



Demand Analysis Report- Republic of South Sudan



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Contours of Demand Analysis of South Sudan

1. An over view of the country

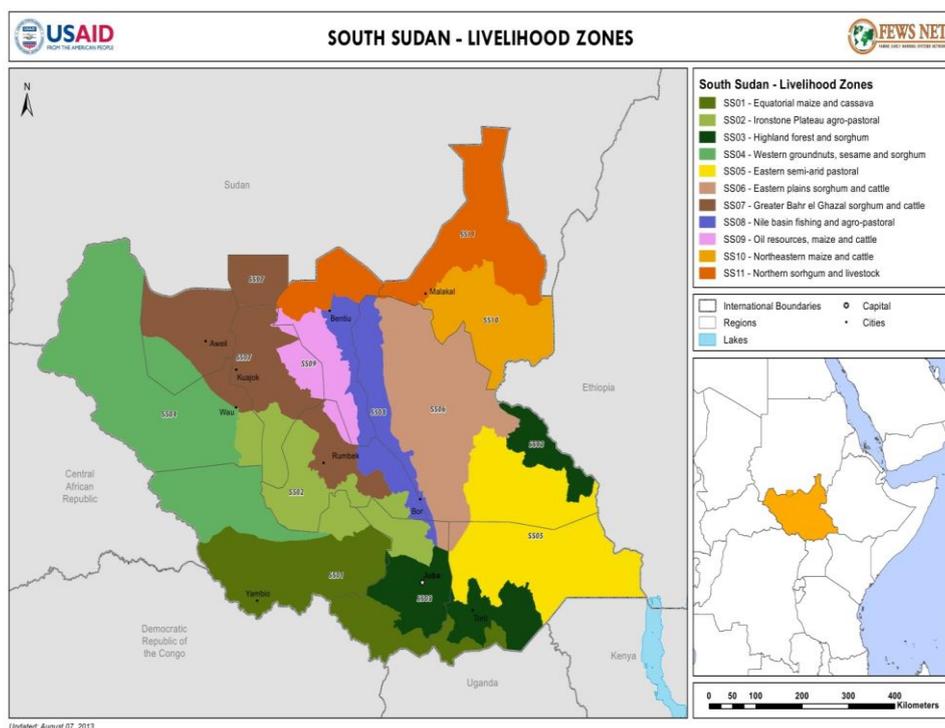
The world's newest nation, south Sudan is endowed with agricultural potential given its favourable soil, water and climatic conditions. It is estimated that about 70 percent of the total land area is suitable for agriculture, animal husbandry, fisheries and forestry for producing a wide range of agricultural products, including annual crop such as grains, vegetables, tree crops such as coffee, tea and fruits, livestock, fishery and various forest products. To realize such productive potential and to achieve economic development for the upliftment and living and standards of the people, a realistic understanding of the country's socio-economic conditions is required so that appropriate policy measures and agricultural growth strategy can be designed in the near future.

1.1 Geography of South Sudan

Formed from the 10 southern most states of Sudan, South Sudan is a land of expansive grassland, swamps and tropical rainforest straddling both banks of the White Nile. South Sudan is bordered by Sudan to the north, Ethiopia to the east, Kenya, Uganda and the Democratic Republic of the Congo to the south, and the Central African Republic to the west. The White Nile river runs from south to north through the country joined by its major tributaries, the Bahr al-Ghazal and the Bahr al-Arab and the Sobat. The centre of the country is dominated by the Sudd, a 120,000 sq km (46,332 sq miles) marshland. This gives way to equatorial forest towards the south, rising to the jungle and the Imatong Mountains on the Ugandan border, which include the country's highest peak, Mount Kinyeti, at 3,187m (10,456ft). It is highly diverse ethnically and linguistically. Among the largest ethnic groups are the Dinka, Neur and Shiluk. The south sudanese follow the traditional religions while minority are Christians.

1.2 Agricultural Land Use in South Sudan

The country lies entirely within the River Nile Basin and is covered by grassland, swamps and tropical forests. Approximately 75% of the country's land area is suitable for agriculture while, approximately 330,000 square kilometers, or about half of the total land space, is estimated to be suitable for cultivation. With its high potential for agricultural production, some expert observers have said that, with the development of appropriate and adequate infrastructure, South Sudan could become the bread basket of Africa.



In spite of having 50% of its arable land mass as prime agricultural land only 4% of this area is cultivated continuously or periodically. As Table No indicates, the total area that is cultivated on a shifting basis is estimated at about 2.8 million hectares.

Table No. 1 Land Use in South Sudan (In hectares)

Category	Area	Share (%)
Cultivated	2760131	4.3
Trees	20742243	32.6
Shrubs	2532308	39.3
Herbaceous	14522385	22.8
Urban/industrial	34188	0.1
Bare rock and soil	159106	0.2
Water bodies	462105	0.7
Total	63712466	100

Areas covered with trees and shrubs account for 72% of land use, with grasslands accounting for about 23% of the total area. The Western Flood Plains livelihood zone has the most cropland (34% of national cropland). Greenbelt and Eastern Flood Plains zones are the other two important crop production regions, accounting for, respectively, 18% and 26% of national cropland. Altogether, these three livelihood zones account for 78% of national cropland. Five states account for 70% of the national cropland (and 56% of the national

territory): Upper Nile, with 19% of total cropland; Warrap, 15%; Jonglei, 14%; Western Equatoria, 11%, and Central Equatoria with 11%. Almost all irrigated crops (mainly rice) are in Upper Nile; rice on flood land is all in Northern Bahr el Ghazal while fruit trees and tree plantations are exclusively in Green Belt Zone encompassing Western, Central, and Eastern Equatoria which have the longest LGP in South Sudan.

1.2 Economy of South Sudan

South Sudan holds promising economic growth potential. It is endeavoured with abundant natural resources including oil, fertile soil and fresh water. While the youthful population provides greater workforce potential. So far, however the country has failed to diversify the economy and relies on oil production for nearly 96% of the budget revenues, 60% of its GDP and 99% of all foreign currency exchange and earnings. The over dependence on oil make the economy particularly fragile and vulnerable to the external shocks. In early 2012, production of oil was suspended due to the government's dispute with Sudan's over transshipment fees. To cope up with the shortfall in this significant source of revenue, the government has approved austerity measures including an average of 50% reduction in non-salary expenditure and elimination of unconditional grants to state governments.

South Sudan's GDP in 2011 was US 19.17 dollars with a growth rate of 2%. The Gini coefficient for the country is 46, representing a relatively high rate of inequality. Although no accurate data exists on the subject, there is large informal economy that is assumed to be a significant source of employment for the population. Major informal activities include small scale construction of homes and lodging, retail trading and transportation services. Approximately 1% of households in South Sudan have a bank account.

Table No. 2 The key Economic Data of South Sudan

S. No	Key Economic Data	Unit		Source
1	Area	Km2	644.329	WDR
2	Population	Million	11.30	WDR
3	GDP	USD Billion	11.80	WB
4	GDP	USD Billion	18.8	WB
5	Annual Economic Growth Rate	%	-12	WDR
6	GNI per Capita	USD	950	WB
7	Growth GNI Per Capita	%	-19	IMF
8	Ease of doing Business	Rank	187	WB

9	Oil sector, percentage of total GDP (est. 2013)	%	60	UNDP
10	Government revenue from oil sector (2013-2014)	%	98	IMF
11	Government expense (% of GDP) (2014)	%	44	IMF
12	Tax revenue (excluding grants,% of GDP) (2013)	%	3.7	WDR
13	Development assistance per capita (2012)	USD	146	WB
14	Net official development assistance (% of GNI) (2014)	%	10	IMF

1.3 Human Development Index in South Sudan

South Sudan ranks among the lowest countries in the world in terms of most standard human development indicators. Available human development index (HDI) is for Sudan which includes South Sudan at 0.40815 in 2011 and is ranked among low human development countries. Although there is no HDI for the new country, the parameters used to gauge the level of human development are the lowest within the region. Poverty levels are estimated at 51% of the population, only 27% of the population is literate while health indicators remain wanting.

