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The Contribution of Livestock to The Ethiopian Economy

A country's GDP, its gross domestic product, does not represent a nation's entire economy. The kinds of economic output that are included in GDP are broad, but what GDP excludes can also be quite significant.

For this reason, IGAD and the Ethiopian Ministry of Finance and Economic Development (MoFED) undertook two consecutive studies on the contribution of livestock to the Ethiopian economy. The results of both of these studies are summarized in this briefing paper. The first study (IGAD LPI Working Paper No. 02-10), examined the contribution of livestock to Ethiopia's agricultural GDP. The working paper concluded that in 2009 – the year chosen for study – agricultural GDP calculations underestimated the contribution of livestock, and readjusted the figures upwards by 47%.

The second study, (IGAD LPI Working Paper No. 02-11) assessed the value of the economic benefits that are derived from livestock but not routinely included in agricultural GDP estimates. Livestock supply power for farming and transport. Livestock also supply their owners with financial services: by providing a substitute for credit and by serving as a form of insurance, as well as giving their owners a way of spreading risk. According to international conventions, most of the value of these services is not separately itemized in national accounts and therefore cannot be identified as part of the economic benefits that livestock provide. The value of these services is nonetheless considerable – in recent years about double the official value of livestock's contribution to agricultural GDP.

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The extent of underestimation becomes clear if we compare the different estimates for 2009. In 2009 the official estimate of the livestock contribution to agricultural GDP was slightly more that 32 billion Ethiopian birr or $3.2 billion US dollars. In the same year, if we combine an adjusted estimate of the livestock component of agricultural GDP with the value of livestock services excluded from GDP, we arrive at a total value for livestock's contribution of 113 billion Ethiopian birr, or roughly $11.3 billion US dollars at 2009 exchange rates. In other words the total economic benefits of livestock goods and services, are more than three and a half times greater than the MOFED's original estimate of the value added from livestock in 2008-09. In short, the great bulk of what Ethiopian livestock provide for the domestic economy is not identified in natural accounts as coming from livestock.

Much the same can be said for the livestock contribution to exports. Livestock and their products probably constitute a fifth of Ethiopia's exports, but about half of these exports are not recorded or officially recognized because they are produced by the informal cross border trade in live animals. These unofficial exports contribute to the welfare of Ethiopians by financing the importation of a wide range of consumer goods, including necessities such as clothing and staple food items. For instance, the gross value added in the informal cross border livestock trading activities on the Berbera and Bosasso marketing corridors in Somali region of Ethiopia is estimated to be as high as 144 million USD (Desta et al 2011). Livestock are also informally exported through Kenya, Sudan, Djibouti and Eritrea. By excluding informal exports, official figures again undervalue the real contribution of livestock to the national economy.

National accounts do not accurately depict the full range and value of the benefits obtained from Ethiopian livestock. Accurately quantifying these benefits promotes an increased appreciation of the central role of livestock in both household welfare and the nation's economy. The findings of these studies also support the conviction of the vast majority of stakeholders to Ethiopia's livestock sector that increased resource allocation for livestock is warranted.

The estimation of agricultural GDP in Ethiopia

GDP estimates for Ethiopia are prepared by the National Accounts Department of the Ministry of Finance and Economic Development according to internationally recognized procedures. Ethiopia follows the production approach to estimating GDP, in which the goods and services produced by all categories of economic activity are summarized to arrive at total GDP. For livestock this approach involves four stages. First, national livestock populations are estimated by MOFED based on data supplied by the

Central Statistics Agency (CSA). Second, production coefficients are applied to the livestock population estimates to generate estimates of the total output of goods such as meat, milk, butter, dung for fuel etc. Third, based on CSA producer price surveys, a monetary value expressed in Ethiopian birr – the gross value of output – is ascribed to the total output of each kind of livestock product. Finally, input costs (intermediate costs) are deducted from the gross value of output to derive value added.

