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(ICPALD)**

# The Contribution of Livestock to the South Sudan Economy

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## **DISCLAIMER**

The authors' views expressed in this publication do not necessarily reflect the views of IGAD, the IGAD Centre for Pastoral Areas and Livestock Development (ICPALD) and the South Sudan government and or their agents.

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Dr. S. J. Muchina Munyua  
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### Currency Equivalence at Study Time:

The official exchange rate is fixed at a constant 2.95 SSP/US\$ while the alternative street market exchange rate is on the down fall, currently at 13-15 SSP /USD\$. The rate used for this study is the official rate.

## EXECUTIVE SUMMARY

This report is part of a series of reports on the contribution of livestock to the economies of the IGAD member states. Building on lessons and in particular the methods used in previous series, this report is an output of the study on the contribution of livestock to the South Sudan national economy. It also assesses and assigns monetary values to the marketed and non-marketed goods and services that livestock provide; and the extent to which this contribution is reflected in national accounts.

The methodology adopted to assess the contribution of livestock to the economy of South Sudan, follows a production approach as adopted in other studies in IGAD member states (Kenya, Uganda, Ethiopia and Sudan) and relies on estimates of the amount of physical product generated on average by a given number of animals. To estimate the agricultural GDP, South Sudan's Statistics Department generally follows the commodity flow approach, which differs largely from the IGAD adopted production approach.

## Conclusions

- By using the production approach, this study has provided different and higher estimates of the contribution of livestock to the economy of South Sudan compared to the official commodity approach used by the then unified Sudan government. Compared to the commodity flow approach adopted by the NBS in 2013, the production approach adopted in this study estimates the contribution of livestock to GDP at **8.894 Billion SSPs (3.015 Billion USD)** compared to the official estimate of **5.049 billion SSPs (1.712 Billion USD)** for the agriculture sector. The difference of 3.845 billion SSPs (1.303 Billion USD) is 76.16% higher than the officially recorded agricultural sector GDP. The GDP estimates include some direct benefits generated by livestock, especially financial services.
- When using the production based approach, the study found that the gross value of the total livestock products was **7.316 Billion SSP (2.480 Billion USD)** in 2013.
- The total estimated value of goods and services provided by livestock i.e. direct use value of livestock to the economy was **9.362 Billion SSPs (3.173 Billion USD)** including 82% derived from conventional goods common in agricultural GDP and 18% from financial services provided by livestock.
- Milk offtakes is South Sudan's most economically important livestock output, with a value of **5.126 Billion SSPs (1.738 Billion USD)** in 2013, equivalent to **57.64%** of livestock contribution to economy.
- Cattle in South Sudan's most important source of red meat, supplying 65% of meat needed and contributing **1.2 Billion SSPs (409 Million USD)**, equivalent to 13.57% of the livestock contribution to the economy.
- Milk is about three times more important than meat while sheep are as equally important as goats in GDP contribution. Export of hides and skins are marginal and that of live animals and value added products such as leather and shoes are insignificant.

- The production of meat and milk for domestic consumption is low in South Sudan, averaging 8.52 kg of beef, 1.13 kg of mutton and 1.1 kg of goat meat consumed per person in 2013. Overall, the red meat consumption per capita was 10.75 kg per person while milk consumption averaged 51.72 litres per person in 2013. The meat figures compare well with estimated 15 kg of red meat per caput in Kenya in 2009 but vary greatly with an estimated 41 kg of meat in Sudan. The milk figures however are higher than the 26 litres of milk per capita in Kenya and lower than the 198 litres per capita in Sudan.
- A significant part of offtake is sourced from cross border imports. Since these are largely informal, they are rarely reflected in the official estimates. As such, the estimates for offtakes may be higher than officially reported. Significantly, the CAMP 2015 estimates show higher populations further indicating that the contribution of livestock to the economy of South Sudan may be higher.
- Livestock and hides and skins offtakes show low extraction rates indicative of dominance of informal/unofficial offtake and slaughter.
- About 18% of the direct benefits derived by livestock owners from their animals are attributable to the financial services provided by livestock and are always omitted in the quantification of economic functions of livestock at both household and national levels.
- Although the contribution of livestock to the South Sudanese economy is significant, the national economy does not depend on it much compared to sectors like oil mining. While not as large as its domestic contribution, livestock's share of exports is minimal. Also, although cross border trade in livestock between South Sudan and its neighbors is evident, there are no official statistics on the trade volumes.

## **Recommendations**

- a) There is need to undertake a rigorous livestock census in South Sudan, hence the planned attempt by FAO and others is welcome.
- b) The livestock sector based staff should be trained on the procedure for gathering data and estimating the economic value of the livestock sector in the national economy using the production approach which has obvious advantages when compared to the commodity flow approach.
- c) There is need to carry out research to quantify the levels of cross border livestock trade between South Sudan and its neighbors. At the moment, no reliable data is available, yet it is common knowledge that some livestock finds its way into South Sudan from northern Kenya and Uganda.
- d) A cost benefit estimate would also be necessary with regard to pastoral livestock production systems taking into account the cost of pastures, water, animal health, etc. At the moment, NGOs seems to cover most of the intermediary costs including animal health.

## ACRONYMS

ASAL	Arid and Semi-Arid Lands
AU IBAR	International Bureau for Animal Resources of the African Union
CAMP	Comprehensive Agricultural Development Master Plan
FAO	Food and Agricultural Organization of the United Nations
FAOSTAT	Food and Agricultural Organization's Statistics
GDP	Gross Domestic Product
ICPALD	IGAD Centre for Pastoral Areas and Livestock Development
IGAD	Intergovernmental Authority on Development
ILRI	International Livestock Research Institute
IMF	International Monetary Fund
MARF	Ministry of Animal Resources and Fisheries
MLFI	Ministry of Livestock and Fisheries Industries
MOAFTAF	Ministry of Agriculture, Forestry, Tourism, Animal Resources, and Fisheries
NBS	National Bureau of Statistics
NCA	Norwegian Church Aid
NGO	Non Governmental Organization
OLS	Operation Lifeline Sudan
PRSP	Poverty Reduction Strategy Paper
SDG	Sudanese Pounds
SSDP	South Sudan Development Plan
SSP	South Sudanese Pound
USD	United States Dollar
VSF	Vétérinaires San Frontier
WFP	World Food Programme
WHO	World Health Organization



## **1.0 INTRODUCTION AND STUDY OBJECTIVES**

### **1.1 Introduction**

The IGAD Centre for Pastoralist Areas and Livestock Development (ICPALD) works to promote dry lands' livelihoods and livestock development policies in the IGAD member states by complimenting efforts of IGAD member states to sustainably generate wealth, employment and to be a regional policy reference institution for sustainable livestock development and resilient dry land livelihoods. It seeks to do this through promoting and facilitating sustainable and equitable dry lands and livestock development in the IGAD region. One of its key objectives is to promote and facilitate elaboration and harmonization of regional livestock and dry-lands policies and the development of initiatives of member states. It also facilitates and supports the domestication, adoption and transfer of appropriate research and technology in dry-lands and livestock development.