Table No. 3 Key Social Data

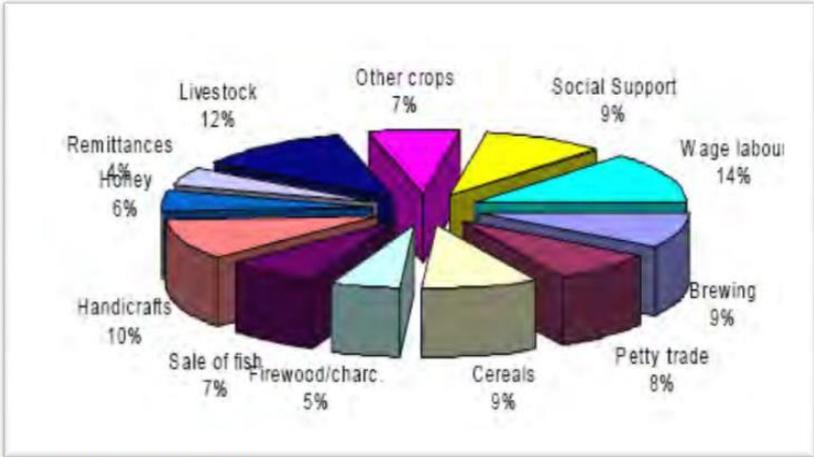
S. No	Key Social Data	Unit		Source
1	Population growth (annual average) (2014)	%	4.3	WDR
2	Life expectancy (2014)	Year	55	WDR
3	Infant mortality (2014)the first year (year)**	Per 1000 births	99	WDR
4	Access to clean drinking water (percentage with access) (2012)	%	57	WDR
5	Access to health facilities (percentage without access)	%	48	HDR
6	Number of doctors (2012)	Total	120	ICRC
7	People btw. 15-49 years living with HIV (2013)	%	2.2	UNDP
8	Adult literacy rate (2013)	%	27	WDR
9	Primary education (Gross primary school attendance) (2014)	%	41	WDR
10	Girls in primary education (attendance of girls of school of age) (2011)	%	34	MDG
11	Military expenditure (percentage of GDP) (2014)	%	N/A	WDR
12	Military expenditure (percentage of GDP)	%	N/A	WDR

	(2014)			
Key Human Rights Data				
1	Ratification with main international human rights instruments (12 in total)	No	7	OHCHR
2	Compliance with main international human rights instruments	No	N/A	OHCHR

1.4 Sources of Household Income

Economic livelihoods are largely dependent upon subsistence agriculture, livestock production and a variety of small scale off-farm income generating activities. Sources of household income in South Sudan are highly diversified but related to agriculture sector. Apart from remittances that accounts for only 4%, sources of income in the rural areas are from farm related activities with livestock at 12% while cereals and other crops account for 16%. Labor, which is important in farming and herding activities, contributes 14% of the rural income.

Fig.1. Sources of Household Income



Source: WFP-FAO-MAF, (2006)

2. An overview of Agriculture sector, policies, programmes and priorities

South Sudan holds extraordinary agriculture potential, with almost 30 million hectares suitable for farming. Varied climactic zones, fertile soil and ample rain water create ideal conditions for a wide variety of food and cash crops, with the potential of yielding two crop cycles a year in much of the country. There are many agriculture opportunities with high return on investment, including bringing current production to scale, developing new

production capacities, and investing in processing, storage, and commercialization. South Sudan's government is committed to support agribusinesses and consumer product companies, to achieve a thriving agriculture sector, diversified economy, and food security.

The agricultural potential of South Sudan is generally high. Soil and climatic conditions allow for a wide variety of food and cash crops and animal production. The sector has the potential to feed the country's growing population, provide raw material to the domestic agro-industries and greater support to the growth and development of the national economy. However, agriculture and livestock production is subsistence and almost entirely rain-fed with low outputs. Cultivated areas have historically ranged between a minimum of one percent and a maximum of two percent of the total area (from 0.65 to 1.3 million ha in 640 000 km²), while non-wood natural products such as honey, medicinal plants, wild foods and spices have helped to enhance food security. For decades, farmers and land users have worked in isolation relying solely on indigenous knowledge and they have not had access to modern production technologies and markets.

Despite the great potential, only about 4% of the land is used for crop production per hectare yields are low compared to production from other countries within the region. At the same time, the country is a net importer of livestock products from the neighbouring countries. Total area cultivated, low yields per hectare and limited economic activities have contributed to food insecurity in the country and greatly diminished the economic potential for the majority of the population residing and relying on agriculture and livestock for their livelihoods.

2.1 Agro Ecological Zones

The country as a whole South Sudan is divided into six major agro-ecological zones which offers a diversity of agricultural potential.

Zone 1 is Green belt, which is good for oil palm, tea& coffee, fruits irish potatoes, maize, vegetables and tropical forestry. Zone 2 is known as Ironstone Plateau it is excellent for sorghum, groundnut sesame sunflower and livestock. The zone three is Nile Sobat bestowed with alluvial soil it is an ideal land for sugarcane, rice and sorghum. The fourth zone is called flood plains of south sudan here variety of crops cultivated ate sorghum, rice, sugarcane, sesame and groundnut. The hills and mountains comes under the fifth zone which

is conducive for cultivating tea, coffee, temperate fruits (apples and grapes) forest plantations and wheat. The sixth zone is the arid zone which is ideal for cultivating gum acacia.

Fig. No 2 Six Major Agro Ecological Zones of south Sudan



2.3 Agriculture Sector

Cultivated areas have historically ranged between a minimum of one percent and a maximum of two percent of the total area (from 0.65 to 1.3 million ha in 640 000 km², while non-wood natural products such as honey, medicinal plants, wild foods and spices have helped to enhance food security. For decades, farmers and land users have worked in isolation relying solely on indigenous knowledge and they have not had access to modern production technologies and markets.

Soil and climate conditions allow for a wide variety of food and cash crops. Most farmers grow sorghum, maize, millet, and upland rice according to location. Other crops grown include groundnuts, cassava, green grams, cowpeas, beans, sesame, pumpkins and tobacco. Crop production is mainly rainfed and is almost exclusively by manual means with rudimentary basic tools. The area of land cultivated is determined by family labor availability; and by the minimum acreage required for assurance of basic household food supply. Over 80% of the population derives their livelihood from agriculture with the majority producing at subsistence level. Cropping areas are cultivated under a shifting regime due to declines in soil fertility after successive crops.