The production approach followed by Ethiopia is a reliable method for estimating agricultural GDP, but the production coefficients used by MOFED to estimate livestock output were potentially outdated. We evaluated and adjusted these production coefficients in light of current research and survey evidence. Using 2008-09 as a basis for comparison, the revised coefficients yielded a recalculated total gross value for 12 categories of ruminant livestock production that was an increase of about 46% over the gross value of the same production categories using MOFED's estimation techniques. While these recalculations represented a significant increase in output estimates, they resulted from an up-dating of old productivity coefficients and, to a lesser extent, a revised estimate of the size of the national herd. These adjustments refine but in no way question the basic methods employed by MOFED in the calculation of agricultural GDP.

Table 1 shows the gross value of livestock product output as originally calculated by MOFED and as recalculated according to revised production coefficients and livestock population estimates recommended in this study.

Table 1: Estimated Gross Value of Ruminant Livestock Production 2008-09, billion Ethiopian birr (ETHB)

Product or Service	MOFED ESTIMATE	REVISED ESTIMATE
Cattle offtake	6.302	8.103
Sheep offtake	1.643	2.254
Goat offtake	1.563	2.255
Camel offtake	0.145	0.145
Total estimated offtake	**9.653**	**12.757**
MOFED total offtake	**9.653**	
Cattle milk	8.483	10.899
Cattle milk for butter	4.533	5.824
Goat milk	1.352	6.436
Camel milk	1.978	3.346
Butter residue	3.125	4.015
Total estimated milk products	**19.471**	**30.520**
MOFED total	19.634	
Sheep wool	0.003	0.005
Dung for fuel	1.966	3.429
Change in stocks	1.384	1.384
TOTAL RUMINANT PRODUCT OUTPUT	**32.64**	**48.095**
Percentage change		47%
Animal draught power	0	21.500
TOTAL RUMINANT PRODUCTION		**69.595**
Percentage change		113%

Livestock Services not captured in conventional national accounts

About 80% of Ethiopian farmers use animal traction to plough their fields. Both the mean area cultivated by a farm household and their yields per hectare are positively correlated with cattle ownership and ploughing, in comparison to hand cultivation. Despite these contributions to agricultural output, no attempt is currently made by MOFED to impute the monetary value of animal traction for Ethiopian agriculture. Based on the average cost of renting ploughing services, the value of the animal draught power input into arable production is about a quarter (26.4%) of the value of annual crop production. Nearly a third (31%) of the total gross value of livestock output is represented by the value of animal draught power as an input into crop cultivation, an estimated 21.500 billion EB in 2008-09 (Table1).

Although the proportional contribution of livestock and crops will fluctuate from year to year, if we include the value of ploughing services, livestock provided 45% of agricultural output in 2008-09 (Table 1). Previous MOFED estimates placed livestock's contribution at about 25% of total agricultural GDP. The gap between these two estimates suggests that the significance of livestock relative to crop production has been considerably misrepresented by past calculations of agricultural sector GDP. Even if technical considerations exclude ploughing services from GDP estimates, the quantification and expression of this value in monetary terms underlines the need to rethink the role and relative importance of crops and livestock in Ethiopian agriculture.

The problem of incorporating the value of oxen ploughing into estimates of agricultural GDP is symptomatic of a wider methodological obstacle to the full appreciation of the economic importance of livestock in developing economies. In principle, the 'production approach' employed by MOFED to calculate agricultural GDP can adequately capture the great bulk of material production in the form of goods from Ethiopian livestock, irrespective of whether this produce is sold or immediately consumed by rural households. But if Ethiopian farmers and herders provide for themselves with home produced goods, they also in large measure service themselves. The most important services provided by livestock include the supply of animal power (for traction, transport and haulage), and livestock as a source of financial services (as providers of credit, as a form of self-insurance and as a means of sharing or pooling risk). According to international conventions, the value of this self-servicing is not separately itemized in national accounts and therefore cannot be identified as part of the economic benefits that livestock provide, which compromises the usefulness of these accounts for understanding the actual contribution of livestock to the economy. Table 2 provides an overview of the value of the different livestock services that are not attributed to livestock in GDP estimates.