To support IGAD, member states advocate for livestock representation commensurate with its contribution to the economy in key national strategy documents like Poverty Reduction Strategy Papers (PRSPs).

### **1.2 Background**

Livestock contribution to a country's gross domestic product (GDP) and to the overall agricultural value is considered to be a measure of the livestock's role to the national economy. GDP in all countries is estimated quarterly and annually by the national statistics authorities where the contribution of various economy sectors to the GDP is calculated using the production approach, the expenditure approach and the income approach.

The production approach quantifies the difference between the value of outputs for all sectors less the value of goods and services used in producing those outputs during one year, i.e. it quantifies the so-called "value added" for all sectors in the economy. The income approach measures the incomes of all individuals living in the economy over the reference year; the expenditure approach quantifies all expenditures by all individuals living in the country in the accounting period.

A variety of livestock are reared in South Sudan including cattle, goats, sheep and chicken. Livestock is the main source of livelihood in many households in the country particularly in Jonglei, Upper Nile, East Equatoria and Bahr El Ghazal State where cattle are mainly reared. The map of the country is as shown in Figure 1 below.

80% of South Sudan population is engaged in agriculture, farming, livestock and fishing hence a need for the country to put more focus and emphasis on the growth and development of this sector as highlighted in the country's 2011-2013 South Sudan Development Plan (SSDP). The livestock sector in South Sudan supports 950,000 livestock farmers, 350,000 herders, 4,500 animal traders, 2,000 slaughter personnel,

2,000 to 4,000 butchery owners and 500 commercial *kraal* operators. In particular, cattle are reared for prestige and define the community's perception of one's wealth. Cattle are very important for social functions such as dowry, settling disagreements and contribute cash for family needs, slaughter for cultural reasons, barter for grain and payment of penalties. Of the livestock owners, 5% own large herds of more than 200 cattle, 20% own between 51 to 200 heads of cattle while the majority 75% of the livestock owners have small herds of less than 50 heads of cattle.



Figure 1: Map of South Sudan

There is a growing potential seen over the years in dairy and poultry production, meat processing, fishery and cattle feed processing. Following the conflict experienced in the various South Sudan States in 2014, livestock herd sizes have since reduced by 40-60% in the affected communities. Although the livestock population in South Sudan has not been accurately determined, the FAO 2009 estimates place the figure at 36,222,802 animals comprising of 11.7 million cattle, 12.4 million goats and 12.1 million sheep. These figures have been adopted by the MARF as the official livestock population figures since 2009. Compared to the country's human population of 8.26 million people, this places South Sudan as the country with the highest livestock per capita holding in Africa.

A study commissioned by IGAD in 2009 on the contribution of livestock to the GDP of the greater Sudan before the independence of South Sudan adopted a production

approach. The estimation was however not accurate as the approach requires an updated estimate of the livestock census, while the county's census was last conducted in 1975 and is yet to be updated. The livestock population numbers are thus subjective estimates based on the experience of senior veterinary officers from the colonial period, the 1975 aerial survey census and assumed herd growth rate model constant. Another limitation of the calculation of the GDP was the omission of the contribution of livestock that may not be classified as "direct use" but which should be attributed to the sector such as credit and self insurance, transport, traction and haulage services, i.e. the economic contributions livestock provide to support the livelihoods of livestock owners directly.

A 2009 re-estimation (Behnke et al, 2009) which factored in the non 'direct use benefits' showed that the contribution of livestock to national agricultural GDP was 33.843 billion SDG (\$14.550 billion USD) in 2009 against the official 2009 estimates of 28.670 billion SDG (about \$12.326 billion USD). The difference between the two estimates was 5.173 billion SDG, equivalent to an 18% increase over the official 2009 estimates (from 33% to 36% contribution. The re-estimation also showed a further 8.409 billion SDG contribution in form of financial and transport services to their owners.

Since its independence, the National Bureau of Statistics of South Sudan has been in charge of the national GDP estimation among other statistics. The department has over the years, adopted the expenditure approach but changed to the production approach for its 2014 GDP estimations, the official results of which are yet to be published. The South Sudan GDP estimates for 2013 was 34.823 Billion SSP (11.804 billion USD), with livestock including forestry and fisheries contributing 5.049 billion SSP (1.711 billion USD), equivalent to 14.5% of the agricultural GDP in that year. Among the challenges faced by the department in GDP estimations include lack of accurate and reliable data, a high staff turnover, particularly of the trained and knowledgeable technical staff and limited technical knowhow, although some support and training have been received from organizations such as World Bank, IMF and other international organizations.

As part of a series of reports on the contribution of livestock to the economies of the IGAD member states, this report therefore, presents the findings consisting of a summary narrative, detailed findings, conclusions, recommendations and annexes. The report is organized into 6 parts. Part 1 is the introduction and provides a brief on ICPALD. In addition, it provides a justification for the approach used in the study to estimate the contribution of livestock to the economy of South Sudan and also outlines study objectives and methods used. Part 2 is a presentation of the direct use benefit values of livestock, covering among others, livestock offtake and milk output, manure as fertilizer, animal draught power, hides and skin and livestock-based financial services. Part 3 highlights the non-agricultural contributions livestock make to the wider South Sudan economy including in household consumption, as inputs into other sectors and in export trade. Part 4 gives the conclusions and recommendations arising from findings while Part 5 and 6 are the bibliography and annexes respectively.

### 1.3 A Production-Based Approach for Estimating GDPs

In line with other studies conducted on the contribution of livestock to the GDPs of Ethiopia, Kenya, Uganda and Sudan (Behnke, et al., various publications), the study adopts the more appropriate and accurate production approach in estimating the contribution of livestock to South Sudan economy. The approach involves four main steps:

- i) Acquiring updated and current national livestock population estimates from the MARF, FAO and NBS.
- ii) Estimating the production coefficients (estimates of the amount of physical product that will on average be produced by known number of animals) and applying them to the livestock population estimates to generate estimates of the total output of goods such as meat, milk, dung for fuel or fertilizer, etc.
- iii) Using available information on producer or 'farm gate' prices of the livestock products and ascribing a monetary value to represent the gross value of the total outputs of each kind of livestock product.
- iv) Using information available in the national accounts, input costs are then deducted from the gross value of output to derive value added, the unit in which GDP is expressed.

#### South Sudan Livestock Population Data

Table 1 below shows the livestock population for South Sudan based on estimates from the Ministry of Agriculture, Forestry, Tourism, Animal Resources, and Fisheries (MOAFTAF) and adopted as the official livestock figures since 2009. There are plans however by FAO and MARF to carry out detailed livestock census in 2014, although this has been hindered by the 2013 conflict experienced in several parts of the country in the same period. The distribution of livestock in the different states is as shown in the Table 1 below.

