	Total	Paid	Not paid or not known	Total
Status during the last 12 month																		
a) Working	**9.6%**	**11.4%**	**21.0%**	**5.7%**	**13.6%**	**19.3%**	**15.3%**	**25.0%**	**40.4%**	**24.1%**	**7.2%**	**31.2%**	**13.4%**	**6.8%**	**20.2%**	**37.5%**	**14.0%**	**51.5%**
Animal husbandry	0.1%	1.2%	1.3%	0.0%	0.4%	0.4%	0.1%	1.6%	1.7%	0.1%	0.7%	0.9%	0.1%	0.1%	0.1%	0.2%	0.8%	1.0%
Farming	2.7%	6.6%	9.3%	2.5%	8.0%	10.6%	5.2%	14.6%	19.8%	0.9%	1.0%	1.8%	0.6%	1.0%	1.6%	1.5%	1.9%	3.4%
Fishing	0.3%	0.2%	0.5%	0.1%	0.0%	0.1%	0.4%	0.3%	0.6%	0.3%		0.3%	0.0%	0.0%	0.1%	0.3%	0.0%	0.3%
Forestry	0.3%	0.1%	0.3%	0.1%	0.1%	0.2%	0.4%	0.2%	0.5%	0.3%	0.1%	0.4%	0.1%	0.1%	0.2%	0.4%	0.2%	0.6%
Household employees	0.6%	1.7%	2.3%	1.0%	3.5%	4.5%	1.5%	5.2%	6.8%	0.6%	1.0%	1.6%	1.6%	2.1%	3.7%	2.2%	3.1%	5.3%
Construction and industry	0.2%	0.1%	0.3%		0.0%	0.0%	0.2%	0.1%	0.3%	1.4%	0.2%	1.6%	0.1%	0.0%	0.2%	1.6%	0.2%	1.8%
Trade and transportation	0.4%	0.0%	0.5%	0.2%	0.1%	0.3%	0.6%	0.2%	0.7%	2.6%	0.3%	2.9%	0.6%	0.2%	0.8%	3.2%	0.5%	3.7%
Services	1.8%	0.8%	2.6%	1.3%	1.2%	2.5%	3.1%	1.9%	5.1%	6.2%	2.2%	8.3%	5.8%	2.6%	8.5%	12.0%	4.8%	16.8%
Government	3.2%	0.7%	4.0%	0.6%	0.2%	0.8%	3.8%	1.0%	4.8%	11.7%	1.7%	13.4%	4.4%	0.7%	5.1%	16.1%	2.3%	18.4%
b) Not working			**27.2%**			**32.5%**			**59.6%**			**21.2%**			**27.3%**			**48.5%**
c) Total			**48.2%**			**51.8%**			**100.0%**			**52.4%**			**47.6%**			**100.0%**
Status during the last 7 days																		
d) Working	**6.4%**	**15.5%**	**21.9%**	**3.1%**	**16.3%**	**19.4%**	**9.5%**	**31.8%**	**41.3%**	**19.4%**	**12.3%**	**31.7%**	**11.4%**	**9.2%**	**20.5%**	**30.8%**	**21.5%**	**52.3%**
e) Not working			**26.2%**			**32.5%**			**58.7%**			**20.7%**			**27.0%**			**47.7%**
f) Total			**48.2%**			**51.8%**			**100.0%**			**52.4%**			**47.6%**			**100.0%**
Increase in "Paid" (a/d-1)	**50%**			**84%**			**50%**			**24%**			**18%**			**22%**		

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

There are a number of factors influencing the differences in the working status of household in the two states presented in Table 3-3. Households were asked to report on their work during the last 12 months and during the last 7 days. The table indicates that working status during the last 7 days and last 12 months are almost the same. However, the percentage of paid work increased significantly in rural areas, but less so in urban areas, e.g. 6.4% of rural males were paid during the last 7 days whereas 9.6% were paid during the last 12 months, which is 50% higher. As work in rural areas is more seasonal than in urban areas, seasonality should affect both the working status and wages for paid work in rural areas. However, the magnitude of excess labour is almost identical in both periods, so the influence of seasonality on working status, as presented in Figure 3-2, must be small, and the differences could be attributed to other factors.

Spatial factors, such as land productivity, agro-climatic conditions, and market conditions could also be responsible for households' production decision-making. Central Equatoria, situated in the Greenbelt, and Hills and Mountains Livelihood Zones, has more favourable physical and market conditions than Warrap State, which is situated in the Western Flood Plains Livelihood Zone. As a result more labour is employed in agricultural production in Central Equatoria suggesting the existence of an active rural labour market and somewhat less out-migration as indicated in Figure 3-2. An example of policy implication is that the characteristics of the rural labour market in each state needs to be incorporated into programme and project formulation and strategic selection of intervention locations.

3.2.3 On-farm and off-farm employment

Approximately 15% of the age group 20-59 years in rural areas was engaged in paid work during the 12 months in 2009, whereas in the urban areas it was 38%, indicating that there is more than twice the chance of finding paid work in urban areas than in the rural area. For females, the chance of their engagement in paid work is about half that of males' in both rural and urban areas. In rural areas 5.2%, 3.8% and 3.1% of people in the 20-59 years age group were engaged in paid work in the farming, government and services sectors. In the urban areas government (16.1%), services (12.0%), household employment (2.2%), trade and transportation (3.2%) and farming (1.5%) are major areas of paid work.

Table 3-4: Estimated average monthly wages in 2009 in Sudanese pounds

Activity	Rural areas			Urban areas			National
	Male	Female	Average (arithmetic)	Male	Female	Average (arithmetic)	average (arithmetic)
Animal husbandry	19	73	46	264	193	229	137
Farming	170	121	145	262	186	224	185
Fishing	282	204	243	387	25	206	224
Forestry	371	137	254	525	317	421	338
Household employees	134	110	122	331	135	233	177
Construction and industry	365	N.A.	365	596	595	596	480
Trade and transportation	1,256	728	992	901	279	590	791
Services	257	125	191	807	323	565	378
Government	602	374	488	926	638	782	635
Average wage (arithmetic)	384	234	309	555	299	427	368

Note: 1) Underlined estimated values are not reliable due to small number of observations (less than 10 observations). 2) Wage payment includes in-kind payment.
Source: Data from the National Baseline Household Survey 2009.
Prepared by NBS/CAMP Task Team

Table 3-4 shows estimated average monthly wages by activity in 2009 in Sudanese pounds (SDG). The average wage in urban areas (SDG 427) is about 38% higher than that of rural

areas (SDG 309). In rural areas trade and transportation provides the highest average wage of SDG 992 followed by government (SDG 488), construction and industry (SDG 365), forestry (SDG 254), and fishing (SDG 243). In the agricultural sector, forestry and fishing employs a small proportion of the age group 20-59 years (0.6% for fishing and 0.5% for forestry). The monthly wages are relatively high (SDG 243 for fishing and SDG 254 for forestry) indicating that fishing and forestry (charcoal making and chainsaw timber production) work is done by skilled workers. The most common paid work in rural areas is farming, but payment is moderate (SDG 145). A large proportion (19.8%) of the age group 20-59 years was engaged in nonpaid farming work probably because they worked on their own agricultural land. Although the work was not reported as paid work, it should be considered as paid work, since it added value in the production of agricultural crops.

3.2.4 Characteristics of livestock production

Animal husbandry work seems to have special characteristics. Although 1.7% of the age group 20-59 years in rural areas was engaged in animal husbandry, only a small portion (0.1%) was paid. In addition, wages, as indicated in Table 3-4, are very low. As described in a later section the possession of livestock is widely practiced, not only by nomads and pastoralists, but also by crop farmers. In fact 67% of households with land in rural areas own livestock. In this sense the reported percentage (1.7%) of people engaged in animal husbandry seems too low. Based on this observation and other results from the situation analysis, animal husbandry, as an important element of the livestock subsector, can be characterised in the following ways:

(1) Households do not see animal husbandry as an economic production activity. They rather consider it as maintenance of assets that have a social and cultural value with expectation of only a small economic return. If animal husbandry is part of asset diversification as a coping strategy (discussed later), the economic value of livestock is only realised at the time of an economic shock, such as food insecurity.
(2) If households think of animal husbandry as an economic production activity, they may see animal husbandry as a very labour intensive secondary economic activity which, by design of the questionnaire used for the survey (one person one activity), was not well-captured. Also, the low wages associated with animal husbandry may suggest that this work is mainly done by the age group younger than 20 years, which is not reflected in Table 3-3.

Broad implications for policy implementation could be public interventions to promote the economic value of animal husbandry through developing markets for livestock products and promoting consumption, and to reduce the risk of economic shocks and food insecurity.

3.2.5 Rural unemployment and labour market transaction costs

Although there exists some excess labour in rural areas as indicated in Table 3-2 and Table 3-3, the monthly wages for farming were SDG 145; this was one third of the average wage (SDG 488) of government workers in same areas, whose work should be considered well paid. As shown in Table 3-5, a large proportion (50%) of males in the age group 20-59 years in rural areas reported losing hope of finding jobs. For females, this proportion declined to 25%, due to their fulltime occupation of homemaking.

Assuming land and labour are plentiful, the question is why only a small proportion of available labour is hired. If the labour market is competitive with relatively low wages, it might be assumed that more labour would be hired. However, for subsistence and smallholder farmers, the increase in production gained by hiring extra farm workers is not sufficient to cover the extra wages. Also, there are the large transaction costs for rural labour, such as commuting costs, over and above actual wages. Prices and wages are set externally due to large inflows of money by government activities into the rural areas.

Table 3-5: Reasons not working or never worked before for 20-59 age group

Age group	Male										Female									
	No hope to find job	Full time student	Income recipient	Too old	Disabled/ too sick	Full time homemaker/ housewife	Pensioner/ retired	Unknown	Total	**% to total male**	No hope to find job	Full time student	Income recipient	Too old	Disabled/ too sick	Full time homemaker/ housewife	Pensioner/ retired	Unknown	Total	**% to total female**
Rural areas																				
10-19	29%	52%	1%	2%	2%	9%	0%	4%	100%	**47%**	38%	37%	1%	2%	1%	16%	0%	5%	100%	**34%**
20-59	50%	17%	0%	8%	4%	18%		4%	100%	**44%**	25%	5%	0%	12%	2%	53%	0%	3%	100%	**59%**
60-99	20%	6%	1%	55%	8%	8%		2%	100%	**9%**	17%	8%	1%	57%	4%	9%	1%	3%	100%	**7%**
Total	**37%**	**32%**	**1%**	**9%**	**3%**	**13%**	**0%**	**4%**	**100%**	**100%**	**29%**	**16%**	**0%**	**11%**	**2%**	**37%**	**0%**	**4%**	**100%**	**100%**
Urban areas																				
10-19	14%	75%	1%	2%	1%	4%	0%	2%	100%	**56%**	15%	67%	0%	1%	1%	9%	0%	6%	100%	**40%**
20-59	29%	41%	1%	6%	3%	11%	1%	6%	100%	**40%**	26%	14%	1%	8%	3%	42%	1%	5%	100%	**54%**
60-99	24%	16%	1%	34%	1%	6%	7%	9%	100%	**5%**	13%	15%	1%	49%	7%	6%	2%	7%	100%	**7%**
Total	**20%**	**59%**	**1%**	**5%**	**2%**	**7%**	**1%**	**4%**	**100%**	**100%**	**21%**	**35%**	**1%**	**8%**	**3%**	**27%**	**1%**	**5%**	**100%**	**100%**

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

3.2.6 Cash inflow to rural areas as a constraining factor for food security

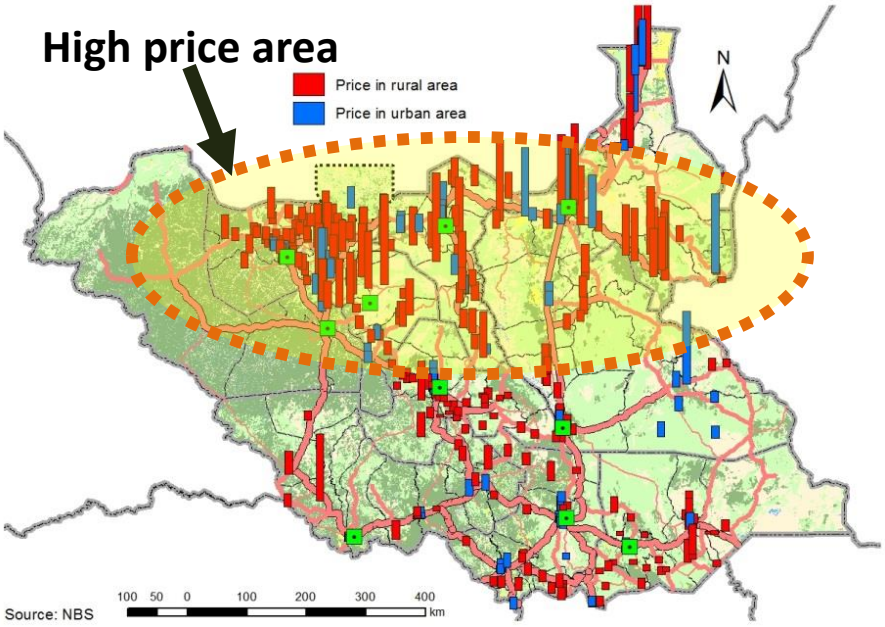
Table 3-3 and Table 3-4 indicate that there are large numbers of government workers in both rural and urban areas. In the rural areas 3.8% of the age group 20-59 does paid work for the government (including security officials); in urban areas, this increases to 16.1%. Monthly salaries of government staff are significantly higher than those of agricultural sector workers. This high number of government workers will result in large inflows of cash into rural areas, which will result in a negative distortion of the agriculture sector's performance. More than 95% of government revenue comes from concession fees levied on the oil industry and so comes from sources external to South Sudan, not from taxes or revenues generated inside the country.

An example of the negative consequences of large cash inflows to rural areas is exhibited in Figure 3-3. The strong purchasing power of money injected from the public sector could be a major cause of the high price of sorghum (dura) observed in Northern Bahr el Ghazal, Unity and Warrap states where sorghum is a major staple food. The incidence of poverty in these three states is more than 64%, which is among the highest in the country. Although sorghum is very expensive in local markets, households who are producers of sorghum may not benefit from this. If sorghum is not as highly priced in comparison with other goods and services, a household, which is a net seller of sorghum, will have a negative net income from agricultural production; this needs to be supplemented by income from off-farm employment and/or remittances. If a household is a net buyer of sorghum, high sorghum prices always result in the depletion of the household's cash and/or assets, which again needs to be compensated by other sources of income.

In fact data shown in Table 3-6 indicates that, on average, households in the rural areas of Unity, Warrap and Northern Bahr el Ghazal states are overwhelmingly net buyers. On average 78%, 55% and 62% of sorghum consumed in the rural areas of Unity, Warrap and Northern Bahr el Ghazal states, respectively, was purchased from local markets. Only 10% to 25% was from their production. The cash necessary for these purchases must come from the sale of other products, off-farm employment, transfers from agencies, and/or remittances. Moreover, it is probable that large income and asset outflows for the purchase

of staple food would result in low asset and capital bases, so preventing the employment of technologies for better agricultural labour productivity. Households' available labour is not easy to sell in a restricted labour market with high transaction costs. Such financial constraints must result in households vulnerable to food insecurity.

Figure 3-3: Spatial distribution of sorghum (dura) consumption and price in May 2009



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

Table 3-6: Sources of sorghum consumed by rural and urban areas

State	Area	Annual consumption (% to total)					Annual per person consumption (kg/person)
		From procured	From own stock	From own production	From gift and other sources	Total	
Unity	Rural areas	78%	8%	10%	3%	100%	65
	Urban areas	76%	17%	5%	2%	100%	74
Warrap	Rural areas	55%	18%	25%	2%	100%	154
	Urban areas	72%	12%	13%	3%	100%	102
Northern Bahr el Ghazal	Rural areas	62%	11%	23%	4%	100%	158
	Urban areas	87%	7%	2%	3%	100%	119
Whole nation	Rural areas	54%	14%	28%	4%	100%	124
	Urban areas	71%	14%	13%	2%	100%	70

Note: Values presented in this table is estimated from information on consumption made last 7 days.
Source: Data from the National Baseline Household Survey 2009.
Prepared by NBS/CAMP Task Team

3.2.7 Households' diversification strategy

Asset, production activity and Income diversification as a household livelihood strategy is widely observed in rural Africa. Despite the persistent image of Africa as a continent of "subsistence farmers," nonfarm income sources may already account for as much as 40-

50% of the average household's income[15]. As shown in Table 3-7, the results of the situation analysis also confirmed that diversification of production and income is a widespread livelihood strategy in the rural areas of South Sudan.

Table 3-7: Households with agriculture and livestock holding in 2009

Area	Household with land			Household without land			Total
	With livestock	Without livestock	Sub-total	With livestock	Without livestock	Sub-total	
Rural areas	67%	19%	86%	8%	6%	14%	100%
Urban areas	14%	10%	24%	24%	52%	76%	100%
Whole nation	59%	18%	77%	10%	13%	23%	100%

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

However, for the purpose of designing public interventions, households' motives for diversification should be understood. The first set of motives are passive: 1) risk reduction prior to a crisis/shock; 2) coping with diminishing labour productivity due to, for example, limited land and increase in population; 3) reaction after a crisis/shock or financial constraints; 4) self-provision of goods and services due to market failure. The second set of motives is active: 1) realisation of complementarities between activities, such as crop-livestock integration, and 2) specialization to gain a comparative advantage due to superior technology skills[16].

In many cases the passive motives are observed among the poor and vulnerable, and the active motives among wealthier and more capable households. Therefore, households' motives for crop-livestock integration, observed in South Sudan and shown in Table 3-7, can be understood as depending on the socioeconomic context of households. For the passive motives, public interventions should be designed to minimise perceived risks, prevent decline in productivity, compensate for damages suffered, and remove causes of market failure. For the active motives, the public interventions should enhance complementarity of different production systems and improve specialisation to allow efficiency of production and economies of scale.

3.2.8 Returnees and internally displaced persons

For CAMP development, returnees and internally displaced persons could be considered as a special type of household. Returnees are households returning from, for example, Sudan who can stay several days or months at facilities called "transit sites" in Sudan and "way stations" in South Sudan, before finally returning to their home community in South Sudan from where they originally came. In the case of returnees that do not have a home community, host communities are found for them to move to. There are two types of internally displaced persons (IDPs): one is internally displaced due to the civil war and the other is displaced due to insecurity and natural disasters such as drought and flood. At present, most IDPs are of the latter type. 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, the settlement process tends to be more difficult than for returnees due to the fact that they are originally not community members. If the IDPs are

[15] Little, Peter D., Kevin Smith, Barbara A. Cellarius, D. Layne Coppock and Christopher B. Barrett. 2001. Avoiding Disaster: Diversification and Risk Management Among East African Herders. *Development and Change*, 32: 401–433.

[16] Barrett, Christopher B., Thomas Reardon, and Patrick Webb. 2001. Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications. *Food policy*, 26(4), 315-331.

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.

Before returnees and IDPs are resettled in their home or host community, emergency and humanitarian public interventions will be necessary as they are households with little or means of production. All their decisions concern their welfare and not production. In this stage, returnees and IDPs could be considered as a special type of household. After resettlement their priority will be resource allocation for production. At this time, they will become the target of regular public interventions intended to enhance their productivity and market integration.

3.2.9 Gauging effectiveness of public interventions

The failure of rural labour input markets and agricultural output markets and the inability of the government to correct such market failures contributes to the food insecurity of vulnerable households in rural areas. Public interventions designed as part of CAMP need to be capable of addressing both these failures and the government's inability to deliver focused public services for maximum impact. Public interventions in the rural labour and agricultural output markets will be considered as instruments to achieve the development goals of the agriculture sector. Many experiences of rural development in other countries have demonstrated that off-farm and nonfarm employment, within or outside the agricultural sector, provide good indicators of development goals. These indicators can be used to monitor and evaluate households' progress in adapting transformation of the agriculture sector and increase in income and move out of poverty.

3.3 Agribusinesses and output markets

3.3.1 Key players of output markets

As shown in Table 3-8, for the purpose of CAMP development, merchants are classified into 4 categories: traders, middlemen, wholesalers and retailers; another key player is the market authority. The situation analysis revealed that the main agribusinesses are small merchants, with only a few medium to large commercial size producers, processors and manufacturers. Therefore, discussion is concentrated on the characteristics of these merchants, output markets, and the actual operation of marketplaces. To analyse the functions of output markets and marketplaces, examples are drawn mainly from the study of the Greater Juba market which included Konyokonyo, Custom, Jebel, Munuki and Gudele markets. A typical relationship of key players and flow of products is described in Figure 3-4.

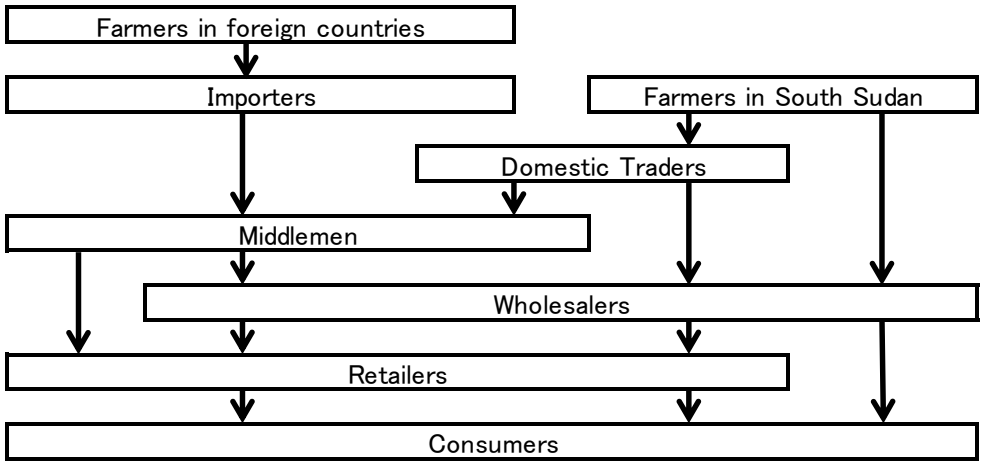
In the agricultural products markets (or output market), transactions for goods and services are considered to function well despite the fact that costs of distribution and transportation are very high, mainly due to poor road conditions, particularly during the wet season. Supply and demand are available and market players make a profit on their transactions, all of which make markets thrive. It is observed that merchants are able to pass on high transportation and market transaction costs to buyers. This may be partly attributed to the strong purchasing power of the large number of government employees, particularly in urban areas as indicated in Table 3-3.

Table 3-8: Key players in markets and their roles

Classification	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.
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 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 in other states, 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.

Figure 3-4: Key players and their relationships



Note: Arrows indicate directions of flows of merchandise.
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.

3.3.2 Regional and domestic markets

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. Juba market receives imported consumable goods from neighbouring countries and distributes them to smaller markets all over South Sudan. The large volumes of agricultural products imported from Uganda is a clear response of the market players to the current market environment, where Ugandan products have better market competitiveness than that of domestic products. 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.

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. 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.

3.3.3 Relationship among merchants and management of marketplace

A schematic presentation of the relationship among merchants is shown in Figure 3-4. This regional market is dominated by large scale actors working with small and medium traders. The large-scale traders sell various kinds of products including staple foods and vegetables from different regions. 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.

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). 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. There is scope for an increase in traded volumes using credit-based transactions.

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 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. 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.

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.

3.3.4 Output markets as food supply stabiliser

The incoming volume of agricultural commodities to the Juba markets is shown in Table 3-9. The volume fluctuates from month to month, in particular the volume of maize flour. In 2011, the highest amount was 21,048 tonnes in May whereas none was recorded in October, November and December. Due to high market prices in Uganda from October to December, traders do not purchase many agricultural commodities in Uganda. This suggests that a large pooling capacity or supply stabilization function is part of the market mechanism in Juba. Consumption of main staples by consumers is assumed to be stable, so merchants store staples and release them from their stock during October to December. This pooling and stabilising function is only applicable for storable commodities. Public interventions can be designed to enhance and control such functions of output markets. However, the experiences of the South African government should be considered; in South Africa all functions concerning food commodities are carried out by the private sector

Table 3-9: Monthly incoming commodities to Juba in 2011 (tonnes)

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**
Maize flour	984	1,076	207	900	21,048	1,413	1,733	3,791	26	-	-	-	**31,177**
Maize grain	39	32	75	53	497	-	-	5	1	-	-	-	**702**
Cassava flour	173	19	19	35	9	25	32	7	17	-	-	-	**337**
Rice	25	283	329	256	192	286	253	723	-	-	3	28	**2,376**
Ground 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

3.3.5 Low competitiveness of domestic agricultural commodities

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 counties in Central Equatoria State (CES) or neighboring states. Crops from CES are generally collected at the harvest site from the farmer by local traders and shipped to Juba markets. Although output markets in Juba are responding to seasonal patterns of market transaction costs, which are high in the wet season and low in the dry season, domestic production is not responding well to market signals concerning price. There are signs of development of peri-urban agriculture and poultry around Juba, but these production responses are considered to be slow. As discussed before the high cost of market inputs such as labour (e.g. the cost of labour for

off-loading in South Sudan is more than 3 times higher than in Uganda), fertiliser and transportation hinders the response of domestic producers.

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.

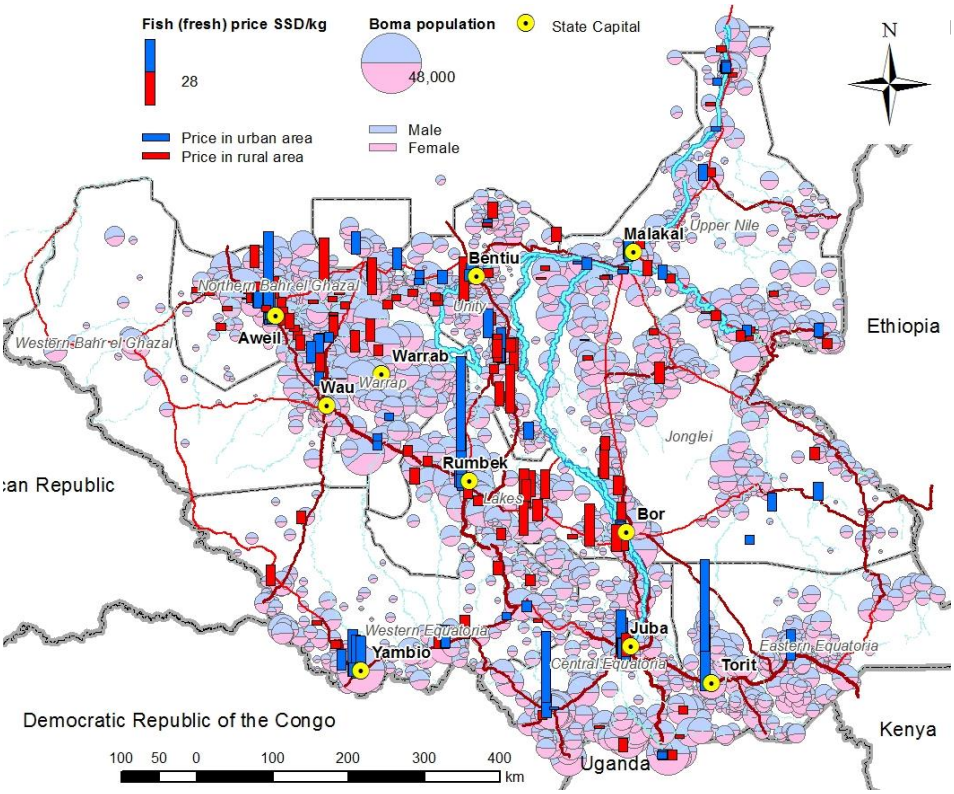
Multiple taxes, including informal (illegal) taxation, are the next highest marketing cost after transportation, which accounts for 15-50% of marketing costs. Taxes account for between 5 and 15% of the marketing costs. There are a large number of taxes and charges. There are also a daily fee to be paid 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. As a result of the above cost factors, for example, the price of cereal in the Juba market is three times more expensive than in Ugandan cities, both at the retail and wholesale levels.[17]

3.3.6 Market efficiency

Despite all these constraints, the agriculture products markets in South Sudan seem to be working well. However, if these constraints were removed, they could perform more effectively. An example of effective operation by traders is the fresh fish market, whose extent is domestic. This market works well, at least during the dry season. As shown in Figure 3-5 large volume of fresh fish is consumed throughout the country, whereas the capture of wild fish occurs only in certain confined areas. Since fresh fish is very perishable, it requires swift and efficient distribution and marketing with or without cooling. This was observed in 2013; a fish trader in Juba hires a pickup truck with two large freezers filled with 21 blocks of ice at SSP30 per block. The trader buys 800 kg of fresh fish from landing sites in Bor and transports the fish to sell in Konyokonyo market in Juba. The trader pays taxes of SSP300 per trip. There are about 10 such traders in Juba making one to three trips each per week. Although they complain of small profits, CAMP estimates that they are actually doing well.

[17] 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, D.C., World Bank.

Figure 3-5: Fresh fish consumption and price, and population distribution



Note: The locations of Boma population indicate the possible spatial extent of the fresh fish market. Since the production of fresh fish is confined to the Nile River and its major tributaries distribution networks of fresh fish must be efficient and swift.
Source: Data from the National Baseline Household Survey 2009.
Prepared by NBS/CAMP Task Team

3.3.7 Output (products) markets as instruments of agricultural development

The agricultural products markets are considered to be functioning well under the various constraining factors, and there is potential for them to be the drivers of agricultural development. If government interventions are effective in easing macroeconomic distortions, reducing high market transaction costs and removing other constraining factors, the markets will be powerful drivers to attain food security and agricultural growth. Public interventions would also aim at regulation of markets to achieve fair distribution of profits among market participants. To mobilise the markets as policy implementation instruments, it is necessary to rationalise taxation schemes, and increase the efficiency and transparency of import and export clearance. The experience from Uganda suggests that the transport industry also needs to be encouraged in order to reduce market transaction costs.

Although global and regional markets are functioning well as the import channels for foreign goods, continuing efforts to improve their functions will benefit the agriculture sector, especially when domestic agricultural products become internationally competitive and are exported. Some forestry products, such as teak timber and gum acacia, and to some extent charcoal, are already competitive in the regional and global markets; improvement of their export market channels could be considered to add more value to South Sudan economy.