The credit benefits of livestock derive from the ability of livestock owners to dispose of their animals for particular purposes at a time that they choose – their ability to 'cash in' on the value of their animals as needed. This flexibility gives livestock owners ready access to money without the need to borrow, and confers an additional financial benefit beyond the sale, slaughter or transfer value of their livestock. This additional financial benefit can be estimated as the opportunity cost of rural credit – what it would otherwise cost a livestock owner in rural areas to obtain funds comparable to those produced by liquidating a part of the herd. Employing this estimation, the additional finance value of a livestock holding is equivalent to the interest that the owners would be required to pay to obtain loans equal to the value of their livestock offtake. Rural interest rates are highly variable, but if we assume that inflation-adjusted interest rates on rural credit in Ethiopia are currently running at about 100% per annum, then the financial value of livestock offtake is identical to the annual value of offtake – in 2008-09, for example, about a 12.8 billion EB. financial benefit on top of 12.8 billion EB in direct offtake value.

Part of the insurance or security value of livestock comes from the ability of owners to liquidate their own herds in an emergency. In this instance, the level of security provided to a particular individual depends on the value of that individual's assets, so livestock ownership functions as a kind of self-insurance. The value of this form of asset-based insurance can be calculated as the annual cost that herd owners would need to pay to purchase insurance coverage equal to the capital value of their herd. Insurance coverage in rural Ethiopia costs about 10% of the value of the cover provided. At this level of premium payments, the self-insurance value of Ethiopian livestock in 2008-09 was about 8.6 billion EB or 10% of the capital value of the national herd.

For pastoralists in Ethiopia, the insurance value of livestock derives not only from their ability to liquidate their individual herds, but also from their ability to call upon assistance from fellow pastoralists in time of need. These collective insurance schemes are based on the gifting and loaning of livestock within pastoral communities, with large herd owners donating some of their animals and less well-off pastoralists drawing support in the form of livestock received as gifts or on loan. Recent research suggests that about 10.5% of pastoral animals in Ethiopia are involved in livestock sharing networks of this kind. Assuming that the total capital value of pastoral livestock in Ethiopia is 34.779 billion EB, the collective insurance value of pastoral herds can be estimated as 10.5% of this value or 3.652 billion EB in 2008-09.

According to internationally agreed conventions, national accounts do not separately itemize the value of transport services that producers supply for themselves. Although many rural households in Ethiopia use their own working animals to meet their transport and haulage needs, conventional national accounting ignores much of the benefit that households derive from animal power. In Ethiopia national-level economic data on the use of animal power does not exist. If one recent field study is any indication of the national situation, equine power may have produced as much as EB 19 billion in value added to the national economy in 2010. Even if it incorporates a large degree of error, the scale of this estimate suggests the need for a national survey of the contribution of animal power to the Ethiopian economy.

Table 2: Livelihood benefits derived from ruminant and equine livestock, 2008-09 in billion EB

Type of Benefit	Agricultural GDP	Services not in current GDP estimates
Value added livestock products (meat, milk, etc)	MOFED: 32.232 re-estimated: 47.687	
Traction power for ploughing		21.500
Benefit from financing		12.800
Benefit from self-insurance		8.600
Benefit from risk pooling/stock sharing		3.650
Transport and haulage by equines		18.959
Sub-totals	47.687	65.590
Total economic benefits	**113.196**	

Total economic benefits of livestock goods and services, now estimated at more than 113 billion EB, are more than three and a half times greater than the MOFED's original estimate of the value added from livestock in 2008-09. Of the roughly 80 billion EB increase in benefits, about 15 billion EB are derived from recalculating the value of livestock products, and the remaining 65 billion come from broadening the estimation to include livestock services.

Reassessment of the national importance of livestock sector exports

The bulk of Ethiopian livestock's contribution to the economy is not identified in conventional national accounts as coming from livestock. These distortions are particularly acute for highland livestock production systems in which animal energy for transport and dung for fuel are under-estimated but nonetheless as important as conventional milk and meat production. Ethiopian pastoralists are, on the other hand, specialized producers of meat, milk and live animals for sale. Provided their animals get into the computations at all, it might be hoped that the output of pastoral herds would be adequately represented in national accounts. This is not the case.

