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The Contribution of Livestock to the Economies of Kenya, Ethiopia, Uganda and Sudan

Livestock specialists frequently argue that livestock production is underrepresented in the GDP estimates of African nations. With respect to Kenya, Uganda, Ethiopia and Sudan – the countries covered in this review – this argument has been confirmed.1

From 2010 to 2012 IGAD undertook a reappraisal of the contribution of livestock to the national economies of these four IGAD member countries. The 'headline' result of this evaluation is summarized in Table 1. Using 2009 as a base year for comparison, 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 that year, 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, totalling 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. Clearly livestock are big business in East Africa – much bigger, in fact, than had been previously suspected.

Table 1: The contribution of livestock to national GDP, 2009 in billion US dollars ($USD)

	Kenya	Ethiopia	Uganda	Sudan	Regional
Official value added	$1.651	$2.511	$0.282	$12.236	$16.68
Re-estimated value added	$4.124	$3.998	$0.527	$14.525	$22.844
Percentage increase on official estimate	150%	59%	87%	19%	37%

Ethiopia

In 2009, GDP estimates for Ethiopia were prepared by the National Accounts Department of the Ministry of Finance and Economic Development (MoFED). Using official producer price figures for 2008-09, we recalculated the combined gross value of 14 categories of livestock product outputs using a revised set of coefficients and livestock population estimates (Table 2). The recalculated combined gross value of livestock product outputs totalled 51.985 billion birr or 3.999 billion US dollars at 2008-09 exchange rates, an increase of about 59% over the gross value of livestock production estimated according to official coefficients and herd size estimates, IGAD LPI Working Paper No. 02 -11 (2011). A tabular summary of our re-calculations and a comparison with official estimates is provided in Table 2.

Table 2: Official and IGAD Estimated Gross Value of Ethiopian Livestock Production 2008-09, in billion Ethiopian Birr (EB), (NEXT)

Livestock Product Outputs	Official Billion EB	IGAD Billion EB
Cattle milk (including milk for butter and butter residue)	16.141	20.738
Camel milk	1.978	3,346
Goat milk	1.325	6.436
Sheep milk	0	0
Subtotal: milk and milk product offtake	19.471	30.520
Cattle offtake	6.302	8.103
Camel offtake	0.145	0.145
Sheep offtake	1.643	2.254
Goat offtake	1.563	2.255
Subtotal: ruminant offtake	9.653	12.757
Egg production	1.656	1.656
Chicken offtake	1.051	1.051
Pig offtake	-	-
Subtotal: non-ruminant production	2.707	2.707
Manure for fuel	1.966	3.429
Change in stocks	1.384	1.384
Other (wool honey and wax)	1.188	1.188
TOTAL	31.831	51.985

Sudan

Estimates of the contribution of livestock to Sudan's economy are beset by one abiding challenge: the absence of reliable, current data. There are multiple deficiencies, but above all, no one knows the current livestock population of Sudan, the last national livestock census having taken place thirty-seven years ago.

With no conclusive evidence to support alternative national livestock population estimates, the calculations in this analysis use the official livestock population estimates. On this basis, IGAD estimates of the contribution of livestock to national agricultural sector GDP, 33.843 billion Sudanese pounds (SDG) in 2009 (or about $14.550 billion USD at 2009 exchange rates), are broadly similar to the official 2009 estimates – 28.670 billion SDG (about $12.326 billion USD). The difference between these two estimates is 5.173 billion SDG, or a re-estimated increase of 18% over the official figure in 2009. Whereas the official figures for 2009 estimated a percentage contribution of the agricultural sector of just over 33% to total GDP, IGAD's revised

estimates would now place that contribution at just over 36%. When compared with the imprecision caused by uncertainties regarding the size of the national herd, these are negligible differences, and constitute an endorsement of official estimates, subject to the reservations about data availability stated above. Table 3 summarizes the comparison between official and re-estimated livestock GDP; detailed calculations and data sources are provided in the original report, IGAD LP Working Paper No. 01 – 12 (2012). In addition to providing statistics for Sudan as a whole, Table 3 also distinguishes between the northern and southern Sudanese states, which subsequently became the independent nations of Sudan and South Sudan.