Sorghum is the main crop cultivated with a wide range of local landraces. It is the main staple food in all states, except for the three Equatorias where the local diet is also based on maize flour (largely imported from Uganda) and cassava (mainly in the Green Belt). In Northern and Western Bahr el Ghazal, Warrap and Lakes, sorghum is often intercropped with

sesame and millet. Maize is normally cultivated in limited areas, close to homesteads and often used for green consumption. In some locations such as Upper Nile, maize is cultivated in larger plots, instead of sorghum, provided the soil is suitable. Minor cereal crops such as bulrush millet, finger millet and upland rice are also cultivated in certain locations. Groundnut is cultivated on sandy soils in most locations and makes an important contribution to the household diet. It is the main cash crop which contributes to farming household income at certain periods of the year. In parts of Central and Western Equatoria, sweet potato, yam, coffee, mango and papaya are commonly grown. Okra, cowpea, green gram, pumpkin and tobacco are also widely grown around homesteads. Vegetables such as onions or tomatoes are not commonly grown in rural areas, but are increasingly cultivated in the peri-urban areas to supply urban markets.

2.4 Agriculture Sector Contribution to the Economy

The agricultural sector has the potential to be an additional engine of growth to the oil sector that would allow the country to diversify its economy to achieve transformational development and reduce poverty and food insecurity. The agricultural sector employs about 80% of the population mainly in the form of small-scale subsistence farming including agribusiness and constitutes about one-third of the country's GDP. Cultivated area in South Sudan has historically ranged between a minimum of one percent and a maximum of two percent of the total area (i.e. 650,000 – 1,300,000 ha).

According to FAO-WFP (Crop and Food Supply Assessment Mission for South Sudan-CFSAM 2009), about 1 million hectares were put under cultivation in 2008, an increase from 2007 levels associated with increasing numbers of returnees. Harvest of the “traditional” (non-irrigated) sector for 2008 was estimated to be 1.25 million tons of cereal crops. Sorghum is the main cereal, followed by millet and maize, with an average yield of 1.01 tons/ha compared to Africa's yields range of 1.04 to 1.14 tons/ha. According to Crop and Food Security Assessment (FAO/WFP Feb 2012), South Sudan's national cereal production in 2011 was about 19% below the previous year and 25% lower than the average for the last five years. The cereal deficit for 2012 is estimated at more than 470,000 metric tons which is almost half of the country's total consumption requirements for the year. The deficit is attributed to poor production methods, large number of returnees and trade restrictions between Sudan and South Sudan and inter-communal conflicts. The report finds

that the level of food insecurity in the country has risen sharply among the population from 3.3 million in 2011 to 4.7 million in 2012.

2.5 Challenges Facing Agriculture Development

There are many challenges facing agriculture development and food security in South Sudan. The major obstacles include lack of investment in agriculture and livestock production, insecure land tenure system, absence of facilitative laws for private investment, as well as inadequate support services and infrastructure.

2.6 Major Agricultural Programs in South Sudan

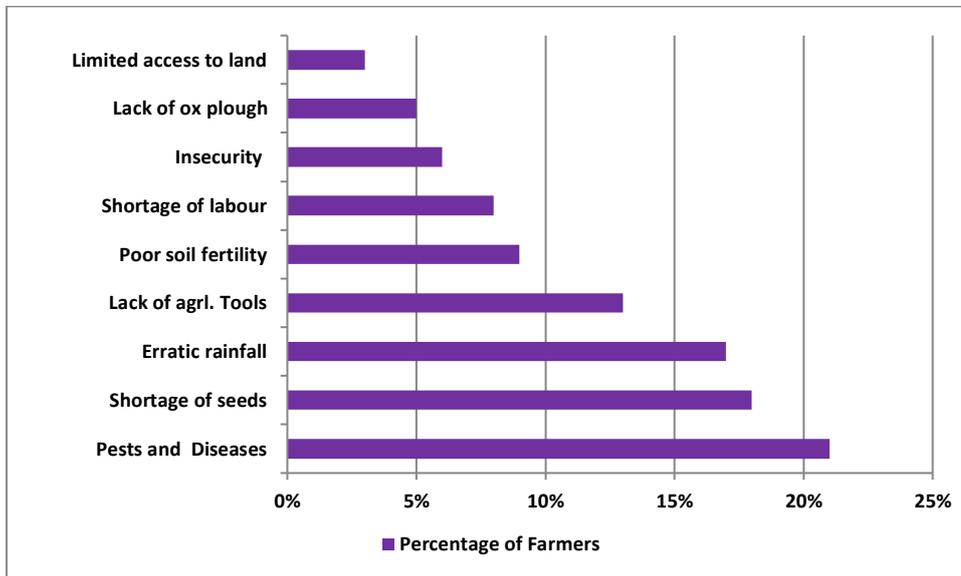
The following ongoing programs in the agriculture sectors are catering the needs of the farming community in south Sudan.

1. SIFSA (Sudan productive capacity food security information for action)
2. SPCRP (Sudan productive capacity recovery program)
3. SSALDP (South Sudan Agriculture and Livestock Development)
4. SAFD (Support to Agriculture and Forestry Development)
5. NFG (Norwegian Forestry Group)
6. Sudan Bridge
7. SSFCRP (South Sudan Food Crisis Response Program)
8. FARM (Food Agribusiness and Rural Market project)
9. South Sudan Cattle Program (SSCP)

A survey done by the Ministry of Agriculture and Forestry with FAO and WFP in 2006 to identify constraints for improved crop production ranked pests/crop diseases and shortage of seeds as the main hindrances. Productivity decline in agriculture and food insecurity can also be explained by the lack of extension services and the absence of efficient research for disease resistant crops and inadequate training opportunities. Provision of extension services is negligible, and the majority of farmers have no education on better farming methods. This is exacerbated by inadequate marketing and transport services. Because of transport bottlenecks that stem from poor state of roads, short and expensive supply of motorized transport services, farmers cannot market their goods or access basic supplies from the main cities. Constraints on access to land and unclear property rights,

including inequalities between men and women over control of resources are key impediment to agriculture production.

Fig. No 3 Major constraints in Crop Production



Another factor limiting agriculture growth potential includes partial commercialization of agriculture in the country associated to lack of appropriate storage facilities. Farmers lose a significant amount of harvested crops to pests and insects due to grain decays or infestation by pests. There are also economic losses from low prices due to lack of access to markets for poor quality grain, or arising from poor quality or contaminated food. Physical grain losses contribute to high food prices by removing part of the food supply from the markets.

2.8 Forest Sector in South Sudan

The forest sector database in South Sudan is extremely poor so there is little or no documentary evidence to base a judgement on the comparative condition of forest cover in the country. However, it is certainly true forest cover has declined in recent years, is widely held. The reason for that decline is usually given as an increase in demand for forest based products especially among people living in urban centres.⁵ there is some evidence that in the recent past forest resources in South Sudan have been exploited to an extent that is unsustainable. For instance, it is reported that only an estimated 2000 Ha of tea plantations remain out of an original plantation area of about 16,000 Ha. This process of degradation has

not only affected plantations but also natural forests. In 2010, FAO used a land cover map to show that the forest cover was 29% of the country - a figure that did not include mixed woodland-shrub land or pasture areas. This percentage is likely to have decreased in the last two years as a result of the socio-economic changes that have recently taken place in the country. It is often said that certain trees have specific roles in the communities of South Sudan and so cannot be cut unless by special arrangement. While that has traditionally been the case, rapid urbanisation is taking a toll on the traditional forest management structures that have underwritten such customs in the past. In many cases these traditional norms are no longer observed. This has resulted in non-selective tree-felling in some areas – usually for the provision of wood fuel for use or sale, charcoal production, as well as for other timber related needs. Nonetheless, the role of traditional and local institutions in management of forest resources should not be ignored, especially in areas where the social fibre is still strong.

