

## POLICY BRIEF



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### IGAD Center for Pastoral Areas & Livestock Development (ICPALD)

## The Contribution of Livestock to the South Sudan Economy

This policy brief paper assesses the contribution of livestock to the South Sudan national gross domestic product (GDP).

Livestock contribution to a country's 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 either the production approach, the expenditure approach or 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. This study estimated the contribution of livestock to the national economy and as a component of the household consumption by assigning monetary values to the non-marketed goods and services provided by livestock.

The methodology adopted to assess the contribution of livestock to the economy of South Sudan follows a production approach as adopted in other studies conducted for 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 National Bureau of Statistics (NBS) generally follows the commodity flow approach, which differs largely from the IGAD adopted production approach. In the study, the production approach was used which 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 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 estimate includes some direct benefits generated by livestock, especially financial services. Thus the contribution of livestock to agricultural GDP (i.e. livestock gross value added) 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 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.

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. A significant part of livestock offtake is sourced from cross border imports mainly from Uganda. Since these are largely informal and are unrecorded, they are rarely reflected in the official estimates. As such, the estimates for offtakes may be higher than officially reported. 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. 80% of the South Sudanese population is engaged in agriculture; crop, 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). Although the contribution of livestock to the South Sudanese economy is significant, the national economy does not depend on it much compared to other sectors like oil mining. The contribution of livestock in the country's share of exports is minimal. Notably, cross border trade in livestock between South Sudan and its neighbors is evident but there are no official statistics on the trade volumes. Thus with adequate documentation and updated data, the incidence of the contribution of livestock to the economy is likely to be higher.

### **The estimation of livestock contribution to South Sudan GDP**

The study summarized in this briefing paper employed a production approach to estimating the livestock contribution to GDP which is the more appropriate and accurate approach for the sector. The approach involves four main steps:

- i) Acquiring updated and current national livestock population estimates from the Ministry of Livestock and Fisheries Industry (MLFI), Food and Agriculture Organization of the United Nations (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) which are then applied to the livestock population figures 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, monetary value is ascribed 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.

Using this approach, no distinction needs to be made between production destined for commercial sale, for immediate consumption by producers, or for export. This approach is suitable for the South Sudan context as their livestock sector is semi-commercialized whereby the livestock owners consume a significant portion of what their herds produce. Home production for home consumption or local sale is not usually recorded in official marketing statistics. By basing estimates on total product output, production-based GDP estimates does not rely on incomplete marketing data and should, in principle, include subsistence production.

The National Bureau of Statistics of South Sudan is in charge of the national GDP estimation among other statistics. The department had over the years adopted the expenditure approach. It changed to the production approach for its 2014 GDP estimations but the official results are yet to be published. The South Sudan GDP estimate 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. Challenges faced by the department in GDP estimations include lack of accurate and reliable data, a high staff turnover, particularly the trained and knowledgeable technical staff and limited technical knowhow; although some support and training has been received from organizations such as World Bank, IMF and other international organizations.

Livestock populations for South Sudan have been based on estimates from MLFI and adopted as the official livestock figures since 2009. There were plans by FAO and MLFI to carry out a detailed livestock census in 2014, but these have been hindered by the 2013 conflict that was experienced in several parts of the country. 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 (CAMP) Livelihood Zone Data Book developed by the Ministry of Agriculture, Forestry, Cooperatives and Rural Development and the Ministry of Livestock and Fisheries Industries. The CAMP report is 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 and summarized in Table 2 below. The discrepancy in livestock population figures between the official numbers which have been estimated over the years, and the CAMP figures already is an indication of a shortfall in accuracy of data used for the GDP estimation. This study however adopted 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>

## The contribution of livestock to GDP

This study used 2013 as the reference year for comparison of the re-estimated and the national GDP calculations based on official livestock population figures given by MLFI. The two calculations produce substantially different results. The re-estimated livestock GDP value using the production approach 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 (1.7115 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 disparity between the official and the revised assessment is due to previously unavailable statistical data on livestock production, alternative computational methods used in this report to estimate the value of individual livestock products and inclusion of other livestock economical benefits not previously considered. The study aimed to estimate the quantity and value of individual animal products, and these individual values are then combined to provide an overall picture of livestock output. Table 3 below summarizes the study re-estimation of the gross value of livestock goods in South Sudan in 2013 which shows that the value of the total livestock products was 7.316 Billion SSP (2.480 Billion USD).