Table 3: Gross value of livestock production in 2009, IGAD and official estimates in Sudanese pounds (SDG)

Product	IGAD Estimates Northern states	IGAD Estimates Southern states	IGAD Estimates Sudan total	Official Estimates Sudan total
Cattle milk	9,123,015,552	1,984,428,576	11,107,444,120	-
Camel milk	3,247,597,056	0	3,247,597,056	-
Sheep milk	1,066,348,320	352,611,232	1,418,959,552	-
Goat milk	3,025,559,008	1,290,502,336	4,316,061,344	-
Subtotal milk	16,462,519,936	3,627,542,144	20,090,062,080	14,454,142
Cattle offtake	4,727,715,702	1,999,256,171	6,726,971,873	6,498,866
Camel offtake	740,720,640	0	740,720,640	535,355
Sheep offtake	2,018,928,224	667,603,212	2,686,531,436	3,002,693
Goat offtake	758,306,700	323,443,200	1,081,749,900	1,661,388
Poultry meat, tons	-	-	302,746,300	302,746
Subtotal animal offtake	8,245,671,266	2,990,302,583	11,538,720,149	12,001,048
Eggs	n.a.	n.a.	287,309,800	287310
Fish	n.a.	n.a.	728,861,300	728861
Manure for fertilizer	n.a.	n.a.		-
Change in stocks	n.a.	n.a.	1,198,176,400	1198176
TOTAL OUTPUT	24,708,191,202	6,617,844,727	33,843,129,729	28,669,537

Uganda

In 2009 official national accounts estimates were produced by the Uganda Bureau of Statistics (UBOS). Both the original official and re-estimated IGAD figures on the contribution of livestock to agricultural GDP in 2009 were based in large measure on official data, but the two calculations produced substantially different results. The re-estimated livestock value added in 2009 - 1,069.407 billion UShs (or about $526 million US dollars at 2009 exchange rates) – was nearly double the original official estimate of 573 billion UShs (roughly $282 million US dollars), an increase of 86.6% over official estimates for that year (see Table 4).

The disparity between the official and our revised assessment is due to previously unavailable statistical data on livestock production and to the alternative computational methods. Table 4 summarizes the comparison between official and re-estimated versions of the livestock component of Uganda's agricultural GDP; details are provided in the original report, IGAD LPI Working Paper No, 02 – 12 (2012).

Table 4: Official and IGAD estimates of livestock production in 2009 – gross value and value added in billion Uganda Shillings (UShs)

Product group	Official gross value of output	Official value added	IGAD gross value of output	IGAD value added
Cattle	482	185	978	-
Goats and other animals	1227	343	265	-
Poultry	89	45	89	-
Total	1789	573	1333	1069

Kenya

In 2009 the Kenya National Bureau of Statistics (KNBS), the department responsible for estimating Kenya's GDP, used a commodity flow approach to estimating agricultural GDP. According to this method, calculations of the value of marketed agricultural production were based on the recorded value, quantities and prices for officially marketed agricultural commodities. Non-marketed agriculture production directly consumed by farmers or pastoralists or traded informally was estimated through periodic household budget surveys, and – in the intervals between surveys – was assumed to grow at the same rate as recorded marketed production. In short, the level of overall production was inferred from that portion of the total that is traded through official channels.

When compared to KNBS's commodity flow approach, the production-based procedures followed by IGAD generated a significantly higher estimate of the contribution of ruminant livestock to agricultural GDP – 318.971 billion Ksh versus the official estimate of 127.723 billion Ksh in 2009, an increase of 150%. In the course of arriving at these different results, the two estimation procedures also provided substantially different pictures of the level of livestock product output and the amount of livestock-derived food that was domestically available.

According to the revised estimates, milk is far and away Kenya's most economically important livestock product, with a value of 257.811 billion Ksh in 2009, or about 70% of the total gross value of livestock's contribution to the agricultural sector. Officially recorded milk production was only about one twentieth of total re-estimated milk production in 2009.