2.9 Forest Policy, 2012

This policy provides a framework for management of forests at all levels across the Republic of South Sudan and also recognises the importance of forests for commerce, communities and conservation. It mandates the South Sudan Forest Commission (SSFC) to provide regulations and operational standards for a vibrant forest sector while the Ministry of Agriculture, Forestry Cooperatives and Rural Development (MAFCRD) provide oversight. The policy also clearly spells out ownership and management responsibilities of forest reserves where it gives ownership and management of National Forest Reserves, previously known as Central Forest Reserves, to the government while at the same time recognising that communities also own and are responsible for the sustainable management of forests on communal lands through community forestry and agro-forestry practices. Furthermore, this policy defines forest revenue collection and sharing at different levels and urges that such arrangements should take into account ownership, responsibility and inputs in forest management such as protecting the rights of local communities. Of major interest is the recognition of the community as a major stakeholder in the sustainable management of the forest. That recognition requires the national and state governments to enter into collaborative forest management agreements and arrangements with communities, in order to manage forests sustainably and in a way that ensures increased benefits to communities.

2.10 Forest Policy Framework

The vision for forestry is “a green South Sudan, with fully recovered natural and plantation forests, effectively managed for sustainable socio-economic development”. With this vision MAFCRD will pursue the following development objectives:

- i. To develop and implement appropriate policies, legislation, institutional reforms and strategies for a vibrant forest sector;
- ii. To create and sustain conducive and facilitative environment for all stakeholders and beneficiaries;
- iii. To establish and ensure sustainable management of industrial and non-industrial plantation to meet the growing wood demands;
- iv. To encourage and support the growth of competitive private sawmilling and manufacture forestry industry based on supply from sustainable managed forests;
- v. To combat desertification and desert encroachment and their negative impacts on biodiversity conservation;
- vi. To reverse the trend of decline in forest cover and to ensure that a set minimum percentage (set at 20%) of the country’s land area remains under forest cover; and
- vii. To strengthen forestry institutions and services to increase productivity, achieve household food security, alleviate poverty and contribute to the macro-economy of Southern Sudan”.

The overall development objective for the forest sector is to ensure a sufficient and sustained forest resource base and flow of forest goods and services to support livelihoods and socio-economic development for the present and future generations. This will be achieved by promoting sustainable utilization of forest resources, and increasing production of timber and non-timber forest products through private-public-partnerships for local, regional and international consumption/markets.

2.11 Climate Change and south Sudan

South Sudan is vulnerable to climate change and associated socio-economic losses and damages due to the dependence of its population on climate-sensitive natural resources for their livelihoods. Furthermore, there is currently limited institutional and technical capacity, appropriate technologies and financial resources to support the implementation of

interventions for adaptation to climate change. To respond to the negative impacts of climate change, the Ministry of Environment, other line ministries and civil society stakeholders – with the support of UNEP – is currently developing a National Adaptation Program of Actions (NAPA, 2015). This will form the basis for adapting to the new realities of climate change impacts. South Sudan is vulnerable to the impacts of climate change due to its poor infrastructure and a range of development challenges resulting from over 50 years of conflict. While the export of oil is the main economic sector accounting for over 98% of the GDP, 95% of the population depend on climate-sensitive natural resources, particularly rain-fed, subsistence agriculture and total dependence on forests as a source of energy (fuel wood and charcoal) and other environmental goods and services. Climate change has impacted these socio-economic activities, particularly as unpredictable rain patterns, recurrent droughts, flash flooding and excessive heat have resulted to crop failures causing food insecurity and famine. South Sudan has the among the largest livestock populations in Africa. Climate change threatens the existence of these livestock as well as the livelihoods of pastoralist communities due to the loss of pasture lands and reduced access to water resources. This has further resulted in deadly conflicts among the pastoralist communities that have claimed many lives. The impacts of climate change thus also cause national security issues.

3. An overview of Horticulture, Animal Husbandry and Fisheries

3.1 Horticulture

South Sudan has great potential to produce good quality fruits and vegetables. This is because of large areas of fertile soil, abundant water, suitable range of climate which allow the viability of horticultural crops. Various vegetables are grown in both irrigated and rain fed conditions. The most important vegetables are onion, tomato, Okra, eggplant, watermelons, cucumbers, pumpkins and a number of leafy vegetables. Vegetables are in small plots with pumped water including national corporations such as Gezira schemes where about 30,000 ha are devoted to vegetables.

3.2 Fruits and Vegetable Markets

There are no marketing institutions dealing with fruits and vegetables. Farmers and producers deal as individual directly with local traders and exporters. The trade lacks exhibition sheds, loading and unloading platforms, cold stores and trucks, loading equipments. Therefore, the producers sell their produce early in the morning at very low

prices especially perishable vegetables and fruits. The performance of horticultural crops marketing system is irregular in terms of prices, profits and cost of production and is unsustainable it is traditional and ineffective system.

3.3 Exports of Fruits and Vegetable

In spite of the high potential and diversification of horticultural products, the exports of fruits and vegetables is very limited as it contributes around 2% of the total exported food commodities. Most of the Sudanese vegetables are produced in winter (November to March) which is the best time to fill seasonal gap demand in European markets for onion, eggplant, sweet pepper, snap bean, gallia melon squash and okra. Fruits with export potential are mango, banana, grape fruits and lime. Exports links with European and Gulf countries is being established. The major factors affecting the programs and plans of fruits and vegetables export are i, small holding fields for export crops and poor cultural practices, ii. The absence of suitable export varieties to compete in international markets, and iii. Lack of suitable and well defined technologies for growing fruits and vegetables for export.

3.4 The constraints and potentials of the Horticulture sector in South Sudan

Constraints

1. Low productivity due to pest and disease problems, lack of certified seeds and its availability and high level of post harvest losses.
2. Irregular production, consumption and prices.
3. High temperature lead to irregular flowering eg., optimum flowering of mango is 8-15 C at night, It also increase the rte of ripening and hence relatively short shelf life.
4. High costs of agricultural inputs.
5. Non-availability of proper packaging material.
6. Inadequate cold chains. reservation of quality requires an unbroken chain from the field to the consumers. No cold store facilities are available at the centre of production , central markets, and airports.
7. Weak entrepreneurial skills.
8. Inadequate market knowledge and weak marketing channels and mechanisms. [No effective market linkages are established.

9. Weak management skill in the field of production, planning, production practices, and organization of harvesting at the correct maturity for fresh consumption processing and export.
10. Lack of extension services and weak technology dissemination mechanism for the application of proper post harvest operations developed by Food Research Centre and Agricultural Research programs .
11. Availability and access to credit and finance

3.5 Potentialities of Horticulture Sector

1. Horticulture crops are products of high demand and in overseas markets.
2. There are great potentialities to expand production areas .
3. There is a window of opportunity in export markets (during December –March) due to a long growing season (winter and summer seasons).
4. The value addition through processing is high and hence its impact on GDP will be appreciable.
5. Availability of experienced labourers and accessibility to cheap water and irrigation infrastructure.
6. Availability of extensive range of institutions and skill in the public sector e.g., Ministry of Agriculture and Forestry, ARC, FRC and Universities.

Fruit production in South Sudan needs very little agro-chemicals thus the fruits are relatively free from chemical residues which if certified could give a comparative edge and competitive advantage in international markets. The variations in climate and topography created conditions for the production of various types of fruits including date palms, citruses, mangoes, guava, pine apples, and banana. In the high areas temperate fruits like apples, grapes, strawberries and sweet oranges grow well. However, commercial production is hampered by lack of investment and poor transport facilities. Mango is the number one fruit tree of production, followed by banana, date palm and lime. South Sudan produces about 5.7% of the total Arab World production.