Table 1 Livestock distribution in South Sudan states as per MARF and FAO records

State	Cattle	Sheep	Goats	Total
Central Equatoria	878,434	1,153,283	1,265,977	3,297,694
Eastern Equatoria	888,278	1,132,541	1,025,297	3,046,116
Western Equatoria	675,091	1,153,283	1,169,705	2,998,079
Jonglei	1,464,671	1,207,214	1,400,758	4,072,643
Unity	1,180,422	1,754,816	1,487,402	4,422,640
Upper Nile	983,027	439,741	640,209	2,062,977
Lakes	1,310,703	1,464,421	1,232,282	4,007,406
Warrap	1,527,837	1,369,005	1,290,045	4,186,887
Western Bahr-el-Ghazhal	1,247,536	1,120,095	1,265,977	3,633,608
Northern Bahr-el-Ghazhal	1,579,160	1,630,361	1,285,231	4,494,752
<b>Total</b>	<b>11,735,159</b>	<b>12,424,760</b>	<b>12,062,883</b>	<b>36,222,802</b>

The above official estimates however differ from those in the 2014 Comprehensive Agricultural Development Master Plan Livelihood Zone Data Book developed by the

Ministry of Agriculture, Forestry, Cooperatives and Rural Development and the Ministry of Livestock and Fisheries Industries based on data collected by various offices and organizations namely South Sudan Digital Atlas, FAO, the National Baseline Households Survey (2009), the NBS and WFP.

This report gives the livestock population in the country as 41,979,705 in total including cattle, sheep, goats, camels, pigs and donkeys (summarized in Table 2 below). This study will however adopt the official MARF population estimates in calculating the livestock contribution to agricultural GDP.

Table 2: Livestock population figures as per the CAMP 2015 report

Livestock type	Population 2014
Cattle	17,729,188
Goats	12,307,686
Sheep	11,682,172
Camel	23,582
Pig	14,406
Donkeys	222,671
<b>Totals</b>	<b>41,979,705</b>

Poultry rearing is a small but growing sector in South Sudan though not recognized in the national level. FAO has estimated that there are about 5 million chickens in the country in few advanced farms around major towns and those reared by the poor households in the more rural areas of the country. The low numbers are attributed to the climatic conditions in the region which do not favor poultry unless reared in advanced farms with highly controlled ventilation and disease control systems. Poultry is commonly reared by the poorer families as a source of household income. The enterprise however attracts less attention as it is not considered a worthwhile industry to invest in. Due to this, inputs required for its growth and support such as training, drugs and vaccines, are limited unless supplied by NGOs to targeted beneficiaries. Despite the small numbers, there is a high demand for chicken meat and eggs particularly in big towns such as Juba.

It is estimated that 250,000 to 450,000 broiler chickens are sold at 2-4.5 USD per kg monthly in the country imported from Kenya, Uganda or Sudan, depending on the location of the town where it is sold. The high price is attributed to the high transport costs and border custom taxes incurred by livestock traders. Overall, with cooperation between the private investors (farmers, feed producers and outlet agents), government and non-governmental agents/donors, the industry shows a high potential for growth. The private investors' roles will be to invest and operate the businesses, the government will be to provide infrastructure and policies supportive of the sector while the donors and NGOs roles will be to coordinate and support investments and reduce the risk level ensuring that rural smallholders reap some benefits. The private sector comprising of mostly the poultry importers have organized themselves in an association

through which they work together. For instance, VSF Germany imported and distributed 2,000 Kenbro and Kuroiler chicken breeds to 400 vulnerable households in Jur River and Warrap Counties, leading to cross breeding with the local breeds and resulting in bigger birds. Following this success, VSF Germany plans to introduce a hatchery to support local poultry production.

Other livestock found in South Sudan include donkeys and pigs whose numbers have not been established or estimated. Donkeys are used for transport of water and also household items during migration. Pigs are reared by few communities in Maban County of in Upper Nile State and also imported to satisfy the growing market in major towns such as Juba with a high population of foreigners. Other emerging livestock include Ostriches, Guinea fowls, Crocodiles, Ducks and Geese.

#### **1.4 Limitations**

The production approach adopted for this study faced numerous limitations especially where gross deficiencies in reliable livestock population figures and other production coefficients exist.

## **2.0 DIRECT USE BENEFITS OF LIVESTOCK**

### **2.1 Introduction**

These are livestock goods and services, both marketed and non-marketed or for subsistence and broader than conventional definitions of agricultural GDPs. In the expenditure approach, the direct economic value of livestock products is not considered in the estimation of livestock contribution to the national GDP. Other un-marketed goods and services from livestock are also not included such as financial services and animal draught power. In the production approach which is used in this study, the direct use value sums up all the various economic benefits derived from livestock including the range of livelihood benefits that livestock owners depend upon in practice, but which are never reflected in national accounts. Part 2 therefore estimates the value of these goods and services to the South Sudan economy, where possible. The estimates are based on 2013 livestock outputs.

### **2.2 Live Animals and Milk Offtakes**

These are the main components of estimates of the contribution of livestock to South Sudan GDP.

#### **2.2.1 Cattle milk outputs**

Among the key variables in the study are the proportions of cows in the national herd, the proportion of milking cows, average milk output per cow per day, average milk output per lactation period in liters, the total milk output in liters, and average farm gate price per liter of cow milk. These are computed to give the value of total cow milk output per year and the corresponding value of milk offtake.

The South Sudan MARF estimates cattle population at 11,735,159, comprising of 5-10% breeding bulls, 5% castrated bulls reared for sale, 85% cows and heifers and 15-22% lactating cows<sup>1</sup> while lactations last anywhere from 7 to 12 months, with a 5 day post partum break. Milk production varies with seasons depending on feed and water availability.

Milk output from the local breeds is estimated at 500ml to 2 liters per day. There has been introduction of cross breeds between the indigenous breeds and other dairy breeds such as Friesian, Shawl, Kenana, Buttana and West African dwarf cow. These crosses have been estimated to produce 5-10 liters a day milked twice. Milk supply in the markets is hampered by conflict, cattle raids, seasonal changes (dry spells) and lack of reliable veterinary and extension services. Due to the long distances from the cattle camps to major town centers, fresh milk is not readily available in the market.