To minimize market transaction costs, efficient, competitive, and fair business practices by agribusinesses and the public sector need to be promoted and regulated, through the

establishment and enforcement of laws and standards for business and taxation. Formation of business and producer associations would also be promoted to enhance private and public sector dialogue and collaboration among businesses.

Enhancement of the food supply stabilizer functions of output markets could be tested, and promoted if found effective. This may be more effective and less costly than publicly managed strategic food reserve programmes. Careful examination of other countries' food security arrangements would be carried out, so as to develop an appropriate mechanism for South Sudan to cope with emergency situations. The example of private sector oriented food security arrangements in South Africa is particularly interesting.

Although imported agricultural commodities are dominant in many large marketplaces in South Sudan, domestic agricultural commodities have the potential to take a larger market share; they are also an important component of agricultural production due to the rapid expansion of the urban sector, with large consumer markets. Promotion of commercial farming would be implemented, through the improvement of farmers' knowledge and business skills so that they can carry out market oriented production, quality control, and marketing using information technology.

3.4 Land markets

The development of a formal land market requires the establishment of rights associated with ownership and use of land, and the proper implementation of land laws to secure these rights. The Land Act is in place, but the Land Policy is still a draft awaiting parliament's approval. The Act classifies land as public land, community land or private land. However, the progress of registration of land rights based on this classification is slow, and securing the land rights for agricultural development under the Act may need some time to be effective. According to managers of banks in Juba, land is very rarely considered as collateral, and provision of loans to farmers to finance agricultural production is rare. Therefore, for CAMP implementation careful assessment of the on-the-ground situation of the land market and associated rights is required.

Although the establishment of formal land markets based on the implementation of the Land Policy and Act may take a while, securing land for agricultural development under the traditional system can be considered for CAMP implementation tool. Management of community land requires consultation and collective decision-making under the system of traditional authority, which has legitimate backing. For small holders, under the traditional authority, fair expansion and intensification of land-use in their area can be achieved, if land transactions and conflict mitigation are handled properly through traditional systems supported by legal systems. For the establishment of large- and medium-size farms, land transactions and securing land rights are exposed to the risk of claims from third parties. In this case combination of traditional and legal systems could be mobilised to achieve fair and amicable solutions.

3.5 Capital markets

The situation of capital (technology and financial) markets is similar to labour markets discussed in the previous section. Technology (or agricultural) inputs such as fertiliser, machinery, pesticide, and financial inputs necessary to purchase such technologies are also overvalued due to the money inflows. Since rural households are not able to achieve extra agricultural productivity to cover the costs of these inputs and the capital to finance them, households opt not to apply them to increase production. In this way, in South Sudan, the demand for technology and financial inputs has been depressed; the technology and financial markets are still undeveloped.

3.5.1 Technology markets

The technology (or agricultural inputs) markets of South Sudan are in the early stage of development. Introduction and enhancement of fertiliser use is under policy debate, although banning of fertiliser use is considered unlikely. Their high prices, and the underdevelopment of commercial and peri-urban farming with high input productivity, are the major reasons for the small technology markets. There are agribusinesses promoting the use of fertiliser, pesticides, improved seed, irrigation, and machinery through their marketing activities and establishment of demonstration farms. Despite the policy debate on use of fertiliser, the growth of this market is dependent on the growth of commercial farming, and appropriate macroeconomic policies to mitigate the impact of large money inflows to the local economy. It is expected that this input market will grow as the demand for agricultural inputs increases. Therefore, public interventions would be focused on expanding demand for inputs, and regulating the market through standardisation and the establishment of a fair and competitive market environment.

3.5.2 Financial markets

Although the potential for financing agriculture sector businesses by commercial and specialised banks is large, the financial markets for the agriculture sector in South Sudan are in their early stage of development. Using financial markets as a tool for agricultural development needs long-term efforts to lower business risks and increase productivity of capital inputs in the agricultural sector. At the same time, the efficiency and specialised knowledge of banking institutions focusing on agriculture sector investment must be established and enhanced. Since most of the current agribusiness entities are informal or micro- and small-scale enterprises with low creditworthiness, promotion of microfinance institutions and informal financial arrangements could also be considered for public interventions.

Currently, formal financial institutions consist of about 20 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.

Among the commercial banks, seven offer loans. The remaining banks mainly deal with the foreign currency exchange business which generates a substantial profit from the difference between the official buying and selling exchange rates. In 2013 the total of current annual new loans by all commercial banks in South Sudan is estimated to be approximately SSP 2 billion. Less than 1%, SSP20 million, goes to agriculture. KCB South Sudan finances half of the new loans, SSP 1 billion, and the remaining 6 banks, such as Equity Bank and Buffalo Commercial Bank, finance 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.

Commercial banks see high risks and low returns in lending to farmers because farmers lack liquid assets and property to be used as collateral. the risky nature of agricultural business due to unpredictable drought or floods, the volatile prices of agricultural products, the farmers' low business skills and few loan applications. 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. In the case of Buffalo Bank, applicants were primarily

importers, hotels and guesthouses. Similarly KCB received limited loan applications from agribusiness, only 1% of applicants.

ABSS is the only source of specialised finance for agriculture, offering soft loans. 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. 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. ABSS staff does not have enough management capacity, such as accounting and marketing.

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.

4. Public sector as service providers

The primary role of the government in CAMP implementation should be to provide an enabling environment for agricultural development. In the long term, their role would be confined to policy formulation, the establishment of a regulatory framework to reduce transaction costs, and the provision of public goods (including infrastructure) and safety nets for the most vulnerable in society. The government would not be a major provider or funder of goods and services that the private sector is capable of providing itself. However, South Sudan's private sector is still weak, partially because of poor infrastructure and regulatory frameworks, so in the short to mid-term, it will be necessary for the public sector to play a larger role, particularly in service delivery.

This chapter discusses the current situation and expected development of the public sector as a service provider in CAMP implementation. In brief, public sector human and financial resources, infrastructure and instruments for service delivery are very limited compared to the huge demand for public services. It will be essential to incorporate into CAMP mechanisms to develop public sector capacity for service delivery. The following discussions are presented as an input to the designing of the CAMP implementation framework, focusing on important aspects of public sector development such as governance, accountability and decentralisation, public financial management (PFM), regulatory and revenue collection services, research, extension and education, infrastructure development, aid coordination, and collaboration with civil society organisations.

4.1 Governance, accountability and decentralisation

Decentralised governance has been an aspiration of South Sudan since the outset of its struggle for independence, as manifested in the Constitution.[18] The SPLM/A's vision for the Civil Authority of New Sudan (CANS) was to establish "decentralised, democratic, efficient, effective, accountable and gender sensitive local government", based on which GoSS set a goal for local government as "an integrated viable system relevant to meet peoples' aspirations for self rule and basic service delivery needs."[19] Nevertheless, low governance, accountability and transparency are reported throughout the government system. The situation analysis has revealed that measures to ensure accountability and transparency, such as supervision and reporting, are inadequately practised; much effort is needed to improve the situation for effective service delivery. In particular, national-state government coordination is weak and reporting from the state governments to the national government is limited. The weak accountability can be attributed to: 1) unclear reporting procedures (without reporting guidelines and formats); 2) inconsistency in ministerial structures between the national and state governments; 3) limited managerial and technical capacity at all levels; and 4) poor transport and communication infrastructure (see SAR Chapters 5 and 6).

The public sector capacity for service delivery is severely constrained by limited human, physical and financial resources at all levels of government, though the situation is more serious at lower levels (see SAR Section 5.2 and Chapters 6 and 10-13). Some organisations within the ministries have not been fully established and staff deployment has not been completed, particularly at the local government level (county, payam, and boma). The state ministries cannot deploy officers required for service delivery at these levels due to the inadequate number of staff as a whole; most officers outside the national government are working at state headquarters, not at local government offices. Facilities and equipment

[18] Government of the Republic of South Sudan. 2011. *Transitional Constitution of the Republic of South Sudan, 2011*. Juba: GRSS. pp. 15-16; and Government of Southern Sudan. 2009. *Local Government Act, 2009*. Juba: GoSS

[19] Government of Southern Sudan. October 2006. *The Local Government Framework for Southern Sudan.* Juba: GoSS. pp. 30-31.

for transport, communication and office work are inadequate or even unavailable. Under the austerity regime, funds available for training and professional development have been significantly reduced, and no new-staff orientation has been provided. The austerity measures has also slashed operating and capital budgets at all levels, but even before its introduction, funds allocated for service delivery were limited. Even though the five-tier decentralised system envisages the establishment of local government institutions as close as possible to the people, lack of capacity at lower levels hinders their service delivery functions.[20]

Given the weaker capacity at the payam and boma levels, in the medium term counties should be considered front-line agencies responsible for providing on-the-ground agricultural support services to rural populations and efforts would be concentrated on capacity development at this level. In the long term, enhancement of the administrative capacity of payams and bomas would be prioritised.

In the local government system, traditional authorities, i.e., "the traditional community body with definite traditional administrative jurisdiction within which customary powers are exercised by traditional leaders on behalf of the community", and customary laws are recognised by the statutory law.[21] Since the Local Government Act, 2009 has stipulated that the administrative aspects of the traditional authority systems be incorporated into the three tiers of local government;[22] their judicial and administrative powers can be considered important elements in providing services to people and communities, particularly in the absence of local government services. The proper exercise of traditional authority needs to be taken into account in CAMP implementation. In the livestock subsector, for example, traditional authorities, which oversee traditional institutions, such as cattle camps, kinship and dowry, wield a great influence on local communities and act as intermediaries between communities and local governments, though the structures of incorporation into the local government systems appear to remain informal (see SAR Chapter 11).

As recognised in the Constitution and the South Sudan Development Plan 2011-2013, the national government's supervision and technical and financial support are essential for strengthening the capacity of the state and local governments, as well as that of traditional authorities for service delivery which would translate into higher governance and accountability at all levels of government.

4.2 Public financial management (PFM) system

A major challenge for the PFM identified through the CAMP situation analysis, was inadequate funds for operating costs and capital investment associated with limited institutional and technical capacity (see SAR Chapter 6). These conditions severely affect public investment and service delivery, especially at lower levels of government. It would be necessary to secure external funds for CAMP implementation through project support earmarked funding, pooled funding and/or budget support. Since the CPA, DPs' assistance has been rendered largely through NGOs as weak government capacity and PFM systems have inhibited donors from providing direct support to the government for basic services.[23] Whatever the funding modality may be, the ministries concerned at the national, state and local levels, would be required to follow properly prescribed procedures for budget

[20] The National Convention of New Sudan in 1994 established three branches of government (legislative, executive and judiciary) and a five-tier decentralised system (central, regional, county, payam and boma) in the SPLM-controlled areas. The Interim Constitution of Southern Sudan, 2005 confirmed the three tiers of local government (Government of Southern Sudan. 2005. *Interim Constitution of Southern Sudan*. Juba: GoSS. p. 68.)
[21] Government of Southern Sudan. 2009. *Local Government Act, 2009*. Juba: GoSS. p. 7.
[22] Government of Southern Sudan. 2009. *Local Government Act, 2009*. Juba: GoSS. p. 11.
[23] World Bank. 2013. *South Sudan - Local Governance and Service Delivery Project*. Washington, DC: World Bank. p. 3.

execution, control and monitoring. This implies a substantial need to strengthen their PFM capacity.

Although austerity measures hinder public service delivery and investment for infrastructure development, the national government's PFM system is improving with technical and financial support from DPs. For example, the Ministry of Finance, Commerce and Economic Planning (MoFCEP) introduced an Integrated Financial Management Information System (IFMIS) with support from the International Monetary Fund (IMF) and the World Bank in 2012. IFMIS is an Access based database system 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 has provided a series of training courses. The introduction of IFMIS has enabled MoFCEP to better perform in budget execution control and monitoring.

State-level annual budget planning, execution, procurement and monitoring are still weak, requiring significant efforts for improvement. The CAMP situation analysis has shown that the PFM capacity of state ministries and lower levels of government is significantly limited due to the lack of clear PFM procedures, inadequate deployment of accountants and other PFM-related officers and absence of internal or external audits. Cash flow is not transparent in many cases, and funds are often misused or misallocated. As transfers to states from the national government are mainly used for salaries, the insufficiency of operating costs exacerbates the already difficult PFM and adversely affects day-to-day operations and service delivery.

Widespread corruption (including collection of unofficial fees or charges) is an issue requiring urgent attention and remedies. The CAMP situation analysis has found that informal (illegal) taxation and bribes are commonly practised in the agricultural sector and that they discourage private investment and business (see SAR Chapters 10-13). The incidence of such conduct is also a result of low governance; the PFM system constitutes an essential part of governance. As indicated in the SSDP, sound governance reduces the potential for corruption and lessens the risk that scarce public resources become diverted from their intended purpose.[24] The GRSS is focusing on establishing and strengthening the principles of accountability and transparency as applied to the operation of government systems and administration.[25] CAMP also needs to be based on these principles and designed to strengthen the PFM capacity at all levels of government.

GRSS also recognises the need to strengthen revenue administration systems, therefore correcting issues associated with multiple taxation which is currently a significant burden on business.[26] Multiple formal and informal tax collection was reported in all the four subsectors studied by the CAMP Task Team. The team attributed the problem to the lack of an integrated taxation framework with proper supervision on the ground, and poor coordination between different levels of government (see SAR Chapters 10-13). Many of the taxes and fees collected are not 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, even though the monthly amount paid as taxation by one individual fish trader alone was greater than the amount deposited annually in the revenue collection office. Therefore very large amounts are going missing. For agriculture to develop in South Sudan, this kind of "taxation" has to be stopped.

[24] Government of the Republic of South Sudan. 2011. *South Sudan Development Plan 2011-2013*. Juba: GRSS. p. 50.
[25] Government of the Republic of South Sudan. 2011. *South Sudan Development Plan 2011-2013*. Juba: GRSS. p. xvi.
[26] Government of the Republic of South Sudan. 2011. *South Sudan Development Plan 2011-2013*. Juba: GRSS. p. 134.

These problems stem from the situation in which the PFM system was based on the regulations of pre-independence origin, e.g., the Interim Public Procurement and Disposal Regulations, 2006, Local Government Act, 2009, Transitional Constitution, 2011, and Public Financial Management and Accountability Act, 2011 (see SAR Chapter 6). Public procurement is governed by the Interim Public Procurement and Disposal Regulations, but they do not apply to local governments.[27] While the Local Government Act gives revenue raising powers to local governments, there are no supporting regulations on local government revenue instruments, and at the county level there is weak capacity for revenue administration.[28] In 2013, the GRSS introduced new regulations governing procedures and management of funds transferred from the national government to the state governments and is preparing a new procurement law expected to be enacted shortly.

Most of the programmes and projects supported by DPs on a grant basis are employing financial management procedures parallel to the government's PFMS system due to perceived accountability and transparency issues.[29] In the Southern Sudan Livelihoods Development Project financed by IFAD and the Dutch government, for example, the government's financial management procedures are not used because MAFCRD partially practises cash-based accounting without proper reconciliation; their procedures were found unfit for project management that required the adoption of international standards. MoFCEP centrally manages ministerial expenditure by using accrual-based accounting, which keeps ministerial-level financial management to a minimum and thus tends to diminish each ministry's financial management capacity. An important implication of this is that effective coordination with MoFCEP would be required for the financial management of CAMP's programmes and projects. The inclusion of institutional capacity building components to improve the PFM system is equally imperative for CAMP resource mobilisation.

For the grant-based programmes and projects, it would be necessary to align DPs' financial management procedures with the PFM system for better resource allocation. The improvement of implementation capacity is also needed for concessional loan-based projects. Since coexistence of the parallel implementation mechanism is expected to last for the foreseeable future, CAMP's programmes and projects should be designed accordingly. The Multi-Donor Trust Fund (MDTF), a pooled fund established in 2005 to finance public investment, will be replaced by the South Sudan Partnership Fund (SSPF), expected to launch in March 2014. The possibility of mobilising SSPF for CAMP implementation would be explored.

4.3 Regulatory services

Regulatory services are required to monitor practices in areas where opportunities for deception or harm to innocent parties exist, e.g., setting standards and grades of products, minimum health and environmental requirements for inputs and outputs, regulation against illegal activities, supervision of monopolistic or oligopolistic market situations, control of diseases and pests, and environmental management. The national government is primarily responsible for creating regulatory frameworks and supervising enforcement mechanisms, though many of these powers may eventually be transferred to the state and local governments. However, private sector organisations, including farmers associations and communities, would increasingly be encouraged to regulate their own activities, once regulatory frameworks are established and fully operational.

[27] World Bank. 2013. *South Sudan - Local Governance and Service Delivery Project*. Washington, DC: World Bank. p. 24.
[28] World Bank. 2013. *South Sudan - Local Governance and Service Delivery Project*. Washington, DC: World Bank. p. 4.
[29] CAMP Task Team. 2012. Preliminary Administrative and Public Financial Management Study. Formulation of the Comprehensive Agricultural Development Master Plan (CAMP) of the Republic of South Sudan. Annex 1, p. 2.

Currently, regulatory services are weak in South Sudan due to the limited number of laws and regulations passed by the National Legislative Assembly (NLA) and their inadequate enforcement on the ground. For example, there are no regulations for the control of fishery. The law of the Sudan, enacted many years ago, is still being used as a basis for such control (see SAR Chapter 13). The management of the Central Forest Reserves (CFRs) is in general extremely poor. Also the natural and plantation forests in CFRs are subject to widespread of illegal activities and encroachment (see SAR Chapter 12). The minimal resources and capacity of the national and state Directorates of Forestry for law enforcement are one cause of insufficient regulatory services. Hygiene standards for food of animal origin are inadequate and unenforceable due to the lack of legal and regulatory frameworks, so deterring private investment in meat and milk processing (see SAR Chapter 11). Internal livestock movement control throughout the country is constrained by the absence of a legal framework, which is exacerbated by multiple taxation and cattle rustling, undermining livestock development.

For the effective implementation of regulatory services, technical and financial support from the national government to the state and local governments is needed, but currently is not sufficiently provided due to limited expertise and funds in the national government itself. Even when such support is provided, the standards set by the national government may not be fully followed by the state governments. For example, the national Directorate of Veterinary Services (DVS) participates in bilateral, regional, and international meetings for the purposes of trans-boundary disease control and standard setting; it provides technical support on animal health to the states through annual coordination meetings that bring together national and state DVSs (see SAR Chapter 11). However, state DVSs are unable to fully practice disease prevention and control measures due to lack of facilities and human resources, particularly veterinarians and veterinary para-professionals.

The state governments do not adequately report the status of regulatory services to the national government, even though they are mandated to do so, or sometimes no such responsibility is stipulated in laws. Due to lack of reporting by the state government concerned, it was not known for some time that a private company no longer managed some of the CFRs, for which they had made a concession agreement with both the national and state governments (see SAR Chapter 12).

The national government should strengthen regulations vital for agricultural development by making all legislation enforceable and relevant to present needs. This will involve an immediate review and updating of outdated legislation since there is a danger that the states will begin to develop their own legislation and regulations, as has already happened in the fishery sector of Jonglei State (see SAR Chapter 13). When the states are preparing laws and regulations, it is essential that they are consistent with those of the GRSS. The national government needs to prepare relevant training programmes to improve the quality of regulatory services, including monitoring and reporting, by strengthening technical staff and facilities of state and local governments.

4.4 Research, extension, education and training services

In general, research, extension, education and training services provided by the public sector are inadequate and weak due to financial and human resource constraints. However, the performance of individual institutions varies, depending on the degree of DPs' involvement and support. DP supported institutions perform better than institutions without such support. For example, the Crop Training Centre Yei (CTC Yei) and Marial Lou Livestock Training Centre (MLLTC), both of which receive technical assistance from Dutch government, actively provide training courses (including certificate and refresher courses) in their respective fields, although the two centres also make significant efforts on their own.

On the other hand, the Nzara Agriculture Technology Training Centre (NATTC) used to provide courses which are not available at other training centres, such as food processing and post-harvest handling. However, no training has been organised since USAID completed its support to the Southern Sudan Agriculture Revitalization Program (SSARP), which had assisted six training centres including CTC Yei, MLLTC and NATTC.

In the crop subsector, there are two functioning research centres under the Directorate of Research, MAFCRD, i.e., the Yei Agricultural Research Centre (YARC) and Palotaka Agricultural Research Centre (PARC) (see SAR Chapter 10). YARC is the largest functioning research centre in the country, but its current activities are limited to: basic and adaptive research; training extension workers, seed producers and technicians; and, setting up a rice breeding programme. The Halima Agricultural Research Centre, also under this directorate, is under rehabilitation. In the livestock, forestry and fisheries subsectors, there are no dedicated research centres (see SAR Chapters 11-13). A government research centre for animal and fisheries resources, with basic infrastructure facilities, is situated at Rejaf West, about 10 km from Juba Town. However, little has been achieved concerning the priorities set out in the strategic plan, due to the unavailability of funds and qualified personnel for research. Agricultural research, though minimal, is also done at some universities, such as the University of Juba and the University of Bahr el Ghazal.

There are opportunities for collaboration with international and regional agriculture research centres. The national Directorate of Research in MAFCRD has several research partners 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 (ICRISAT). Most of the researches done at research centres under the Directorate of research in MAFCRD are requested and/or funded by these international research institutes or DPs.

The provision of extension services is the responsibility of the state governments. A total of 285 Agricultural Extension Officers (AEOs) are deployed at the state or county level as of June 2013 (see SAR Chapter 10). The National Agriculture and Livestock Extension Policy (NALEP) suggests that at least two officers are stationed in each county, two extension workers in each payam and one extension worker in each boma,[30] but there are not enough AEOs even at the county level. While AEOs' target groups are mainly crop farmers, front-line officers are also responsible for providing extension services to producers in the forestry, livestock, and fisheries subsectors. As in other areas of service delivery, their activities are constrained by limited training, funding, transport, facilities and equipment needed for delivering extension services. Among these, major challenges are insufficient means of transport and knowledge of extension methods and subjects. Majority of AEOs have basic agricultural knowledge with secondary school certificates and have no training opportunities to improve their knowledge and skills. In some states, insecurity inhibits their activities. Community Development Officers (CDOs) are deployed in the state Department of Community Development, but extension work for agricultural purposes is not their responsibility. Very few AEOs collaborate with CDOs and Cooperative Officers.

Extension services provided by DP-supported projects and NGOs have made significant impacts on agricultural production (see SAR Chapter 10). NGOs, hired extension workers who provide effective services, exist across the country. Generally, NGO extension workers have better means of transport, funds, knowledge and training opportunities. In Upper Nile State, several DPs and NGOs, such as UNDP, FAO, Norwegian People's Aid (NPA), World

[30] 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: GoSS. p. 26.

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. These NGOs report to and collaborate with the state or county governments. NGO extension workers normally have a university degree or diploma in agricultural extension. Nevertheless, they still have some challenges such as: 1) the coverage is extensive and the range of activities wide; 2) the number of target farmers is large with limited funds; and 3) they have to deal with language barriers.

Several public institutions provide agricultural education and training in South Sudan, such as CTC Yei, MLLTC, NATTC, Kagelu Forestry Training Centre, Padak Fisheries Training Centre, universities and vocational training centres (see SAR Section 5.4). However, their services, in terms of quantity and quality, do not meet the demand in both the public and private sectors. A major common challenge for these institutions is lack of funding and qualified teaching staff. There is no long-term programme of staff development training at these institutions, which results in qualified staff moving to NGOs and DP-supported projects. The standardisation and updating of training curricula are also an issue. Collaboration between research centres and training centres is minimal. Therefore, new knowledge and skills are not included in existing training courses. Collaboration between universities, particularly the University of Juba as a leading higher education institution in the country, and other training institutions needs to be encouraged, so as to strengthen all parties' capacity to provide better agricultural education and training.

Improvement of research, extension, education and training is indispensable for agricultural development, but investment in research, extension, education and training would require relatively long and continuous endeavour to realise an impact in terms of increase in labour productivity and returns to capital. There are knowledge bases within the international and regional agricultural research and training institutes. Effective and feasible collaboration with these institutes, with support from DPs, in the medium- and long-term perspective has to be implemented within CAMP.

4.5 Infrastructure and facility development

Infrastructure forms the basis for development and significantly affects the overall capacity to move people, inputs and outputs, and to send and receive information in the agricultural sector.[31] It is particularly essential for service delivery. Although it is outside the jurisdiction of CAMP implementation agencies, transport and communication infrastructure need to be swiftly developed all over the country. Buildings office facilities, ICT equipment and vehicles need to be provided, upgraded and put into use, especially at the state and county government offices. Lack of infrastructure and facilities impedes timely and effective service delivery, increases the costs of service delivery, and reduces the number of beneficiaries given budget constraints. For example, few of the county offices visited by CAMP Task Team had adequate office equipment, and transport and communication facilities; none of them had electricity; and some counties do not even have offices (buildings). Nevertheless, county officers are supposed to be front-line service providers in the agricultural sector (see SAR Section 5.2). Due to poor maintenance, parts of some road networks are not passable during the rainy season (see SAR Chapter 10); that is to say, no extension service can be provided to farmers during the planting period.

Sustainable management and maintenance of administrative infrastructure and facilities are also of concern for effective service delivery. Measures to cover maintenance and operating costs need to be incorporated into a project at the design stage; not only public funds but also cost recovery measures could be considered and tested. For example, the Yei

[31] For the impacts of inadequate infrastructure on agricultural development, see Section 2.5 Infrastructure of this report.

Agricultural Training Centre (YATC), which has been supported by NPA since 1999, generates much of the funds necessary for operation through its own activities (see SAR Section 5.4). YATC offers four training courses, which are a major source of funds. In order to expand sources of income, YATC tries to provide new courses with higher demand and to collaborate with other NGOs.

Effective and efficient use of transport, communication and information facilities will be explored and implemented, which will also result in organisational efficiency gains. An institutional culture of appreciating corrective action to improve productivity of public services would be nurtured. Infrastructure and facility development would be implemented in the short-term to address these urgent needs of the state and local governments. Capital expenditure for asset acquisition must be accompanied by measures to secure costs for maintenance and operation and to utilise such assets productively and sustainably. The provision of cost efficient and cost recovery based public services can be considered in the case that such service provision may increase the economic returns of beneficiaries. The quality of public services will be on a par with the cost needed to render such services.

4.6 Aid coordination mechanisms and resource mobilisation

Aid coordination is crucial for provision of public services. As indicated in the preceding discussions, DPs' support, either directly or via NGOs, has complemented public service delivery and contributed to developing public sector capacity for service delivery in the agricultural sector, especially when and where government financial and human resources are limited. Improvement, in government leadership and capacity in aid coordination, requires government commitment to articulate a consolidated policy direction and to develop an integrated master plan, based on reality on the ground. DPs are willing to support government-lead planning, resource mobilisation and implementation of public interventions incorporating capacity development in the agricultural sector. The present formulation of CAMP through government-DP coordination is an attempt to achieve such planning and sustainable public service delivery.

GRSS leads aid coordination through a mechanism consisting of the High-level Partnership Forum (HPF), Quarterly Government-donor Forum (QGDF), Inter-Ministerial Appraisal Committee (IMAC), and Sector Working Groups (SWGs) (see SAR Chapter 6). MoFCEP envisages that the SWG 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. Aid coordination in the agricultural sector mainly takes place in the Natural Resources SWG (NRSWG). Inadequate consolidation of agriculture sector policies and short-, medium-, and long-term development plans within the national government, and insufficient alignment of sector priorities with the international and regional agenda, weaken the government's leadership in the aid coordination mechanism. Furthermore, NRSWG does not include the Ministry of Electricity, Dams, Irrigation and Water Resources (MEDIWR), which is critical considering the importance of water resources for the agricultural sector. It is necessary to consider a broader coordination arrangement inclusive of MEDIWR.

In addition to SWGs, the government is leading the establishment of SSPF, which will be an aid coordination mechanism and platform for pooled funding to be contributed by the government, DPs and other sources for development projects.[32] SSPF can be considered as

[32] The concept of SSPF originates with the agreements reached by GRSS and its DPs during the Washington Conference held in April 2013 to establish a new development partnership with the government taking responsibility to drive the development process and its donors to improve aid effectiveness. The objective of SSPF is to support sustainable state and local government-led service delivery and economic diversification by strengthening and using government systems and institutions. The fund would provide for a resource pooling mechanism with the involvement of multiple donors and with the purpose of supporting capacity building and

a successor to MDTF and is based on MDTF's experience. Upon the establishment of SSPF, it is expected that CAMP and development plans of other sectors can utilise the funds for their activities, including capital investment, service delivery, and capacity development of stakeholders in the public and private sectors. As clarified in Section 4.1 above, however, good governance and accountability are keys to successful management and utilisation of SSPF under government leadership, particularly in a decentralised implementation framework. The government has an opportunity to mobilise the aid coordination mechanisms to achieve its development goals. CAMP process can be used as a platform for government-led stakeholder coordination.

4.7 Collaboration with civil society organisations

The government, including the national, state and local governments, is not the sole actor in public service delivery.[33] The private sector, communities and civil society (including NGOs and community-based organisations) could all play important roles in shaping demand, developing policies, and delivering services. The relationship between these actors changes as the public sector consolidates, the private sector proliferates, and citizens become more assertive. In CAMP, the government should delineate the roles of civil society organisations as a service provider and seek effective collaboration with them.

International and local NGOs have a strong presence in South Sudan since the civil war era.[34] Currently, numbers of international and local NGOs are actively providing various kinds of services to the people, including agricultural extension services, animal health services, and training of farmers, traders and extension officers (see SAR Sections 5.4-5.5 and Chapters 10-11). During the CPA period, NGOs focused on relief and emergency assistance including food aid. After independence, however, their focus has shifted towards support for socioeconomic development. While NGO activity fills the gap in public service delivery, it tends to create dependency of the government and DPs on substitution systems managed by NGOs, undermine government capacity, and deter DPs from providing direct support to the government for service delivery. Consequently, government capacity for service delivery remains minimal and is trapped in a vicious circle. Therefore, mutually beneficial collaboration mechanisms between the government and NGOs would be explored and set up for CAMP implementation through stakeholder consultation.