The major constraints in fruits and vegetable production are lack of efficient improved management technologies, inadequate credit and financial facilities, land fragmentation, poor vegetable seed production, limited application of agricultural research findings due to the

inadequate extension services, low productivity due to poor and traditional cultural practices, high cost and improper local transportation and biotic stress like weeds pests and diseases.

3.6 Animal Husbandry

Livestock production represents significant proportion of agricultural activity in South Sudan. The main population of livestock are cattle, goats, sheep and poultry; the main products are meat, dairy products, hides and skin and eggs. Livestock keeping is important to the country as a major source of livelihood to the majority of the population and also makes significant contribution to the economy. Livestock are primary investment resources which generate food (meat, milk), cash income, fuel, clothing, employment and capital stock and also provide manure and draught power for crop production. In addition, livestock are stores of wealth which provide a sense of security, prestige, social status and cultural value.

The rangelands of South Sudan have got a large number of animals available in all the livelihood zones. Livestock production represents significant proportion of agricultural activity in South Sudan. The main population of livestock are cattle, goats, sheep and poultry; the main products are meat, dairy products, hides and skin and eggs. Livestock production, especially cattle, is undertaken in the more arid and semi-arid zones such as East Equatoria. Livestock systems are either nomadic pastoralist or mixed crop livestock systems and are a major source of livelihood, especially in the floodplains and the semi arid pastoral area. Table No: shows the estimated livestock populations by state.

Table No. 4 Cattle Numbers in Thousands by State in South Sudan (2005-2011)

State	2005	2006	2007	2008	2009	2010	2011
Upper Nile	990	1,005	1,021	1,024	983	1,003	1,024
Unity	1,189	1,207	1,226	1,230	1,180	1,204	1,229
Jonglei	1,475	1,497	1,521	1,526	1,465	1,495	1,526
N Bahr el Ghazal	1,590	1,615	1,640	1,646	1,579	1,611	1,644
W Bahr el Ghazal	1,256	1,275	1,295	1,300	1,248	1,274	1,300
Lakes	-	-	-	-	1,311	1,338	1,365
Warrap	1,539	1,562	1,586	1,592	1,528	1,559	1,591
Central Equatoria	895	908	922	926	878	896	914
Eastern Equatoria	883	896	910	913	888	906	925
Western Equatoria	680	690	701	703	675	689	703
South Sudan	10,497	10,655	10,822	10,860	11,735	11,975	12,221

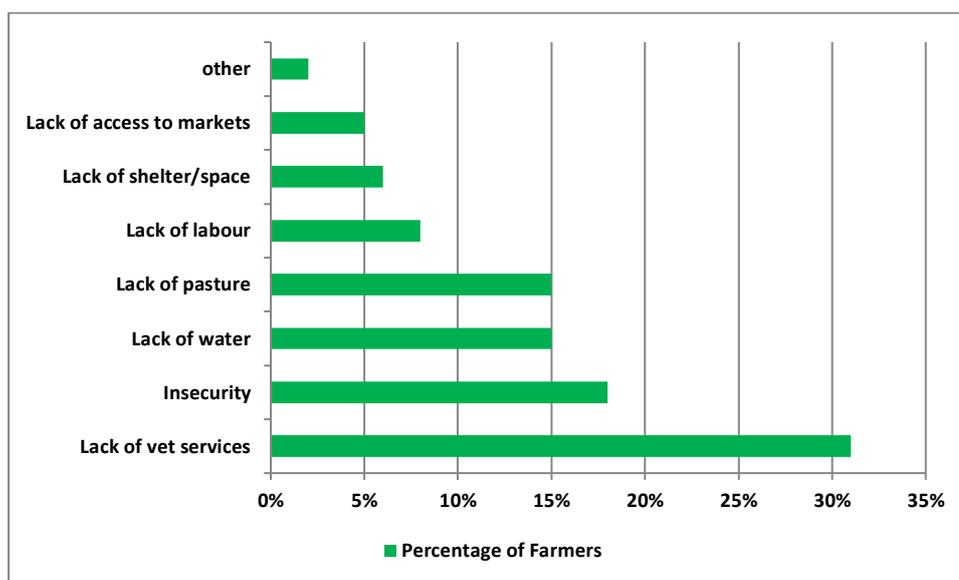
According to the estimates, there are almost 12 million cattle, 14 million goats and 13 million sheep in the country. The population is equivalent to about 2.6 animals per

hectare of grassland in South Sudan as a whole and 1 animal per hectare of grassland and savannah. These population densities per hectare are relatively high. The livestock population in South Sudan makes it one of the countries densely populated with livestock (mainly cattle and small ruminants) and with a calculated average number of livestock at 25 per household¹³.

The livestock production system is characterized by low milk production, poor quality of meat and low production for market, lack of value addition on products and high mortality for livestock. According to Annual Needs and Livelihood Analysis Report (2012), there has been increasing trend in demand for live animal and products. However, the current livestock production is less than 20% of the potential due to high calf mortality rate (of about 40-50%) and adult livestock mortality (10-15%). The report indicates the challenges facing the sector as inadequate veterinary and advisory services, low breed potential, traditional husbandry practices, seasonal feed and water availability and quality, and poor livestock marketing structure. From the FAO and WFP 2006 survey, livestock farmers identified lack of veterinary services as the main constraint at 31% of the assessed households identified livestock production constraints as reported by livestock keepers. Agriculture farming and livestock keeping indicate lack of labor at 8% in both cases. This is explained by rural-urban migration phenomena as young people migrate to urban areas to seek other livelihood opportunities other than agriculture and livestock causing serious problem of labor.

The other factors contributing to low livestock productivity include poor pasture management, water and relatively unproductive breeds, both consequences of the fact that cattle are kept more for social than for direct commercial reasons and that numbers are therefore more important than quality.

Fig. No4. Major Constraints in the Animal Husbandry Sector



Even though changing from the social model is paramount obstacle to transform South Sudan's livestock sector into commercial orientation, several other constraints must be addressed if the sector objective is to be localized. Looming among these other constraints are the following viz., i. weak off-farm infrastructure, ii. Insecurity and cattle rustling, iii. Lack of trust, iv. Poor breeds, v. poor animal health, vi. Inadequacy of animal feeds, vii. Nascent private sector and low level of entrepreneurship and viii. Challenging economic and policy environment.

A large scale survey undertaken in 2006 with the support of FAO and WFP identified number of concerns among the livestock producers, the most important of which was the lack of veterinary services. Almost 32 % of producers cited lack of these services the main concern.

3.7 Fisheries

Fisheries sub sector in South Sudan

According to a 2010 baseline survey report on agriculture and animal resources in South Sudan, about 14% of households in South Sudan particularly those in the sudd area along the river Nile and its tributaries engage in fishery as a means of livelihood. Fishing is practiced as a complementary seasonal livelihood strategy by pastoralists when they frequent their dry season grazing grounds. Detailed statistical data for the industry does not exist because no field assessments have been undertaken, however, the fisheries production

potential is believed to be 10,000 to 30,000 metric tonnes per year. This based on combined water surface area of 90,000 square kilometre of the river Nile. According to FAO (2008) report aquaculture development may have vast potential in the central, eastern and western Equatrain states, in the Northern and Western Bahr El Gazal states, as well as in Warrap state. In addition to river and lake fishing, there is significant potential for fish farming in South Sudan that remains to be exploited.