Pastoral output underpins almost all of Ethiopia's live animal and meat exports. Combined with hides, skins and leather exports (which are sourced primarily from highland animals) live animal and meat exports probably constitute about a fifth of all of Ethiopia's exports. Approximately half of these livestock sector exports are not recorded and not recognized by the National Bank of Ethiopia because they are produced by the cross border trade in live animals, which the government deems to be illegal and does not recognize.

The value of official livestock and meat exports has fluctuated widely over the decades, while official exports of hides, skins and leather have been both more stable and more valuable. For example, in the twenty-one year period from 1984 to 2004, hides and skins provided on average 90% of official livestock sector exports, livestock provided 6% and meat 4%. For a time in the 1990s, hides, skins and leather were Ethiopia's second largest export earner after coffee.

The current situation is depicted in Table 3 which gives the US dollar value and percentage export share of Ethiopia's major exports from 2002-03 to 2008-09.

Table 3: National Bank of Ethiopia estimates of the value in million US dollars and percentage of export share for major exports, 2002-2009

Commodity	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Coffee	165.26 34.2%	223.45 37.2%	335.37 39.6%	354.3 35.4%	424.2 35.8%	524.5 35.8%	375.9 26.0%
Leather, hides and skins	52.22 10.8%	43.59 7.3%	63.73 8.0%	75.0 7.5%	89.6 7.6%	99.2 6.8%	75.3 5.2%
Pulses	19.97 4.1%	22.58 3.8%	35.47 4.2%	37.0 3.7%	70.3 5.9%	143.6 9.8%	90.7 6.3%
Oilseeds	46.09 9.5%	82.66 13.8%	102.29 14.8%	211.4 21.1%	187.4 15.8%	218.8 14.9%	356.1 24.6%
Fruit and veg.	9.58 2.0%	12.72 2.1%	16.07 1.9%	13.2 1.3%	16.2 1.4%	12.8 0.9%	12.1 0.8%
Meat	2.42 0.5%	7.66 1.3%	14.59 1.7%	18.5 1.9%	15.5 1.3%	20.9 1.4%	26.6 1.8%
Live animals	0.481 0.1%	1.91 0.3%	12.82 1.5%	27.6 2.8%	36.8 3.1%	40.9 2.8%	52.7 3.6%
Chat	58.02 12.0%	88.02 14.7%	99.96 11.8%	89.1 8.9%	92.8 7.8%	108.3 7.4%	138.7 9.6%
Gold	42.08 8.7%	48.71 8.1%	52.50 7.0%	64.7 6.5%	97.0 8.2%	78.8 5.4%	97.8 6.8%
Flower	-	2.3 0.4%	7.8 0.9%	21.8 2.2%	63.6 5.4%	111.8 7.6%	130.7 9.0%
Others	86.66 18.0%	66.7 11.1%	73.0 8.6%	87.8 8.8%	91.8 7.7%	106.3 7.2%	91.3 6.3%
Total	**482.78 100%**	**600.45 100%**	**817.74 100%**	**1000.3 100%**	**1185.1 100%**	**1465.7 100%**	**1447.9 100%**
Livestock/ products share	11.4%	8.9%	11.2	12.2	12.0	11.0	10.6

Table 3 shows that the contribution of the livestock sector (live animals, meat and hides, skins and leather products) to exports has held steady at about 11% of the national total, with declines in the value of skins, hides and leather being offset by roughly comparable increases in live animal exports. By 2008-09 the position of hides, skins and leather exports had declined to the point where these constituted less than half of the livestock sector's contribution to official exports. From the perspective of the official figures in Table 3, livestock and their products make a regular but modest contribution to exports.

But the official figures do not tell the entire story. Table 4 takes two widely accepted estimates for the value of informal cross border livestock trade (US $106 million in 2002-03) and (US $250 million in 2008-09) and adds these estimates to official figures for the relevant years.