Other civil society organisations include associations and societies formed under the guidance of public authorities, DP-supported projects, and activities carried out by NGOs. The existence of such organisations is reported in all the four subsectors (see SAR Chapters 10-13). In the fisheries subsector, for example, there are a large number of associations, and in some cases cooperatives, in areas where DPs or NGOs have operated or continue to operate. As far as they receive DP assistance, associations remain a useful conduit for skills enhancement and general development activities. However, their activities tend to slow down or wither when DP assistance has ceased. Sustained collaboration with the public sector in service delivery has yet to be seen.

Traditional authorities, recognised in the local government system (see Section 4.1 above), can also be considered to be part of civil society. There are two types of traditional authorities in South Sudan. One type is "kingdom" with centralised monarchical systems of

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investments. The potential size of the pooled funding arrangement would be around USD100 million a year, with the intention to disburse about USD50 million in the first year. It would be designed as a pilot of four years' duration but with the intent for the initiative to become a long-term facility.
Source: Job description for SSPF Program Manager on the World Bank's website (http://web.worldbank.org)

[33] Global Forum on Local Development. January 2011. *Global Forum on Local Development Report: Pursuing the MDGs through Local Government*. New York: UN Capital Development Fund. p. 35.

[34] In animal health, they were particularly active in the late 1990s and 2000s, implementing rinderpest eradication activities and training and equipping Community Animal Health Workers (CAHWs) who have since become the main primary animal health care service providers in South Sudan. See SAR Chapter 11.

rule, which performs local government functions, and is divided into chieftainships, sub-chieftainships, and headman-ships. The other type is “chiefdom” with decentralised systems of rule, which performs traditional and local government functions and is divided into sub-chieftainships and headman-ships.[35] Whereas kingdoms are recognised as self-existing traditional systems, chiefdoms can be established in accordance with the provisions of the Local Government Act and regulations. Although the power and status of traditional leaders were reportedly weakened during the civil war, they still occupy an influential position in their communities (see SAR Chapter 8). Therefore, collaboration with traditional authorities and leaders would be important in CAMP implementation, particularly at the boma level, the main domain of traditional authority.

Civil society has been significantly contributing to food security and agricultural development in the country. They are expected to contribute further to the national agenda by: 1) working with national and local governments to identify and utilise locally available resources, including human, financial and natural resources; 2) maintaining an open and constructive dialogue with national, state, and local governments towards the establishment of an enabling local environment; 3) engaging with local governments in designing development strategies and using their financial resources and human capacities to assist with implementation; 4) developing community-based solutions for service delivery in partnership with local governments; and 5) setting up appropriate institutions for social auditing of local governments’ performance and promoting transparency and inclusiveness.[36] The government can encourage civil society initiatives and provide support for them so that people can have better access to necessary services.

[35] Government of Southern Sudan. 2009. *Local Government Act, 2009*. Juba: GoSS. pp. 56-57.
[36] Based on: Global Forum on Local Development. January 2011. *Global Forum on Local Development Report: Pursuing the MDGs through Local Government*. New York: UN Capital Development Fund. p. 10.

5. Agriculture sector development scenarios

Public interventions are comprised of programmes and projects which can be implemented in the short-, mid- or long-term. Their impact may be felt in the short-, mid- or long-term. For example, a public intervention to plant teak seedlings will be implemented as a short term intervention but the impact will not be felt until the long term. In this section, unless otherwise stated, the time frames (short-, mid- or long-term) referred to are the time frames when the impacts will be felt. However, as in the example of teak seedlings, the intervention may need to be initiated in a different time frame. Also, an intervention initiated in the short-term can have impacts in all time frames, which is particularly true of the institutional development subsector, where an intervention in, for example, capacity development can have far reaching impacts. In the other sectors, an intervention with a long-term impact will probably require some activity in the short-term.

5.1 Macroeconomic agricultural development scenario

It is necessary to understand the current position of the agriculture sector and its subsectors in the national economy. Although sector-wise GDP data is largely unavailable, efforts were made to construct past sector and subsector-wise GDP estimates. Based on these estimates a 25-year macroeconomic development scenario is proposed as shown in Figure 5-1, Table 5-1 and Table 5-2. The scenario, beginning in 2015, is determined by the assignment of sector growth rates shown in Table 5-2. Based on these assumptions concerning growth rates, the performance of the agriculture sector and impact of public interventions can be assessed periodically against this macroeconomic scenario. For example, in Table 5-2, growth rates in the agriculture sector steadily increase from 3% to 6% over the CAMP period. Another assumption is that the government is committed to deliver high quality and disciplined public services from all parts of government.

Figure 5-1: Macroeconomic scenario during the CAMP period

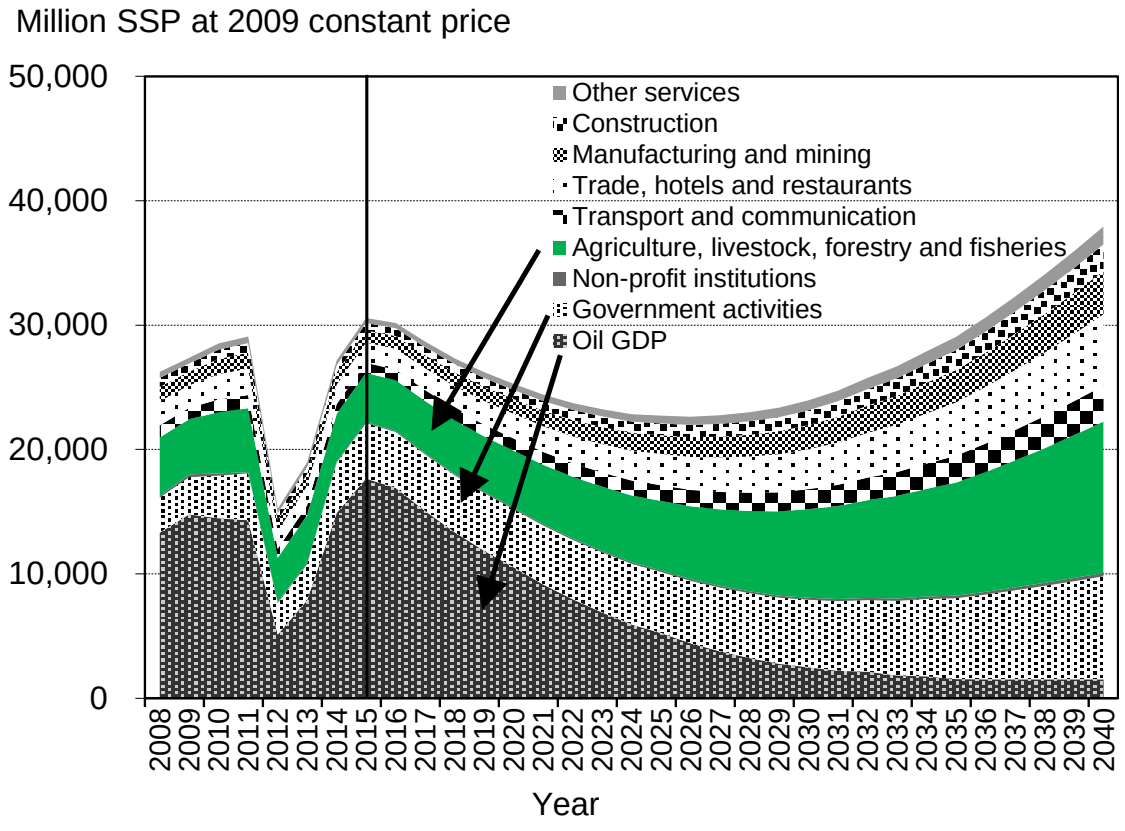


Table 5-1: Macroeconomic scenario and position of agricultural sector

CAMP period	Year	Fiscal Year	Gross domestic product (GDP) (at 2009 constant price)												
			Oil GDP	Non-oil GDP											Total
				Government activities	Non-profit institutions	Other activities								Sub-total	
						Agriculture, livestock, forestry and fisheries	% to total	Trade, hotels and restaurants	Manufacturing and mining	Transport and communication	Construction	Other services	Sub-total		
	2008		13,313	2,827	135	**4,713**	**18%**	1,918	1,170	975	715	481	9,972	12,934	26,247
	2009		14,792	2,988	220	**4,432**	**16%**	1,804	1,100	917	673	453	9,379	12,587	27,379
	2010		14,475	3,427	180	***4,940***	***17%***	*2,010*	*1,226*	*1,022*	*749*	*504*	10,452	14,059	28,533
	2011		14,325	3,760	91	**5,155**	**18%**	2,098	1,280	1,067	782	526	10,908	14,759	29,084
	2012	2012/13	*5,128*	2,526	101	**3,534**	**23%**	1,438	877	731	536	361	7,477	10,104	15,232
	2013	2013/14	*7,874*	2,900	97	**3,838**	**20%**	1,562	953	794	582	392	8,121	11,118	18,992
	2014	2014/15	*14,899*	4,047	88	**3,842**	**14%**	1,563	954	795	583	392	8,130	12,265	27,163
0	2015	2015/16	*17,661*	4,452	90	**3,958**	**13%**	1,610	983	819	600	404	8,374	12,916	30,577
1	2016	2016/17	*16,914*	4,496	94	**4,076**	**14%**	1,675	1,022	852	624	420	8,669	13,259	30,174
2	2017	2017/18	*15,066*	4,541	98	**4,199**	**15%**	1,742	1,063	886	649	437	8,975	13,614	28,680
3	2018	2018/19	*13,349*	4,587	101	**4,325**	**16%**	1,811	1,105	921	675	455	9,293	13,981	27,330
4	2019	2019/20	*11,865*	4,632	106	**4,454**	**17%**	1,884	1,149	958	702	473	9,621	14,359	26,224
5	2020	2020/21	*10,530*	4,679	110	**4,588**	**18%**	1,959	1,195	996	731	492	9,961	14,750	25,279
6	2021	2021/22	*9,166*	4,725	114	**4,771**	**20%**	2,057	1,255	1,046	767	516	10,413	15,253	24,419
7	2022	2022/23	*7,959*	4,773	119	**4,962**	**21%**	2,160	1,318	1,098	805	542	10,886	15,778	23,737
8	2023	2023/24	*6,914*	4,820	123	**5,161**	**22%**	2,268	1,384	1,153	846	569	11,381	16,325	23,240
9	2024	2024/25	*5,943*	4,869	128	**5,367**	**24%**	2,381	1,453	1,211	888	598	11,899	16,896	22,838
10	2025	2025/26	*5,237*	4,917	134	**5,582**	**25%**	2,501	1,526	1,271	932	627	12,440	17,491	22,728
11	2026	2026/27	*4,421*	5,016	139	**5,861**	**26%**	2,626	1,602	1,335	979	659	13,062	18,216	22,637
12	2027	2027/28	*3,783*	5,116	144	**6,154**	**27%**	2,757	1,682	1,402	1,028	692	13,715	18,975	22,758
13	2028	2028/29	*3,230*	5,218	150	**6,462**	**28%**	2,895	1,766	1,472	1,079	726	14,401	19,769	22,999
14	2029	2029/30	*2,766*	5,323	156	**6,785**	**29%**	3,039	1,855	1,545	1,133	763	15,121	20,600	23,365
15	2030	2030/31	*2,492*	5,429	163	**7,124**	**30%**	3,191	1,947	1,623	1,190	801	15,877	21,468	23,960
16	2031	2031/32	*2,212*	5,592	171	**7,480**	**30%**	3,383	2,064	1,720	1,261	849	16,758	22,521	24,733
17	2032	2032/33	*2,130*	5,760	179	**7,854**	**30%**	3,586	2,188	1,823	1,337	900	17,689	23,628	25,758
18	2033	2033/34	*1,842*	5,990	188	**8,247**	**31%**	3,801	2,319	1,933	1,417	954	18,672	24,850	26,692
19	2034	2034/35	*1,755*	6,230	198	**8,659**	**31%**	4,029	2,458	2,049	1,502	1,011	19,709	26,137	27,891
20	2035	2035/36	*1,562*	6,479	207	**9,092**	**31%**	4,271	2,606	2,172	1,592	1,072	20,805	27,492	29,053
21	2036	2036/37	*1,533*	6,803	220	**9,638**	**31%**	4,527	2,762	2,302	1,688	1,136	22,054	29,076	30,609
22	2037	2037/38	*1,533*	7,143	233	**10,216**	**32%**	4,799	2,928	2,440	1,789	1,204	23,377	30,753	32,286
23	2038	2038/39	*1,533*	7,500	247	**10,829**	**32%**	5,087	3,104	2,586	1,897	1,276	24,779	32,527	34,060
24	2039	2039/40	*1,533*	7,875	262	**11,479**	**32%**	5,392	3,290	2,742	2,010	1,353	26,266	34,403	35,936
25	2040	2040/41	*1,533*	8,269	278	**12,168**	**32%**	5,715	3,487	2,906	2,131	1,434	27,842	36,389	37,922

Note: Agricultural sector values are indicated by bold numbers.
Source: NBS (underlined values); IMF (double underlined values); AfDB (double underlined Italic values); South Sudan Development Plan. 2011 (underlined Italic values); CAMP TT (other values)

The significant features of the macroeconomic environment in South Sudan are 1) high dependence on oil revenues which are expected to decline over the next few decades, 2) ongoing economic shock of the austerity measures starting in 2012, and 3) risk of economic shock in the future due to volatile oil price and the large contribution of oil revenues to the economy. Figure 5-1 shows these three characteristics clearly, and makes it clear that economic diversification is tasked to the agricultural sector. This task is extremely challenging given the volatile macroeconomic environment.

In the scenario presented above, it is assumed that the depletion of oil revenues would occur in 30 years. Even if a longer period was assumed, it is still necessary to invest oil revenues in quality public interventions. If the money is used for consumption rather than the creation of productive assets and improvement of sector productivity, it will not be possible to compensate for the lost growth (-10% to -15% annually) indicated in the first column of Table 5-2 by the growth of the agriculture sector. As discussed in a previous section, the county was diagnosed as suffering from the Dutch disease, which had a negative effect on agricultural development. It appears that as oil revenues decline this situation will improve, but the government will have less money to invest. An understanding of this situation will be reflected in the process of programme and project development to find the best ways to mitigate this macroeconomic reality.

Table 5-2: Assumed growth rates of all sectors of the economy

CAMP period	Year	Fiscal Year	Gross domestic product (GDP) (constant price at 2009)											
			Oil GDP	Non-oil GDP										Total
				Government activities	Non-profit institutions	Other activities							Sub-total	
						Agriculture, livestock, forestry and fisheries	Trade, hotels and restaurants	Manufacturing and mining	Transport and communication	Construction	Other services	Sub-total		
	2008													
	2009		11.1%	5.7%	63.0%	**-5.9%**	-5.9%	-5.9%	-5.9%	-5.9%	-5.9%	-5.9%	-2.7%	4.3%
	2010		-2.1%	14.7%	-18.3%	**11.4%**	11.4%	11.4%	11.4%	11.4%	11.4%	11.4%	11.7%	4.2%
	2011		-1.0%	9.7%	-49.3%	**4.4%**	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	5.0%	1.9%
	2012	2012/13	-64.2%	-32.8%	10.8%	**-31.4%**	-31.4%	-31.4%	-31.4%	-31.4%	-31.4%	-31.4%	-31.5%	-47.6%
	2013	2013/14	53.6%	14.8%	-4.3%	**8.6%**	8.6%	8.6%	8.6%	8.6%	8.6%	8.6%	10.0%	24.7%
	2014	2014/15	89.2%	39.5%	-9.4%	**0.1%**	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	10.3%	43.0%
0	2015	2015/16	18.5%	10.0%	3.0%	**3.0%**	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	5.3%	12.6%
1	2016	2016/17	-4.2%	1.0%	4.0%	**3.0%**	4.0%	4.0%	4.0%	4.0%	4.0%	3.5%	2.7%	-1.3%
2	2017	2017/18	-10.9%	1.0%	4.0%	**3.0%**	4.0%	4.0%	4.0%	4.0%	4.0%	3.5%	2.7%	-4.9%
3	2018	2018/19	-11.4%	1.0%	4.0%	**3.0%**	4.0%	4.0%	4.0%	4.0%	4.0%	3.5%	2.7%	-4.7%
4	2019	2019/20	-11.1%	1.0%	4.0%	**3.0%**	4.0%	4.0%	4.0%	4.0%	4.0%	3.5%	2.7%	-4.0%
5	2020	2020/21	-11.3%	1.0%	4.0%	**3.0%**	4.0%	4.0%	4.0%	4.0%	4.0%	3.5%	2.7%	-3.6%
6	2021	2021/22	-12.9%	1.0%	4.0%	**4.0%**	5.0%	5.0%	5.0%	5.0%	5.0%	4.5%	3.4%	-3.4%
7	2022	2022/23	-13.2%	1.0%	4.0%	**4.0%**	5.0%	5.0%	5.0%	5.0%	5.0%	4.5%	3.4%	-2.8%
8	2023	2023/24	-13.1%	1.0%	4.0%	**4.0%**	5.0%	5.0%	5.0%	5.0%	5.0%	4.5%	3.5%	-2.1%
9	2024	2024/25	-14.1%	1.0%	4.0%	**4.0%**	5.0%	5.0%	5.0%	5.0%	5.0%	4.5%	3.5%	-1.7%
10	2025	2025/26	-11.9%	1.0%	4.0%	**4.0%**	5.0%	5.0%	5.0%	5.0%	5.0%	4.5%	3.5%	-0.5%
11	2026	2026/27	-15.6%	2.0%	4.0%	**5.0%**	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	4.1%	-0.4%
12	2027	2027/28	-14.4%	2.0%	4.0%	**5.0%**	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	4.2%	0.5%
13	2028	2028/29	-14.6%	2.0%	4.0%	**5.0%**	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	4.2%	1.1%
14	2029	2029/30	-14.4%	2.0%	4.0%	**5.0%**	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	4.2%	1.6%
15	2030	2030/31	-9.9%	2.0%	4.0%	**5.0%**	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	4.2%	2.5%
16	2031	2031/32	-11.2%	3.0%	5.0%	**5.0%**	6.0%	6.0%	6.0%	6.0%	6.0%	5.6%	4.9%	3.2%
17	2032	2032/33	-3.7%	3.0%	5.0%	**5.0%**	6.0%	6.0%	6.0%	6.0%	6.0%	5.6%	4.9%	4.1%
18	2033	2033/34	-13.5%	4.0%	5.0%	**5.0%**	6.0%	6.0%	6.0%	6.0%	6.0%	5.6%	5.2%	3.6%
19	2034	2034/35	-4.7%	4.0%	5.0%	**5.0%**	6.0%	6.0%	6.0%	6.0%	6.0%	5.6%	5.2%	4.5%
20	2035	2035/36	-11.0%	4.0%	5.0%	**5.0%**	6.0%	6.0%	6.0%	6.0%	6.0%	5.6%	5.2%	4.2%
21	2036	2036/37	-1.8%	5.0%	6.0%	**6.0%**	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	5.8%	5.4%
22	2037	2037/38	0.0%	5.0%	6.0%	**6.0%**	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	5.8%	5.5%
23	2038	2038/39	0.0%	5.0%	6.0%	**6.0%**	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	5.8%	5.5%
24	2039	2039/40	0.0%	5.0%	6.0%	**6.0%**	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	5.8%	5.5%
25	2040	2040/41	0.0%	5.0%	6.0%	**6.0%**	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	5.8%	5.5%
Average			-8.4%	2.8%	4.5%	**4.5%**	5.1%	5.1%	5.1%	5.1%	5.1%	4.8%	4.3%	1.3%

Note: Agricultural sector values are indicated by bold numbers.
Source: CAMP TT

5.2 Food security, commercialisation and transformation of Agriculture

5.2.1 Food insecurity

In February 2013, about 48% of the population was either severely or moderately food insecure in South Sudan. Western Bahr El Ghazal, Northern Bahr El Ghazal and Upper Nile states have the highest percentages of people facing food insecurity, while Central Equatoria, Western Equatoria and Unity states have the lowest.[37] Improving food insecurity conditions is an immediate target of CAMP implementation.

There are four dimensions to food security: availability, accessibility, utilisation and stability. At the initial stage of the CAMP process, availability and accessibility will be addressed. Food availability is determined by the level of food production, stock levels and net trade. The net cereal production in 2012 was estimated at 761,000 tonnes (an increase of 35% from 2011) but a 371,000 tonnes food deficit is expected in 2013.[38] This deficit could be addressed by imports and food aid. To improve food availability, a key measure is to increase food production, specially cereals, tubers, livestock meat, milk, and fish, for home and domestic (within South Sudan) consumption; this will be the main focus of CAMP implementation in the short-term.

Accessibility means economic and physical access to food. Insufficient food access will be improved through income growth of households, better physical access to markets and available cheaper food. Income growth of households could be achieved by improving the productivity and facilitating marketing activities of smallholders, who will produce more marketable products, and creating on- and off-farm employments in rural areas through diversification of rural economy. Physical access to markets would be improved by better road networks (e.g., interstate and feeder roads) and the availability of cheaper transport. Affordable food prices will be realised through the reduction of production costs of domestic products or the import of cheaper food from neighbouring countries. CAMP will address all these aspects in the short- and medium-term in a holistic way.

5.2.2 Commercialisation and transformation of agriculture

Commercialisation of agriculture will be the main target of CAMP implementation in the medium- and long-term. Commercialisation will be the key instrument to: achieve poverty reduction of rural residents by increasing their agricultural income; and, to realize diversification of the economy by establishing longer value chains and promoting agricultural exports. Through the commercialisation process, the agriculture sector in South Sudan will be transformed from subsistence agriculture into productive, value added and market oriented agriculture.

In the commercialisation process, CAMP will address two focus areas: smallholders and large-scale agricultural development. Commercialisation for smallholders, such as individual and group farmers, livestock keepers and fishermen, will be achieved by transforming their behaviour from subsistence producers to market oriented entrepreneurs. Improvement of productivity, production of more marketable products and better access to markets will be realised through various efforts, such as: delivery of quality inputs through functional markets; development and enhancement of improved and appropriate technologies; promotion of organised farmers groups; provision of financial services; development of the necessary infrastructure; provision of a firm legal basis and favorable institutional arrangements; appropriate management of natural resources; and, maintenance of security.

[37] 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.

[38] FAO/WFP. February 22, 2013. *Special Report: FAO/WFP Crop and Food Security Assessment Mission to South Sudan.* Juba.

The smallholder commercialisation process needs to be addressed in a comprehensive approach as mentioned (e.g. firm legal basis, effective public service delivery, infrastructure development and institutional arrangements), while respecting the views and conditions of smallholder farmers. This process is closely related to the improvement of food security, especially accessibility to food as mentioned previously.

For large-scale agricultural development, investment by the private sector is the most crucial factor. To realise vigorous private investment, it is necessary for the government to establish favourable conditions for investors by setting up clear laws and regulations in terms of labour employment, business registration, taxation, land acquisition and export and import. Moreover, the government needs to improve basic infrastructure (e.g., roads, ports, electricity and water), anti-corruption measures and maintenance of security.

To realise effective and efficient agriculture transformation, the government must concentrate on providing favourable conditions for business transactions by the private sector (e.g., smallholder producers, merchants and investors), and not to be involved directly in business activities. The private sector is more effective and efficient and must be the engine of agricultural development.

5.3 Crop subsector development scenario

5.3.1 Establishment of crop subsector development focuses

Crop subsector will play a crucial role in realising the objectives of food security and economic growth through agricultural transformation. Especially, in the short-term, the crop subsector needs to focus on increasing cereal production and diversifying crop production to achieve food self-sufficiency, which is the most urgent and important issue for South Sudan.

In the Local Government Act 2009 the functions of the national and state governments are primarily policy making and regulation, and coordinating and monitoring the implementation of these policies and regulations. The function of the local government (counties / payams / bomas) is to implement these policies and regulations. The reality is somewhat different. In this discussion, the term government with no qualification (national, state or local) implies all levels of government.

In the short-term, increasing subsistence farmers' production for home and domestic (within South Sudan) consumption will be the main target. In this term, the governments have to play a crucial role to support subsistence farmers. The national and state governments must establish an effective implementation mechanism (e.g. planning, budgeting, tendering, monitoring and evaluation) for various programmes/projects to enhance the production of subsistence farmers. Significant support for capacity development is required to strengthen the ability of the government to deliver public services on the ground. Simultaneous service delivery by NGOs would also be effective in the short-term since the government's capacity at the delivery level (county/payam/boma) is extremely poor and cannot provide sufficient services to farmers. Parallel service delivery might be maintained until the government has enough capacity to deliver effective services. For this to be effective, coordination mechanisms among stakeholders (government and NGOs) on the ground needs to be strengthened. Preparing laws and acts based on agricultural related policies is also important to establish a firm legal basis for agricultural development. Moreover, improvement of security is essential to stabilise agricultural activities in rural areas.

In the medium-term, increasing production for marketing will be given more priority to realise farmer household income growth. Market oriented farming and value addition will be promoted by using market functions as instruments for agricultural development and poverty

reduction. An increase in household income would also enable farmers to buy more food. Farmers' organisations, such as cooperatives and associations, need to be established and strengthened so as to improve productivity and the marketing activities of smallholder entrepreneurs. To establish a more favourable environment for market oriented agriculture, continuous investment in infrastructure, especially interstate and feeder roads, is crucial. To achieve higher competitiveness with agricultural products from neighbouring countries, research and extension of new technologies have to be promoted. Higher educational institutions for the agriculture sector need to be strengthened or new institutions established to produce sufficient agricultural technicians. Continuing capacity development for government officers and farmers is also necessary to accelerate agricultural transformation. Efforts made in the medium-term would be continued in the long-term.

In the long-term, priority focuses will be shifted gradually from domestic consumption to export. More effort will be made for reductions in production costs and for improvement of quality to realise higher competitiveness in the international markets. Advanced research is required to produce high quality agricultural products for export. The quarantine system needs to be strengthened to protect domestic products from foreign pest and diseases. To maintain a favourable environment for private sector investment, good governance (e.g., transparency in taxation, anti-corruption measures and a clear land acquisition process) has to be strengthened. It is also important for the government to continuously promote private sector investments for infrastructure development (e.g., processing factories and electricity). In addition, security must continually be improved.

The objectives of food security and economic growth through agricultural transformation will be achieved by national, state and local governments in collaboration with the private sector and other stakeholders, such as DPs. For the effective and efficient implementation of the CAMP, the following needs clarification: responsibilities of the government and private sector; demarcation of national, state and local government roles and responsibilities; and, implementation mechanisms for government programmes/projects.

However there are some challenges to be addressed during the three terms (i.e., short, medium and long). The short-term issues mostly relate to food insecurity for subsistence farmer households. The medium-term issues relate to the poverty of subsistence and smallholder farmers. At this stage, the problems are not only related to direct government service delivery to farmers but also to indirect support (e.g., research, financial services, infrastructure development, establishment of higher educational institutions and private sector facilitation) which will be the basis for long-term development. In the long-term, most challenges relate to developing export products for economic growth. Higher quality service delivery is required to produce international quality products.

Table 5-3: Categorised issues and challenges in three time frames

Issues and challenges to be addressed
Short-term (5 years)
(1) Low cereal production
• Low level of cereal yield and area harvested per capita due to rain-fed farming, use of traditional varieties, low quality seeds, low inputs (e.g., fertiliser and agro-chemical), damage by pests and diseases and use of traditional tools
• Serious food insecurity due to low cereal production
(2) Insecurity
• Failure of crops due to insecurity; conflicts between farmers and armed pastoralists, intertribal conflict, cattle raids
(3) Weak service delivery to farmers
• Limited service delivery (e.g., extension, pest control and plant protection) to farmers by all levels of government
• Limited support to beneficiaries by NGOs
(4) Unfavourable environment for investments

Issues and challenges to be addressed
• Legal and illegal multiple taxation • Weak legal basis • Weak law enforcement agencies • Poor basic infrastructure (roads, electricity, irrigation, potable water, ports, etc.)
Medium-term (10 years) (1) High costs and weak competitiveness • High labour costs and high prices of agricultural inputs • High domestic transport costs due to poor road conditions and high fuel prices • Weak competitiveness of agricultural products due to higher production costs (2) Poor infrastructure • Poor interstate and primary road networks; extremely poor condition of feeder roads • Limited number of large and medium scale irrigation facilities, warehouses and drying yards (3) Weak service delivery to farmers • Limited extension services and basic research by the government • Limited tractor and rural financial services by the government and private sector (4) Poorly organised farmers • Lack of farmers' capacity to gather their harvest into a large volume to sell • Limited number of active farmer organisations, such as cooperatives and Farmer Based Organisations (5) Unfavourable environment for investments • Poor basic infrastructure (roads, electricity, irrigation, potable water, ports, etc.) • Relatively high costs of inputs and labour, and insecurity
Long-term (25 years) (1) Low cash crop production • Limited cash crop production (e.g., vegetables, fruit, tea, coffee and oil seeds) • Limited export to neighbouring countries and international markets (2) Weak service delivery to farmers • Limited advanced research by the government • Limited quarantine services at the border to prevent pest and diseases (3) Unfavourable environment for investments • Poor basic infrastructure (roads, electricity, irrigation, potable water, ports, etc.) • High uncertainty of land acquisition for foreign investors

Source: CAMP situation analysis report. December 2013

5.3.2 Crop subsector 25-year development scenarios

5.3.2.1 Food security

Since increase of cereal production is a crucial factor to realise food self-sufficiency in South Sudan, a 25-year forecast of cereal production is presented in Table 5-4. For this forecast, an annual population growth rate of 2% for 25 years is adopted, based on IMF projections until 2018.[39] The area harvested and annual yield rates are projected to increase at 4% annually until 2020. Expansion of cultivated area (extensification) and increase of yield (intensification) have to be realised simultaneously to maintain rapid and stable growth. It seems that these targets are realistic and attainable, since these two indicators achieved an annual average increase of more than 3% from 2009 to 2012.[40]

Even though much arable land is available, in the medium and long-term, expansion of area harvested might slow down due to labour shortages for land reclamation and farming activities. But area harvested could still increase if large and medium scale mechanised farming is successfully implemented by the private sector. Similarly, increase in yield rates will probably slow down due to the decrease in soil fertility due to continuous cropping. To maintain increase in yield, cultivation of high yielding crops, such as maize and rice, under

[39] IMF. World Economic Outlook. http://www.imf.org/external/pubs/ft/weo/2013/02/weodata/download.aspx (accessed on 1 December 2013)

[40] FAO/WFP. 2013. *CFSAM to South Sudan*. p. 25. Rome: FAO/WFP

irrigated conditions with the use of fertilisers needs to be promoted in suitable areas. Introduction of high yielding varieties of sorghum might also contribute to an increase in yield.