South Sudan has a huge capture fisheries stocks about the size of Lake Victoria reserves. Existence of other water bodies outside the Nile provides attractive opportunities for fish farming. Numerous indigenous fish species occur in the Nile system and associated swamps of the Sudd region including Tilapia, Nile perch, Catfish, etc.

The characteristics of fisheries sector in South Sudan are viz., the Nile (White and Blue), its tributaries and aquifers provide major wetland and water resources for freshwater fish in South Sudan. The Sudd covers 57,000 to 100, 000 sq.km of land, is an inland delta comprising groups of wetlands; lakes, swamps, marches and extensive floodplains is declared an International Sudd-Ramsar. The Sudd has been proclaimed a Ramsar site, conferring a status of global importance to this wetland, containing the most globally important biodiversity/ fauna and flora. The Sudd is an important breeding area for Nile ecosystem fish species and is the largest potential source of freshwater fish in South Sudan. Estimates indicate that Sudd alone could provide 100,000 to 300,000 Metric tons of fish annually on a sustained basis. However, accurate statistics on actual production have been unavailable since 1991. Sudan, some quite extensive, providing huge breeding habitat for a diversity of fish species and hence increase in fish harvest per annum. Estimated catch for the whole of South Sudan is about 30,000 to 40,000 tons; with 10,000 tons of exportable species taken to Khartoum. Approximately 20,000 -30,000 tons consumed in South Sudan in addition to 2500 tons imported from Uganda every year. This gives a per capita consumption of somewhere between 3 and 3.5kg/person. Where fishing occurs fish is a much more important part of the diet than in those areas away from water. Production rate is at least 40kg/ha/yr from the Sudd, other wetlands, rivers and lakes Maximum Sustainable Yield of the fisheries is at least 180,000 tons; valued at circus 300 million US\$.

3.8 Fish species in South Sudan

There are eight commercially important fish in the Sudd and probably in the other wetland and water resources in South Sudan namely; Nile Perch (*Lates niloticus*), Bagrid

Catfishes (*Bagrus bayad* and *B. docmac*) Nile Tilapia (*Oreochromis niloticus*), carp (*Labeo* spp), Binny Carp (*Barbus binny*), Elephant-Snout fish (*Mormyrus*) spp, Stubs (*Distichodus*) spp, Tigerfish (*Hydrocyon*) spp and c Haracins (*Alestes* spp) (for wet salting.

3.20 Challenges in the Fisheries Sector

The main constraints to fisheries development in South Sudan are the absence of policy incentives, lack of storage facilities due to weak or total absence of power supply and the absence of effective processing technologies, lack of inputs (including credits) and input supply channels, weak institutional & manpower capacity, inadequate research and extension services, In addition, inadequate transport infrastructure which limits producers access to markets, is a deterrent to fisheries development in South Sudan.

4. Present status and challenges of Agricultural Extension, Marketing and Insurance, Agricultural Mechanization, Food Processing, Infrastructure and another relevant issues.

4.1 Agricultural Marketing in South Sudan

Both agricultural input and output markets in South Sudan are undeveloped. No effective investment can be made in scaling up production, however, without first strengthening markets. The period of civil disorder has largely destroyed the traditional market linkages and channels – including the complex set of social and economic relationship between intermediaries necessary for markets to work. The present system of fresh supplies to retail markets in urban areas is dominated by imports – in the case of Juba by supplies from Uganda. Apart from these imports, inter-regional trade flows only really exist at present for livestock marketing. Efforts are underway to re-establish former production levels of fruits and vegetables. However, new or improved assembly market centres in key production areas will be required to supply the evolving wholesaling system.

Three types of food markets currently exist in South Sudan: rural primary markets located in villages and small towns and often held on a periodic basis; rural assembly markets located in agricultural surplus areas; and urban retail markets serving consumers in main town and cities. Terminal wholesale markets within or near major cities have yet to evolve in South Sudan. In the ten markets in the country, stallholders with wholesale licenses make up 20% of the total and the balance are retailers/petty traders. As a result of the underdeveloped marketing arrangements, post-harvest losses at the farm level and within markets are very

high, as are food prices. All markets in South Sudan are currently managed by the lowest tier in the local government system, the payam (ward), who collect market fees and also provide a public health oversight to the market operations. The payams are also responsible for issuing four basic types of licenses: wholesale, retail, EASYPol Module 150

4.2 Food Agribusiness, and Rural Markets (FARM)

USAID established FARM in 2010 to increase agricultural production, build rural markets, and improve public and private capacity in South Sudan to develop commercial smallholder agriculture. The \$54 million project operates in Eastern, Central and Western Equatoria, across the broad swath of high-potential agricultural land known locally as the Greenbelt. The FARM Project contributes to South Sudan's goals of achieving food self-sufficiency, reducing poverty, and promoting economic growth through higher agriculture productivity and market creation.

In the southern Greenbelt of South Sudan's three Equatoria States, USAID's Food Agribusiness, and Rural Markets (FARM) Project helps smallholder farmers grow staple crops to become self-sufficient, develops farmer cooperative organizations to aggregate and better market surplus production, promotes more agriculturally favourable policies, and builds local institutional capacity. Despite the volatile political climate of the world's newest nation, FARM is yielding results. Formerly subsistence farmers are boosting productivity and growing surpluses, while new and revived farming organizations are improving management and taking steps towards commercializing key commodities. Across nine rural counties and 27 payams or townships, FARM is training progressive farmers as community models, distributing improved seed, developing community block farms, introducing mechanization, organizing first-time agricultural fairs, developing market information systems, and helping cooperatives to engage directly in formal markets.

4.3 Food Security

The immediate objective for South Sudan is to become food secure, which means independent from food aid and much less dependent on food imports. Two main components can be distinguished in the Dutch programs for food security in South Sudan: increasing food production through access to inputs and direct support to agri-based enterprises, and improving the enabling environment for production and entrepreneurship. Specific elements are as follows: i. organising farmers and strengthening their capacity ii. Improved supply of

inputs (seeds, fertiliser) to increase productivity iii. Providing (vocational) training and advisory services to entrepreneurs and farmers, in business skills and farming techniques respectively, to build small scale enterprises and generate employment, in the agricultural and other sectors iv. Increasing access to finance by setting up a guarantee fund for local banks which lend to small and medium enterprises and farmers.

Dutch knowledge institutions in the field of food security were and continue to be involved, like Wageningen University and Triodos Facet. Public private partnerships will be used as a modality, such as Agri-inputs programme, which involves the GRSS, USAID and the Embassy of the Kingdom of the Netherlands as donors, the Alliance for a Green Evolution in Africa (AGRA) and Wageningen University as technical advisory partners, and the local private sector. Private companies in South Sudan will be assisted in setting up businesses to produce improved seeds and other companies to supply inputs to farmers.

4.4 Status of Mechanization

South Sudan's rainfed mechanized sector is mainly found in two states, Upper Nile and Unity. Mechanization is limited to only land preparation while all other operations from sowing to harvesting are manual¹⁸. Individual farms are expansive and can cover several thousands of hectares of crops mainly sorghum, millet, maize, sesame and sunflower. A farmer would make a decision at the end of the season as to which parts of his crop to harvest or abandon based on the cost of manual harvesting, the estimated yield and the prevailing market price. All these factors contribute to losses either at the farm level or on the market chain.