To estimate the total national volume of milk produced by local breeds, this study adopts the 2013 official estimate of 11,735,159 heads of cattle estimates that

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<sup>1</sup> Estimates based on key informant interviews with Nile Community Development Organization (NICODO), Dr. Catherine Kong'a a veterinary doctor in charge of a cattle camp and the central Equatoria Butchers Association.

indigenous breeds comprise about 97% of total cattle population. Indigenous breeds produce 500 mls to 2 liters of milk per day depending on the seasonal variations. For the study, an average amount of 1.25 liters per day per lactating cow was used and a 15% lactating proportion and 120 day lactation length per annum giving the milk output per local bred cow per annum at 150 liters. Based on these figures, the total national volume of milk produced by local breeds is thus:

**Volume of local bred cattle milk:  $11,735,159 \text{ heads} \times 97\% \times 15\% \times 150 \text{ liters per head} = 256,119,845 \text{ liters in 2013}$**

To estimate the total national volume of milk produced by cross-bred cattle, this study adopts the 2013 official estimate of 11,735,159 heads of cattle. It estimates that crosses comprise about 3% of total cattle population which produce 5-10 liters of milk per day depending on the management conditions. This study thus adopts an average of 7.5 liters per lactating cow, a 20% lactating proportion and 180 day lactation length giving the milk output per cross bred cow per annum at 1350 liters. Based on these figures, the total national volume of milk output by crossed breeds in 2013 was thus:

**Volume of cross cattle Milk:  $11,735,159 \text{ heads} \times 3\% \times 20\% \times 1350 = 95,054,788 \text{ Liters in 2013}$**

**Total Volume of Cattle Milk:  $256,119,845 + 95,054,788 \text{ liters} = 351,174,633 \text{ Liters in 2013}$**

### **The value of cattle milk**

The farm-gate price is 12 SSP per liter for fresh milk and 15-20 SSP per liter of fermented milk. This study adopts the price of fresh milk of 12 SSP per liter in estimating the value of cattle milk. Thus the value of cattle milk in 2013 was thus:

**Value of cattle milk output:  $351,174,633 \text{ liters} \times 12 \text{ SSP} = 4,214,095,596 \text{ SSP or } 4.214 \text{ Billion SSPs (1.429 Billion USD)}$ .**

### **2.2.2 Camel Milk Output**

There are a few livestock farmers rearing camels and these are mainly found in the Eastern Equatoria State of South Sudan. Because of absence of official and confirmed data on camel population numbers in South Sudan, milk production data and for their rates of offtake, this study could not estimate their value to be included in the calculated estimates.

### **2.2.3 Goat and Sheep Milk Output**

There are no official data or research findings on goat and sheep milk sale since it is seldom sold. Although goats (not sheep) are milked with outputs averaging 250-500mls, it is all consumed at home. Based on data from other regions like Ethiopia which estimates average lactation length at about 60 days and 30% lactating females and in the absence of any other information, this study uses the above estimates and the 2014 MARF's goat population figures of 12,062,883 heads to calculate the volume of goats' milk produced in 2013. Thus, with 30% of lactating, producing 350 ml of milk per day for



60 days each year, equivalent to 21 liters annually, the total goat milk output in 2013 was thus:

**The volume of goat milk: 12,062,883 head of goats x 0.30 x 21 liters per head = 75,996,162 liters of milk or about 76 million liters.**

### **The value of goat milk**

Although goats produce considerable amounts of milk, this study was however, unable to find any data on goat milk sale since all is consumed at home. Goat milk is thus quantified at 12 SSP per liter for fresh milk, using the estimated farm-gate price of cow milk. Thus the value of goat milk in 2013 was thus:

**Value of goat milk output: 75,996,162 liters x 12 SSP = 911,953,944 SSP or 911 million SSPs (309.14 Million USD).**

### **2.2.4 Cattle Offtake**

South Sudan MARF estimates cattle offtakes at 4% offtake rate per annum. This study adopts this official estimate to calculate the value of livestock offtake in 2013. Using the cattle population of **11,735,159** heads, this study estimates the 2013 offtake to:

**11,735,159 x 4% gross offtake rate = 469,406 heads of cattle in 2013**

Livestock sold in the local South Sudan markets comes from 2 sources, the local producers and traders; and livestock imported from the neighboring countries of Uganda, Kenya and Sudan. The high cultural value placed on livestock by local South Sudanese herders mean that they prefer importing cattle from neighboring countries rather than selling any from their own herds for slaughter. Since 2005, about 80-100% of cattle slaughtered for beef for consumption in Juba, Yei and Nimule of South Sudan come from imports from Uganda.

Cattle and sheep from Uganda are also preferred due to their high carcass weight compared to the locally available breeds. Local cattle yield an average carcass weight of 125kgs while the cattle from Uganda yield a higher average carcass weight of 220kgs. The domestic market however recently faced a number of challenges, key one being the 2013 conflict thus putting them at risk of their livestock being raided while on transit on hoof. Conflict has also hindered livestock flow and disrupted the traditional trade routes. Sheep and goats are sold for quick cash in times of need as they are more easily disposed than cattle. The estimated off-take rate for cattle is 4% and 10% for sheep and goats from the local national herds and this is what has been used for this study. Thus the estimated offtake for cattle is as shown below:

**11,735,159 x 4% gross offtake rate = 469,406 heads of cattle in 2013**

The Food and Agricultural Organization (2014) estimates cattle prices at 2,571 SSP. Based on these figures, the value of cattle offtake in 2013 was:

**Value of offtake: 469,406 heads x 2,571 SSP = 1,206,843,752 SSP or 1.20684 Billion SSPs (409,099,576 USD)**

### 2.2.5 Camel Offtake

There are a few livestock farmers rearing camels and these are mainly found in the Eastern Equatoria State of South Sudan. Because of absence of official and confirmed data on camel population numbers in South Sudan, milk production data and for their rates of offtake, this study could not estimate their value to be included in the calculated estimates.

### 2.2.6 Sheep and Goats Offtake

The official 2013 estimated offtake rate for sheep and goats is 10%. In the absence of any other comparative offtake data for sheep and goat this study adopts the MARF offtake rate, and using the official 2013 sheep and goats heads at 12,424,760 and 12,062,883 respectively, this study estimates the 2013 sheep and goats offtake to:

**Sheep: 12,424,760 sheep x 10% offtake rate = 1,242,476 sheep**

**Goats: 12,062,883 goats x 10% offtake rate = 1,206,288 goats**

According to the Food and Agricultural Organization (2014) livestock marketing monitoring data estimates sheep and goat prices at 368 SSP and 348 SSP respectively. Based on these figures, the estimated offtake values for sheep and goats in 2013 were thus:

**Sheep: 1,242,476 heads x 368 SSP = 457,231,168 SSP (154,993,616 USD)**

**Goats: 1,206,288 heads x 348 SSP = 419,788,224 SSP (142,301,092 USD)**

### 2.2.7 Pigs offtake

The pork market is growing in South Sudan especially in the major towns due to demand from the increasing number of foreigners in the country. This is satisfied by importing pork while some farmers also rear pigs locally to supplement this demand. This study however, was unable to find any data on pig production and rates of offtake conclude that pigs have negligible economic value to the South Sudan economy.

### 2.2.8 Poultry offtake

South Sudan's MARF do not have official data on poultry population in the country but FAO estimates the figure at 5 million birds and this includes the local as well as imported birds. This study however, was unable to find any official data on rates of offtake and coupled with inaccurate estimates on the local poultry population, this part was not calculated.

## 2.3 Hides and Skins Offtakes

An estimate of 70% of the skins and hides generated from slaughtered livestock are discarded and only 30% enter the markets, especially to private investors for export<sup>2</sup>. A few NGOs have shown interest in promoting cattle by-products processing including hides, skins, horns and hooves. There are few private companies currently buying hides

<sup>2</sup> Estimates based on key informant interviews with the Central Equatoria Butchers Association

and skins from slaughter houses in Juba, then exporting to Uganda, China and West African countries for processing and/or consumption. However, the supply is hindered by the poor quality of skin supplied due to poor flaying skills and facilities. The cattle hide prices average from 70 -120 SSP per piece, depending on the sizes. For sheep and goats skins prices average 10-30 SSP per piece.