Under this scenario, the country would achieve cereal self-sufficiency by 2023 and be able to produce a surplus after that. By 2040 cereal production could be almost four times that of 2015. Area harvested would be more than double and yield would reach to about 1.8 Mt, higher than the average cereal yield in Eastern Africa in 2012.[41]

Figure 5-2 indicates the trends of net cereal production, area harvested and yield under the 25-year scenario. It is projected that the rate of increase of area harvested in 25 years will be higher than that of yield. This is due to the availability of land for expansion of farmland. Under this scenario, net cereal production per capita is projected to reach 109kg in 2023, which is the level for cereal self-sufficiency; this is 8 years after launching the CAMP process (Figure 5-3). A surplus of approximately 1 million tonnes is projected by 2040, capable of feeding 18 million people (Figure 5-4 and Table 5-4).

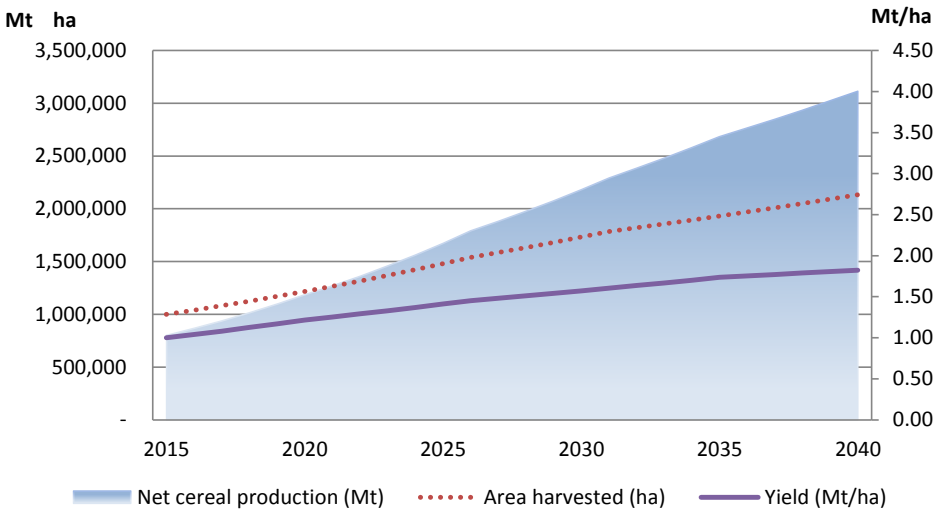
Table 5-4: 25-year cereal production forecast

Year	Population	Population increase rate	Gross cereal production (Mt)	Net cereal production (Mt) 1	Area harvested (ha)	Area harvested increase rate	Yield (Mt/ha)	Yield increase rate	Cereal production per capita (kg)	Cereal demand (Mt) 2	Surplus (Mt)
2015	11,022,000	2%	1,000,000	800,000	1,000,000	4%	1.00	4%	72.6	1,201,398	-401,398
2016	11,242,000	2%	1,081,600	865,280	1,040,000	4%	1.04	4%	77.0	1,225,378	-360,098
2017	11,467,000	2%	1,169,859	935,887	1,081,600	4%	1.08	4%	81.6	1,249,903	-314,016
2018	11,696,000	2%	1,265,319	1,012,255	1,124,864	4%	1.12	4%	86.5	1,274,864	-262,609
2019	11,929,920	2%	1,368,569	1,094,855	1,169,859	4%	1.17	4%	91.8	1,300,361	-205,506
2020	**12,168,518**	**2%**	**1,480,244**	**1,184,195**	**1,216,653**	**4%**	**1.22**	**3%**	**97.3**	**1,326,369**	**-142,173**
2021	12,411,889	2%	1,585,638	1,268,510	1,265,319	4%	1.25	3%	102.2	1,352,896	-84,386
2022	12,660,127	2%	1,698,535	1,358,828	1,315,932	4%	1.29	3%	107.3	1,379,954	-21,126
2023	12,913,329	2%	1,819,471	1,455,577	1,368,569	4%	1.33	3%	112.7	1,407,553	48,024
2024	13,171,596	2%	1,949,017	1,559,214	1,423,312	4%	1.37	3%	118.4	1,435,704	123,510
2025	**13,435,028**	**2%**	**2,087,787**	**1,670,230**	**1,480,244**	**4%**	**1.41**	**3%**	**124.3**	**1,464,418**	**205,812**
2026	13,703,728	2%	2,236,438	1,789,150	1,539,454	3%	1.45	2%	130.6	1,493,706	295,444
2027	13,977,803	2%	2,349,601	1,879,681	1,585,638	3%	1.48	2%	134.5	1,523,580	356,101
2028	14,257,359	2%	2,468,491	1,974,793	1,633,207	3%	1.51	2%	138.5	1,554,052	420,741
2029	14,542,506	2%	2,593,397	2,074,717	1,682,203	3%	1.54	2%	142.7	1,585,133	489,584
2030	14,833,356	2%	2,724,623	2,179,698	1,732,669	3%	1.57	2%	146.9	1,616,836	562,862
2031	15,130,023	2%	2,862,489	2,289,991	1,784,649	2%	1.60	2%	151.4	1,649,173	640,818
2032	15,432,624	2%	2,978,133	2,382,506	1,820,342	2%	1.64	2%	154.4	1,682,156	700,351
2033	15,741,276	2%	3,098,450	2,478,760	1,856,749	2%	1.67	2%	157.5	1,715,799	762,961
2034	16,056,102	2%	3,223,627	2,578,902	1,893,884	2%	1.70	2%	160.6	1,750,115	828,787
2035	16,377,224	2%	3,353,862	2,683,089	1,931,762	2%	1.74	1%	163.8	1,785,117	897,972
2036	16,704,768	2%	3,455,148	2,764,119	1,970,397	2%	1.75	1%	165.5	1,820,820	943,299
2037	17,038,863	2%	3,559,494	2,847,595	2,009,805	2%	1.77	1%	167.1	1,857,236	990,359
2038	17,379,641	2%	3,666,990	2,933,592	2,050,001	2%	1.79	1%	168.8	1,894,381	1,039,211
2039	17,727,234	2%	3,777,733	3,022,187	2,091,001	2%	1.81	1%	170.5	1,932,268	1,089,918
2040	**18,081,778**		**3,891,821**	**3,113,457**	**2,132,821**		**1.82**		**172.2**	**1,970,914**	**1,142,543**

Note: 1 Net cereal production is calculated as 80% of gross cereal production due to subtraction of post-harvest loss and seeds for the next season.
2 Cereal demand per capita is 109kg.
Source: IMF. World Economic Outlook. http://www.imf.org/external/pubs/ft/weo/2013/02/weodata/download.aspx (accessed on 1 December 2013)
FAO/WFP. 2013. *CFSAM to South Sudan*. pp. 20-21. Rome: FAO/WFP

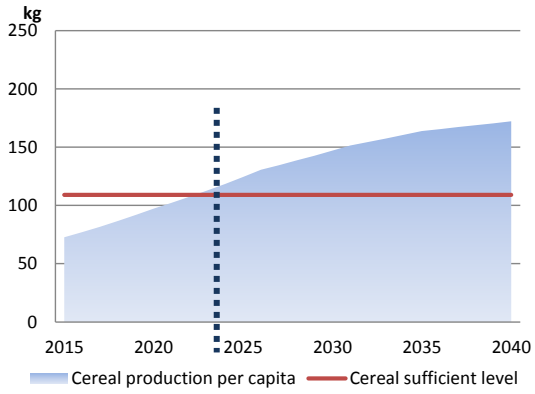
[41] Average yield of cereal (total) in Eastern Africa in 2012 is about 1.67 tonnes. FAO Stat http://faostat.fao.org/ (accessed on 18 November 2013)

Figure 5-2: 25 year net cereal production forecast



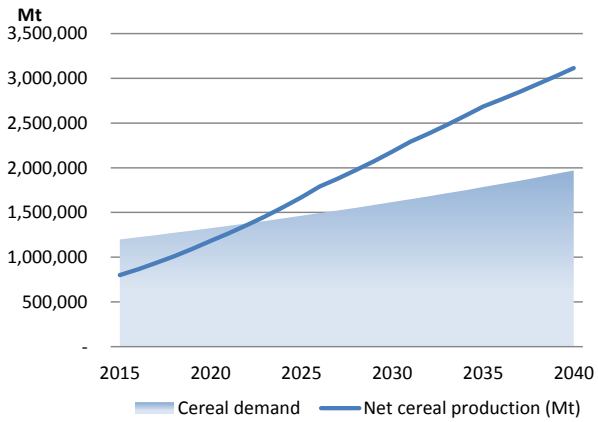
Source: Prepared by the CAMP Task Team

Figure 5-3: Forecast of 25-year cereal production per capita



Source: Prepared by the CAMP Task Team

Figure 5-4: Forecast of 25-year cereal production and demand



Source: Prepared by the CAMP Task Team

There are risks that this scenario would not be achieved due to factors such as low yield and weak competitiveness with foreign products. Achieving a rapid yield increase is not easy; neighbouring countries also struggle with low cereal yields. Competitiveness is also a crucial factor, since farmers will have no incentive to produce agricultural products which cannot be sold in domestic markets due to their high price compared to imported products. To be more competitive, more efforts have to be made to reduce production costs such as labour, inputs, processing and transport. Farmers need to find markets for their surplus.

In addition to an increase in cereal production, diversification of farming activities is also essential for food security. Tuber crop production needs to be promoted because farmers can harvest and consume tubers when they face seasonal food insecurity. Integrated farming with livestock, especially small ruminants (e.g. goats and sheep) and chickens, is also an effective strategy to mitigate food insecurity because farmers can sell them to obtain cash for purchasing staple foods. Holistic approaches will be encouraged.

5.3.2.2 Poverty reduction and economic growth

In the medium-term, more market oriented farming has to be promoted to generate income from agricultural activities. Subsistence farmers need to be transformed into market oriented smallholder entrepreneurs through gaining higher productivity and more access to markets. This transformation will affect the rural labour market. More labourers would be required for intensive and productive agriculture in rural area and additional rural off-farm employment (e.g. blacksmith, postharvest, processing, input supply and transport) could be created with diversification of the rural economy.

In the long-term, production of export commodities and the development of longer value chains by small and medium agro enterprises would be important focuses to accelerate export and value addition. Currently, very little is exported from the crop subsector, but this could be drastically changed.

To project medium- and long-term scenarios, a review of agricultural development in Uganda for the past 25 years would give important insights. The reconstruction of the crop subsector in Uganda was executed under similar conditions to which South Sudan is now facing, such as post-civil war period, poor infrastructure, limited service delivery by public and private sectors and low agricultural productivity. Table 5-5 shows the past 25-year crop production trend of Uganda. Total cereal production has more than tripled; the country is now an exporter of maize and rice. Oil seed production has rapidly increased more than fivefold; sunflower seed has become the second highest produced oil seed in Uganda. On the other hand, production of tubers, and peas and beans has increased more moderately by about 70% and 80%. The total volume of major crop production has doubled in 25 years.

Table 5-6 indicates formal exports by crop in Uganda. Not only traditional commodities (e.g., coffee and tea) but also non-traditional ones, such as maize, beans, sesame and vegetables, are exported. Through these exports, a relatively large amount of foreign currency is accumulated; the total value of these export crops is about USD627 million.[42] High value export crops are coffee, tea, sesame and vegetables; South Sudan also has the potential to produce these crops.

The crop subsector in Uganda has made exceptional progress in 25 years and would be a good model for South Sudanese agricultural development, particularly for crop production. Balanced development for domestic and export products is one of the key challenges. The production of highly profitable export crops, such as coffee, tea, sesame and vegetables, is a key strategy for economic development, reducing or eliminating dependency on oil revenue in the long-term.

[42] This number is nearly equal to the value of crop production in Southern Sudan in 2009. Value of total agricultural production in Southern Sudan was estimated at USD808 million in 2009 and USD608 million (about 75% of the total value) was generated by the crop subsector. World Bank. May 2012. *Agricultural Potential, Rural Roads and Farm Competitiveness in South Sudan*. p15. Washington D.C. World Bank.

Table 5-5: 25- year major crop production trend of Uganda

Item	Production (Mt)				Increase ratio			
	1986	1991	1996	2011	1986-1991 (5 years)	1991-1996 (5 years)	1996-2011 (15 years)	1986-2011 (25 years)
Maize	322,000	567,000	759,000	2,551,000	76%	34%	236%	692%
Sorghum	279,652	363,000	298,000	437,000	30%	-18%	47%	56%
Rice, paddy	21,000	61,000	82,000	233,000	190%	34%	184%	1010%
Millet	427,000	576,000	440,000	292,000	35%	-24%	-34%	-32%
Sub total of cereal	1,049,652	1,567,000	1,579,000	3,513,000	49%	1%	122%	235%
Cassava	2,900,000	3,229,000	2,245,000	4,757,800	11%	-30%	112%	64%
Potatoes	98,000	254,000	318,000	765,000	159%	25%	141%	681%
Sweet potatoes	1,864,595	1,785,000	1,548,000	2,554,000	-4%	-13%	65%	37%
Sub total of tuber	4,862,595	5,268,000	4,111,000	8,076,800	8%	-22%	96%	66%
Beans, dry	267,093	383,000	234,000	447,430	43%	-39%	91%	68%
Peas, dry	10,000	15,000	17,000	17,330	50%	13%	2%	73%
Pigeon peas	30,049	50,000	58,000	93,645	66%	16%	61%	212%
Sub total of peas and beans	307,142	448,000	309,000	558,405	46%	-31%	81%	82%
Groundnuts, with shell	118,000	144,000	125,000	327,000	22%	-13%	162%	177%
Sesame seed	34,614	61,000	73,000	216,100	76%	20%	196%	524%
Sunflower seed	2,000	43,000	45,000	265,000	2050%	5%	489%	13150%
Sub total of oil seeds	154,614	248,000	243,000	808,100	60%	-2%	233%	423%
Coffee, green	159,881	147,366	287,925	191,371	-8%	95%	-34%	20%
Tea	3,335	8,877	17,418	35,194	166%	96%	102%	955%
Fruit, fresh nes	43,000	48,426	47,000	51,107	13%	-3%	9%	19%
Vegetables, fresh nes	325,000	370,000	375,000	882,347	14%	1%	135%	171%
Total	6,905,219	8,105,669	6,969,343	14,116,324	17%	-14%	103%	104%

Source: FAO Stat http://faostat.fao.org/ (accessed on 27 November 2013)

Table 5-6: Formal exports by crop in Uganda in 2011

Items	Volume (Mt)	Value (000USD)	Unit value (USD/Mt)
Coffee	188,623	466,659	2474
Tea	55,650	72,162	1297
Maize	89,246	26,752	300
Rice	38,254	18,442	482
Beans and other leg	35,920	20,428	569
Sesame	14,841	17,318	1167
Vegetables	3,720	3,484	937
Fruits	3,682	1,443	392
Groundnuts	299	163	545

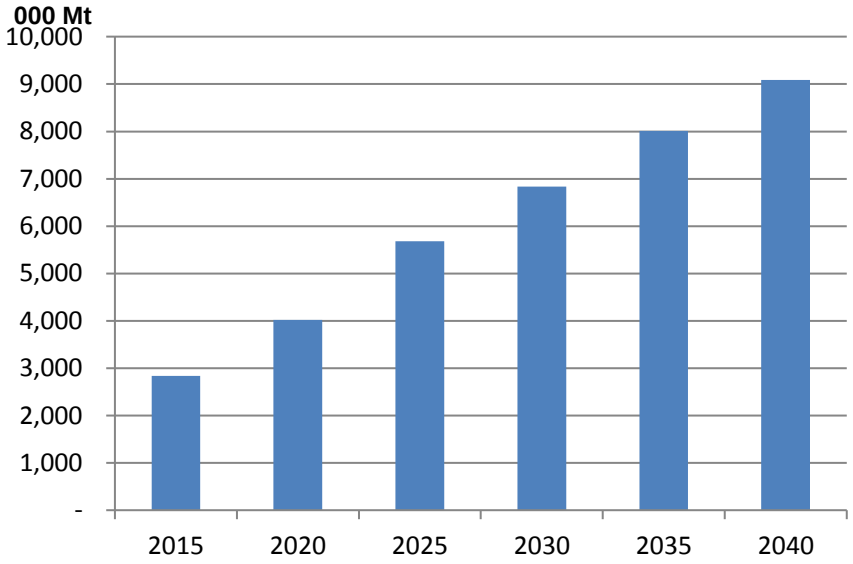
Source: Uganda Bureau of statistic. Statistical abstract 2012. pp. 222-223.

Based on the case of Uganda, CAMP crop subsector develops 25-year scenarios on volume of crop products (Figure 5-5), values of domestic and export products (Figure 5-6) and values of major agricultural products (Figure 5-7). In this scenario, the total volume of production in 2040 would be approximately three times that of 2015. The value of the crop subsector at USD 342 million in 2015 would become USD 1.341 billion in 2040. [43] Approximately 30% of the total value of crop products would be exported and the crop subsector would contribute about 50% of the estimated GDP in the agriculture sector, which itself accounts for about 15% of the estimated total GDP in 2040. Cereals (e.g., maize and rice), coffee, oilseeds (e.g., sesame, groundnuts, sunflower and oil palm) and vegetables are

[43] USD at 2009 constant price

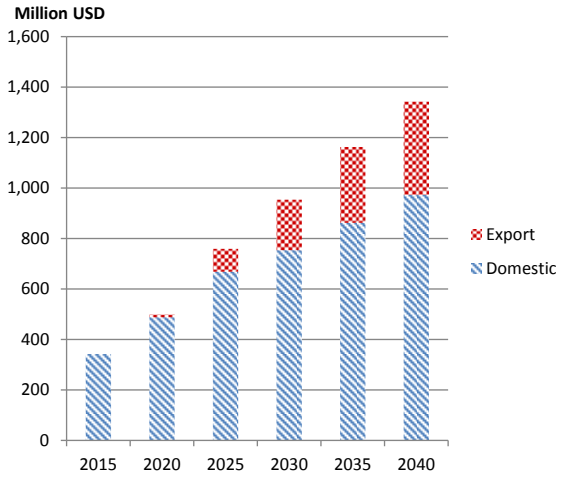
potential crops for both domestic consumption and export. Diversification of export commodities is essential to stabilise an economy which relies on agricultural exports, since commodity prices in the international market tend to fluctuate.[44]

Figure 5-5: **Projected volume of crop products in 25 years**



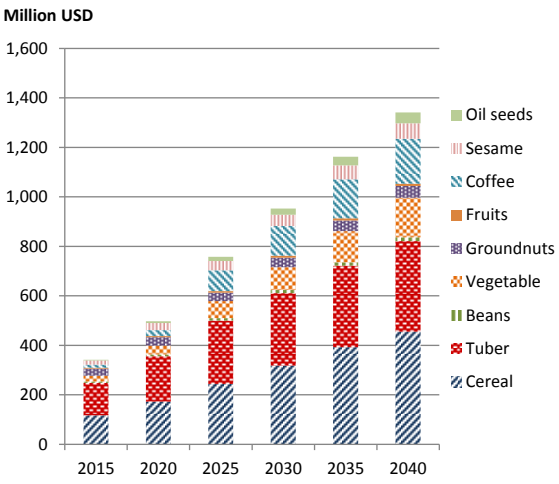
Source: Prepared by the CAMP Task Team

Figure 5-6: Projected values of domestic and export products in 25 years



Note: USD at 2009 constant price
Source: Prepared by the CAMP Task Team

Figure 5-7: Projected values of major agricultural products in 25 years



Note: USD at 2009 constant price
Source: Prepared by the CAMP Task Team

5.3.3 Public interventions by national, state and local government

Table 5-7 shows areas of public interventions by national, state and local governments to achieve the 25-year scenario. As mentioned, in the short-term, the main objective is to achieve food self-sufficiency; most resources must be allocated to address this issue. Then, in the medium-term, after improving food security, a core objective becomes household

[44] Please refer *the Section 10.6 Cash crop production* in the Situation Analysis Report.

income growth for poverty reduction through market oriented farming. Subsistence farmers are transformed into smallholder farmers who have enough capacity to produce surplus to sell at their local markets. Household income could increase through these transactions with local markets, which would make improve accessibility to food in rural areas. Finally, in the long-term, more attention is paid to export products. Reduction or cessation of oil revenue will have a serious negative impact on South Sudan's economy. To minimise this impact, the agriculture sector must play a crucial role in diversifying the economy and obtaining foreign currency, by producing more domestic and export products.

Table 5-7: Areas of intervention by governments in the three terms (draft)

Areas of interventions	Indicators	Areas/targets
I. Short-term: Food security		
1. Achieve food self sufficiency		
▪ Expansion of cereal area harvested ✓ Enhancement of expansion of small scale farming through animal power utilization and appropriate tools	4% annually	Whole country
▪ Improvement of cereal yield ✓ Provision of quality seeds ✓ Promotion of use of organic/inorganic fertilisers	4% annually	Whole country
▪ Diversification of crop production ✓ Acceleration of roots and tubers crop production ✓ Acceleration of horticultural crop production ✓ Integrated farming with livestock	 TBD TBD TBD	 Whole country Peri urban and Greenbelt Whole country
2. Strengthen public service delivery		
▪ Capacity development for the national and state governments on programmes/projects implementation	Implementation framework/training	National and state governments
▪ Strengthening of training and extension service delivery to farmers ▪ Strengthening capacity of farmer organizations/groups	No. of trained individual farmers/groups/organizations	Key farmers. farmers organizations and extension workers
▪ Strengthening of collaboration between government institutions and local and international NGOs ▪	Improvement of coordination mechanism at state and county levels	National and state levels, governments and NGOs
3. Establish a firm legal basis		
▪ Preparation of necessary laws and acts based on agricultural related policies	No. of laws and acts established	National and state governments
4. Develop infrastructure (in collaboration with other ministries)		
▪ Interstate and feeder road development	No. of km	Main interstate roads and priority feeder roads
▪ Small scale storage development (farmer's level)	No. of sites	Whole country
II. Medium-term: Household income growth for poverty reduction		
1. Improve productivity for poverty reduction		
▪ Expansion of cereal area harvested ✓ Enhancement of medium and large scale farming through mechanisation and animal power utilisation	4% annually	Whole country
▪ Improvement of cereal yield	3% annually	Whole country
▪ Diversification of crop production (integrated farming)	TBD	Whole country
2. Promote market oriented farming and value addition		
▪ Strengthening of farmers' organisations for effective marketing and access to inputs and services	TBD	Cooperatives, associations and FBOs
▪ Production of high value crops for domestic markets (horticultural crop, oil seeds, processed cassava, etc.)	TBD	Progressive and smallholder farmers
▪ Provision of rural finance	TBD	Agricultural Bank and Coop Bank, progressive farmers
3. Strengthen public service delivery		

Areas of interventions	Indicators	Areas/targets
▪ Promotion of basic research	No. of appropriate technologies developed	Some target areas
▪ Strengthening of agricultural information collection system	Statistical information, agricultural census	Whole country
▪ Strengthening of training and extension service delivery to farmers	No. of trained farmers	Key farmers and extension workers
▪ Strengthening of plant protection and pest control service delivery to farmers	Coordination function at national level	Some target areas, DLCO-EA
▪ Enhancement of appropriate natural resource utilization and management	TBD	Whole country
4. Establish/strengthen higher educational institutions		
▪ Establishment or strengthening of agricultural colleges/universities	Number of institution established	Some target areas
5. Improve competitiveness		
▪ Tax exemption for agricultural inputs and services	Selected inputs and services	Whole country
6. Develop infrastructure (in collaboration with other ministries and private sector)		
▪ Interstate and feeder road development	No. of km	Priority interstate and feeder road
▪ Irrigation development (small and medium-scale)	No. of sites	Some target areas
III. Long-term: Agricultural transformation into export industry		
1. Improve production for export		
▪ Efforts for quality control	Laboratory services	Some target products
▪ Standardisation of commodities	No. of standards established	Some target products
2. Promote value addition		
▪ Support establishment of processing factories by private sector	Tax reduction	Some target areas such as special economic zones
▪ Creation of longer value chains	TBD	Some target commodities
3. Strengthen public service delivery		
▪ Promotion of advanced research	No. of advanced technologies developed	Some target areas
▪ Strengthening of quarantine system	No. of check points at border, laboratories	Some target sites
4. Develop infrastructure (in collaboration with private sector)		
▪ Development of electricity, transport and road.	TBD	Some target areas
▪ Irrigation development (large-scale)	No. of sites	Some target areas
5. Establish favorable conditions for private investment		
▪ Clear tax policy	Tax reduction	Some target areas such as special economic zones
▪ Good governance (high transparency, no corruption, clear land acquisition process and good security)	TBD	National, state and local governments

Source: Prepared by the CAMP Task Team

5.4 Livestock subsector 25year development scenarios

5.4.1 Overview

The livestock herd in South Sudan is ranked seventh in Africa based on estimated livestock numbers with the highest per capita livestock holding on the continent, and a livestock resources asset worth over 28.8 billion SSP. The 1954 assessment of the potential of the resources, of the then Southern Sudan region, highlighted the capacity of the livestock subsector to increase the financial self-sufficiency of the region. Currently, South Sudan's livestock subsector is untapped and under-developed for food security, livelihoods improvement, income generation, industrial growth and export due to underinvestment. The subsector adds approximately 3.2 billion SSP (about 800 million USD) worth of marketed value annually although the larger part of what is produced is consumed at household level, mobilised or exchanged to meet social objectives and obligations or wasted. Social offtake

(or removal of goods from the market) and exchange which include dowries, distribution of livestock among kin and social networks as a safety net measure, and purchase of livestock for herd build-up is higher than commercial offtake, limiting output for market.[45] In comparison, the 5th ranked Kenya livestock herd, which is largely held by pastoralists and agro-pastoralists in its arid and semi –arid lands (ASALs), is estimated to contribute Kenya shillings 320 billion (3.7 billion USD) annually, equivalent to almost 50% of the agricultural GDP.

The livestock subsector, like all other sectors, suffered considerably during the protracted civil war of neglect and marginalization. Key public sector investments are needed especially in policy, legal and regulatory frameworks and enforcement mechanisms, in capacity building, and awareness raising. Public sector investment is also necessary in areas of public interest related to animal health and food hygiene, and for large scale infrastructure developments such as roads to connect production areas to markets, water for livestock production, protection of grazing areas, migratory and trade routes, development of markets and for service delivery, research and extension. However a multi-stakeholder approach with public-private partnership is necessary given the potential diversity of production systems dominated by extensive pastoral and agro-pastoral systems.

Not only is socio-economic development starting from a very low base, but issues such as conflict and insecurity still have an unduly significant impact on the growth of the livestock subsector of the post-conflict economy. Both the South Sudan Development Plan and the more recent Fragility Assessment[46] emphasize the need to prioritize interventions that maintain and/or strengthen peace and stability, as critical prerequisites for development. Much of the conflict is resource based, fuelled by the proliferation of small arms and weapons, and exacerbated by rebel activity and the rise in large scale cattle raids and thefts. Incidents of inter and intra-communal violence have fallen sharply from 444 reported incidents in 2011, to almost half (237) between January and October 2012.[47] However, underlying causes have not been dealt with, key reforms in natural resource management are pending, and the traditional authorities and institutions important to conflict resolution at the local level are not empowered although their role is constitutionally mandated.[48] The dividends from addressing these issues are critical and will be a foundation for to the development of the livestock subsector, and its potential for stimulating growth in other sectors such as processing and manufacturing.

South Sudan sits within a region with the highest population and concentration of livestock in Africa, with the sector predominated by extensive pastoral and agro-pastoral livestock production systems. Livestock contribute significantly to the national and regional economies, with some countries having the highest milk production on the continent, with vibrant dairy industries that export to the region. There is a large trade in live animals worth millions of dollars annually, with the export to the Middle East and North Africa region, renowned as the largest trade of animals on the hoof globally. The trade of hides and skins, and production of leather and leather products is also significant, as is the production and trade of honey, with some countries engaged in lucrative global markets in the European Union and elsewhere. Livestock keepers have harnessed technologies and innovations including mobile technologies and innovative financing, among others. Conversely, while most of these economic benefits come from pastoral production, there is no commensurate reinvestment into the development of pastoral populations which have become increasingly vulnerable, and are among the communities with the highest levels of poverty and marginalization in the region. The recent drought in 2011 that brought over 14 million people in the region to the brink of starvation, most of whom were pastoral populations, again emphasized the need for a rethink on the models of development of livestock resources in

[45]Republic of South Sudan. 2012. *Strategic Plan 2012 to 2017.* Ministry of Livestock and Fisheries. Jonglei State, Bor.

[46]Republic of South Sudan. 2012. *Fragility Assessment Republic of South Sudan: Summary Results.*

[47]Republic of South Sudan. 2012. *Fragility Assessment Republic of South Sudan: Summary Results.*

[48]Republic of South Sudan. 2012. *Fragility Assessment Republic of South Sudan: Summary Results.*

the region. South Sudan must take cognizance of all these local, national and regional dynamics including: national needs and priorities, the challenges and opportunities, competition and areas of comparative advantage, best practices and lessons learnt, in shaping the development of its livestock subsector over the next twenty-five years.

5.4.2 Livestock subsector development focuses

While there are a number of livestock species and options, the livestock subsector analysis highlights five focal areas where investment would achieve the highest growth and impact, stimulate broader sectoral growth and development, and greater integration with other sectors, and the national and regional economies. There are various kinds of stakeholders in the livestock subsector (Refer to the SAR 11.8.2 “main value chains” for more details of the stakeholders and their relation with markets).