Table 5 compares official and revised estimates of livestock sector performance in Kenya; substantiation for the figures in Table 5 can be found in IGAD LPI Working Paper No. 03 – 11 (2011).

Table 5: A comparison of official and revised estimates of livestock sector performance

	Value of cattle and calf offtake, billion Ksh	Value of dairy offtake, billion Ksh	Milk production, Mn. litres	Bovines slaug-htered '000 head	Sheep/ goats slaug-htered '000 head	GDP livestock, billion Ksh
Official/ recorded	14.627	11.497	407	2,057	5,716	127.723
Production -based estimate	54.826	257.811	7634	2,9152	6,062	353.6531
Official/ recorded as % of production-based estimate	27%	4%	5%	71%	94%	36%

Country comparisons – the diversity of livestock's contribution to national economies in IGAD member countries

Despite lying geographically adjacent to one another, the differences between the livestock sectors of the four study countries are at least as important as the similarities. The following discussion highlights the distinctive features of the livestock sector in each of the study countries.

Ethiopia – animal power

To understand the significance of livestock in Ethiopia we must look beyond GDP and examine the kinds of livestock benefits that are intentionally excluded from national accounts. With few exceptions, estimates of the contribution of livestock to GDP are based on the output of goods – material products such as milk and meat. For accounting reasons the value of livestock services – as draft or pack animals, or as a source of financial security for their owners, for instance – may be included in national accounts but are not ascribed to livestock. Table 6 – which includes all the direct use benefits derived from livestock, both goods and services – corrects this deficiency and, at least for Ethiopia, the results are startling.

Table 6: Direct use benefits derived from ruminants and equines 2009 – billion UD dollars

	Kenya	Ethiopia	Uganda	Sudan
Total direct use benefits	$4.61	$9.04	$0.99	$18.13
Re-estimated value added	$4.124	$3.998	$0.527	$14.525
% direct use benefits recognized in national accounts (livestock goods)	89%	44%	53%	80%
% financial services	10%	21%	47%	15%
% ploughing	No estimate	18%	No estimate	No estimate
% transport and haulage, equines and camels	No estimate	16%	No estimate	5% (equines only)

According to Table 6, less than half of the full range of benefits – only 44% of total direct use benefits – that are derived from livestock by Ethiopians are recognized in national accounts as livestock outputs. In 2009, official estimates placed livestock's contribution at about 25% of total agricultural sector GDP, with the bulk of the remaining 75% attributable to crop agriculture. By making animal traction costs explicit, valuing animal draught power increases the costs of cultivation and diminishes the contribution of arable production to GDP. Once ploughing costs are deducted from the value of arable output, crop sector value added in 2009 stood at $7.495 billion USD versus total direct benefits from livestock of $9.040 billion USD. In other words, the relative position of crop and livestock agriculture had been reversed. Rather than producing a mere quarter of all agricultural output, livestock were now seen to be contributing more to the national economy than crops.

Kenya – the dominance of milk

Rural or urban, pastoral or farming, Kenyans love their milk, and one product – fluid milk – dominates the Kenyan livestock sector. In terms of value added, milk production is nearly four times more important than ruminant meat production to the Kenyan economy, and relatively more important than milk production in the other IGAD member countries examined in this report (Table 7).

The importance of milk production for Kenya's economy underscores the serious limitations of Kenya's official agricultural statistics, which record an estimated one-twentieth of total national milk output Missed by these statistics is one of Kenya's most recent agricultural success stories – the sustainable intensification of mixed dairy and arable farming on smallholdings in the Kenyan highlands.