### **2.3.1 Cattle hides and Skins offtake**

Using the 2013 cattle offtake of **469,406 heads** and the official cattle offtake rate of 30%, this study estimates the official cattle hides and skins offtake volume in 2013 to:

**469,406 cattle heads x 30% = 140,821 cattle hides offtake in 2013**

Using the estimated offtake figures and the average producer price of 95 SSP, this study estimates the economic values of cattle hides and skins offtake volume in 2013 to:

**Value of Cattle Hides: 140,821 cattle skins x 95 SSP = 13,377,995 SSP (4,534,913 USD)**

### **2.3.2 Camel hides offtake**

This study was not able to find any data on the rates of offtake or sale price of camel hides largely because of negligible numbers of camels in South Sudan. It concludes that there was negligible camel hide offtake and this had no economic value to the South Sudan economy.

### **2.3.3 Sheep Skins offtake**

Using the 2013 sheep offtake of **1,242,476 heads** and the official sheep offtake rate of 30%, this study estimates the official sheep skins offtake volume in 2013 to:

**1,242,476 sheep heads x 30% = 372,742 sheep skins offtake in 2013**

Using the estimated offtake figures and the average producer price of 20 SSP, this study estimates the economic values of sheep skins offtake volume in 2013 to:

**Value of Sheep skins offtake: 372,742 sheep skins x 20SSP = 7,454,840 SSP (2,527,064 USD)**

### **2.3.4 Goats Skins offtake**

Using the 2013 goat offtake of **1,206,288 heads** and the official sheep offtake rate of 30%, this study estimates the official goat skins offtake volume in 2013 to:

**1,206,288 goat heads x 30% = 361,886 goat skins offtake in 2013**

Using the estimated offtake figures and the average producer price of 20 SSP, this study estimates the economic values of goat skins offtake volume in 2013 to:

**Value of Goat Skins: 361,886 goat skins x 20 SSP = 7,237,728 SSP (2,453,467 USD)**

## 2.4 Manure as Fertilizer

In South Sudan, livestock manure is seldom sold but used by households as farm fertilizer, as cooking fuel and when mixed with certain local plant leaves and burnt, as insect repellent in the cattle *luaks* where the livestock are housed overnight and in *bomas/kraals* where cattle are kept in the dry season. The ash from manure is also used as a repellent to ectoparasites where it is smeared on the livestock before they are left to go out for grazing. The herders even smear the ash on themselves for the same reason. In some communities such as the Nuer, the manure is used as a source of cooking fuel particularly in the very dry seasons when firewood is scarce.

In areas where communities practice crop farming, it is common to find farmers requesting herders to hold their livestock on their farms where the deposited manure is then left to fertilize the land for the next planting. The farmer agrees with the herders to pay in kind using a bag of the produce harvested from the land or a bull. Commercial fertilizer is not used by farmers and neither is it sold in the markets as the government has discouraged its' introduction or use. Other uses include in building houses where it is mixed with red soil to improve the strength of the red bricks for house construction. A mixture of dung, grass and mud is also used frequently to construct traditional houses as the locals believe this makes the material more resistant to damage from heavy rains. In Aweil, the manure collected from the slaughter house is now used to produce bio-gas and this project is in the piloting stage with the intention of introducing the technology to the whole area.

According to Livestock Waste Facilities Handbook (April, 1993), estimated manure production from beef cattle is 5 – 6% of body weight. Using the estimated body weight of 200 Kg for the local cattle breeds in South Sudan, manure produced per day is calculated as  $200 \text{ Kg} \times 5.5\% = 11 \text{ Kg}$ . 88% of the manure is water in form of urine, giving an estimate of total solid at 1.32 Kg. Using the cattle population of 11,735,159, the total solids of manure produced is 15,490,410 Kg per day and 5,653,999,650 Kg (5,653,999 tons) per year.

On average a tonne of manure is composed of 6.3 kgs of Nitrogen, 2kgs of Phosphorus and 4kgs of Potassium. The nutrient content of 50 tonnes of manure is equivalent to one tonne of commercial fertilizer of the type NPK (30-10-10). The price of one tonne of imported NPK (30-10-10) is USD 235 which is equivalent to a tonne of manure estimated to cost USD 4.70 or 13.87 SSP. Based on the estimated prices, the value of cattle manure is estimated to be:

**5, 653, 999 tonnes x 13.87 SSP per tonne = 78,420,966 SSP (26,583,378.35 USD).**

## 2.5 Animal Draught Power

Traditionally, cattle are not commonly used in South Sudan for ploughing. In the early 1990s, the Regional Government in collaboration with the World Bank and NGOs such as Norwegian Church Aid (NCA) introduced ox-ploughing in demonstration farms in Northern Bahr-EI-Gharzal, Western Bahr-EI-Gharzal, Lakes, Warrap and Upper Nile States. Later on this was also supported by the Operation Lifeline Sudan (OLS) project in 1998-2000. Currently few farmers in these States particularly in Rumbek (Lakes State) and Gogrial (Warrap State) still continue with the practice. In Warrap State some farmers still use oxen for ploughing where 500 households supported by VSF Germany were provided with ploughs though not all are using it regularly. Feedback from farmers show that ox-ploughing increases the size of land under farming but also increases the need for more labor and other inputs thus hindering the full adoption of the technology. Donkeys are used to transport water and household items during migrations. Because of gross deficiency in data on social uses, it is not possible to estimate the economic value of animal draught power or to place any commercial value on any opportunity costs of alternatives.

## 2.6 Livestock based Financial Services

### 2.6.1 Livestock as Credit

This is the value of the finance (in this case interest) equivalent to the value of livestock offtakes and in a way, is the opportunity cost of credit finance or what it would otherwise cost a livestock owner to obtain funds comparable to those produced by liquidating the herd and flocks. Table 3 below gives the total estimated value of livestock offtake in South Sudan in 2013.

Table 3: Estimated Value of Livestock Offtakes (2013)

Livestock	Offtake Values Billion (SSP)
Cattle	1.20684
Camel	-
Sheep	0.45723
Goats	0.41979
Pigs	-
Poultry	-
<b>Total offtake Value</b>	<b>2.08386</b>

Source: Study estimates, 2015

The Agricultural Bank of South Sudan provides credit facilities to the livestock and crop farmers based on the models developed under the Islamic tenets or Sharia law by the mother Agricultural Bank of Sudan established in 1959. The bank has 4 established branches in the country but plans to open more. Basically the models dictate that instead of giving cash to the farmers, whatever they want to use the loan for is procured and provided directly by the bank. Cash is given in very rare instances.