5.4.2.1 Live animals and red meat

Cattle are the main livestock species accounting for approximately 70% of the livestock resources in South Sudan in terms of tropical livestock units (TLUs), but account for only 35% of meat consumed, while shoats (sheep and goats) account for 44% of the meat market. Beef consumption is below the average for Africa, i.e, 4.4kg per capita in South Sudan compared to an average of 6.4 kg per capita on the continent, while per capita consumption of shoat meat is 6.6 kg, which is much higher than the continental average of 2.80 kg per capita. Current commercial offtake rates for cattle are low i.e., only 4%. Much lower than the social offtake rate (dowry, herd rebuild and losses incurred through raids and thefts) estimated at 12%. Commercial offtake rates for shoats are higher than social offtake i.e., 10% compared to 8%. There is a high and growing demand for red meat, especially in the fast growing urban centres due to the influx of migration from rural areas and returnees, and from increased incomes. Red meat prices have risen sharply from 2010 to 2013, from an average of SSP 10 per kg of beef with bones, and SSP 19 per kg of shoat meat in 2010, to SSP 21.2 per kg beef, and SSP 33.7 per kg of shoat meat in 2013.

Most domestic demand is met by local producers. Nevertheless, due to conflict, insecurity, impassability of roads, and multiple and unreceipted taxes which raise transaction costs, and the poor quality and low body size of animals, livestock are imported for the fast growing markets in the major urban centres. However, only 25% livestock keepers have over 50 head of cattle, the herd size required in South Sudan to sustain a household, so the majority of livestock keeping households only sell cattle for social reasons or as a last resort in coping mechanisms. It will therefore be important in the short term to help the majority of households restock and rebuild herds, so that in the medium term there is greater integration into markets, and in the long term more households can benefit from the lucrative regional trade. There is already a steady importation of goats especially into Western Equatoria and into the terminal markets of Juba, and other parts of Central Equatoria, and on-going programmes on restocking goats.

South Sudan has historically exported livestock to Ethiopia, Kenya and Uganda or transferred them to the North after the CPA trade into Kenya and Uganda ceased. Trade with Sudan became official with the creation of the international border when South Sudan gained independence. The Lamu Port- South Sudan – Ethiopia Transport Corridor (LAPSSET) is expected to stimulate export of livestock and facilitate meat trade from South Sudan. Measures are needed to meet sanitary and phyto-sanitary standards and manage transboundary diseases; currently South Sudan has only two official border (export) posts i.e., Juba International Airport and Nimule, which constrains export of live animals, and no export quality abattoir.

5.4.2.2 Dairy sector development

Milk is an important food security commodity and source of protein especially for pastoral and agro-pastoral communities. Almost all milk is produced from indigenous breeds, held by the subsistence pastoral, agro-pastoral and small holders, with low milk production of

between 0.5 to 1.5 litres per day. Total available milk production (minus that consumed by calves) is estimated at 161,000 MT per annum (269,000MT per annum before calf consumption). According to the National Household Baseline Survey, total milk consumption is only 89 million litres, an average of 11 litres per capita annually, which is far less than the average across Africa of 43.90 litres per capita, and meagre in relation to WHO recommendations of 200 litres per capita. More milk is consumed in rural areas, 12 litres/person/year compared to urban areas where it is only 9 litres/person/year. Urban needs, especially for Juba and state capitals, are met through milk imports from the region and globally, as powder milk and other dairy products, with up to 3874 metric tonnes of powder milk imported annually. In general, the source of milk for the total population is from their own production and less than 10% of milk marketed. Some households that sell milk are unable to meet their own consumption, only resorting to milk sales to enable them to purchase their daily grain needs.[49]

Average milk production is below the genetic potential of the local breeds, and a significant increase can be attained through better watering and an improvement in seasonal access to water, access to better grazing and longer hours of grazing/less hours spent walking to and from grazing. Consumption data also suggests that there could be significant wastage through poor milking and handling techniques, type of storage, and spillage during transportation. Milk wastage in Uganda currently stands at 27% of all milk produced.[50]

South Sudan has a liberalized economy which raises the question on the efficiency/ competitiveness of investing in the development of its milk sector given the already more advanced and competitive milk industries of its trading partners Uganda, Kenya and Sudan.[51] However, certain considerations are pertinent: milk is a critical source of food and nutrition for a large population of livestock keepers, with animal source foods making up 53% of the protein consumption in some of the states with high livestock populations, where reliance on livestock is critical. It is therefore important that South Sudan develop its milk sector for both rural food security and for meeting urban demand. A low input model, like that of Uganda, that integrates extensive pastoral and agro-pastoral production into the dairy industry offers a more appropriate and sustainable option, than the more capital intensive dairy farm model (see example from the region, below). There is high potential for making cattle camps collection centres, especially those camps close to urban centres at least for part of the year. The fact that key urban centres are sited close to permanent water sources means there is high potential for development of peri-urban dairy farms and dairy processing units. Mushrooming 'permanent' cattle camps close to urban centres would also be important opportunities for growth of the urban milk sector. The high per capita holding, and the herd structure, with 70% female animals gives a high potential for growth of the milk sector to meet local and domestic demand, and eventually for value addition and export of milk and other dairy products.

Example from the region*:* The livestock industry in Uganda is similar to South Sudan with most livestock held by pastoralists, agro-pastoralists and small holders with 95% of the livestock from indigenous breeds. Uganda grew the milk industry from 365 million litres in 1991 to an estimated 1.526 billion litres in 2012 in 21 years. The country which was a net importer of milk in the 1980s, now earns an estimated USD12.1 million through export to the region. Milk consumption increased from 20.2 litres per person/year in 2000 to 33.9 litres in 2009. Ugandan's milk industry is one of the few lost cost milk industries globally. The development of the sector took a two pronged approach: low cost interventions working with informal actors (mainly pastoral and agro-pastoral communities and smallholders) to improve production, milk handling and hygiene, collection and cooling of milk in rural areas; this was linked to interventions to improve the installed processing and product development capacity

[49]CAMP 2013 field data collection visits from March to September 2013

[50]Government of Uganda. 2013. *Policies, Laws, Strategies and Achievements of the Livestock Sector Since 1986.* Ministry of Agriculture, Animal Industries and Fisheries, Uganda

[51]Muriuki, H.G. 2010. *Development of the Dairy Industry in Southern Sudan – Issues and Suggestions.* Ministry of Animal Resources and Fisheries, Juba, South Sudan.

of largely urban based formal actors. This approach serves to distribute profits that encourage both the rural and urban producers. This is different to the more sophisticated capital intensive approach of the Kenya milk industry, which is dominated by dairy farms in the high potential highland regions, with high grade animals that constitute about 30% of the national herd.

5.4.2.3 Poultry sector development

The poultry sector is untapped for food security (food and money to buy food) and for income, with most rural households that raise poultry (80%) consuming the poultry they produce themselves. Commercial poultry production is faltering due to lack of a vital support input system for day old chicks, feeds, veterinary supplies and equipment. A rising proportion of poultry demand in urban areas is met through importation of both live poultry and frozen dressed chicken from regional and global actors. Initially the growth of the poultry sector will be linked to the growth of commercial enterprises in urban and peri-urban areas and the growth of support systems and infrastructure. Commercial poultry production offers a high opportunity for employment and income for vulnerable groups such as female headed households, IDPs, returnees, demobilised forces, and youth. Over the short term, it would be critical to ensure incentives to stimulate the growth of the domestic poultry industry; many African countries took a deliberate approach of protecting their nascent poultry industries from regional and global competition. Incentives are also needed to grow linkages to the crop sector as a source of grain and by-products, important to growth of a sustainable feeds industry. There are opportunities to harness regional investors and innovative financing to invest in the growth of support systems

In the rural areas, where there is higher consumption of poultry, in the short term the key thrust would be to vitalize the local market for poultry and eggs, and to improve disease control and management which would contribute to food security. Support for improved production and marketing of local chicken, which attracts higher prices in domestic markets, is also needed. In the medium term, input systems for hatching of day old chicks for the local chicken market will help to increase the rate of growth of poultry production in the rural areas, and encourage greater market integration.

5.4.2.4 Hides and skins

Before the Comprehensive Peace Agreement (CPA), hides and skins collection and export in Southern Sudan was predominantly by Ugandan and north Sudanese traders. The trade dwindled markedly after the CPA due to insecurity and tariffs that increased the cost of doing business. It has since improved up, but only an estimated 20% of all hides and skins are recovered, mostly from slaughter facilities. Considerable slaughter occurs outside of slaughter facilities, especially in rural areas; almost all these hides and skins generated do not enter the market.

Over the short term, South Sudan will be looking to export more hides and skins through increasing the recovery of hides and skins from the current very low levels, from facilities, households and other places of slaughter. There are quick gains to be made through improving flaying and skinning techniques, and handling and initial basic processing of the hides and skins thereafter. In the medium to long term, enforcement of meat hygiene regulations should realize an incremental increase of slaughter within facilities, so improving recovery and creating a basis for the growth of a tannery industry and development of leather products. Further improvements in hide and skin quality will come with improvements in nutrition and disease management, and improved animal welfare in transportation and slaughter. The vibrant tanning and leather manufacturing industries in Ethiopia and Sudan are regional examples to emulate. The IGAD Leather Institute in Addis offers technical support for the hides and skins, tanning and leather industries in the region.

Example from the region: neighbouring Ethiopia collects an estimated 1.1 million hides, plus 8.5 million sheep and 7.5 million goat skins annually, attracting an average price of 0.3

US/kg, 3.2 US/ piece, and 1.5 US /piece, respectively, within the domestic market[52] from an estimated annual offtake rate of 7% for cattle, 33% sheep and 38% goats.[53] The proportion of the quality grades of the hides and skins are 40/50/10% of grades I, II and III. South Sudan prices are much lower i.e., on average for cow hide 0.1 USD/kg, sheep and goat skins USD 1.1/ piece.[54] In Ethiopia most hides are exported (80%) earning USD 79.7 million in 2006/7, equivalent to 5.57% of the total exports.[55] Main destinations are Europe 60%, Asia 30% Asia and USA and Africa 10%. Raw hides are charged an export levy of 150% of their value, wet blue hides 20%, wet blue sheep and goat skins are charged at 5%, and pickled sheep skins at 10%. [56] There are 21 domestic tanneries, processing the remaining 20% which are constituted of 80% hides and 60% skins. To improve recovery of hides and skins beyond those collected at slaughter facilities, the hides and skins from animals slaughtered within households are collected, or brought to specific collection centres. [57]

5.4.2.5 Honey

Development of beekeeping for honey and other products is rudimentary and largely unexploited. The vegetation cover across the agro-ecological zones of most of the country is suitable for production of honey, and there is tremendous potential for entry into niche organic honey markets, due to the freedom from chemical residues, since use of agricultural chemicals and fertilizers is almost non-existent. The ecological variations and biodiversity also means that there is variation in the taste and character of honeys from different areas. Presently most honey is either gathered (wild honey) or produced through traditional beekeeping, with only 20% of beekeepers having apiaries, and only 2% utilising modern equipment or modified and improved versions of traditional hives. The sector is dominated by men although women are increasingly involved where modern hives and practices are used and in projects promoted by NGOs. Beekeeping is an important source of livelihood for returnees, and has potential for employment for other vulnerable groups such as internally displaced persons (IDPs), demobilized forces, youth and female headed households.

A key constraint is the lack of a definitive estimate of honey and other bee products in South Sudan. In 2008 MARF/ GOSS estimates put potential at 100,000 MT, and 1000 MT of beeswax which would make South Sudan the leading producer of honey in Africa. The report estimated that with modern technologies and equipment these estimates could be expected to triple in the foreseeable future, but these projections could be disputed when compared to historical data from other producing countries.[58] Key indicators in the short term will be the amount and quality of honey marketed, and the development and strengthening of domestic marketing channels. There is also tremendous short term opportunity for increased production through increased numbers of apiaries, and use of modern equipment and methods, which can also result in increased employment opportunities and incomes, especially for vulnerable groups. In the short to medium term, more deliberate approaches would be taken to minimise export of raw or minimally processed honey, to brand and promote South Sudan honey and to enter lucrative and highly competitive EU markets.

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[52] International Trade Centre, African Platform. Ethiopia: Hides and Skins. http://legacy.intracen.org/Appli2/Leather/AfricanPlatform/CountryProfile.aspx?info=HidesSkins&countryid=24&countryname=Ethiopia&kk=

[53] Ethiopian Investment Agency. 2008. *Investment Opportunity Profile for Tanning of Hides and Skins upto Finished Level in Ethiopia.*

[54] CAMP 2013 field data from April to September 2013

[55] Ethiopian Investment Agency. 2008. *Investment Opportunity Profile for Tanning of Hides and Skins upto Finished Level in Ethiopia.*

[56] Nazret.com. 2008. Ethiopia: House Imposes 150% Tax on Hide and Skin Exports. Nazret.com, the First Ethiopian Blog on Current Affairs, Business, Sports and Style. http://nazret.com/blog/index.php/ethiopia_house_imposes_150_tax_on_hide_a

[57] All Africa.com. 2012. Ethiopia: Hides, Skin Market Goes Gloomy with Sheep Expensive. http://allafrica.com/stories/201205040696.html

[58] MARF. 2012. *Investment Opportunities in Livestock and Fisheries Sectors in South Sudan.* Department of Investment and Marketing, Ministry of Animal Resources and Fisheries, South Sudan.

Example from the region: Ethiopia is Africa's leading producer of honey and the fourth largest producer of beeswax worldwide. From 2005-2010, Ethiopian honey production increased 26% from 36,000 to 45,300 metric tonnes.[59] Ethiopia however is unable to export honey to the EU as it has not met requirements for third country listing under regulations for products of animal origin. Uganda is an exporter of honey to the EU, with exported honey valued at three times the domestic market price ex-Mombasa port.[60] Reports from Uganda show that in the mid-2000s large quantities of honey entered the Uganda market, effectively driving down prices of honey in the country by as much as 30%. The quality of South Sudan honey is comparable to that from the Ugandan market, and interventions to improve production, harvesting, processing, storage, packaging and branding will allow South Sudanese to directly derive better profits from targeting both urban domestic markets and export markets, better than what is being received from sale and export of raw or minimally processed honey.

5.4.3 Livestock subsector 25-year development scenario

A major impediment to developing 25-year development scenarios and forecasts for the livestock subsector is the lack of authoritative data on the subsector: population, production, productivity, carrying capacity[61] and consumption data are inconsistent.

The scenario is based on modest growth forecasts (Table 5-8 to Table 5-10) recognizing that the country has emerged from decades of civil war and economic and social marginalization. The overall thrust of the scenario is to enable the country to meet its local and domestic demand and grow a competitive edge for substitution of imports and for entry into lucrative regional and global trade. The current situation is high food insecurity and poverty in rural areas, especially in those states with high livestock populations, indicating structural constraints to deriving food and incomes from livestock, such as endemic insecurity and conflict much of which is resource based, market distortions and inefficiencies, poor animal health services delivery systems, poor road infrastructure, high transportation costs, multiple and unreceipted taxes and importation tariffs that don't support commercialization. A significant portion of the high and fast growing demand for livestock products in urban areas is being met through imports.

Investments are needed to first remove the constraints, to leverage opportunities and comparative advantages to meeting local and domestic demand, and for setting the stage for competitively engaging in export markets. It can be expected that given the comparative advantages of a high livestock population and per capita holding, the country has a high potential to meet its domestic demand, competitively substitute imports in domestic urban markets, and eventually benefit from increased revenue through export.

5.4.3.1 Food security: through building and protecting assets and harnessing urban opportunities

In the short term (5 years): Food security and urban market opportunities: protecting production assets, building livestock assets and improving access to local markets and harnessing the opportunities from rapid urban growth.

Rural areas: Among pastoral and agro-pastoral livestock keepers, key production and marketing objectives are food security (consumption of animal source foods produced within

[59]The Ethiopian Herald. 2013. *Production and Marketing of Honey in Ethiopia.* http://www.ethpress.gov.et/herald/index.php/herald/development/2070-production-and-marketing-of-honey-in-ethiopia

[60]Maku, J. 2004. *Honey Market in Uganda.* APICATA, vol. 38, pp 302-306.

[61] Carrying capacity is: the maximum population of a given species that can survive indefinitely in a given environment.
(Source:http://sustainablescale.org/ConceptualFramework/UnderstandingScale/MeasuringScale/CarryingCapacity.aspx).

the household and sale of livestock products to get money for purchase of food) and social offtake (12% of the herd) which is higher than the commercial offtake of 4%. Social offtake consists of production of up to 7% of the herd for dowry, investment in herd-build up (2% of the herd) and losses or gains through cattle thefts or raiding, which average up to 3% of the herd. Social offtake is an institution for maintaining social capital important as social networks and safety nets as well as a vehicle for social status and prestige. Therefore while there is a potential 'surplus' between the number of total stock available for sale, and those actually sold, the reality is that unless the objectives of social offtake can be met, households will be reluctant to produce or sell for commercial gain. Most South Sudanese households have below the 50 cattle needed to sustain their livelihoods and only sell animals under distress situations.

In the short term, a focus is needed on interventions that build and protect livestock assets. Key are securing and protecting the natural resource base, reduction of natural resource based conflict, increased capacity for managing and rebounding from natural disasters especially drought, flooding and disease. Secured natural resources will result in realisation of immediate gains in production and productivity in terms of increases in calving rates, calf survival, and reduced mortality of adult animals that are key to natural herd increase and therefore the number of animals available for commercial offtake, and of lactating cows. Reduction in natural resource conflict reduces the loss of animals and well as increases access to important production resources and markets. Interventions include: restocking and improvement of markets for herd build-up, disease control, mapping and protection of dry and wet season grazing, and migration and trade routes; investments into water for livestock production, support of community and traditional institutions as safety nets and managing migration and conflict; and improved local markets in terms of access, infrastructure and efficiency especially turnaround time and access to trade in grain, with improved linkages to domestic markets.

Honey is important for food security, as a source of food, as well as income for purchase of food. In the rural areas, the focus will be on increased recruitment of honey producers, and improved organization of producers for production, bulking and marketing.

Urban areas: Fast growing urban demand for food of animal source is an opportunity that is currently met through inefficient domestic markets with strong competition from regional and global producers and processors. Incentives are needed to substitute the imports. Support is necessary for investments in commercial production focusing on intensive production in the urban and peri-urban areas, development of supply and input systems, processing and value addition infrastructure that will eventually support the whole sector. For red meat, linkage from high production areas into urban markets will improve supply and reduce transaction costs to give local producers an advantage. Areas of focus could include poultry production, both meat and eggs; milk collection centres and commercial processing units for consistent quantity and quality in urban areas; improved meat hygiene and quality control, infrastructure and mechanisms for enforcement of regulations; commercial pig production; honey processing, branding, marketing and export; and improved collection, primary processing and export of hides and skins. Regional and global innovative financing and experience could be harnessed to support the growth of input systems for the livestock subsector.

5.4.3.2 Poverty reduction:

The medium term (from 6th to 15th year) will build on a more secure and revitalized production base in both the rural and urban areas, a nascent private sector led input and support system and an emergent processing industry.

Key areas for intervention include: identification of clusters of high production and areas of comparative advantage as the basis for investment; expansion of supply and input systems with rural networks. Improved production and productivity will be promoted. In extensive pastoral and agro-pastoral systems, the focus will be on investment in increasing production and productivity through integrated rangeland and water management, diversification of

forage resources, increased access to water, improved animal husbandry, breed selection, and disease control and management. Investments will be needed to enhance animal health service delivery including increased support for community animal health workers (CAHWs) and incentives for private animal health providers. In urban and peri-urban areas increased commercialization and diversification into a broader range of livestock production systems that use a broader range of breed, forage and feed options.

Collection and bulking will be mediated through producer groups networked with processors and linked to domestic markets. Rural marketing will be enhanced through informal distribution networks. Policy actions will target strengthening mechanisms for enforcement of regulations governing food hygiene and quality.

Semi-autonomous institutions and agencies for sub-subsectoral development will be developed, i.e., for dairy development, meat industry, export of live animals, honey development, and poultry development to provide guidance and coordination.

5.4.3.3 Economic transformation and integration into regional and global markets

Long term livestock subsector development (from 16th to 25th year) will focus on structural transformation of the sector from subsistence to one that is market and commercially orientated. Specialised production to meet the specifications for local, domestic and export markets will be promoted, including processing, value addition, and manufacturing. Areas of specific comparative advantage in industrial development and manufacturing for domestic markets and for export will be identified and supported with incentives.

Support systems are needed, including product identification and development, and quality assurance for competitiveness. industrial and artisanal manufacturing of equipment and inputs locally, to meet producer and processing needs, will be promoted, plus credit and financing for innovation.

Access to export markets requires increased and consistent supply, and greater production efficiency, to increase returns and competitively meet demand. Investments are needed in breed improvement for desirable traits and in ensuring export quality to meet specifications and sanitary and phyto-sanitary standards and requirements. Appropriate investments are needed in export infrastructure, including that for transportation, managing transboundary diseases, establishing disease free zones and export zones and in systems for certification of livestock and livestock products for sale.

5.4.4 Potential production

Cattle - live animals and beef: under the potential production found in Table 5-8, cattle herds can be expected to increase by 1.4 to 1.9% in the first 5 years based on improved nutrition from secured access to natural resources (higher calving rates, lower calf and adult mortalities) and decreases related to losses of animals due to conflict and insecurity. Higher herd growth rates of 2.4 to 3.8% can be expected from the 6-25th year due to nutrition and mortality interventions to improve production and productivity. Analysis shows that, over the 25 year period, there will be an average 1,209,597 cattle annually available for sale over and above the core breeding herd and for calves, of which only 27%, an average of 329,548 cattle annually will be slaughtered for red meat. Under the forecast scenario, commercial offtake is expected to rise from the current 4% to 6%, equivalent to a rise from 483,444 in 2015 to over 1,400,000 in 2040 to meet domestic needs for slaughter, social offtake and export. The suggested scenario aims to increase commercial offtake for domestic markets and decrease social offtake. South Sudan has a high potential to export cattle which can only be realized if the issues of high social offtake are addressed in combination with changes in production and marketing techniques.

Milk: Referring to the milk and hide potential production scenario forecast in Table 5-9, average daily milk production per lactating cow is expected to rise from the current 0.7 litres to 1 litre, and total milk production to approximately double within five years from 177,850

MT to 302,465 MT, with improved access to water and grazing, and to basic animal health care. In the mid-term, measures to improve production and productivity with organized collective marketing to attract better prices, is expected to further double milk production. Milk markets are expected to double during the short term from 10% to 20%, and increase faster (50%) in the mid-term with a further increase to 70% in the long-term. Milk pasteurization and packaging is expected to grow at a slower rate, with the informal sector expected to play a stronger role in marketing. Based on analysis of the trajectories of other countries in the region, it can be expected that South Sudan, which will have more than quadrupled its milk supply by 2027, will be capable of competitive substitution of part of its imports and engagement in export of selected products.

Hides and skins: in the short term, collection and processing of hides and skins is forecast to increase from 20% to 30%, based on better recovery and handling at slaughter facilities (Table 5-9). Over the short term, collection and processing will increase up to 50%, and with improved production and handling, an improvement in quality realized providing the basis for establishment of tanneries, for export of semi-processed leathers, and finished hides and skins, and development of small scale industries for leather products. In the long term, it is projected that up to 60% of hides and skins can be recovered, and processed, and incentives put in place to support growth of a leather industry and manufacturing.

Shoats- live animals and red meat: under the scenario shoat populations can be expected to increase by 11.2–13% in the short term based on improved nutrition, feeding and watering, and decreases in losses from theft and raiding related to insecurity and natural resource based conflict (Table 5-10). In the medium to long term, flocks can be expected to increase by 15.6% to 19.2% generating on average a total available stock of 5,684,516 annually available for sale over and above the core breeding herd and kids and lambs, and a surplus of on average 1,973,133 annually over the 25 year period, about 35% of the total stock available annually. However, the consumption data from NBS suggests that either there is a much higher shoat population or restocking is needed to meet the demand for shoat meat.

5.4.5 Limited change scenario

A worst case scenario would be one in which there is a mismatch between the structure of the livestock sector and the development and investment strategy. This has been a challenge for the development of livestock resources across most of the Greater Horn of Africa region where pastoral, agro-pastoral and smallholder livestock keepers predominate. A sectoral development approach was taken that failed to factor in the social institutions, traditional structures and natural resource related issues that are central to the strategies and objectives of pastoral, agro-pastoral and small holder production. A livestock sectoral approach prioritizes modern high input, sedentary commercial systems based on private land holdings with improved livestock breeds. Extensive and smallholder systems based on communally held land and dependent on shared resources and indigenous breeds are considered inferior. The natural based conflict that is an inherent part of such systems is more often handled as a security issue, and the underlying causes that exacerbate the competition for access and utilisation of resources is left unaddressed. This scenario also views institutions for creating social capital and for maintaining social safety nets such as dowry, distribution of livestock among kin and herd build-up as retrogressive and backward. The reluctance of pastoral and agro-pastoral households to sell livestock is viewed as irrational, as is the need for seasonal migration of livestock to access key wet and dry season resources. These views do not take into consideration the fact that these are risk avoidance approaches that are necessary to maintain viable breeding herds in the face of harsh environmental conditions, including periodic droughts and floods. A key intervention has been sedentarization and promotion of other forms of production, and livelihoods including cropping, which are often high risk in the drought prone environments that pastoralists and agro-pastoralists live in. The approach also prioritises the formal private sector over the informal private sector, failing to draw on comparative advantages and complementarities.

This challenge has recently received considerable attention; the African Union developed a Policy Framework for Pastoralism in Africa in 2012 that was endorsed by member states. The recently developed Inter-Governmental Authority on Development (IGAD) Comprehensive Africa Agricultural Development Programme (CAADP) 2012 has a strong focus on strategizing for greater inclusion of pastoral concerns in development of the livestock sector of member states and in the region. Kenya recently (2012) developed a National Policy and an accompanying Development Strategy for the sustainable development of its arid and semi-arid lands (ASALs), both of which recognise the intricate relationship between livestock, natural resources and human social structures that are core to pastoral livestock production systems; this is a departure from the more sectoral approach the country had hereto pursued in developing its livestock subsector that contributes approximately 50% of its AGDP.