Table 4:Value (million US dollars) and percentage of export share for major exports, with and without the cross border livestock trade – 2002-03 and 2008-09

Commodity	2002-03 official	2002-03 cross border included	2008-09 official	2008-09 cross border included
Coffee	165.26 34.2%	165.26 28.1%	375.9 26.0%	375.9 22.1%
Leather, hides and skins	52.22 10.8%	52.22 8.9%	75.3 5.2%	75.3 4.4%
Pulses	19.97 4.1%	19.97 3.4%	90.7 6.3%	90.7 5.3%
Oilseeds	46.09 9.5%	46.09 7.8%	356.1 24.6%	356.1 21.0%
Fruit and veg.	9.58 2.0%	9.58 1.6%	12.1 0.8%	12.1 0.7%
Meat	2.42 0.5%	2.42 0.4%	26.6 1.8%	26.6 1.6%
Live animals	0.48 0.1%	106.48 18.1	52.7 3.6%	302.7 17.8
Chat	58.02 12.0%	58.02 9.9	138.7 9.6%	138.7 8.2%
Gold	42.08 8.7%	42.08 7.1%	97.8 6.8%	97.8 5.8%
Flower	-	-	130.7 9.0%	130.7 7.7%
Others	86.66 18.0%	86.66 14.7	91.3 6.3%	91.3 5.4%
Total	482.78 100%	588.78 100%	1447.9 100%	1697.9 100%
Livestock/ products share	11.4%	19.66%	10.6	23.8%

For the two years that it covers, Table 4 undoubtedly provides a more realistic estimation of Ethiopia's export situation than do the official figures alone. Including the cross border trade, live animals were the second most important national export by value in 2002-03, following coffee, and the third most important export in 2008-09, following coffee and oilseeds. The revised total value of livestock and their products now stands at about 20% of all national exports, up from 11% according to official calculations.

__Note:__ Data sources that substantiate the calculations in this briefing paper are given in the original reports: The Contribution of Livestock to the Economies of IGAD Member States (IGAD LPI Working Paper No. 02 - 10) by Roy Behnke and The Contribution of Livestock to the Ethiopian Economy - Part II (IGAD LPI Working Paper No. 02 - 11) by Roy Behnke and Fitaweke Metaferia.

As putatively illegal animals flow out of Ethiopia, equally illegal consumer goods purchased by the proceeds of animal sales flow back. Informal live animal exports do not produce foreign exchange or tax revenues. What the cross border trade does finance is the provision of internationally sourced commodities, presumably exactly the goods on which Ethiopian consumers would have spent their foreign exchange if the trade was legalized. All that has been lost is the paper trail that would link imported consumer goods to livestock production. What has suffered here is not the Ethiopian economy but rather, yet again, the recognition of the importance of livestock production to that economy.

Even including the cross-border trade, the vast bulk of Ethiopia's livestock output is consumed domestically. Household expenditure on livestock products was estimated in 2008-09 at 19 billion EB. Generous estimates of the total value of livestock sector exports places their value at slightly more than 4 billion EB in that year. Domestic consumption outweighs exports by a factor of nearly five to one.

Policy Recommendations

- To conform to international standards, MOFED must continue to estimate GDP according to established procedures. These conventional methods nonetheless do a poor job of capturing the full range of economic benefits provided by livestock to the Ethiopian national economy. In the interest of supporting more informed policies for livestock development, MOFED and the Ministry of Agriculture (MOA) should collaborate to supplement the standard national accounts with periodic estimations – possibly once or twice a decade - of the value of those livestock goods and services that are underestimated in national accounts.
- With the support of MOFED and MOA, the CSA should undertake a national survey of the value of animal power to the economy and of the role of animal power in sustaining both rural and urban livelihoods. This survey 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 agricultural 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.
- Ethiopia needs to recognize the central contribution of the informal cross border livestock trade to national exports. As a regional organization committed to supporting regional trade, IGAD is well positioned to discuss this issue with government, and should continue to do so.
- The document above indicated that there is extensive policy bias against livestock production and marketing and that the creation of an enabling environment in support of livestock's broader functions would strengthen national and household economies, and be of particular benefit to the poor.

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