The interest rates vary from 15-24% for the short, medium and long term loans which is usually recovered in produce form. Farmers are encouraged to form registered groups and micro-enterprises to benefit from these services particularly women who are considered to be better in repaying loans. In recent years the bank has not provided loans to farmers due to challenges in capital, qualified personnel and conflict. Using the estimated offtake values as in Table 3 above, the financial value of livestock offtake are shown in Table 4 below using an average interest rate of 19.5%.

Table 4: Estimated Value of Livestock as Credit (2013)

Livestock	Offtake values (Billion SSP)	Estimated financial credit value (Billion SSP)
Cattle	1.20684	0.23533
Camel	-	-
Sheep	0.45723	0.08916
Goats	0.41979	0.08186
Poultry	-	-
<b>Total offtake Value</b>	<b>2.08386</b>	<b>0.40635</b>

Source: Study estimates, 2015

From the calculations (Table 4), the total financial value of livestock offtake in 2013 in South Sudan was **0.40635 Billion SSP (0.13774 billion USD)**, equivalent to 19.5% of annual value of offtake in 2013.

## 2.6.2 Livestock as Self Insurance

This is the same as the value that would be accrued if herders were to sell off their herds, for instance, during calamities. It is the value of livestock assets as a function of self-insurance and gives annual cost of insurance equivalent to value of livestock offtakes as indicated in Table 5 below. In this study, the value of livestock as capital is estimated at 100% of the farm gate value, without any discounting.

Table 5: Estimated capital value of South Sudan livestock, December 2013

Livestock	Livestock Population	Value (SSP)	Capita Values of livestock (Billion SSP)
Cattle	11,735,159	2571	30.171
Camel	-	-	-
Sheep	12,424,760	368	4.572
Goats	12,062,883	348	4.197
Pigs	-	-	-
Poultry	5,000,000*	20	0.1
<b>Total capital value of livestock</b>	<b>36,222,802</b>		<b>39.04</b>

Source: Study estimates, 2015; \* FAO estimates

From the Table 5 above, the capital value of the South Sudan livestock in 2013 was about **39.04 Billion SSP**. The estimated value of the livestock assets as self-insurance is equivalent to the insurance premiums that herders in South Sudan would need to pay to provide themselves with **39.04 Billion SSP** of insurance coverage, i.e. the opportunity cost of comparable levels of coverage.

There is no agency offering livestock insurance in South Sudan. Using the premium rates offered by livestock insurance providers in Kenya of 3.25 – 5% of the animal value, the study estimates the self-insurance value of South Sudan livestock in 2013 as the capital value of the national herd i.e. (At average rate of 4.2%) at **39.04 Billion SSP x 4.2% = 1.639 Billion SSPs (0.555 billion USD)**.

## 2.7 Summary Of Part II

The gross value of the livestock goods in South Sudan in 2013 is indicated in Table 6 below.

Table 6: Gross Value of Domestic Livestock Production in South Sudan, 2013

Product	Value (Billion SSP)
Cattle milk	4.214095596
Camel milk	-
Goat milk	0.911953944
<b>Subtotal estimated milk offtake</b>	<b>5.126049540</b>
Cattle offtake	1.206843752
Camel offtake	-
Sheep offtake	0.457231168
Goat offtake	0.419788224
Pigs offtake	-
Poultry offtake	-
<b>Subtotal estimated livestock offtake</b>	<b>2.083863144</b>
Cattle hides and skins	0.013377995
Camel hides	-
Sheep skins	0.007454840
Goats skins	0.007237728
<b>Subtotal estimated hides and skins offtake</b>	<b>0.028070563</b>
Manure as fertilizer	0.078420966
<b>Total Product Output</b>	<b>7.316404213</b>

Source: Study estimates, 2015

From the Table 6 above, the value of the total livestock products was **7.316 Billion SSP (2.480 Billion USD) in 2013**.

The gross value of livestock based goods and services in 2013 are shown in Table 7 below.

Table 7: Direct use benefits derived from livestock, 2013

Benefit type	Value of agric GDP (Billion SSP)	Services not in GDP estimate (Billion SSP)
Value added livestock products (slaughter animals, milk, manure for fertilizer, eggs, hides & skins)	7.316404213	
Livestock as Credit		0.40635
Livestock as Self Insurance		1.63900
<b>Subtotals</b>		<b>2.04535</b>
<b>Total Economic Benefits</b>	<b>9.361754213</b>	
Cost of Inputs	0.468087711	
<b>Livestock gross value added</b>	<b>8.893666502</b>	

Source: Study estimates, 2015

From Table 7 above, in 2013, the total estimated value of goods and services provided by livestock i.e. the direct use value of livestock to the South Sudan economy was **9.362 Billion SSPs (3.173 Billion USD)**. Overall, although inputs used in the livestock sector is very low and in the absence of recent data on levels of input usage in South Sudan, we assumed a flat rate of 5% of the total value of the total livestock products to take care of the costs of inputs such as veterinary drugs. This figure is based on variable costs estimates, in standard livestock management handbooks for pastoral areas of Kenya. Thus the inputs costs based on the values above is estimated at **0.468 Billion SSPs** in 2013. The contribution of livestock to agricultural GDP (i.e. livestock gross value added) is therefore arrived at by subtracting the cost of inputs from the total value of livestock outputs in 2013, or **9.362 Billion SSPs** less **0.468 Billion SSPs**, equaling **8.894 Billion SSPs (3.015 Billion USD) in 2013**. This value includes 82% derived from conventional goods common in agricultural GDP, and 18% from financial services provided by livestock. From the results, cattle are South Sudan's most economically important livestock, with a value of **5.513 Billion SSPs (1.869 Billion USD)** in 2013, equivalent to **62%** of the total gross value of livestock's contribution to the agricultural sector.



### 3.0 CONTRIBUTION OF LIVESTOCK TO THE WIDER ECONOMY

#### 3.1 Introduction

Part III analyses the various disposal methods for livestock products in South Sudan, including in household consumption, inputs into sectors and exports.

#### 3.2 The Role of Livestock in Household Consumption

This study estimates the local milk and red meat consumption per caput using the South Sudan's NBS estimate of national population of 8.26 million and estimated slaughter weights from FAO market monitoring data and the results from the milk and meat production offtakes for 2013. The study's findings on per capita availability of red meat are show in Table 8 below.

Table 8: Red meat and offal available for consumption, 2013

Product	Total meat & offal offtake for consumption	Total offtake for meat & offal in kg for domestic consumption	Consumption per Caput(kg)
Total beef & offal, heads	469,406	70,410,900	8.52
Sheep meat and offal	1,242,476	9,318,570	1.13
Goat meat & offal	1,206,288	9,047,160	1.10
<b>Total meats and offal</b>		<b>88,776,630</b>	<b>10.75</b>

From Table 8 above, based on carcass yields of 150 kg for cattle and 7.5 kg for goats and sheep, on average, 8.52kg of beef, 1.13 kg of mutton and 1.1 kg of goat meat is consumed per person in South Sudan annually while the red meat consumption per capita in 2013 was 10.75 kg per person. The milk production estimates given in this report are indicated in Table 9 below.