Table 5-8: 25 year forecast for cattle: live animals and beef

						Commercial Offtake			Beef Production		
	Year	Human Population	Cattle Population	Percent Herd Increase	Total Stock Available for Sale	Cattle Sold in a Year (%)	Total Number of Cattle Sold in a Year	Potential Surplus	Per Capita Beef Consumption (2% growth rate)	Number of Stock Slaughtered Per Year	Total Annual Beef Production (Metric tonnes)
1	2015	11,022,000	12,098,607	1.4	894087	4	483944	410143	4.43	260413	48827
2	2016	11242440	12,269,802	1.4	906738	4	490792	415946	4.44	249518	46785
3	2017	11467289	12,443,420	1.4	919569	4	497737	421832	4.45	255017	47816
4	2018	11696635	12,619,494	1.9	932581	4	504780	427801	4.46	260638	48870
5	2019	11930567	12,859,896	1.9	950346	4	514396	435950	4.47	266383	49947
6	2020	12169179	13,104,877	1.9	968450	5	655244	313207	4.47	272254	51048
7	2021	12412562	13,354,525	1.9	986899	5	667726	319173	4.49	278532	52225
8	2022	12660813	13,608,928	1.9	1005700	5	680446	325253	4.50	284955	53429
9	2023	12914030	13,868,179	2.4	1024858	5	693409	331449	4.51	291526	54661
10	2024	13172310	14,209,890	2.4	1050111	5	710495	339616	4.53	298248	55922
11	2025	13435756	14,560,022	2.4	1075986	5	728001	347985	4.54	305126	57211
12	2026	13704472	14,918,781	2.4	1102498	5	745939	356559	4.56	312162	58530
13	2027	13978561	15,286,380	2.4	1129663	5	764319	365344	4.57	319361	59880
14	2028	14258132	15,663,036	2.4	1157498	5	783152	374347	4.58	326725	61261
15	2029	14543295	16,048,973	3.4	1186019	5	802449	383570	4.60	334259	62674
16	2030	14834161	16,597,768	3.4	1226575	6	995866	230709	4.62	342308	64183
17	2031	15130844	17,165,329	3.4	1268518	6	1029920	238598	4.63	350551	65728
18	2032	15433461	17,752,297	3.4	1311895	6	1065138	246757	4.65	358992	67311
19	2033	15742130	18,359,337	3.4	1356755	6	1101560	255195	4.67	367637	68932
20	2034	16056973	18,987,135	3.4	1403149	6	1139228	263921	4.69	376490	70592
21	2035	16378112	19,636,400	3.8	1451130	6	1178184	272946	4.71	385555	72292
22	2036	16705674	20,394,463	3.8	1507151	6	1223668	283483	4.73	394840	74032
23	2037	17039788	21,181,791	3.8	1565334	6	1270907	294427	4.75	404347	75815
24	2038	17380584	21,999,514	3.8	1625764	6	1319971	305793	4.76	414084	77641
25	2039	17728195	22,848,805	3.8	1688527	6	1370928	317598	4.78	424055	79510
26	2040	18082759	23,730,883	3.8	1753712	6	1423853	329859	4.80	434266	81425

Sources: CAMP data 2013; National Bureau of Statistics. *National Household Baseline Survey*, 2009; 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 Covered by MDTF with a Focus on Red Meat.* Draft Report, SNV and MARF

Table 5-9: 25 year forecasts for cattle: milk and hides

				Milk						Hides		
	Year	Human Population	Cattle Population	Number of Lactating Cows	Average Daily Milk Production per Cow	Total Annual Milk Production (MT)	Per Capita Milk Consumption	Percent of milk Marketed	Percent Milk Processed	Number of Hides Produced Annually	Estimated Percent of Hides Sold	Number of Hides Sold
1	2015	11022000	12,098,607	1,778,495	0.8	177850	16	10	0	260413	20	52083
2	2016	11242440	12,269,802	1803661	0.8	180366	16	10	1	249518	20	49904
3	2017	11467289	12,443,420	1829183	0.8	182918	16	10	1	255017	30	76505
4	2018	11696635	12,619,494	1855066	1.0	296810	25	20	2	260638	30	78191
5	2019	11930567	12,859,896	1890405	1.0	302465	25	20	2	266383	30	79914
6	2020	12169179	13,104,877	1926417	1.0	308227	25	30	5	272254	40	108901
7	2021	12412562	13,354,525	1963115	1.0	314098	25	30	5	278532	40	111413
8	2022	12660813	13,608,928	2000512	1.2	416107	33	30	5	284955	40	113982
9	2023	12914030	13,868,179	2038622	1.2	424033	33	30	5	291526	40	116610
10	2024	13172310	14,209,890	2088854	1.2	434482	33	40	5	298248	40	119299
11	2025	13435756	14,560,022	2140323	1.2	445187	33	40	5	305126	40	122050
12	2026	13704472	14,918,781	2193061	1.2	456157	33	40	5	312162	50	156081
13	2027	13978561	15,286,380	2247098	1.5	629187	45	40	5	319361	50	159680
14	2028	14258132	15,663,036	2302466	1.5	644691	45	50	5	326725	50	163363
15	2029	14543295	16,048,973	2359199	1.5	660576	45	50	10	334259	50	167130
16	2030	14834161	16,597,768	2439872	1.5	683164	46	50	10	342308	50	171154
17	2031	15130844	17,165,329	2523303	1.5	706525	47	50	10	350551	50	175276
18	2032	15433461	17,752,297	2609588	1.7	855945	55	60	10	358992	50	179496
19	2033	15742130	18,359,337	2698823	1.7	885214	56	60	10	367637	60	220582
20	2034	16056973	18,987,135	2791109	1.7	915484	57	60	10	376490	60	225894
21	2035	16378112	19,636,400	2886551	1.7	946789	58	60	20	385555	60	231333
22	2036	16705674	20,394,463	2997986	1.7	983339	59	70	20	394840	60	236904
23	2037	17039788	21,181,791	3113723	2.0	1245489	73	70	20	404347	60	242608
24	2038	17380584	21,999,514	3233929	2.0	1293571	74	70	30	414084	60	248450
25	2039	17728195	22,848,805	3358774	2.0	1343510	76	70	30	424055	60	254433
26	2040	18082759	23,730,883	3488440	2.0	1395376	77	70	30	434266	60	260559

Sources: CAMP data 2013; National Bureau of Statistics. *National Household Baseline Survey*, 2009; 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 Covered by MDTF with a Focus on Red Meat.* Draft Report, SNV and MARF

Table 5-10: 25 year forecast for shoats (sheep and goats): live animals and meat

	Year	Human Population	Shoats Population	Growth Rate	Total Stock Available for Sale	Estimated Percent of Shoats Sold in a Year	Estimated Total Number of Shoats Sold in a Year	Potential Surplus	Per capita consumption of shoats	Number of Stock Slaughtered Per Year	% of Total Shoats Population
1	2015	11,022,000	25,216,119	11.2	4644809	10	2521611	2123197	6.6	6735667	27%
2	2016	11242440	25498540	11.2	4696831	10	2549853	2146977	6.6	6870380	27%
3	2017	11467289	25784123	11.2	4749435	10	2578412	2171023	6.6	7007788	27%
4	2018	11696635	26072905	13	4802629	10	2607290	2195339	6.6	7147943	27%
5	2019	11930567	26411853	13	4865063	10	2641185	2223878	6.6	7290902	28%
6	2020	12169179	26755207	13	4928309	11	2943072	1985236	6.7	7511087	28%
7	2021	12412562	27103025	13	4992377	11	2981332	2011044	6.7	7737922	29%
8	2022	12660813	27455364	13	5057278	11	3020090	2037188	6.7	7854394	29%
9	2023	12914030	27812284	15.6	5123023	11	3059351	2063671	6.7	8011481	29%
10	2024	13172310	28246156	15.6	5202942	11	3107077	2095865	6.7	8171711	29%
11	2025	13435756	28686796	15.6	5284108	12	3442415	1841692	6.8	8418497	29%
12	2026	13704472	29134310	15.6	5366540	12	3496117	1870423	6.8	8672735	30%
13	2027	13978561	29588805	15.6	5450258	12	3550656	1899601	6.8	8801316	30%
14	2028	14258132	30050390	15.6	5535282	12	3606046	1929235	6.8	8977343	30%
15	2029	14543295	30519176	17.4	5621632	12	3662301	1959331	6.8	9156889	30%
16	2030	14834161	31050210	17.4	5936800	13	4036527	1900273	6.8	9340027	30%
17	2031	15130844	31590484	17.4	6040100	13	4106762	1933338	6.9	9666928	31%
18	2032	15433461	32140158	17.4	6145198	13	4178220	1966978	6.9	9860267	31%
19	2033	15742130	32699397	17.4	6252125	13	4250921	2001203	6.9	10057472	31%
20	2034	16056973	33268366	17.4	6360912	13	4324887	2036024	6.9	10258621	31%
21	2035	16378112	33847236	19.2	6471591	14	4738613	1732978	6.9	10463794	31%
22	2036	16705674	34497103	19.2	6595846	14	4829594	1766252	7.0	10779800	31%
23	2037	17039788	35159447	19.2	6722486	14	4922322	1800164	7.0	11105350	32%
24	2038	17380584	35834509	19.2	6851558	14	5016831	1834727	7.0	11265193	31%
25	2039	17728195	36522531	19.2	6983108	14	5113154	1869954	7.0	11490497	31%
26	2040	18082759	37223764	19.2	7117184	14	5211326	1905857	7.0	11720307	31%

Sources: CAMP data 2013; National Bureau of Statistics. *National Household Baseline Survey*, 2009; 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 Covered by MDTF with a Focus on Red Meat.* Draft Report, SNV and MARF

5.4.6 Public interventions by national and states governments

Table 5-11: Public interventions by national and states governments

Areas of Public Sector Intervention	Indicators	Coverage
I. Short term: Food security through asset building, reduction of conflict and protection of the natural resource base		
1. Policy, legal and regulatory framework		
A comprehensive overarching subsector policy	Policy in place	Nation wide
Sub-subsectoral policies for milk, live animal and red meat, poultry, leather and hides and skins and honey development	Policies in place	Nation wide
A legal and regulatory framework with supportive acts and enforcement mechanisms with special attention to milk and meat quality and hygiene	Frameworks in place and number of laws and acts enacted	Nation wide
2. Reduction of natural resource based conflict		
Natural resource sector reforms to align to the provisions in the constitution and increase access and utilization of natural resources	Reforms completed	Areas where natural resource based conflict is endemic
Mechanisms for natural resource management and resolution	Mechanism in place % decrease in natural resource based conflicts % concomitant growth in natural increase of herds/ decrease in losses due to conflict (3%)	National, state, and local government
Strategy for inclusion and capacitation of traditional and local authorities as frontline actors in natural resource based conflict reduction and peace building	Strategy in place and mechanism for implementation	State and local government
Completion of mapping of stock and trade routes and demarcation and protection of the routes, and development of basic infrastructure for water, human and livestock disease control and management	Km of stock and trade routes demarcated, and protected Type of infrastructure installed	Areas where transhumance and nomadic migration occurs
Mapping and protection of dry and wet season grazing areas	Map(s) of dry and wet season areas Mechanisms instituted for enforcement Quality of process and participation	Areas where transhumance and nomadic migration occurs
Provision of key water infrastructure	Type, number and coverage of water infrastructure established	All livestock producing areas
3. Restocking and herd re-build		
A strategy and mechanism for restocking	Mechanism in place/ number of stock	Selected areas
Government restocking programs for conflict affected areas and for Internally displaced persons (IDPs), returnees, and female headed households	Species and number of animals distributed	Selected affected areas
Development of road infrastructure from key production areas to local and domestic markets	Number of roads and number of km	Selected areas
4. Establishment of commercial enterprises in urban and peri-urban areas		
A strategy and incentives to stimulate the emergence of veterinary and animal production supply and input support systems: tax exemptions and incentives	Strategy and quality of incentives in place	Urban and peri-urban centers
Incentives for private sector establishment of basic processing plants for milk, meat, poultry, honey, and hides and skins	Quality of incentives in place	Urban and peri-urban centers
Review of import tariffs to give a competitive edge to local producers and processors	Import tariffs supportive of growth of domestic sector	
5. Strengthening of public service delivery		

Areas of Public Sector Intervention	Indicators	Coverage
Strengthening and expansion of annual vaccination and surveillance programs	% coverage	Nation wide
Strategy for support, guidance and coordination with NGOs and Community Animal Health Workers (CAHWs) in delivery of animal health services	Strategy in place Level and quality of public sector support to CAHWs	National and state government and NGOs
Capacity building for public sector livestock extension and strengthening NGO extension to improve production and reduce wastage	Number trained and quality of training	State and local government
Support for expansion of Marial Lou Livestock Training Institution, and for institution of more accessible regional centers	Number of regional institutions and Marial Lou established	National government
6. Research and outreach		
Establishment of regional research facilities and adaptive research programs in collaboration with universities and with programs in the IGAD and EAC regions	Number of research facilities and programs and level of collaboration	Greater Equatoria, Greater Bahr el Ghazal and Greater Upper Nile
Establishment of outreach programs at state level	Outreach programs established	States
7. Institutions and facilities to manage natural disasters (droughts and floods)		
Drought and flood early warning system	System in place	National and state
Semi-autonomous institution for drought and flood resilience	Institution and strategy in place	National
II. Medium term: Improved rural and urban livelihoods and integration into domestic markets		
1. Promotion of production clusters		
Strategy for identification and development of comparative advantages, domestic, regional and global	Strategy in place	Nation wide
Identification and incentives for development of production clusters	Production clusters identified	Selected areas/ states
2. Strengthening of delivery services		
Incentives to promote private sector animal health delivery especially clinical services, treatment and supply of veterinary inputs	Incentives for growth of private sector animal health delivery	Private sector
Strengthening of public disease control infrastructure, services and facilities to meet OIE sanitary and phyto-sanitary requirements	Infrastructure, facilities and services in place	National and state
Incentives to increase access to veterinary services and production and processing inputs and equipment	Strategy and quality of incentives	Public and private providers, states
3. Support for livestock institutions and associations		
Establishment and strengthening of groups and associations for livestock production, processing and marketing	Number of associations and groups supported	Groups and associations
4. Infrastructure improvements		
Improvement of domestic marketing systems and infrastructure	Strategy, level and quality of investment	Government, states
Improving of roads to domestic markets (secondary markets and regional hubs) feeder roads and interstate roads	Number of kms	Selected areas
Public private partnerships and incentives to private sector to develop processing infrastructure including slaughter facilities, domestic markets, milk collection centres, feed mills, artisan manufacture of equipment, value addition facilities	Quality of partnerships Level of public and private investment Profile of investments	National, state
Formal, technical and other skills based training, and literacy improvement classes for livestock keepers	Profile of training Level of investment, number of trainees	State
5. Research and outreach		

Areas of Public Sector Intervention	Indicators	Coverage
Strengthening of adaptive research to support market integration, commercialization and value chain development	Research strategy and program Level of investment	National
Institution of a country specific basic research program	Research strategy and level of investment	National
Strengthening of state outreach programs	Number of programs	State
III. Long term: economic transformation and integration into regional and global markets		
1. Industrial development		
Policy, legal and regulatory frameworks to support sector industrial development	Frameworks in place	National
Incentives for industrial development and manufacturing	Quality of incentives	Private sector
2. Export orientation		
Identification and promotion of export opportunities	Opportunities identified, quality of promotion and incentives	Private sector
Investment in export infrastructure and support systems especially roads and transportation	Strategy, quality and level of investment	Selected areas
Identification and development of disease free zones, export zones and a system for examination and certification of livestock for export (EXCELEX)	Number of DFZ and export zones established EXCELEX in place	Selected areas
Incentives for export of processed and value added products and disincentives for importation	Quality of incentives	Private sector
3. Production for industry and export		
Breed improvement for specific desirable traits	Breeding program in place	National
Promotion of increased and specialized production for export	Quality of incentives	States/ groups

5.5 Forestry subsector development scenario

5.5.1 Establishment of 25-year forestry subsector development focuses

5.5.1.1 Background, key issues and establishment of development focuses

South Sudan is endowed with diverse natural forests and woodlands with a high potential for economic and environmental value creation. An estimated total area of 191,667 km^2, or about 30% of total land area, is covered by forests and woodlands. However, deforestation pressures are increasing, driven mainly by demands for agricultural land, fuelwood, and charcoal. 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. The Forest Policy indicates that the total teak plantation area is 70,160 ha of which 20,000 ha is considered to be good quality.[62]

In terms of plantation resources, most of the teak plantations (approximately 14,400 ha) were destroyed in Western Bahr el Ghazal State, whereas match of the teak plantation areas recorded in Central Equatoria State (approximately 22,500 ha) and Western Equatoria State (approximately 12,600 ha) are still in existence. Although areas are limited some of the teak plantations are in the state of maturity with more than 25-year old teak trees for harvesting. About 1,800 ha of the teak plantations in Central Equatoria State and 3,000 ha in the Western Equatoria State are under the concession arrangement involving the three private companies.

[62] In contrast, the cross checked data provides the total teak plantation area as 36,548 ha. Further clarification should be needed by conducting properly designed forest resources inventory.

Previously, the resources and opportunities were taken advantage of by previous governments and the private sector. South Sudan went through two civil wars before its independence in 2011. 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, the forestry subsector 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 in the process of adoption. Many perceive that there are no laws to govern the forestry subsector, so that anyone can do anything without fear of, for example, prosecution.

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. According to the 2013/14 national budget book the total of 82 officers are deployed in the national government. In terms of the state governments, although there is no accurate human resources information of the stage government is available, the situation analysis reveals that states governments are understaffed. 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 mere 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.

Their limited resources and capacity are shown in their inadequate level of on-the-ground public service delivery. Management of CFRs is, in general, inadequate. 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).

For the formulation of the forestry subsector development scenario, the key issues and challenges of the subsector, as identified through the situation analysis, are examined to establish forestry subsector development focuses. The following focuses are established: (1) Legal and institutional framework for the forestry subsector; (2) Public service delivery capacity of the forestry subsector; (3) Management and conservation of public forests; (4) Commercial forestry and forest products markets; (5) Community forestry and agroforestry. At the same time, areas of public interventions are examined to address the issues identified under the development focuses. Table 5-12 summarises a conceptual structure of the forestry subsector development scenario with elements of the issues and challenges, forestry development focuses, areas of public interventions, and short-term, medium-term and long-term public intervention perspectives. Details of the scenario will be discussed based on the structure.

Table 5-12: Structure of forestry subsector development focuses

Issues and challenges	Impacts and areas of public intervention
(1) Legal framework and institutional framework	
• The legal framework, including	***Short-term (5 years)***

Issues and challenges	Impacts and areas of public intervention
customary laws, to determine power, responsibilities, functions and financial modalities of the government is still under development. • Key legal instruments such as Forestry Law, related acts and other legal instruments are still not in place or only partially implemented. • 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. • South Sudan Forest Commission and Forest Development Consultative Forum are proposed in the Forest Policy 2013, but the viability and efficiency of such organisations have not been analysed.	• Approval of the Forest Policy • Establishment of the forestry legal framework consisting of Forest Policy, Forest Law, related rules and regulations, and forestry products standards • Establishment of legal bases for accountability, coordination, cooperation, supervision, and monitoring and evaluation crossing across jurisdictions of national, state and local governments • Establishment of coordination mechanisms with related legal frameworks to maintain legal consistency among the frameworks ***Medium-term(10 years)*** • Review and amendment of the forestry legal framework to meet emerging needs of forestry activities of households, micro-, small-, and medium-scale enterprises • Inclusion of global warming and biodiversity related laws and regulations to the framework • Examination of economic and financial viability of South Sudan Forest Commission ***Long-term impact intervention (25 years)*** • Review and amendment of the forestry legal framework to meet emerging needs of forestry activities of medium- and large-scale enterprises • Establishment of legal bases of South Sudan Forest Commission if its establishment is justified
(2) Public service delivery capacity	
• Government delineation of authority, responsibility and ownership of projects and programmes is inadequate for the implementation of the Forest Policy 2013. • Completeness, fairness, and efficiency of forest revenue collection are neither achieved nor can be achieved due to limited human and financial resources. • Forest revenue and fee collection are sporadic and tarnished by corrupt practices which hinder private sector development. • 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. • Budgets of national, state and local governments are insufficient. • Planning, implementation, supervision, monitoring and evaluation of government and DP supported projects are not well coordinated. • Human resource development, application of modern science and technology, and knowledge creation activities are severely constrained by insufficient funding.	***Short-term (5 years)*** • Capacity development of forestry officials and organisational strengthening of the national government • Introduction of efficient public financial management system (PFMS) in the forestry departments in the national government • Piloting capacity development of core forestry officials and organisational strengthening of selected state governments • Piloting introduction of efficient PFMS in the forestry departments of selected state governments • Piloting extension service delivery by quasi forestry extension officials in selected state governments • Establishment of Forest Development Consultative Forum as a system of stakeholder communication and coordination • Establishment and maintenance of nation-wide forest resource and public forest reserve information base through forest resources assessment, survey and inventory ***Medium-term (10 years)*** • Nation-wide capacity development of forestry officials and organizational strengthening of all state governments • Nation-wide implementation of efficient PFMS in the forestry departments in all state governments • Nation-wide service delivery by quasi forestry extension officials in all state governments ***Long-term (25 years)*** • Establishment and enhancement of forestry research, technical development, and training capacity of the national government • Collaboration and coordination with national and international academic and research institutions to enhance knowledge production and dissemination • Establishment of South Sudan Forest Commission if its establishment is justified
Issues and challenges	**Impact classes and areas of public intervention**
(3) Management and conservation of public forests	
• Investment for biodiversity and habitat conservation needs long-term vision and planning. • Illegal and uncontrolled utilization of biodiversity resources has, and still is, widespread and the country has	***Short-term (5 years)*** • Establishment and maintenance of inventory of forest resources of public forest reserves including Central Forest Reserves (CFRs) • Development of national CFR management plan and identification of CFRs for pilot forest management

Issues and challenges	Impacts and areas of public intervention
experienced their rapid degradation. • Government resources are limited and are not sufficient to implement conservation measures in an effective manner. • The management of Central Forest Reserve (CFR) has collapsed and uncontrolled exploitation of forest resources and encroachment are wide-spread. • Collaboration among government authorities for the management of forest resources is weak due to an inadequate legal framework, expertise, and communication and transportation resources.	• Piloting advanced CFR management in selected CFRs. The management includes identification and confirmation of CFR boundaries, control of illegal activities, effective management of forest concessions, enhancement of plantation activities and forest products utilisation to maximise forest conservation, utilisation, and profit and income generation • Establishment of joint forest management (JFM) schemes. ***Medium-term (10 years)*** • Enhancement and maintenance of inventory of forest resources of public forest reserves • Implementation of advanced CFR management including JFM in all CFRs in selected states • Piloting establishment and management of state and local government forest reserves and community forest reserves ***Long-term (25 years)*** • Nation-wide implementation of advanced CFR management including JFM in all CFRs • Nation-wide implementation of collaborative CFR management with forest fringe communities to control illegal activities and diversify communities income sources in all CFRs • Nation-wide establishment and management of state and local government forest reserves and community forest reserves
(4) Commercial forestry and forest products markets	
• A poor legal framework and infrastructure result in high investment risks and high production and marketing costs hindering private sector investment and employment creation. • Potential of teak plantations and woodlots for production is not fully exploited due to limited extension effort and a speculative market environment. • The limited cases of private investment are/were forest management under concession arrangements. • Development of forest plantations and woodlots by farmers and businesses in the form of agroforestry and small-scale plantations has happened to some extent. • Traditional and micro- and small-scale enterprise oriented marketing of forest products and services dominate in the sector. • Specific products (teak timber and gum acacia) have accessed regional and global markets but to a limited extent.	***Short-term (5 years)*** • Piloting technical, financial, in kind, facilitative and marketing support to small- and medium-scale out-growers of teak, eucalyptus, gum-acacia, and other forest plantation species in selected states • Piloting marketing, technical and facilitative support to traditional, micro-, small- and medium-scale forest products businesses • Piloting provision of concessional loans to ease financial constraints of out-growers and forest products businesses in selected states • Piloting reasonable forest products taxes and fees levied on forest products businesses in selected states • Piloting efficient licensing schemes • Piloting control of illegal forest products transactions in selected states • Piloting extension and enforcement of forest products standards in selected states ***Medium-term (10 years)*** • Nation-wide implementation of technical, financial, in kind, facilitative and marketing support to small- and medium-scale out-growers • Nation-wide implementation of marketing, technical and facilitative support to traditional, micro-, small- and medium-scale forest products businesses • Nation-wide implementation of efficient licensing schemes • Nation-wide extension and enforcement of forest products standards • Piloting promotion of forest products exports L***ong-term (25 years)*** • Nation-wide promotion of concessional loans to ease financial constraints of out-growers and forest products businesses • Nation-wide implementation of forest products taxes and fees levying on producers and traders of forest products • Nation-wide control of illegal forest products transactions • Nation-wide promotion of forest products export
Issues and challenges	**Impact classes and areas of public intervention**
(5) Community forestry and agroforestry	
• Although the concept community forestry is defined in the Forest Policy 2013, neither firm legal framework nor government expertise exists to promote community forestry and agroforestry.	***Short-term (5 years)*** • Piloting sustainable community forest management in communal and/or private lands for protection, conservation and production of charcoal, timber and minor forest products in selected states • Piloting Joint Forest Management in CFRs with forest fringe communities to control illegal activities and diversify

Issues and challenges	Impacts and areas of public intervention
• The legal framework and technical expertise of the government is weak to promote the collaborative management of CFRs involving communities, concessionaires, and forest products businesses.	communities income sources in selected CFRs • Piloting promotion of agroforestry in communal and private land in selected states • Piloting control of illegal forest operations in communal and private land in selected CFRs ***Medium-term (10 years)*** • Nation-wide promotion of agroforestry in private and communal land ***Long-term (25 years)*** • Nation-wide implementation of sustainable community forest management in communal and/or private lands for protection, conservation and production of charcoal, timber and minor forest products in all states • Nation-wide implementation of JFM in CFRs with forest fringe communities to control illegal activities and diversify communities income sources in all CFRs • Nation-wide control of illegal forest operations in communal and private land in all states

Source: CAMP Task Team

5.5.2 Forest subsector 25-year development scenarios

5.5.2.1 Legal and institutional framework

As shown in Table 5-12, under this focus programmes and projects will target the establishment of the forestry legal framework, and forestry legal bases of accountability, coordination, supervision, monitoring and evaluation across national, state and local governments.

Since the establishment of these legal frameworks by the government is urgent, these projects and programmes must be short-term. Maintenance of the frameworks, including periodical reviews and amendments, will be conducted as the subsector develops. Maintenance programmes and projects will be medium-term and long-term interventions.

The establishment of a parastatal organization such as the South Sudan Forestry Commission (SSFC) requires careful examination of the optimal demarcation of public and private sector responsibilities, in order to achieve the establishment of fair and competitive forest products markets. The examination and designing of SSFC will be a medium-term intervention; its establishment and operation, if viable, will be in the long-term.

Effort is measured by the amount of budget spent. The largest effort would be exercised for short-term interventions. For any intervention, the government expenditure contributes directly to GDP. This discussion concerning GDP is applicable to all subsector focuses, where the major players are national, state, or local governments (i.e. public sector authorities; see Table 5-13). An indirect contribution of public interventions to GDP growth will happen through improved production and a better market environment for forestry products.

Table 5-13: Summary of intervention and effort level by three intervention types

Forest subsector development focuses (Major players)	Impact classes	Short-term impact intervention (5 years)	Medium-term impact intervention (10 years)	Long-term impact intervention (25 years)
(1) Legal and institutional framework for the forestry subsector (Public sector)	Intervention	Establishment of legal and institutional framework	Maintenance of framework	Maintenance of framework
	Effort level GDP growth	High +++ Public expenditure +	Medium ++ Public expenditure +	Low + Public expenditure ++
(2) Public service delivery capacity of	Intervention	Capacity development and pilot implementation	Capacity development and nation-wide	Knowledge and human resources development

Forest subsector development focuses (Major players)	Impact classes	Short-term impact intervention (5 years)	Medium-term impact intervention (10 years)	Long-term impact intervention (25 years)
the forestry subsector (Public sector)			implementation	
	Effort level GDP growth	Medium ++ Public expenditure +	High +++ Public expenditure +	Low + Public expenditure +
(3) Management and conservation of public forests	Intervention	Establishment of management base	Pilot implementation of public forest management	Nation-wide implementation of public forest management
(Public sector) (Private sector)	Effort level GDP growth	High +++ Public expenditure + Forest products ++	Medium ++ Public expenditure + Forest products +++	High +++ Public expenditure + Forest products +++
(4) Commercial forestry and forest products market	Intervention	Extension capacity dev. and pilot implementation	Nation-wide implementation of private sector support	Nation-wide implementation of private sector support
(Private sector)	Effort level GDP growth	High +++ Forest products ++	High +++ Forest products +++	High +++ Forest products +++
(5) Community forestry and agroforestry	Intervention	Extension capacity dev. and pilot implementation	Nation-wide implementation of community forestry	Nation-wide implementation of community forestry
(Private sector)	Effort level GDP growth	Medium ++ Forest products +	High +++ Forest products ++	High +++ Forest products ++

Source: CAMP Task Team

5.5.2.2 Public service delivery capacity

Under this focus are programmes and projects aimed at the establishment and enhancement of the government's capacity for planning, budgeting, public financial management, programme and project implementation, monitoring and evaluation, human resource management. The focus includes the government's effort to develop an information base of natural resources, which is necessary to perform its roles of forest management and conservation, promotion of forest industries, and regulation of production and market activities. The information base includes, for example, a nation-wide inventory of forest resources created and managed by the application of GIS and remote-sensing technologies. The establishment and enhancement of research, training and extension institutions and of collaboration with academic institutions for the generation of a knowledge base are also envisaged under this focus.

In terms of the effort level, the mid-term programmes and projects will require the largest resource allocation in order to address the complex and urgent needs of capacity enhancement of the government. These will be preceded by short-term interventions which will pilot capacity development models in selected states and Central Forest Reserves to test their suitability for nation-wide application. High quality public service delivery is essential for agricultural sector development; such public service capacity will be established at the completion of the medium-term interventions. Resources required for long-term interventions for capacity development should be small. The establishment and enhancement of SSFC (if viable) plus research, training, and extension organisations require a relatively small, but steady, resource allocation over a long period of time. This will be a long-term intervention.

One significant characteristic of programmes and projects under this focus will be capacity development through on-the-job training, which requires sufficient budget to allow capital investment and service delivery activities.

5.5.2.3 Management and conservation of public forests

Under this focus programmes and projects will aim to: establish a management information base of Central Forest Reserves (CFRs); develop a national CFR management plan;

establish and extend joint forest management (JFM) schemes; implement public private partnerships through concession forestry; and, identify pilot CFRs to test advanced forest management. Nation-wide implementation of CFR management by both national and state governments is also envisaged. Forest management practices such as boundary demarcation and resource inventories, plus protection, maintenance, and harvesting of forest plantations, will be reinstituted. If economically feasible, timber processing and wood products manufacturing units will be established in association with CFRs. Demarcation of roles and responsibilities between the public and private sector, and communities for the management of public forests will be examined and implemented carefully. In addition to the conventional functions of forest resources the functions of forests such as water catchment, biodiversity conservation, and CO_2 sink should be recognized for comprehensive management of the forest resources. Such management involves, for example, monitoring and evaluation of forests health with respect to insect pests, pathogens and fire, and effects of mono- and mixed species plantations on water resources, biodiversity and soil conditions.

As shown in Table 5-13, there will high effort in the short-term and long-term. Since current CFR management is minimal, a quick recovery of their management regimes needs to be considered. Long-term interventions to promote forest plantations will require a high effort level, so as to restore and maintain a stable supply of forestry products. Extraction of logs must be done such that yield is sustainable. Plantation activities will be carried out by mobilising public and private investments.

Public forest management is a joint effort of public and private actors, with the aim of producing forest products. The economic impacts of public interventions will generated through public expenditures and production of forest products. Economic returns from forest plantations will be achieved in the long-term (more than 30 years for teak log production). Since forestry programmes and projects require time to realise returns to investment, their contribution to GDP growth will come from medium- and long-term interventions.

5.5.2.4 Commercial forestry and forest products markets

Households, and micro-, small-, medium-, and large-scale enterprises all participate in the commercial forestry and forest products market. This market is a driving force to achieve food security, income and economic growth, and agricultural sector transformation. As shown in Table 5-13, a high effort level by the government will be required to support and facilitate the development of commercial forestry and forests products markets.

Enhancement of plantation activities by out-growers, production of minor forest products by households, and processing and production by industries will be essential. Excessive market transaction costs, such as informal and multiple taxes, bad road conditions, and inefficient delivery of public services to the private sector will be addressed. The success of commercial forestry and forest products market largely depends on 1) public sector reforms for the delivery of efficient and effective public services by national and decentralised governments, and 2) realisation of conducive forestry and forest products market and business environment through the recognition and enhancement of capabilities of private sector and local communities including NGOs and CBOs.

Short-term interventions will focus on piloting the provision of financial, technical and facilitative services to enhance enterprises' business operations. Regulatory control, through changes in tax and tariff regimes and licencing requirements, will also be piloted. Medium-term and long-term interventions will be planned and implemented to build on successful pilot programmes and projects.

The forest products are categorised by market type; their expected contributions to food security, increase in income, economic growth and agricultural transformation are also

indicated. Based on market type forestry products are categorised into three groups as shown in Table 5-14 together with their expected impact and time frame. Expected growth of these products is introduced in section 5.5.2.6.

Table 5-14: Types and characteristics of forest products markets

Market type	Forest products	Implication to CAMP objectives	Recommended impact class
Regional and global market	Teak logs Teak products Other logs and timbers Gum acacia Shea products	Agricultural transformation Income and economic growth	Long-term impact intervention
Domestic and regional market	Charcoal Other logs and timbers	Income and economic growth	Medium-term impact intervention
Subsistence production and local market	Fuelwood Minor local forest products	Food security	Short-term impact intervention

Source: CAMP Task Team.