The rate of post-harvest losses estimated within the regional countries to range from 15% to as high as 50% of what is produced. The causes include harvest incorrect stage of produce maturity excessive exposure to rain drought or extreme temperature, contamination by microorganisms, and physical damage that reduce the value of the product. Crops also loss value because of spillage, damage from inappropriate tools, chemical contaminations or rough handling during harvesting, loading and packing, or transportation as well as pest infestation. The initiatives to reduce losses can include farmer training centres with examples of improved local storage facilities. There are traditional on-farm seed storage facilities consisting of thatch and mud construction in the country. It is common for crops to be stored

over the kitchen fire as one way to decrease pest infestations. Improvements of such local storage methods can be starting point towards cutting down post-harvest losses.

The FAO/WFP assessment (February 2009) report points out that a major obstacle to the sector progress is the state of the transportation infrastructure. The cost of transporting produce from producing areas to the markets is prohibitive. Absence of grinding mills (maize to maize flour) or processing plants (fresh cassava to tapioca/gari) that might add value to the products, compounds the problem. Transportation poses a major problem for the movement of both people and commodities throughout the country especially during the rainy season largely due to poor and undeveloped nature of road infrastructure and limited availability and high cost of transport facilities. It also serves as a disincentive to produce surplus food products, as farmers find it expensive and very difficult to transport surpluses to markets. This discourages farmers in fertile areas from producing at capacity, even when there are food shortages in surrounding states.

4.4 Acute Shortage of Infrastructure

Poor and inadequate physical and soft infrastructure is a binding constraint to economic development in South Sudan. A central assumption of the agricultural transformation strategy is that alongside investment in agriculture there will be a parallel development of rural infrastructure that will serve as an incentive for smallholder and commercial farmers to increase production knowing that markets are accessible. If rural connectivity is not improved, then the strategy for agricultural development will be in jeopardy. It is right time that the government must increase its budgetary allocation for rural infrastructure in order to improve rural connectivity. One of the ways through which allocation to rural roads can be increased is by adopting cost-saving material and technology measures that will reduce the cost and budget allocation to interstate roads, thus channelling the savings towards the financing of more rural/feeder roads. Another plausible measure will entail shifting part of the cost of enhancing rural connectivity to the SIAP as an integral part of any SIAP agreement. As a general guiding principle, for all public investment in infrastructure, it is important to ensure that government expenditure is used to “crowd in” private investments rather than discourage them.

5. Status of Agricultural Extension and Research System

The history of agricultural extension in South Sudan is almost a century old and it was introduced in 1928 during the British rule. Extension agents used to disseminate protection and prevention messages in an attempt to curb the diseases. Extension work focused mostly on the increased production of cotton which was the backbone of the Sudanese economy dubbed “The White Gold” of Sudan. Extension messages were later extrapolated to livestock production, coffee and fruit trees. Choice of crops to receive extension priority was largely influenced by their economic values, climate and soil types. The approach to extension services in South Sudan from 1954-1972 was top down. The Government did the planning and the plan trickled down to the communities for implementation. It was primarily centred on government owned projects and plantations. Extension was largely crop based with inadequate attention paid to livestock and fisheries. Individual farmers and cattle owners received little attention.

However, from 1959 to 1964, the Government piloted the American model of 4-H clubs in Equatoria where crop demonstration plots were established, run by organized groups of youth and students in gender balanced groups. The model picked up well with plots serving to demonstrate improved varieties of seeds and crop husbandry practice resulting in increased yields.

For the period 1972-82, a district-wide extension strategy was implemented by the Regional Ministry of Agriculture, Livestock and Natural Resources in collaboration with the Project Development Unit. Activities largely concentrated around small agricultural projects such as coffee estates, tea plantations, vegetable farms and citrus nurseries. Since 1974 an effective extension programme was implemented where extension workers provided farmers with general advice on basic food crops, supervising contract growing of sorghum and groundnuts, assisting in the distribution of agricultural inputs and participating in regular multidisciplinary extension meetings with staff from other organizations carrying out different activities apart from agriculture and livestock such as health, water and sanitation and education.

The Ministry of Agriculture and Forestry was also involved in the maintenance of many nurseries for the production of fruit trees, coffee and pineapple. Other achievements included the setting up of State irrigation schemes, (Aweil Rice Scheme), model demonstration farms such as the MAFAO for dairy and poultry production and training centres that provided short courses for extension workers. Farmers’ training courses, ranging

from one to two weeks were also undertaken. Training of extension staff was done through basic induction training of four months duration followed by a three months in-service training. Agricultural research took place mainly at the government-run Agricultural Training Centres in Yei, Rumbek and Yambio.

The most popular extension approaches used in South Sudan pertaining to agriculture and livestock are i. The Group Development Area Approach (1970s and 1980s), ii, The Training and visit system, (1980s) iii. The Conventional System (1974), iv. The Commodity Focussed Approach (1950s and 1970s) v. Farmer Books, vi. Community Animal Health worker (CAHE) and Community Based Extension Worker (CBEW).

5.1 Current Agriculture and Livestock Extension System

At present extensions is delivered through public extension (run by government) and through services provided by civil society and the NGOs. A private sector extension system has not yet taken off the ground.

While agriculture and livestock programmes in South Sudan continue to operate under emergency and relief models, there have been conscious efforts to implement programmes based on development. The 4 major development programmes with agriculture and extension components that are currently being launched are; 1. The Sudan Productive Capacity Programme (SPCRP); 2. The Support to Agriculture and Forestry Development project (SAFDP) 3. Livestock and Fisheries development Project (LFDP) both through Multi Donor Trust fund (MDTF). As these programmes have capitalized on building institutional and human resources capacity to provide agriculture and livestock advisory services the need to finalize and make available agriculture and livestock extension policies are both vital and urgent.

5.2 The major challenges facing effective and efficient delivery extension services include

- i. Unavailability of competent, motivated and well facilitated extension staff particularly at the county, Payam and Boma levels. As a result extension services tend to end at the state level thus not reaching the producers.
- ii. Inadequate support to agriculture and livestock education and training such as agricultural institutes, vocational schools, school farms, at the secondary levels, and agricultural institutes, has resulted in a lack of extension workers and mid-level technicians who are needed more at the grass root levels.

- iii. Inadequate mechanisms / instruments in place for quality (Monitoring and Evaluation) control of ESPs and also a lack of measurements criteria.
- iv. Ineffective coordination and linkages between private and public sector service providers.
- v. Inadequate stakeholders participation in planning and implementation of agricultural and livestock extension services including weak inter-sectoral and ministerial coordination.
- vi. Lack of clarity on privatization. How to engage non-state actors both profit and non-profit organizations in extension.
- vii. Need to create linkages with other ministries (to support work on facilitating factors and cross cutting issues).
- viii. Change needed in the visions of extension delivery to move away from a high labour force with many levels of office and administration to a delivery system focused on measuring impact of extension when utilizing new and multiple delivery mechanisms such as contracting with private sector, development of information and communication technologies and farmer led extension.
- ix. Need to link more strongly with Research and Agriculture and Livestock Education and ensure a holistic AKIS approach to extension services delivery.
- x. Since majority of the agriculture work is done by women, a stronger focus on delivery mechanism to address the needs of women farmers is needed. There is need for more female extension agents but also programmes and messages specifically tailored for the needs of women farmers.
- xi. Lack of clarity on decentralization and aspects, components or outcomes to be covered by GOSS, state and Counties in the context of pluralistic extension system.
- xii. Need to strengthen the role of government to source funds, develop appropriate extension messages, provide monitoring and evaluation, as well as a coordinating role of all stakeholders.