Table 9: Milk available for consumption, 2013

Product	Amounts (liters)	% of national total	Total offtake for consumption	Consumption per Caput(liters)
Total cattle milk	351,174,633	82%	351,174,633	42.52
Total camel milk	-	-	-	-
Total goat milk	75,996,162	18%	75,996,162	9.20
<b>Total milk</b>	<b>427,170,795</b>	<b>100%</b>	<b>427,170,795</b>	<b>51.72</b>

Source: Study findings, 2015

Based on the estimated 2013 country population figures of 8,260,000 per capita liquid milk consumption from domestic supply was 51.72 liters per person per year. However, this varies greatly from the CAMP 2015 report, which estimates milk consumption per capita at 10kg per year and total output of 0.085553 Billion liters of fresh milk annually.

### 3.3 Livestock Products as Inputs in other sectors

The livestock sector in South Sudan is still in its formative stages with potential for investments and growth feeding into other sectors of the economy. Hides and skins processing for leather products is one such example that is yet to be tapped for the processing and manufacture of leather products. The use of bones for animal feed manufacture particularly poultry feed or for use in the processing of soaps etc is also another untapped area. Without any reliable data, this study was unable to quantify livestock based products that are destined for use as inputs in other sectors in South Sudan.

### 3.4 The Export of Livestock, Hides, Skins and Leather Goods

Except for hides and skins, live animals, leather and leather products exports are insignificant; however, no data on hides and skins is available to aid economic analysis and thus the value of livestock-related exports was estimated to be negligible.

### 3.5 Summary of Part III

Findings from this study show that, except for milk, the estimates of availability of red meat are low. Although this is similar to neighboring countries, it is lower than the WFP/FAO recommended thresholds per capita. However, the estimates are higher than the CAMP 2015 report estimates of 3 kg of beef per capita per year. The estimates for mutton and goat meat are similar at 2kg per capita per year.

In terms of contribution to agricultural GDP, while milk is South Sudan's most economically important livestock product, with a value of **5.126 Billion SSPs (1.738 Billion USD)** in 2013, equivalent to **57.64%** of the total value of livestock's contribution to the agricultural sector, cattle are South Sudan's most economically important livestock, with a value of **5.513 Billion SSPs (1.869 Billion USD)** in 2013, equivalent to **62%** of the total gross value of livestock's contribution to the agricultural sector.

Also milk is about three times more important than meat while sheep are as equally important as goats in GDP contribution. The export of hides and skins is marginal. Also the exports of live animals and value added products such as leather and shoes are insignificant.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

### 4.1 Conclusions

By using the production approach, this study has provided different and higher estimations of the contribution of livestock to the economy of South Sudan. This mirrors the 2009 re-estimation (Behnke et al, 2009) which also showed that the contribution of livestock to the national agricultural GDP was higher using the production approach, compared to the official commodity approach used by the then unified Sudan government. Compared to the commodity flow approach adopted by the NBS in 2013, the production approach adopted in this study gives a higher estimate of the contribution of livestock to GDP at **8.894 Billion SSPs (3.015 Billion USD) compared to the official estimate of 5.049 billion SSPs (1.712 Billion USD) for the agriculture sector**. The difference of 3.845 billion SSPs (1.303 Billion USD) is 76.16% higher than the officially recorded agricultural sector GDP. The GDP estimates include some direct benefits generated by livestock, especially financial services.

The total estimated value of goods and services provided by livestock i.e. direct use value of livestock to the economy was **9.362 Billion SSPs (3.173 Billion USD)** including 82% derived from conventional goods common in agricultural GDP and 18% from financial services provided by livestock. The contributions from financial services are always omitted in the quantification of economic functions of livestock at both household and national levels. Using a production based approach, milk offtake is South Sudan's most economically important livestock output, with a value of **5.126 Billion SSPs (1.738 Billion USD)** in 2013, equivalent to 57.64% of livestock contribution to economy. The gross value of livestock goods in South Sudan in 2013 was **7.316 Billion SSP (2.480 Billion USD)**.

Cattle is South Sudan's most important source of red meat, supplying 65% of meat needed and contributing **1.2 Billion SSPs (409 Million USD)**, equivalent to 13.57% of the livestock contribution to the economy. Also, while export of livestock is an insignificant part of South Sudan's exports, in terms of contribution to agricultural GDP, milk is about three times more important than meat. Sheep are equally important as goats in GDP contribution.

The production of meat and milk for domestic consumption is low in South Sudan, averaging 8.52kg of beef, 1.13 kg of mutton and 1.1 kg of goat meat consumed per person in 2013. Overall, the red meat consumption per capita was 10.75 kg per person while milk consumption averaged 51.72 litres per person in 2013. The meat figures compare well with estimated 15 kg of red meat per caput in Kenya in 2009 but vary greatly with an estimated 41 kg of meat in Sudan. The milk figures however are higher than the 26 litres of milk per capita in Kenya and lower than the 198 litres per capita in Sudan. From the study, a significant part of offtake is sourced from cross border imports. Since these are largely informal, they are rarely reflected in the official estimates. As such, the estimates for offtakes may be higher than officially reported.

Significantly, the CAMP 2015 estimates show higher populations further indicating that the contribution of livestock to the economy of South Sudan may be higher.

### Slaughter animals

The slaughter volumes and hides and skins outputs figures are shown in Tables 10 and 11 below.

Table 10: Slaughter Volumes, 2013

	Cattle	Sheep	Goats	Camels
CAMP Livestock population 2015	17,729,188	11,682,172	12,307,686	-
Official 2013 livestock population	11,735,159	12,424,760	12,062,883	-
Offtake volume based on CAMP figures	709,167	1,168,217	1,230,768	-
Study estimated offtake volumes	469,406	1,242,476	1,206,288	-
Offtake rate based on CAMP figures	4%	10%	10%	-
Offtake rate based on data in this report	4%	10%	10%	-

Source: Calculated based on Department of Veterinary Services 2014 and FAOSTAT, 2015 data

From Table 10 above, cattle offtake volumes based on both CAMP figures show higher rates than in this report. This report estimated the cattle offtake in 2013 at 469,406 heads, a figure that is slightly lower than the CAMP offtake estimate of 709,167. The low extraction rates for cattle are indicative of dominance of informal/unofficial offtake and slaughter or that the official cattle population is overestimated. Also, this report estimated offtake volumes of 1,242,476 and 1,206,288 for sheep and goats respectively in 2013, figures that mirror the estimates based on CAMP figures in 2015, indicating near similarity in official and CAMP population estimations.