Table 7: Gross value of livestock production 2009 in national currencies

	KENYA billion Ksh	ETHIOPIA billion EB	UGANDA billion USh	SUDAN billion SDG
Cattle milk	197.018	20.738	350.152	11.107
Camel milk	16.190	3,346	3.778	3.248
Goat milk	44.603	6.436	12.978	4.316
Sheep milk	0	0	0	1.419
Subtotal: milk offtake	257.811 (70%)	30.520 (59%)	366.908 (28%)	20.090 (59%)
Cattle offtake	53.960	8.103	627.374	6.727
Camel offtake	1.948	0.145	0.484	.741
Sheep offtake	3.699	2.254	35.380	2.687
Goat offtake	7.540	2.255	181.913	1.082
Subtotal: ruminant offtake	67.147 (18%)	12.757 (25%)	845.151 (63%)	11.237 (33%)
Egg production	10.305	1.656	89.000	.287
Chicken offtake	4.616	1.051		.303
Pig offtake	1.506	-	30.893	0
Subtotal: non-ruminant production	16.427 (4%)	2.707 (5%)	119.893 (9%)	.590 (2%)
Manure	27.829	3.429	No estimate	No estimate
Change in stocks	No estimate	1.384	No estimate	1.198
Other	0	1.188 (wool, honey and wax)	1.355 (blood)	.729 (fish)
TOTAL	369.214 billion Ksh or $4.124 USD 100%	51.98 billion EB or $3.998 USD 100%	1,333.307 billion UShs or $0.527 USD 100%	33.843 billion SDG or $14.525 USD 100%

table continued

Uganda – pastoralism as a regional specialization

According to previous official estimates, livestock contributed 1.7% to total national GDP in 2009; our revised estimates would now place this contribution at about 3.2% of the national total. To put the revised livestock contribution into perspective, it is larger than the GDP derived from either cash crops or fishing, marginally smaller than the contribution from forestry, but still only about a quarter of the value of food crop production. While livestock are vitally important to household welfare and in certain regions of the country, Uganda is not a pastoral nation on the scale of IGAD member states such as Sudan, Ethiopia or Kenya.

In 2009 just under half – about 47% - of the direct benefits derived by Ugandan livestock owners from their animals were attributable to the financially related livelihood services provided by livestock (Table 6). According to conventional national accounting procedures, the financial benefits derived by livestock owners from their animals may support farming households and thereby enhance farm output, but the increases in economic productivity that arise from these services are not identified as part of the contribution by livestock to the economy. Including financial benefits, total direct use benefits derived from livestock were 2007.390 billion UShs or about $989,000,000 US dollars in 2009.

The financial component of livestock output is high in Uganda because formal sector financial services are unavailable or expensive in rural areas. When the coverage provided by formal financial institutions increases, these services become more affordable, and the financial component of livestock production diminishes in importance relative to the value of more tangible goods and services – milk, meat, manure, animal traction etc – as has happened in Kenya. In sum, increasing 'normal' forms of livestock production, which are recognized in GDP accounting, is dependent, to some extent, on the provision of affordable credit and insurance for livestock owners, which permits animal owners to re-focus their production objectives to conventional types of livestock output. Until this happens, the apparent low output of Ugandan livestock will reflect, in part, the diverse and unaccounted array of services that these animals must provide for their owners.

Sudan – pastoralism as the dominant component of domestic agriculture

The most prominent characteristic of livestock keeping in Sudan is the sheer size and diverse productivity of the enterprise. In terms of the value added to agricultural GDP, together Sudan and South Sudan produced more than the combined livestock output of the three other countries covered in this report - Uganda, Kenya and Ethiopia.

GDP estimates also reveal the very significant contribution made by livestock to combined Sudan and South Sudan domestic economy. Sudan's agricultural sector GDP includes crop, livestock, fisheries and forest production. Using official statistics, livestock has consistently provided more than 60% of the estimated value added to this sector in recent years, and is a substantially more important contributor

to agricultural sector GDP than crop farming. With the advent of oil production and exports in the late 1990s, the relative contribution of the agricultural sector to national GDP has declined, but at no time in the last decade has the contribution of petroleum to GDP come close to equalling the contribution of agriculture, of which livestock provides the biggest part. Livestock is by value the largest subsector of Sudan's domestic economy, larger even than petroleum.

The great bulk of all livestock production – possibly 90% of the total, though no one really knows the actual figure – comes from small holders and migratory producers. To a remarkable extent, the Sudanese economy is based on a combination of mobile and sedentary pastoral and agro-pastoral production by farming and herding households in almost every region and state.