5.5.2.5 Community forestry and agroforestry

Under this focus, programmes and projects will aim to increase community forestry and agroforestry. Protection, conservation and production of forest products in communal and/or private land will be encouraged particularly at the state and county level. Short-term interventions will implement pilot projects to test the social and economic viability of community forestry and agroforestry models. Once the models are tested, nation-wide promotion will be implemented in medium- and long-term interventions (Table 5-14). Financial and human resources will be allocated at a moderate level in the short-term, but will increase in the medium-term and long-term.

Community forestry and agroforestry will have a direct impact on households' production diversification and contribute to food security and poverty, if the input and output markets for forestry products are functioning. It is also expected that collective management of local natural resources would reduce illegal and uncontrolled utilisation of forest resources.

5.5.2.6 Production forecasts of forestry subsector

The future dynamics of the forestry subsector are represented by production forecasts presented in Table 5-15. These forecasts are developed based on the consumption or production estimates for 2015 and prices observed in 2013. The major forestry products of fuelwood, charcoal, logs and products of teak or other species and gum acacia are used. Subsector trends are determined by the annual growth rates assigned to each product. SSP values are expressed as 2009 SDG values for the purpose of comparison with the macroeconomic GDP growth scenario. Nation-wide estimates of forestry resources, including biomass, growth rates, rate of deforestation, log and timber production, are not available; therefore, forecasts consistent with sustainable natural resources management are not used. The production forecasts will be used to guide the development of programmes and projects. Reviews and amendments will be done as new information becomes available using indicators designed as part of programmes and projects.

At the beginning of the CAMP period in 2015, it is estimated that SDG 538 million of value will be created by the forestry subsector, which will grow up to SDG 862 million by 2040, showing an increase of 60%. In 2015 the forestry subsector will contribute 1.8% of the total GDP of the year, which will grow to 2.3% in 2040.

Table 5-15: Production forecasts of major forestry products

(SDG at 2009 constant price)

CAMP period	Year	Fiscal Year	Fuelwood (Domestic market)			Charcoal (Domestic market)			Teak logs and products (Domestic and export markets)			Other logs and timbers (Domestic market)			Gum acacia (Export market)			Total			Foretry value % to GDP	
			Production (Million m^3)	Value (Million SSD)	Annual growth rate (%)	Production (000' tonne)	Value (Million SSD)	Annual growth rate (%)	Production (000' m^3)	Value (Million SSD)	Annual growth rate (%)	Production (000' m^3)	Value (Million SSD)	Annual growth rate (%)	Production (000' m^3)	Value (Million SSD)	Annual growth rate (%)	Value (Million SSD)	Annual growth rate (%)	Cumulative growth (%)	Value (Million SSD)	(%)
0	2015	2015/16	2.8	244		108	104		60	60		200	87		10	44		538		100%	30,577	1.8%
		% to total		45%			19%			11%			16%			8%		100%				
1	2016	2016/17	2.9	249	2%	110	106	2%	60	60	0%	206	90	3%	10	44	2%	548	1.9%	102%	30,173	1.8%
2	2017	2017/18	2.9	253	2%	112	108	2%	60	60	0%	212	92	3%	10	45	2%	559	1.9%	104%	28,680	1.9%
3	2018	2018/19	3.0	259	2%	114	110	2%	60	60	0%	219	95	3%	11	46	2%	570	2.0%	106%	27,329	2.1%
4	2019	2019/20	3.0	264	2%	116	113	2%	60	60	0%	225	98	3%	11	47	2%	581	2.0%	108%	26,222	2.2%
5	2020	2020/21	3.1	269	2%	119	115	2%	60	60	0%	232	101	3%	11	48	2%	592	2.0%	110%	25,278	2.3%
6	2021	2021/22	3.2	274	2%	121	117	2%	60	60	0%	239	104	3%	11	49	2%	604	2.0%	112%	24,419	2.5%
7	2022	2022/23	3.2	280	2%	124	119	2%	60	60	0%	246	107	3%	11	50	2%	616	2.0%	115%	23,737	2.6%
8	2023	2023/24	3.3	285	2%	126	122	2%	60	60	0%	253	110	3%	12	51	2%	628	2.0%	117%	23,239	2.7%
9	2024	2024/25	3.3	291	2%	129	124	2%	60	60	0%	261	114	3%	12	52	2%	641	2.0%	119%	22,837	2.8%
10	2025	2025/26	3.4	297	2%	131	127	2%	60	60	0%	269	117	3%	12	53	2%	654	2.0%	121%	22,727	2.9%
11	2026	2026/27	3.5	303	2%	134	129	2%	60	60	0%	277	120	3%	12	54	2%	667	2.0%	124%	22,636	2.9%
12	2027	2027/28	3.6	309	2%	136	132	2%	60	60	0%	285	124	3%	13	55	2%	680	2.0%	126%	22,756	3.0%
13	2028	2028/29	3.6	315	2%	139	134	2%	60	60	0%	291	127	2%	13	56	2%	692	1.8%	129%	22,998	3.0%
14	2029	2029/30	3.7	321	2%	142	137	2%	60	60	0%	297	129	2%	13	57	2%	705	1.8%	131%	23,363	3.0%
15	2030	2030/31	3.8	328	2%	145	140	2%	60	60	0%	303	132	2%	13	59	2%	718	1.8%	133%	23,957	3.0%
16	2031	2031/32	3.8	334	2%	148	143	2%	60	60	0%	309	134	2%	14	60	2%	731	1.8%	136%	24,730	3.0%
17	2032	2032/33	3.9	341	2%	151	146	2%	60	60	0%	315	137	2%	14	61	2%	744	1.8%	138%	25,754	2.9%
18	2033	2033/34	4.0	348	2%	154	148	2%	60	60	0%	321	140	2%	14	62	2%	758	1.8%	141%	26,689	2.8%
19	2034	2034/35	4.1	355	2%	157	151	2%	60	60	0%	328	143	2%	15	63	2%	772	1.8%	144%	27,888	2.8%
20	2035	2035/36	4.2	362	2%	160	154	2%	60	60	0%	334	145	2%	15	65	2%	786	1.8%	146%	29,050	2.7%
21	2036	2036/37	4.2	369	2%	163	158	2%	60	60	0%	341	148	2%	15	66	2%	801	1.8%	149%	30,608	2.6%
22	2037	2037/38	4.3	377	2%	166	161	2%	60	60	0%	348	151	2%	15	67	2%	816	1.9%	152%	32,285	2.5%
23	2038	2038/39	4.4	384	2%	170	164	2%	60	60	0%	355	154	2%	16	69	2%	831	1.9%	154%	34,057	2.4%
24	2039	2039/40	4.5	392	2%	173	167	2%	60	60	0%	362	157	2%	16	70	2%	846	1.9%	157%	35,934	2.4%
25	2040	2040/41	4.6	400	2%	176	171	2%	60	60	0%	369	160	2%	16	71	2%	862	1.9%	160%	37,917	2.3%
		% to total		46%			20%			7%			19%			8%		100%				

Source: NBS; African Forest Forum. 2011. *Forest plantations and woodlots in Sudan*. Working paper series. Nairobi.; CAMP TT.

In 2015 45% of the total value is created by fuelwood production followed by charcoal (19%) indicating the heavy dependence on forestry products for meeting households' energy needs. Growth of both fuelwood and charcoal is set at 2% throughout the CAMP period to match the 2% assumed population growth rate. These conservative growth rates, for both products, assume that the current rapid rate of deforestation will be reduced by the promotion of wood lot creation, use of energy efficient kilns, and alternative and economical energy sources. By the end of the CAMP period in 2041, it is projected that fuelwood will be 46% of the total value, and charcoal 20% showing a slight increase.

In 2015 teak timber production accounts for 11% of the total value. By the end of CAMP implementation in 2040, teak will account for a smaller portion of total value due to the assumed constant level of production. A timber equivalent of 60,000 m^3 of teak is assumed to be harvested annually due to its limited resource base and long-term (more than 25 years) maturity. In order to produce more teak timber by 2040 massive plantation activity needs to be take place at the start of the CAMP period. Only currently matured or nearly matured teak can be harvested during the CAMP period. According to CAMP TT team estimates, the

annual allowable harvest, in the 20,000 ha of good teak in plantations found in the CFRs, is about 28,000 m^3; this assumes an average of 232 m^3/ha volume and 2% growth rate. The assumption of 60,000 m^3 timber equivalent harvest means the relatively fast utilisation of matured teak plantations. Therefore, the establishment of new plantations to sustain production is assumed in the forecast.

Other logs and timbers account for 16% of the total value in 2015 and 19% in 2040. A rapid increase in demand for these products is assumed due to the rapid expansion of the urban sector and its construction needs. An annual growth rate of 3% is used in the early stages of CAMP implementation, later reduced to 2%. Most of this production originates from natural forests and uncontrolled illegal logging operations. Timber species grow very slowly and a slight decline in production is anticipated. Therefore, fast growing species for the production of fuelwood and timber, such as eucalyptus, must be promoted.

Gum acacia production accounts for 8% of the total value and remains unchanged during the CAMP period. The production areas of gum acacia coincide with the most food insecure areas of the country; its production during the dry season does not conflict with agricultural labour needs. The potential of gum acacia to contribute to food security must be carefully explored. The gum acacia is also currently used for charcoal and fuelwood production; its production is labour intensive. A growth rate of 2%, equal to the assumed population growth rate, is assumed. The supply and price of gum acacia is volatile in the international market, which must be considered in the promotion of gum acacia production.

5.5.3 Public interventions and subsector development indicators

Table 5-16 shows areas of public interventions, monitoring indicators, and target locations of programme and project implementation to achieve the 25 year scenario. Short-term public interventions will be designed to achieve the objectives of: establishment of a legal framework governing the forestry subsector; initial stage of institutional development: and, piloting of public interventions.

Medium-term public interventions will be planned to achieve the objectives of full scale implementation of public sector capacity and institutional development programmes and projects. Long-term interventions will enhance research, training, and extension activities and educational institutions.

Interventions providing support to private sector activities will be included in all time frames.

Table 5-16: Public interventions, monitoring indicators and target locations

Impact classes and areas of public intervention	Monitoring indicators	Target locations
(1) Legal framework and institutional framework		
Short-term (5 years)		
• Approval of the Forest Policy	Approved forest policy	National government
• Establishment of the forestry legal framework consisting of Forest Policy, Forest Law, related rules and regulations, and forestry products standards	Legal framework of forestry subsector	National and state governments
• Establishment of legal bases for accountability, coordination, cooperation, supervision, and monitoring and evaluation crossing across jurisdictions of national, state and local governments	Legal framework of the relevant areas	National and state governments
• Establishment of coordination mechanisms with related legal frameworks to maintain legal consistency among the frameworks	Coordination mechanisms established	National and state governments
Medium-term (10 years)		
• Review and amendment of the forestry legal framework to meet emerging needs of forestry activities of households, micro-, small-, and medium-scale enterprises	Amended legal framework	National and state governments
• Inclusion of global warming and biodiversity related laws and regulations to the framework	Global warming and biodiversity laws	National government
• Examination of economic and financial viability of South Sudan Forest Commission	Results of examination	National government
Long-term (25 years)		
• Review and amendment of the forestry legal framework to meet emerging needs of forestry activities of medium- and large-scale enterprises	Amended legal framework	National and state governments
• Establishment of legal bases of South Sudan Forest Commission if its establishment is justified	Laws and regulations	National government
(2) Public service delivery capacity		
Short-term (5 years)		
• Capacity development of forestry officials and organisational strengthening of the national government	Increase in efficiency by 50%	National government
• Introduction of efficient public financial management system (PFMS) in the forestry departments in the national government	Increase in efficiency by 50%	National government
• Piloting capacity development of core forestry officials and organisational strengthening of selected state governments	Increase in efficiency by 50%	National and state governments
• Piloting introduction of efficient PFMS in the forestry departments of selected state governments	Increase in efficiency by 50%	State governments
• Piloting extension service delivery by quasi forestry extension officials in selected state governments	Service delivery model examined	State governments
• Establishment of Forest Development Consultative Forum (EFDCF) as a system of stakeholder communication and coordination	EFDCF established and managed	National government
• Establishment and maintenance of nation-wide forest resource and public forest reserve information base through forest resources assessment, survey and inventory	Information base established and maintained	National and state governments
Medium-term (10 years)		
• Nation-wide capacity development of forestry officials and organizational strengthening of all state governments	Efficiency increased by 50%	State governments
• Nation-wide implementation of efficient PFMS in the forestry departments in all state governments	Efficiency increased by 50%	State governments
• Nation-wide service delivery by quasi forestry extension officials in all state governments	Efficiency increased by 50%	State governments
Long-term (25 years)		
• Establishment and enhancement of forestry research, technical development, and training capacity of the national government	Research and training facility strengthened	National and state governments
• Collaboration and coordination with national and international academic and research institutions to enhance knowledge	Efficiency of knowledge generation increased by	National government

Impact classes and areas of public intervention	Monitoring indicators	Target locations
production and dissemination	100%	
• Establishment of South Sudan Forest Commission (SSFC) if its establishment is justified	SSFC established	National government
(3) Management and conservation of public forests		
Short-term (5 years)		
• Establishment and maintenance of inventory of forest resources of public forest reserves including Central Forest Reserves (CFRs)	Forest resources base for public forests	Selected public forests
• Development of national CFR management plan and identification of CFRs for pilot forest management	CFR management plan developed	National government
• Piloting advanced CFR management in selected CFRs. The management includes identification and confirmation of CFR boundaries, control of illegal activities, effective management of forest concessions, enhancement of plantation activities and forest products utilisation to maximise forest conservation, utilisation, and profit and income generation	Efficiency of CFR management improved Plantation area increased by 5% of total CFR areas	CFRs
• Establishment of joint forest management (JFM) schemes.	Production under JFM increased by 10%	JFM members
Medium-term (10 years)		
• Enhancement and maintenance of inventory of forest resources of public forest reserves	Updated database of CFRs	Selected CFRs
• Implementation of advanced CFR management including JFM in all CFRs in selected states	Increase in production and productivity of CFR by 10%	Selected CFRs
• Piloting establishment and management of state and local government forest reserves and community forest reserves	Performance of pilot projects	Selected CFRs
Long-term (25 years)		
• Nation-wide implementation of advanced CFR management including JFM in all CFRs	Increase in CFR production by 50%	Major CFRs
• Nation-wide implementation of collaborative CFR management with forest fringe communities to control illegal activities and diversify communities income sources in all CFRs	Increase in CFR production of minor forest products by 50%	Major CFRs
• Nation-wide establishment and management of state and local government forest reserves and community forest reserves	Increase in productivity of public forest by 50%	All states
(4) Commercial forestry and forest products market		
Short-term (5 years)		
• Piloting technical, financial, in kind, facilitative and marketing support to small- and medium-scale out-growers of teak, eucalyptus, gum-acacia, and other forest plantation species in selected states	Annual growth of forest products by 5%	Selected states
• Piloting marketing, technical and facilitative support to traditional, micro-, small- and medium-scale forest products businesses	Annual growth of forest products by 5%	Selected states
• Piloting provision of concessional loans to ease financial constraints of out-growers and forest products businesses in selected states	Annual growth of loans to forestry sector by 3%	Selected states
• Piloting reasonable forest products taxes and fees levied on forest products businesses in selected states	Annual increase in revenue collected by 5%	Selected states
• Piloting efficient licensing schemes	Efficiency increased by 5%	Selected states
• Piloting control of illegal forest products transactions in selected states	Decline in number of illegal activities by 5%/year	Selected states
• Piloting extension and enforcement of forest products standards in selected states	Forest products standards enforced	Selected states
Medium-term (10 years)		
• Nation-wide implementation of technical, financial, in kind, facilitative and marketing support to small- and medium-scale out-growers	Annual growth of forest products by 5%	All states
• Nation-wide implementation of marketing, technical and	Annual growth of forest	All states

Impact classes and areas of public intervention	Monitoring indicators	Target locations
facilitative support to traditional, micro-, small- and medium-scale forest products businesses	products by 5%	
• Nation-wide implementation of efficient licensing schemes	Efficiency increased by 5%	All states
• Nation-wide extension and enforcement of forest products standards	Forest products standard enforced	All states
• Piloting promotion of forest products exports	Annual growth of forest products exports 5%	All states
Long-term (25 years)		
• Nation-wide promotion of concessional loans to ease financial constraints of out-growers and forest products businesses	Annual growth of forest products by 5%	All states
• Nation-wide implementation of forest products taxes and fees levying on producers and traders of forest products	Annual increase in revenue collected by 5%	All states
• Nation-wide control of illegal forest products transactions		All states
• Nation-wide promotion of forest products export	Annual growth of forest products exports 5%	All states
(5) Community forestry and agroforestry		
Short-term (5 years)		
• Piloting sustainable community forest management in communal and/or private lands for protection, conservation and production of charcoal, timber and minor forest products in selected states	Number of community forestry increased by 10%/year	Selected states
• Piloting JFM in CFR forest fringe communities to control illegal activities and diversify communities income sources in selected CFRs	Number of JFM increased by 10%/year	Selected states
• Piloting promotion of agroforestry in communal and private land in selected states	Annual increase in areas of agroforestry by 5%	Selected states
• Piloting control of illegal forest operations in communal and private land in selected CFRs	Annual decline in forest offences by 5%	Selected states
Medium-term (10 years)		
• Nation-wide promotion of agroforestry in private and communal land	Annual increase in areas of agroforestry by 5%	All states
Long-term (25 years)		
• Nation-wide implementation of sustainable community forest management in communal and/or private lands for protection, conservation and production of charcoal, timber and minor forest products in all states	10% of forest areas covered under community forestry scheme	All states
• Nation-wide implementation of JFM in CFRs with forest fringe communities to control illegal activities and diversify communities income sources in all CFRs	50% of CFRs with JFM scheme	All states
• Nation-wide control of illegal forest operations in communal and private land in all states	Annual decline in forest offences by 5%	All states

5.6 Fisheries subsector development scenario

5.6.1 Establishment of fisheries subsector development focuses

When forecasting for fisheries in South Sudan, the problem is made more difficult by a shortage of accurate data on fisheries, and a worrying lack of capacity in the national and state governments to manage fisheries; this is coupled with a lack of comprehension of the economics and necessary responses to increasing exploitation of renewable common property resources.

The CAMP process pre-supposes that the national and state governments will take a lead role in management and regulation of the country's fish resources, including monitoring and research of the fisheries and aquaculture; and, at the same time addressing the major constraints of public infrastructure (roads, bridges, ports) and provision of utilities (such as clean water and electricity). The private sector is expected be the engine for growth through investment in fisheries production, and marketing facilities and equipment.

Fisheries is not a suitable sector for public-private investment nor direct government intervention.

CAMP foresees over the period 2015-2040, development of capture fisheries, integrated aquaculture-agriculture (IAA) and commercial aquaculture. Of these, capture fisheries is currently the most important, and would remain so in the future; although the wild fisheries face grave threats from an uncontrolled rise in effort and subsequent overfishing due to the likely failure to apply management measures to control entry to the fishery and limit fishing effort.

In many countries aquaculture is hailed as the savour of fisheries, but it is important to emphasise that aquaculture cannot in itself solve the problems of poor regulation, overfishing and illegal fishing practices that threaten the wild-caught fisheries of South Sudan. Both aquaculture and capture fisheries require effective governance and development activities, and aquaculture may supplement but will not be able to substitute for the benefits of a healthy and well-regulated capture fishery.

5.6.1.1 Capture fisheries

The current situation with capture fisheries is that the potential yield in South Sudan is unknown with any accuracy but may be in the order of 200,000 tonnes. The catch in 2013 is probably 140,000 tonnes per year and the per capita consumption of fish is approximately 17kg/year. More than 18% of the population depend on fisheries directly for livelihood or employment and there are more than 220,000 active fishermen in the country. The fishery is a multispecies one, with *Heterotis niloticus*, *Gymnarchus niloticus* (a carnivorous mormyrid), *Tilapia spp* and *Lates niloticus* (the Nile Perch) appearing amongst more than 40 relatively common species in the catch. Due to a lack of ice, most of the fish catch is either eaten by the fishing household, retailed fresh locally, smoked or sun dried. Relatively small amounts are moved fresh to the towns. Most fishing households sell some of their catch. Smoked and dried fish are transported by traders all over the country, and there are significant imports of smoked and dried fish, and some fresh fish, from Uganda. Exports have been limited to a considerable trade in fresh and dried products northwards into what is now Sudan; but the trade has recently (2012) stopped due to border closures.

The catch from the fishery can probably increase by at least 40% though already (2013) there are unmistakable signs of overfishing from enclosed lakes and small rivers throughout the country and those areas of the Sudd and the Nile river near large towns (northern Central Equatoria State, Malakal and Juba).

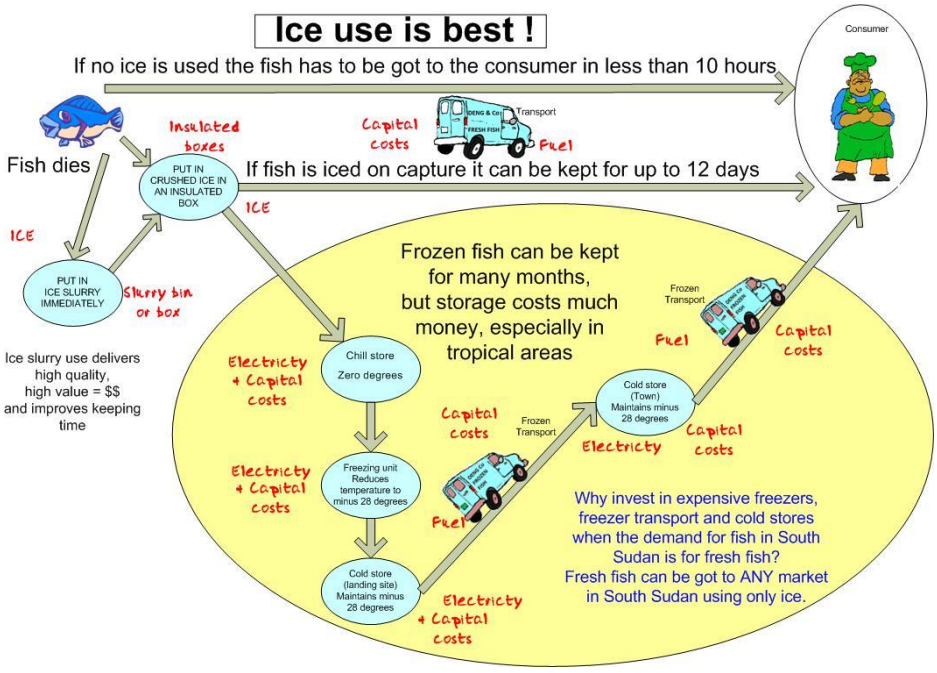
If South Sudan can manage its fish stocks in a sustainable manner then the country could, by about 2030, have a sustainable wild capture fishery contributing about 200,000 tonnes of fish protein to local and export markets. For this to occur will require:

- the creation of a Fisheries Law and associated regulations, both nationally and in the states;
- establishment of co-management systems throughout the country (appropriate legislation is a pre-requisite);
- application, though the legislation, of the precautionary approach and ecosystems approach to fisheries management as required by the FAO Code of Practice for Responsible Fisheries and in the Fisheries Policy for South Sudan, 2012;
- a transparent means of enforcement of rules and regulations through the co-managers of the resources;
- a rapid investment in data collection and research, leading to a thorough knowledge of the fishery, and the biological attributes of the various species being caught;

- establishment of a competent authority (probably within the National Bureau of Standards) to control quality and certification for the export industry; and
- a general enhancement of skills throughout the sector, including the private sector.

Additionally, to maximise returns from the fishery, there will have to be investment in ice machines and insulated boxes for storage and transport of chilled fish, refrigerated chill stores and chill transport, centralised landing sites, hygienic markets in the town and a general education of the fishing communities in fish quality and fish handling. Most of the investment will be done by the private sector but the public amenities like markets and the education and training programmes will have to be done by the national government, probably with assistance from DPs and NGOs.

Figure 5-8: Ice use is the best method of getting fresh fish to market in South Sudan



The quickest and best way to reduce post-harvest losses and increase values of fish is to encourage the use of ice to chill fish. Fish that is presently dried or smoked can thus be sold fresh, increasing its value by almost 100 %.[63] For CAMP this will be the thrust of the short and medium term investment plan for capture fisheries; this will address food security and livelihoods, and develop slowly into a more mature industry, producing value added products for local consumption. Exports will be considered for the latter period of the CAMP timeframe, particularly once commercial aquaculture is established. The simple diagram in Figure 5-8 shows how the rigorous use of ice is the optimal path for fish marketing in South Sudan.

5.6.1.2 Integrated aquaculture agriculture (IAA)

Aquaculture in south Sudan is in its infancy. The total area of fish ponds is less than 10 ha, with over 70 ponds. These are scattered mainly though CES and WES, particularly around Yei and Yambio towns, and have been supported by NGOs. Typically the ponds themselves are small, less than 0.1 ha each. The intention is to provide protein to the diet of subsistence farmers, with some surpluses being sold off to provide income.

63 Smoked fish costs approximately twice as much as fresh fish costs in Juba, but has lost about 75% of its weight through the processing.

This type of aquaculture development has failed to have the impact expected in other 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 towards "entrepreneurship" (Box 5-1).

It must also be said that the success of the aquaculture initiatives so far has been somewhat muted, possibly because the DPs and NGOs who have encouraged aquaculture through their activities provide only intermittent support and are themselves lacking in skills in African aquaculture, thinking aquaculture to be "easy" and not requiring much technical support.

Box 5-1: IAA aquaculture support

The paradigm shift in support required for sub-Saharan African aquaculture is towards entrepreneurship rather than subsistence (Moehl *et al*., 2006). The starting point is the concept of "clusters" of activity in which there are production and economic thresholds (number of farmers, farmed area or tonnes produced) below which public or private support is not worthwhile. Cluster sites would be "high potential zones for a particular aquaculture system based on bio-physical or ecological socio-economic parameters, such as a site well endowed with water and a peri-urban area with good access to markets for inputs and produce, respectively."

Source: FAO/Universitat de les Illes Balears Expert Workshop. 7–11 May 2007, Palma de Mallorca, Spain. *FAO Fisheries and Aquaculture Proceedings*

South Sudan is fortunate however that the conditions in CES and WES are very suitable for IAA aquaculture, with suitable land, permanent water and streams allowing for gravity feeds to ponds. Additionally, the two main aquacultured species in Africa, *Clarius garipinus* (the "African" catfish) and *Oreochromis niloticus* (the "Nile" tilapia), are both endemic to the Nile basin. As there are very many indigenous species in the Nile basin there are likely to be other local candidate species for aquaculture in South Sudan in the future. There is also a good market, particularly in the towns of CES and WES, because most of the towns away from the Nile itself have very poor fresh fish supplies and subsequent high prices.

In other states of South Sudan, IAA does not seem so applicable, given that most of the northern states have insufficient rainfall and so lack permanent waters sources. Additionally the flatlands and floodplains of the northern areas have no possibility of gravity fed water supply, and the summer temperatures can be very high, high enough to negatively affect fish growth and survival in ponds. There is also no guarantee that IAA principles can be applied in areas where the livestock have to be nomadic (to follow pasture) and the arable growing season is only 5 months.

CAMP would expect IAA to expand gradually in CES and WES, depending on how quickly pre-requisites like an aquaculture research and training facility can be provided by donors, and the feed industry necessary is established (though imports will be relied on in the first instance). Other support services, like laboratories, ice factories and pharmaceutical suppliers will also be needed, but as demand increases private sector actors would presumably move to satisfy it. By 2040 it is not impossible that 2,000 farmers, each with 5 ha of ponds each, clustered round the major towns and markets of CES and WES (Juba, Yei, Yambio, Mundri, and Maridi) could be growing fish. Yields are conservatively estimated to be 1 tonne/ha/yr from the low input ponds; a total of 10,000 tonnes/year being produced in the country from IAA by 2040. With appropriate inputs and good pond management yields could be much higher.

5.6.1.3 Commercial aquaculture

Commercial aquaculture and IAA cannot hope to make up for poor management in capture fisheries, but throughout the world there is a great push to encourage commercial, large-scale aquaculture

Commercial aquaculture is about making money from aquaculture: it is not about feeding people, nor providing jobs, nor supporting cereal farmers, though these may well happen as spin offs from the activities of commercial aquaculture. In this form of aquaculture the object is profit. No profit and the enterprise will stop.

In that this is an activity for the private sector, the government has no place except as a regulatory and supervisory body, and to create an enabling environment for investment in the sector.

The government's role will include:

1) A land policy that is attractive for large scale aquaculture, given that it is a long term investment and requires considerable capital
2) A financial system that can provide investment funds to entrepreneurs
3) A legal framework that protects the industry. Investors will be looking for security in a variety of areas, such as:
    - security of tenure on the lands where they have made their investments;
    - security from pollution and water contamination;
    - bio-security, so that they can be as free of introduced pathogens as possible, and free of the dangers of introductions and transfers of exotic species;
    - the security of knowing that the feeds they buy and use from local feed manufacturers are pure and unadulterated;
    - the security of being part of an export orientated industry that conforms to HACCP and EU quality control rules, and other import regulations regarding residues and contaminants; and
    - physical security for themselves and their staff and equipment on the farm site, and on the roads and in the towns.

The investors will make the decision on whether to invest or not, depending on whether the conditions in the country are amenable to them or not. At the moment South Sudan has no comparative advantage over neighbouring countries (like Uganda or Kenya), and until it develops this advantage it is unlikely to attract significant investment. This will take at least 7-10 years.