Table 11: Hides and Skins Volumes, 2013

	Cattle	Sheep	Goats	Camels
Livestock offtake volume based on CAMP figures	709,167	1,168,217	1,230,768	-
Study livestock offtake volumes	469,406	1,242,476	1,206,288	-
Offtake volume based on CAMP figures	212,750	350,467	369,230	-
Study offtake volumes	140,821	372,742	361,886	-
Offtake rate based on CAMP offtake volumes	30%	30%	30%	-
Offtake rate based on data in this report	30%	30%	30%	-

Source: Department of Veterinary Services, MORF, 2015; FAOSTAT, 2015

In this report, the estimated cattle hides and skins offtake in 2013 was 140,821 heads, a figure that is slightly lower than the CAMP estimated extraction rate of 212,750. Sheep and goats skins offtake from this study were estimated at 372,742 and 361,886 respectively. This mirrors the estimates based on CAMP figures. The variation in offtakes between the study finding and CAMP estimates for cattle indicate informal

slaughter of cattle while the overall low extraction rates show high post slaughter hides and skins losses before sale.

### **Milk and dairy production**

Like in most East African states, South Sudan's milk outputs flow through informal systems. According to estimates in this report, cattle milk contributes about 82% of total milk output, with goats contributing the remaining 18%. This study establishes that milk production constitutes 57.64% of the value of livestock's contribution to agricultural GDP, and milk from cattle is South Sudan's single most valuable dairy product contributing **4.214 Billion SSPs (1.429 Billion USD)** in 2013.

### **Animal draught power**

There is insufficient data on animal power in South Sudan to enable economic analysis or even estimate the contribution of animal traction to the economy.

### **Other Observations**

- a) Although the contribution of livestock to the South Sudanese economy is significant, the national economy does not depend on it much compared to sectors like oil mining.
- b) While this study relied on official livestock statistics, because it adopted a different methodology, clear variations in GDP estimates were noted.
- c) Although as noted, the contribution of livestock to the economy is significant, its share of exports is minimal. Also, cross border trade in livestock between South Sudan and its neighbors is evident, but there are no official statistics on the trade volumes.
- d) With adequate documentation and updated data, the contribution of livestock to the economy is likely to work out higher.

## **4.2 Recommendations**

- a) There is need to undertake a rigorous livestock census in South Sudan, hence the plan by FAO and others to undertake this is welcome.
- b) The livestock sector based staff should be trained on the procedure for gathering data and estimating the economic value of the livestock sector in the national economy using the production approach which has obvious advantages when compared to the commodity flow approach.
- c) There is need to carry out research to quantify the levels of cross border livestock trade between South Sudan and its neighbors. Currently no reliable data is available yet it is common knowledge that some livestock finds its way into South Sudan from northern Kenya and Uganda.
- d) A cost benefit estimate would also be necessary with regard to pastoral livestock production systems taking into account the cost of pastures, water, animal health, etc. At the moment, NGOs seems to cover most of the intermediary costs including animal health.

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## **6.0 ANNEXES**

### **Annex 1: Study Terms of Reference**

#### **A Study on the Contribution of Livestock to the GDP of the Republics of Djibouti, Somalia, South Sudan and Eritrea**

##### **Background**

In Africa livestock are vital for poor households. Predictions of future global demand for livestock products indicate considerable opportunities for African producers. However, many of the emerging challenges in livestock production are not technical, but in the complex area of policies and institutions. The challenge is to develop the capacity of African governments and stakeholders to meet the new policy and institutional challenges, from national to regional to international settings. The opportunity to engage with policy processes is often limited, and the challenges are great, but the potential impacts can be significant. In addressing the policy challenges, there is always a need for evidence-based data for policy shifts or formulation.

During the implementation of the IGAD LPI, data was generated on the contribution of livestock to the GDPs of Ethiopia, Kenya, Sudan and Uganda. The re-estimated value added to national GDP by livestock was, depending on the country in question, 19% to 150% higher than official estimates for 2009, and the monetary value added by livestock ranged from a low of over half a billion US dollars in Uganda to over fourteen and a half billion US dollars in Sudan, totaling more than 23 billion US dollars for the four countries combined. This new regional estimate represented a 37% increase in value added over the combined official estimates in 2009 for the countries concerned.

##### **Rationale for studies on the contribution of livestock to GDP**

Clearly livestock are big business in the Eastern African region – much bigger, in fact, than had been previously suspected. Livestock specialists frequently argue that livestock production is underrepresented in the GDP estimates of African nations. With respect to Ethiopia, Kenya, Sudan and Uganda, this argument has been confirmed. However, the picture is not complete for the IGAD region as the studies did not cover Djibouti, Somalia, Eritrea and the newly independent Republic of South Sudan. An estimate of the contribution of livestock in these IGAD member States will contribute more effectively to livestock policy formulation than is presently the case in these countries.

##### **Overall objective**

The major objective of this consultancy conduct studies on the contribution of livestock to the GDPs of the Republics of Djibouti, Somalia, Eritrea and South Sudan.

**Specific objective**

- i. To adopt a production approach to estimating the contribution of livestock to agricultural GDP of the respective IGAD member states under the study

**Expected Results**

The consultancy will achieve the following results:

- Produce an updated national livestock population estimates
- A comprehensive report on the contribution of livestock to the GDPs of the Republics of Djibouti, Somalia, Eritrea and South Sudan;

**Methodology**

The consultancy is required to propose a methodology of addressing the overall and specific objectives of the assignment that shall be followed in response to the TORs. The approach should include, among others, the following:

- Proposed data collection instruments and methodology for data analysis
- Schedules to review
- w relevant documents
- Schedule of meetings with relevant bodies in the member states

**Duration of the Consultancy****Location and Field Missions**

The exercise shall mainly comprise of desk study, online research and consultations largely through exchange of correspondences with specified member countries and relevant regional organizations. Where necessary, field trips may be undertaken to relevant institutions in the target countries for data collection.

**Commencement Date and Duration of Assignment**

The duration of this consultancy would be between 60 and 90 calendar days.

**Requirements****Qualification**

The successful candidates shall have an advanced degree in livestock and or agricultural economics or the equivalent with a strong bias in statistics.

**Specific Experience**

The candidate should have:

- i. At least 10 years' experience in livestock sector development in Africa
- ii. At least 5 years' experience working in the Central Bureau of Statistics particularly with systems of national accounts.

**Reports**

The Consultant is required to prepare the following technical reports in English/French:



i. Inception Report (IcTR)

An Inception Report (IcTR) shall be produced within 5 days of commencing duty. The IcTR of not more than 10 pages should include the proposed methodology, the timeline/calendar and programme of activities, places to visit, people to meet and an outline of the contents of the Final Technical Report.

ii. Interim Technical Report (InTR)

The interim Technical Report is perceived to be the First Draft of the Final Technical Report (FTR), before a final clean copy of the FTR is formally and officially submitted to and for acceptance by ICPALD.

iii. Final Technical Report (FTR)

The Final Technical Report (FTR) should take into account contributions and comments from the relevant IGAD/ICPALD MS and ICPALD. The draft final report must be submitted at the end of the period of implementation of the tasks.

iv. Submission & Approval of Progress Reports

Three copies of the progress reports referred to above must be submitted to IGAD/ICPALS. The progress reports must be written in English/ French. IGAD/ICPALD is responsible for approving the progress reports.