According to the approximate calculations undertaken in this report series, more than 70% of Sudan's livestock value added comes from northern Sudan. The concentration of livestock output in northern Sudan suggests that, the independence of the Republic of South Sudan is unlikely to diminish the economic significance of livestock in what is now Sudan.

Policy Recommendations

We conclude that national accounting techniques can contribute more effectively to livestock policy formulation than is presently the case. The following recommendations are designed to assist IGAD member states in developing accounting procedures that are more comprehensive, accurate and serviceable as a basis for policy in the livestock sector.

1. In different ways, all the countries covered in this report need to come to terms with accurately counting their national livestock populations. Irrespective of the care taken with other aspects of the calculation, it is impossible to estimate the value added to a national economy by a livestock population of unknown size.

In Kenya, the information on livestock numbers provided by the 2009 human population census revealed the limitations of the procedures then used by the Ministry of Livestock Development (MOLD) to estimate livestock populations. The next human population census may not contain questions on livestock, and it is essential that MOLD develop survey techniques to reliably estimate the country's livestock numbers, or subcontract this responsibility to a qualified national research institute or university.

In Sudan – after a hiatus of nearly four decades – it is essential that a livestock census or large scale sample survey – either aerial, ground-based or both – be undertaken as soon as possible in both Sudan and South Sudan.

In Ethiopia, an accurate estimate of the contribution of livestock to agricultural GDP will not be possible until the size of the national pastoral livestock populations has been established. In 2009, pastoral livestock had last been surveyed in 2003-04, and a more frequent schedule of surveying is required.

Finally, in Uganda Karamoja Sub-Region poses a challenge in terms of representative sampling given the organization of current survey efforts and conditions in the sub-region. We therefore recommend a specialized study of livestock production in Karamoja designed to quantify the region's considerable contribution to national livestock output.

2. We recommend that all IGAD countries adopt a production approach to estimating the contribution of livestock to agricultural GDP. There are many advantages to the production approach: It is transparent, it avoids the problems that arise when subsistence output is underestimated, and it facilitates the measurement of the performance of specific types of livestock enterprises, as well as the overall size of the livestock sector.

The current series of studies, summarized in this report, has revealed considerable variation in the procedures followed in individual IGAD member countries, and considerable variation in the accuracy of the resulting estimates. Many of these procedural variations are the result of countries adopting methods that make sense for their economy as a whole, but do not work well for the livestock sector. IGAD has proven its ability to work constructively to improve livestock accounting, in cooperation with the departments responsible for national accounts in four IGAD member states under this study; it is essential that IGAD now extend this programme of work to cover those states within the organization that have not yet had their livestock accounting examined (Djibouti, Somalia, South Sudan and Eritrea).

3. With the support of national government departments and research institutes, IGAD should undertake a regional survey of the monetary value of animal power to the economy of its member states, and the role of animal power in sustaining both rural and urban livelihoods. This report has shown that animal power (including draft power, transport and haulage) may constitute over half of the economic benefits derived from livestock, as it currently does in Ethiopia, and yet it is persistently ignored both in academic research and by national statistical departments. As the responsible regional organization, IGAD should work to remedy this situation.

This survey should be comprehensive. It should include all forms of animal traction, transport, and haulage by all species of working animals – cattle, equines and camels – in rural and urban areas and in all economic sectors – agriculture, manufacturing and services. As well as the commercial provision of animal power, the survey should assess the monetary value of the services that working animals directly provide for their owners.

4. The IGAD member states covered in this report all need to recognize the central contribution of the informal cross border livestock trade to national welfare. Kenya is a net livestock importer dependent on the cross-border trade to provide the bulk of the red meat available in Nairobi, while Ethiopia and Sudan are major exporters. But no country officially sanctions the entire cross-border trade and none attempts to accurately monitor it. As a regional organization committed to supporting regional trade, it is recommended that IGAD discuss this issue with its member governments, and continue to support research that will document the scale of the trade and its benefits for urban consumers, rural communities and livestock owners.

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(Endnotes)

All sources and data in this report come from and are fully referenced in the preceding studies in this series.

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