**Table 3: 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

### The economic benefits of livestock

The direct and indirect economic benefits of livestock were estimated, and these included benefits from livestock products and from livestock services (normally not part of GDP estimates). From the study estimates, the total estimated value of goods and services provided by livestock to the South Sudan economy was 9.362 Billion SSPs (3.173 Billion USD) in 2013. This value includes livestock products and the financial contribution i.e. livestock as credit and livestock for self-insurance.

Livestock as credit is the value of the financial equivalent (in this case interest) 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. 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 interest rates vary from 15-24% for the short, medium and long term loans. Loan recovery is usually in produce form. Using the estimated offtake values, the financial value of livestock offtake are shown in Table 4 below using an average interest rate of 19.5%. From the calculations, the total financial value of livestock offtake in 2013 in South Sudan was 0.40635 Billion SSP (0.138 billion USD), equivalent to 19.5% of annual value of offtake in 2013.

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

<b>Livestock</b>	<b>Offtake values (Billion SSP)</b>	<b>Estimated financial credit value (Billion SSP)</b>
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*

Livestock as self insurance is 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. In this study, the value of livestock as capital is estimated at 100% of the farm gate value, without any discounting. From the Table 5 below, 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.

**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

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).

The gross value of livestock based goods and services in 2013 are shown in Table 6 below.

**Table 6: 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

## The Role of Livestock in Household Consumption

This study estimated 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 as shown in Table 7 below indicate that based on carcass yields of 150 kg for cattle and 15 kg for goats, 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. Cattle are the country's most economically



important livestock, contributing **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.

**Table 7: 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>

Based on the estimated 2013 country population figures of 8.26 million, the per capita liquid milk consumption from domestic supply was 72 liters per person per year. However, this varies greatly from the CAMP 2014 report, which estimates milk consumption per capita at 10kg per year and total output of 0.085553 Billion liters of fresh milk annually. The milk production estimates given in this report are indicated in Table 8 below:

**Table 8: Milk available for consumption, 2013**

Product	Amounts (liters)	% of national total	Total offtake for consumption	Consumption per Caput(liters)
Total cattle milk	517,520,511	87%	517,520,511	62.7
Total camel milk	-	-	-	-
Total goat milk	75,996,162	13%	75,996,162	9.2
<b>Total milk</b>	<b>593,516,673</b>	<b>100%</b>	<b>593,516,673</b>	<b>71.85</b>

Source: Study findings, 2015

Findings from this study show that, except for milk, the estimates of availability of red meat is low though similar to other neighboring countries but lower than the WFP/FAO recommended thresholds per capita. However, the estimates are higher than the CAMP 2014 report estimates of 3 kg of beef per capita per year. The estimates for mutton and goat meat are similar at 2kg per person per year. Milk is South Sudan's most economically important livestock product, with a value of 6.12 Billion SSPs (2.07 Billion USD) in 2013, equivalent to 73% of the total gross value of livestock. Also milk is about three times more important than meat while sheep are as equally important as goats in GDP contribution.



## 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. Exports of hides and skins are marginal, and that of value added products such as leather and shoes are insignificant. 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.

## Recommendations

The following recommendations address the challenges faced in acquiring the required data for the study and gaps noted in the calculation of livestock sector GDP contribution. They are focused on the official system for the collection of data and the analysis of livestock production.

- a) Livestock Census figures: There is need to undertake a rigorous livestock census in South Sudan, hence the plan by FAO and others to do this is highly encouraged.
- b) Adoption of Production-based approach: In estimating the livestock contribution to the country's GDP we recommend that NBS consider adopting a production-based approach. The NBS are in the process of changing the approach used in calculation of the national GDP from the expenditure approach to the production approach. This is the more suitable approach as it well captures the true value and contribution of livestock to the livestock owners and the national economy as a whole.
- c) Technical capacity: 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.
- d) Cross border trade: 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 livestock enter South Sudan from northern Kenya and Uganda.
- e) Cost-benefit Analysis: 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. Currently it is the NGOs that seem to cover most of the intermediary costs including animal health.







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