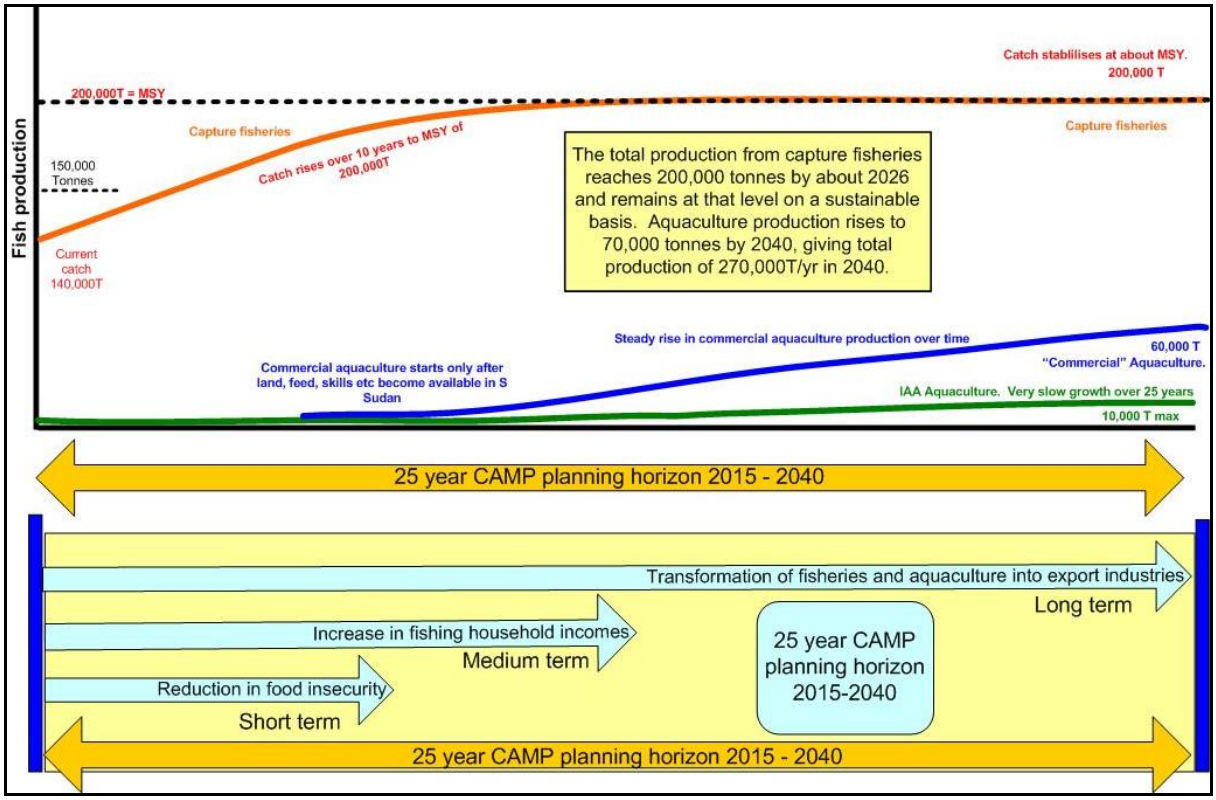
Commercial aquaculture, once established, will grow quickly and it is not inconceivable that it will be producing 60,000 tonnes/year by 2040, with a production rate of 5 tonnes/ha/yr from 12,000 ha of ponds. This figure will depend on the enabling environment being created, and could be larger or smaller depending on the level of investment attracted to South Sudan.

5.6.2 Fisheries subsector 25-year development scenarios

5.6.2.1 Desired scenario with proper fisheries management

A combination of inputs, as described above, to the three sub-sectors of fisheries is the approach that the CAMP Investment Plan will pursue, as it is the best outcome for the fishery in the long term. This situation is described diagrammatically in Figure 5-9.

Figure 5-9: Desired scenario with proper fisheries management



5.6.2.2 Undesired scenario with overfishing

Unfortunately it is unlikely that the desired situation in 2040 will be achieved. It is informative to look at other African fisheries to obtain an insight as to what may occur in the South Sudanese fisheries in the future. The Lake Victoria Nile perch fishery is a good example where after a relatively long period of exploitation the fishery has declined rapidly, due to uncontrolled use of damaging fishing gears catching undersized fish, a complete failure of monitoring control and surveillance by the government and Beach Management Committees (the co-managers of the resource) and uncontrolled increases in effort in the fishery (both increasing numbers of fishermen and increasing numbers and lengths of nets). This has led to the fishery being exploited at greater than its sustainable levels and subsequently caused reductions in catches.

After being introduced into Lake Victoria in 1954, Nile perch took some time to become established, but by the 1980s their population levels had increased dramatically. Between 1975 and 1990, annual catches of Nile perch in Uganda increased, growing to over 132,000 tonnes.[64] Since then the catch has dropped dramatically, dropping to 103,000 tonnes in 1994 and in 2010 reached 84,969 tonnes and a historic low in 2011 of 70,061 tonnes.[65] This is a catastrophic drop; export volumes and earnings have fallen considerably and the catch per unit effort declined to such an extent that there are real hardships being experienced by fishing communities.

[64] Benkenstein A. 2011. '*Troubled Waters' Sustaining Uganda's Lake Victoria Nile Perch Fishery.* South African Institute of International Affairs. Research report 9. Governance of Africa's Resources Programme. Johannesburg: SAIIA.

[65] Data from The National Fisheries Resources Research Institute, Uganda. Annual Report 2011/2012.

Uganda has had more than 20 years of assistance with its management arrangements for the fisheries of Lake Victoria, a Lake Victoria Fisheries Organisation (LVFO)[66] to coordinate efforts in the 3 lacustrine countries, but even now suffers from gross overfishing of the stocks (Box 5-2).

Box 5-2: Overfishing - example of Nile perch in Uganda

"Over the past decade a co-management system has been put in place, fish processing factories have instituted self-policing, and a number of management plans and strategies, including a regional 'Operation Save Nile Perch', have been declared. Yet Nile perch catches, and particularly catch per unit effort (CPUE), have continued to decline."

"… governance efforts have struggled because of an inability to develop pragmatic solutions to a few key challenges, including sustainable financing systems for fisheries governance, the failure to address the regional trade in immature Nile perch, corruption at various levels, stalled fisheries legislation, and poor co-operation between national and local actors in addressing the use of illegal fishing gears."

Source: Benkenstein A. 2011. '*Troubled Waters' Sustaining Uganda's Lake Victoria Nile Perch Fishery.* South African Institute of International Affairs. Research Report 9. Governance of Africa's Resources Programme. Johannesburg: SAIIA.

Similarly in Lake Malawi artisanal catches have stagnated whilst the population has risen. In the 1980s 70% of the animal protein intake of the rural population of Malawi was provided by local fish, and 40% of total protein supply for the country. These figures have declined as a result of the decline in catches and rapid population growth over the last thirty years. The per capita consumption of fish in Malawi has reduced by more than 70%, from 14 kg per person per year in the 1970s, to about 5.4 kg in 2009. The reduction in fish consumption and hence protein intake brings serious nutritional implications for the nation. [67] In Malawi climate change, producing a small drop in lake levels, appears to have also contributed to reducing the catch.

The assumption that South Sudan will follow the Uganda example is based on the current complete lack of any management of fish stocks, a situation that is predicted to continue unless drastic remedial action is taken. There is not even any legislation in place to cover fisheries, nor regulations, the former necessary for any co-management initiatives, and the latter necessary to control the use of destructive fishing gears and practices. Indeed the Ministry of Agriculture, Forestry, Tourism, Animal Resources, Fisheries, Cooperatives and Rural Development (MAFTARFCRD) and Directorate of Fisheries seem set on a course of rapid expansion of capture fisheries, with commercialisation being a major objective including plans to establish a parastatal private-public commercial fishing company to encourage the private sector to enter the industry. States also consider fisheries to be a potential cash creator for the administration, and have encouraged foreign companies to enter the industry, with no controls and checks, nor laws and regulations, nor data collection and research, neither in place nor planned.

There may also be added complications of climate change affecting the size and character of the Sudd area, where much of the fish comes from.

Bearing this in mind it is not difficult to foresee fish catches in South Sudan rising to unsustainable levels within 15-17 years and then falling back considerably. This scenario is shown in Figure 5-10, where it is assumed that a peak in catches will be achieved some time by 2027 with a decline down to a stabilised level of 80,000 tonnes from then on. Figure 5-10

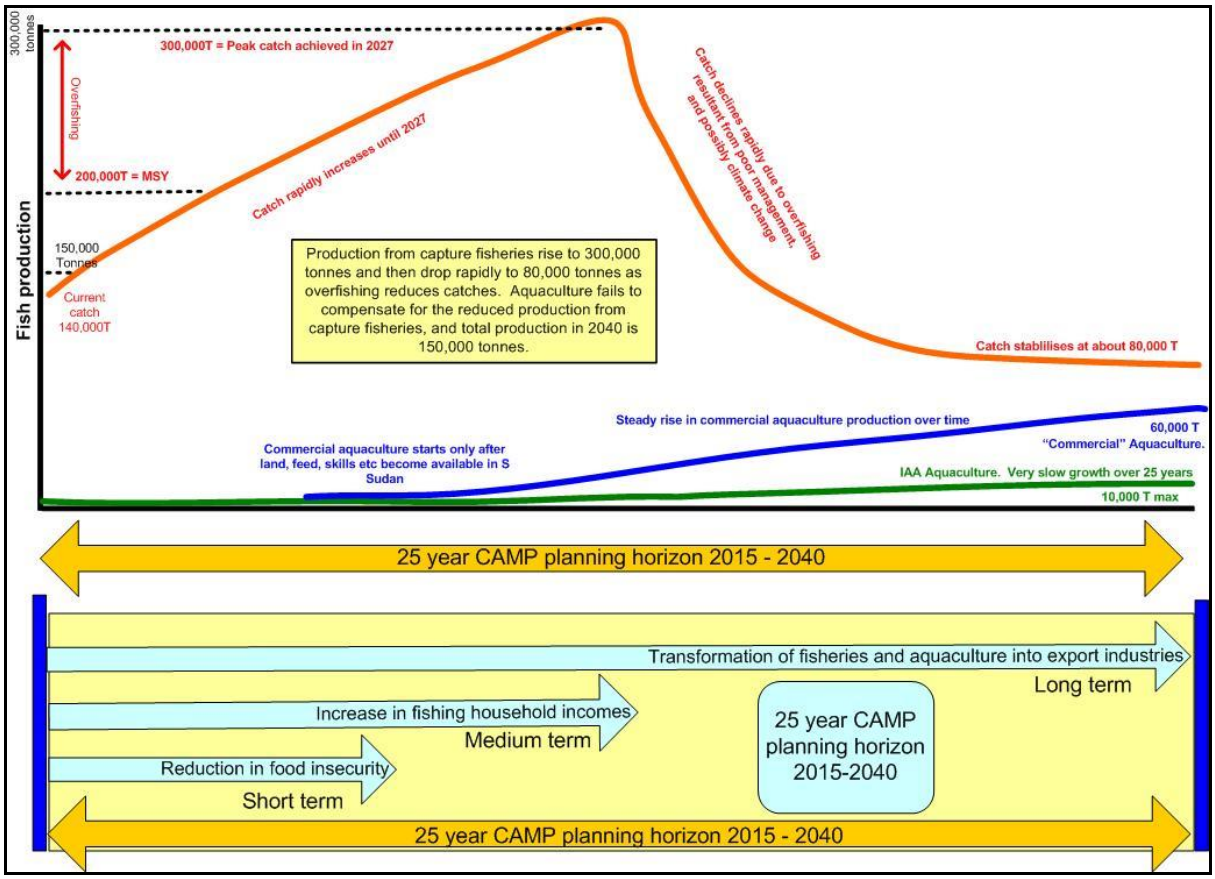
[66] The LVFO East African Community Institution constituents are from Kenya, Tanzania and Uganda. The organization's aim is to harmonise, develop and adopt conservation and management measures for the sustainable utilisation of living resources of Lake Victoria to optimize socio-economic benefits from the basin for the three partner states.

[67] ACP Fish II. 2011. *Revision of National Policy for Fisheries and Aquaculture in Malawi and National Fisheries Policy in Swaziland.* ACP Fish II – Strengthening fisheries management in ACP states 9 ACP RPR 128. Final Report May 2011.

pre-supposes very poor management, little data collection and a lack of enforcement of regulations in the industry, a mirror image of what has happened in Uganda.

It is obvious that this is not a desirable outcome; production of fish from aquaculture and capture fisheries would only be 150,000 tonnes, rather than the 270,000 tonnes that would happen with the ideal situation of fishing at Maximum Sustainable Yield (MSY) shown in Figure 5-10.

Figure 5-10: Fish production projections for 2040 if overfishing is allowed to occur



Proposed CAMP investment plans would avert this situation, through an emphasis on fisheries management and the principles of the precautionary approach and ecosystems approach as laid down in the FAO Code of Conduct for Responsible Fisheries. The government has to enable this with support for the mechanisms and principles.

5.6.3 Public interventions by national and states governments

Table 5-17 shows areas of public interventions by national, state and local governments to achieve the 25 year scenario in fisheries.

The main objective in the short term will be raise catches in capture fisheries to a sustainable level of about 200,000 tonnes/year and then stabilise fishing effort at that level. This will provide food security to be fishing communities and those that consume fish throughout the country. Overfishing is the greatest threat to capture fisheries and must be avoided.

In the medium and long term, the objective will be maintain capture fisheries production through management of the resources and fishing effort, and to increase subsistence and

large scale commercial aquaculture, which will become more and more important as time goes on.

Some rapid increase in the export of fish to Sudan, from capture fisheries in the north of South Sudan, is expected, which will have to be controlled to avoid overfishing, probably at about 25,000 tonnes/year. As time passes, production from commercial aquaculture will increase and some of this can be exported, either regionally or to European markets.

Table 5-17: Areas of intervention by governments in the three terms (draft)

Areas of interventions	Indicators	Areas/targets
I. Short-term: Food security		
1. Achieve food self sufficiency		
▪ Increase of production from Capture Fisheries, whilst improving management to avoid overfishing.	Gradual increase from the 140,000T currently produced to 200,000 T over 10 years	Particularly the Sudd and floodplains of Jonglei, CES, Unity, Lakes and Upper Nile
▪ Increase in production from IAA/small scale aquaculture	Increase in numbers of these subsistence farmers, to about 2000 by 2040	Particularly the "Green Belt" in CES and WES
2. Strengthen public service delivery		
▪ Capacity development for the national and state governments on programmes/projects implementation	Implementation framework/training	National and state governments
▪ Strengthening of training and extension service delivery to fishermen (quality control, processing, Community Based Management systems). Requires strengthening of the activities of the Fisheries Training Centre in Padak, Jonglei State.	No. of trained fishermen	Fishing groups and extension workers, particularly the Sudd and floodplains of Jonglei, CES, Unity, Lakes and Upper Nile
▪ Strengthening of Community Based Management systems for capture fisheries	Numbers of Beach Landing Committees	Particularly the Sudd and floodplains of Jonglei, CES, Unity, Lakes and Upper Nile
▪ Provide necessary skills enhancement for subsistence and commercial fish farmers.	Establishment of an Aquaculture Training and Research Centre in the Green Belt	Either Yei or Yambio would appear suitable sites.
▪ Strengthening of collaboration between government organizations and NGOs	Coordination mechanism at state and county levels	National and state levels, governments and NGOs
3. Establish a firm legal basis		
▪ Preparation of necessary laws and acts based on fisheries related policies. The whole Fisheries Law and associated regulations requires to be rewritten. ▪ Necessary policies and regulations established to attract commercial investment to Aquaculture (covering land, feed, export etc.)	No. of laws and acts established	National and state governments
4. Develop infrastructure (in collaboration with other ministries & private sector)		
▪ Interstate and feeder road development, for marketing of fresh fish.	No. of km	Main interstate roads and priority feeder roads
▪ Fish wharves and jetties	No of jetties and wharves	Nile and Sobat
▪ Improved fish markets in urban areas	No. of sites	Whole country
▪ Improved facilities at landing sites (hardstandings, ice production, shade areas etc.)	No. of sites	Whole country
▪ Removal of barriers to investment in the sector	Simplification of tax codes etc. Reduction in informal taxes	Whole country
II. Medium-term: Household income growth for poverty reduction		
1. Maintain and improve productivity for poverty reduction		
▪ Increase in fish production ✓ Maintenance of fish production from Capture Fisheries, avoiding the ill-effects of overfishing, though proper management of resources	Capture fisheries stablised at about 200,000 tonnes/year production for whole	For capture fisheries particularly the Sudd and floodplains of Jonglei, CES, Unity, Lakes and

Areas of interventions	Indicators	Areas/targets
✓ Increase in IAA aquaculture ✓ Establishment of commercial aquaculture	country by 2020 Aquaculture production rises rapidly and then stabilizes at about +5% per year	Upper Nile Green Belt Aquaculture concentrated in the Green Belt
▪ Improvement in value of the catch though the use of ice and appropriate insulated and chilled storage raising quality ▪ Improvement in value of the catch through a shift away from dried fish to fresh fish	Gradual. Possibly 20% over the period	Whole country, but mainly Jonglei, CES, Unity, Lakes and Upper Nile
2. Promote market oriented fisheries production and value addition		
▪ Strengthening of beach management committees to maintain proper management of the capture fisheries ▪ Strengthening of Fish Marketing Co-operatives		Whole country but concentrated in the Sudd and floodplains of Jonglei, CES, Unity, Lakes and Upper Nile
▪ Strengthening of Fish Farming Cooperatives and fish marketing bodies		Progressive and smallholder fish farmers
▪ Provision of rural finance for establishing of fish marketing premises		Agricultural Bank and Coop Bank
3. Strengthen public service delivery		
▪ Promotion of basic research into river and floodplain fisheries	Incorporation of research findings into management schemes for individual species of fish.	Whole country but concentrated in the Sudd and floodplains of Jonglei, CES, Unity, Lakes and Upper Nile
▪ Strengthening of fisheries information collection system	Statistical information, agricultural census	Whole country
▪ Strengthening of training and extension service delivery to fishermen	No. of trained farmers	Through Beach Management Committees and Co-operatives countrywide.
▪ Promotion of basic research into aquaculture in South Sudan (Species, feeds, technologies)		Green belt
▪ Strengthening of the role of States in the promotion of fish quality control		Whole country
▪ Enhancement of appropriate fisheries management regimes through Beach Management Committees		Whole country
4. Establish/strengthen higher educational institutions		
▪ Establishment of the Aquaculture Training and Research Centre ▪ Continued strengthening of the Padak Fisheries Training Centre		Green Belt Padak, Jonglei
5. Improve competitiveness		
▪ Tax exemption for aquaculture inputs and services (no subsidies for capture fisheries) ▪ Reduce the imposition of informal taxes and levies through formalization of tax code	Selected inputs and services Formal tax code adhered to	Green belt Whole country
6. Develop infrastructure (in collaboration with other ministries and private sector)		
▪ Ongoing interstate and feeder road development, building of jetties, quays, moles and wharves	No. of km No of quays, jetties, wharves and moles.	Priority interstate and feeder roads and landing sites on the Nile
III. Long-term: Agricultural transformation into export industry		
1. Improve production for export (in conjunction with South Sudan Bureau of Standards)		
▪ Establishment of a Competent Authority for the control of fish quality for local consumption and export.	Laboratory services Inspection services at export points.	All fish for export
▪ Training of staff in quality control and inspection	No of staff	Whole country
2. Promote value addition		
▪ Support establishment of processing factories by private sector	Tax reduction	Some target areas such as special economic zones
3. Strengthen public service delivery		
▪ Promotion of advanced research in Aquaculture	No. of advanced technologies developed	Green Belt
▪ Strengthening of quarantine system to reduce	Licensing system	Green belt

Areas of interventions	Indicators	Areas/targets
introductions, and transfers of fish species in Aquaculture		
4. Develop infrastructure (in collaboration with private sector)		
▪ Development of electricity, transport and road links, and improve river communications	TBD	Some target areas
5. Establish favorable conditions for private investment		
▪ Clear tax policy	Tax reduction	Some target areas such as special economic zones
▪ Good governance (high transparency, no corruption, clear land acquisition process and good security)	TBD	National, state and local governments

Source: Prepared by the CAMP Task Team

5.7 Institutional development subsector development scenario

5.7.1 Establishment of institutional development subsector development focuses

5.7.1.1 Institutional development subsector development focus

The development focus of the institutional development subsector will be on public sector service provision as outlined in chapter 4, P*ublic sector as service providers*. The main activity will be to develop the capacity of the various levels of government, following GRSS's decentralization policy, through their changing roles over the next 25 years. That is, as the people of South Sudan and their government move from a focus on food security, to a market economy for economic growth, and to agribusiness for international markets. As the country, and in particular the agriculture sector, moves through these developmental stages, the roles of all levels of government change and their capacity to guide each stage requires new skills to be developed. These skills include:

- policy development;
- policy implementation;
- regulation and enforcement;
- direct and indirect service provision;
- monitoring and evaluating service provision by government and other stakeholders;
- coordination of stakeholders;
- establishing enabling environments for all stakeholders, large and small;
- protection from exploitation;
- environmental protection;
- research and dissemination of research results (extension).

In order for the various levels of government to effectively and efficiently fulfil their various roles their capacity must be developed. As the CAMP Situational Analysis Report points out in Chapter 4, current government capacity at all levels, and particularly at the local government level, is very limited. This is true in all three categories of capacity: (1) organizational resources, (2) human resources; and (3) physical resources. To capacitate the public sector much effort will be required in organizational development, human resources development, and infrastructure development.

5.7.1.2 Key issues and challenges

Organizationally, MAFTARFCRD, the state line ministries, and local government bodies are guided by GRSS's decentralization policy and the public financial management system. As well, MAFTARFCRD has sectoral five-year strategic plans[68]in place. What is lacking is the ability to effectively utilize these organizational tools. Human resources management and administration is particularly weak and will require *right-sizing* throughout all levels of government. Communication and coordination between levels of government requires

[68] For example, MAFTARFCRD Agriculture, Forestry and Rural Development Sector Strategic Plan 2013-2018

attention. Agricultural research, agricultural training, and extension systems are all at a near standstill.

Within the agriculture sector, human resources development requires much support. Pre-service educational institutions need to be revitalized. In-service training and professional development of public servants will be an ongoing theme. Capacity in higher education, especially for agricultural research, is another indirect human resources development (HRD) need for MAFTARFCRD to address.

The CAMP situational analysis has shown that the government's physical resources are limited. There is a lack of buildings and electricity at the payam and boma levels for agricultural officers in several states, and a lack of furniture, office equipment and computers at all levels of government. Vehicles, from bicycles to motorcycles to four-wheel drives, are not available to enable extension work and M&E to take place.

There are two main challenges for the Institutional Development Sub-sector:

1) Funding for the massive capacity development initiative that is required;
2) Utilizing the capacity once it is developed.

The Government of the Republic of South Sudan could fund a good portion of the required capacity development mainly from oil revenues, with the view of diversifying the economy for a time when the oil will run out. This will require the political will to reduce the money that is going missing from the public service. Development partners are willing to invest at the moment, both directly in government projects and indirectly through NGOs, although this could change if corruption is not successfully tackled by GRSS.

The implementation of efficient, effective and appropriate government service provision will mainly be developed through technical assistance, training and the provision of physical resources to build and utilize agricultural sector structures and functions within its institutions. However, political will is required to ensure that the capacity that is developed is allowed to be used as intended and used for the good of all citizens of South Sudan.

5.7.2 Institutional development subsector 25-year development scenarios

All CAMP sub-sectors, in their 25 year scenarios, have spoken of the need for a strong public sector to lead the country through the progression from food security to economic growth to agribusiness. The next five to seven years, as indicated in MAFTARFCRD's sectoral strategic plans, will require a huge investment to rapidly develop the capacity of the government's organizational, human and physical resources, at all levels. This is also the period of greatest impact that the interventions will have for the country and the agricultural sector in particular. The impact of the first few years of the institutional development initiatives will be immediate and continue throughout CAMP's twenty five year implementation. This initial period will be followed by a less intense, from an institutional development perspective, period of consolidation, reinforcement and continuation of the capacities developed during the first seven years, in addition to making adjustments to changing roles as the economy moves from subsistence to a market economy. Similarly, in about 15 years, the normal operations of a public sector, that continually renews itself, will be evident and in the case of the agricultural sector its organizational structures and staff skill sets will adjust as the private sector assumes more direct service provision to the agriculture sector.

The following sections present a progression of public sector capacity development broken down into three time periods. They roughly follow the CAMP model of food security, economic growth and agribusiness. It must be pointed out that while, in general terms, these three stages of agricultural development for South Sudan are separated in the scenario, in reality there will be overlap with the possibility of some agribusiness taking off in the short-

term with such initiatives as, for example, the revitalization of a large rice scheme. As well, value chain development is important for the few fledgling medium sized producers presently operating in South Sudan and may require attention before the medium term.

5.7.2.1 Short-term (5-7 years)

This period will be the most intense as the government and its partners rush to create efficient, effective and appropriate government institutions to lead and coordinate agriculture sector development in South Sudan.

While the public sector organizational structure and strategic planning for agriculture is in place, other organizational development initiatives will need to be carried out. These include the:

- establishment of an accountability framework;
- establishment of a policy research function and unit to advise the national minister and senior management;
- design of regulations, such as for food health standards, environmental protection, subsidies for agricultural inputs, input provision, and avoidance of exploitation by private sector and foreign government entities;
- design of communication systems and coordination systems, especially in aid coordination and between the local governments and the NGOs who will continue to partner with the government to deliver services directly to the farmers;
- establishment of resource mobilization plans;
- refinement of the monitoring and evaluation system;
- establishment of human resource administration systems, as per GRSS's civil service reform program that is underway, including procedures for recruitment, promotion, performance assessment and training systems. Also included here will be the *right-sizing* of the public sector human resource, in particular, how many and with what skill set should be at each level of government;
- refinement of the public financial management system as applied at the various levels of government in the agricultural sector;
- establishment of processes for subsidies for agricultural inputs;
- establishment of an agricultural extension system that will initially provide service directly to the farm household;
- rationalization of the public sector agricultural training centres;
- establishment of a national agricultural research system;
- establishment of operations and maintenance systems;
- establishment of fleet management systems; and
- establishment of systems for input provision.

Human resources development will consist of a massive amount of training and professional development to ensure that the systems established through the organizational development activities are managed, operated and maintained properly. Also to be addressed is the pre-service education of individuals who will become public servants, NGO sector agricultural specialists, private sector employees, and farmers.

Infrastructure, office equipment, vehicles will all need to be supplied during this initial period. Offices at the payam and bomas will need to be built and equipped. Small and simple community-level farmer training centres and demonstration farms will need to be established. Larger agricultural research centres will need to be revitalized and equipped. Laboratories will need to be refurbished. All level of government will require refurbishing in terms of office space, office equipment, and office furniture.

5.7.2.2 Medium-term (7-15 years)

Once the basic organizational structures and systems are in place the next period will see a consolidation and refinement of these. That is, most likely the initiatives began in the short-term will be carried over to completion during the medium term. It will also involve a change in focus for the public sector service provision to move from providing individual farmers and households with direct services to indirectly providing such services through farmers associations/producer cooperatives. Value chains become the order of the day. It will be these intermediaries that will be assisted by the government to provide the services directly to their members, thus there will be a need for a change in approach for the extension system. Partnering with financial institutions to provide services, such as credit to producers, will be important for the government.

In-service training and professional development of government staff will change in content to focus on the new skills required to lead the move of the agriculture sector away from food security to economic growth.

Physical resources will now focus on expansion of infrastructure and the replenishment of equipment from computers to laboratory equipment.

5.7.2.3 Long-term (15+ years)

Organizationally, the government now focuses on ensuring an enabling environment for all stakeholders in the agricultural sector. The private sector takes on many of the functions previously provided by the government and NGOs. Producers or their associations now are able to purchase some of these services from new service providers. The government now ensures that small producers are not exploited by the private sector or foreign government entities and that the natural environment is not degraded by agribusiness schemes.

Again, in-service training and professional development of government staff will change in content to focus on the new skills required to, this time, lead the move of the agriculture sector to the potential for export. At the same time government will retain the skills and knowledge to support the small and medium size farmers.

Consolidation of infrastructure will take place with the possibility of selling some assets to the public sector. Replenishment of equipment is ongoing.

5.7.2.4 Decentralization and CAMP implementation

Experience has shown in Ethiopia and Uganda that a successful decentralization process for a country is a slow, methodical progression not unlike the CAMP 25 year scenarios suggest and that will mirror South Sudan's decentralization process. In 1992, Uganda began implementing several reforms in the government sector. One of the significant reforms was the decentralization of government functions from the central government to the local governments. This included the transfer of budgets from national to state governments. Fourteen years later, in 2006, the local governments shared approximately 32% of the national budget, higher than any other African country. In addition, a performance management system was instituted, as part of the public financial management system, where the performance of a district determined the level of budget the district received in the following year. For example, if the performance of a district is high, 20% additional budget will be guaranteed for the next year, but on the other hand, if performance is poor, 20% of the budget amount will be reduced for the next year. Uganda continues to refine its decentralization process more than 20 years after it began. South Sudan can well expect to follow a similar trajectory for both its decentralization process and CAMP's implementation.

Table 5-18: Summary of institutional development subsector development focus

Time frame and areas of public sector development
Short-term (5-7 years)
• Organisational strengthening, human resources development and Infrastructure development of MAFTARFCRD, state ministries and local government agricultural-related departments
• At MAFTARFCRD, structures, systems, training and equipment provision to operationalize: accountability framework; policy research and development; regulation development and enforcement; coordination of development partners and resource mobilization; monitoring and evaluation; public financial management; human resource administration systems, including procedures for recruitment, promotion, performance assessment and training systems, the *right-sizing* of the public sector human resource; agricultural research; agricultural extension service; agricultural education and training
• At the state and local government level, structures, systems, training and infrastructure to operationalize: monitoring and evaluation; coordination of DP projects and NGOs; public financial management; human resource administration; agricultural extension; farmer training; distribution of inputs
Medium-term (7-15 years)
• The continuation with consolidation, refinement and reinforcement of organisational strengthening; human resources development and Infrastructure development of MAFTARFCRD, state ministries and local government agricultural-related departments, which was initiated in the first 7 years.
• The development of new organizational policies, structures, skills and equipment reflecting a change in emphasis from direct service provision to indirect service provision with the development of farmer association/producer cooperative and a market-based/value chain approach to the agriculture sector development
Long-term (15+ years)
• As with any maturing public sector institution, standard, on-going, renewal of organisational strengthening; human resources development and Infrastructure development of MAFTARFCRD, state ministries and local government agricultural-related departments.
• The development of new organizational policies, structures, skills and equipment reflecting a change in emphasis to private sector service provision and support to agribusiness, while maintaining protection of small and medium producers.

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