5.3 Agriculture and Livestock Extension Policy

Massive efforts are needed to revive the agriculture and livestock sectors due to the long protracted war which has destabilised food production system. Most states are having food deficit with population relying on food donations. The complexity of the post war conflict situation and capacity of extension to manage this transition calls for an

extension system that is coherent and well-coordinated. In this context, the role of agriculture and livestock extension will be vital to facilitate the process of transitioning from relief and emergency to development, and subsistence food security even surplus farming.

The objective of MAF and MARF and the Government of South Sudan Growth Strategy are the importance of agriculture and livestock research and extension for strengthening the agriculture and livestock value chain and food security in the country are the guiding policy direction of NALEP. The vision of NALEP is that client should have access to demand-driven decentralized pluralistic and farmer led extension system. The mission of NALEP is to transform agriculture and livestock from traditional subsistence systems to achieve food security, wealth creation and national economic growth through science based, market oriented, competitive and profitable agricultural systems.

The objectives of the extension policy is to guide the establishment and implementation of a pluralistic extension system which will be instrumental in achieving national agricultural and livestock goals, efficiently contribute to the national economy and reduction of poverty, through developing and improving the efficiency of sustainable agriculture, livestock, water, forestry and rangeland resource sub sector activities , based on sound environmental practices.

The objectives of NALEP will be achieved through i). The empowerment of farmers to adequately respond to food security issues and the growing demands of domestic and international markets for crop, livestock and forest products through the transfer of adapted research technologies, ii) Organizing farmers in viable rural organizations, iii) Provision of institutional credit, supply of improved farm input and output, improvement commercialization and intensification of farming systems.

While analysing challenges to be addressed by the NALEP, these were grouped into 11 broad areas requiring policy intervention as follows i) Extension service provision and organization, ii) Privatization and commercialization, iii) Extension approaches and methods, iv) Contents and choices of extension messages, v) Clientele empowerment, vi) Stakeholders coordination and networking, vii) Human resource development of extension service providers, viii) Technology development and packing,

ix) Extension facilitating factors, x) financing of extension services and xi) Mainstreaming and crosscutting issues in agriculture and livestock extension services delivery.

7. Public and private institutions and their relevance in agricultural Development.

The Public and private institutions and their relevance in agriculture development in South Sudan include University of Juba, Catholic University of South Sudan, University of Bahr el Ghazal, Upper Nile University. These universities deal with agricultural degree programs with a specialization in the subject matter areas of Agronomy, Agricultural Engineering, Agricultural Economics, Aquaculture, Animal Nutrition and Soil Science. The other well-known vocational training centres in South Sudan deal with agriculture and allied subjects are Yambio Institute of Agriculture, Yei Crop Training Centre, Kagelu Forestry Training Centre, Mariallau Livestock Training centres, Maridi Experimental farm, YeiRice Research station and Halima Research station.

Some of the CGIAR institutes like ICRISAT, IITA, ILRI and CIMMYT are having their research programs in South Sudan. In addition to these CGIAR institutions some of the reputed NGOs like Oxfam UK) and NCA (NPA) also involved in Training farmers and the agriculture extension professional in south Sudan.

In February 2012, South Sudan became a member state of the international Fund for Agricultural Development (IFAD). IFAD's ongoing strategy will stress the importance of settling communities that have been in continuous movement for over 20 years due to conflicts and natural hazards. Priorities includes increasing crop production by expanding areas under cultivation, strengthening government institutions, developing community-level capacity to improve crop production, animal resource management and water use, making improved agricultural inputs available to vulnerable households through market-based systems, expanding smallholder farmers' access to appropriate technologies, markets and community-owned infrastructure in order to increase rural incomes and contributing to self-reliance and the creation of social capital in rural areas.

7. Present capacity building programmes and potential areas.

Capacity Building and Technical Support

One of the key components of to step up agriculture production in South Sudan is to built a strong capacity building and technical support in agriculture and the allied sectors.

This will ultimately help both the national and state governments for provision of basic services to smallholder farming communities. Farmers, pastoralists, and people that depend on agriculture. Livestock rearing fisheries for a livelihood, have cited lack of technical support services for a wide range of activities in these sectors as a major obstacle to increased production. These include, for example, inadequate supplies of improved seeds and planting materials, inadequate support for the management of animal diseases and pests and diseases in crops, and issues relayed to land use. A comprehensive list of ongoing donor-funded capacity building and technical support is not available for the Ministry of Agriculture and Forestry, the Ministry of Animal Resources and Fisheries, and the state government ministries responsible for the agriculture sector. Information from the AIMS database of the MoFEP identifies \$11.5 million of technical support and capacity building in 2010, there is significant provision of technical support and capacity building in other ongoing programs supported of donors. The successful implementation of the proposed capacity building strategy for agriculture, there will be a major expansion in basic extension and other services to smallholder farmers, pastoral and fishing families. Some of the increase in services will come from commercial investors under the proposed out grower models; but there will also have to be a significant increase in public support services as well. In the early stages of the program, build-up in these public service capacities would be undertaken by the government with strong support from the international donor community. In the latter part of the decade, large scale commercial investors would become important suppliers of services to smallholder farms that contract to supply agricultural, livestock and fisheries products on a regular basis. The operating services funded by the government and donor community would need to increase to close to \$100 million a year by 2020, with much of the \$50 million increase going into extension, veterinary and other direct services to farm families.

8. Training priorities of the country in agriculture and allied sectors.

8.1 Training Priority Areas in Agriculture and allied Sectors

After reviewing the published papers, reviews and reports by UNDP, FAO, African Development Bank, World Bank, IMF, World Development Report related to South Sudan the following priority training areas have been identified. By organising training in these priority areas will help the agriculture professionals to abreast their knowledge and the technical know-how in the these prioritized areas, further this will help the technology

dissemination process in a much faster way and ultimately break the production constraints at the field level.

8.2 The priority training areas identified are listed below. The number of Persons to be trained are given in the bracket.

1. Improved Sorghum Production Technology (200)
2. Integrated Cereal Production Program (200)
3. Sustainable Water and Land Management Practices (200)
4. Soil and Water Conservation Measures for Natural Resource Management (200)
5. Agroforestry Management (150)
6. Selective Mechanization to Reduce Drudgery and Profit Enhancement (150)
7. Community-Based Natural Resource Management (CBNRM) in Fragile Ecosystem (150)
8. Sustainable Utilization of Fishery Resources (200)
9. Fish Processing Technology (200)
10. Training on improved Quality of fishery Products and Market Chains (200)
11. Improved Livestock Production Management (300)
12. Modern Dairy Technology Management for livelihood Enhancement (200)
13. Scientific Fodder Production Practices and Management (200)
14. PostHarvest Technology in Agriculture (150)
15. PostHarvest Technology and Value Addition in Horticulture (150)
16. Post Harvest Technology and Value Addition in Fisheries (200)
17. Women Empowerment in Agriculture (300)
18. Women Empowerment in Horticulture (300)
19. Women Empowerment in Fisheries sector (300)
20. Alternate Land Use systems in Agriculture (100)
21. Integrated Watershed Management (250)
22. Community Forest Management (150)
23. Extension strategies for sustainable Cereal production (250)
25. Extension strategies for Sustainable Livestock Management (250)
26. Low cost Animal Feed Production Technology (300)
27. Organic Horticulture for Livelihood Enhancement (150)
28. Improved Rice Production Technology to ensure household food security (150)
29. Integrated Farming systems to enhance household food security (300)
30. Integrated nutrient and pest management in cereal production (250)
31. Management of Soil Testing and soil Fertility Management (300)

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