

# ETHIOPIA

## Strategy Support Program



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SYNOPSIS OF [ESSP WORKING PAPER 101](#)

### ***Synopsis:* An assessment of the livestock economy in mixed crop-livestock production systems in Ethiopia**

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The livestock sub-sector has contributed little to the remarkable economic growth recorded in Ethiopia in the last decade. In an effort to stimulate livestock production, the Ethiopian government has recently recognized livestock as an important strategic sub-sector in which to invest. Unlike most studies that focus purely on aspects of livestock production, this study provides a detailed descriptive assessment of the livestock production and marketing behavior of smallholder mixed crop-livestock farmers.

The study uses data from the Agricultural Growth Program baseline survey of farm households in districts of Ethiopia with high potential in grain crops production, areas which have a significant share of the livestock in the country. Smallholder livestock production is characterized by low levels of livestock ownership, limited market orientation, and low productivity. These characteristics restrict the capacity of these livestock systems from taking advantage of emerging opportunities in both domestic and export livestock markets. We find a high degree of heterogeneity in access to livestock assets, production practices, marketing, and livelihood strategies among the farm households studied. Hence, a single policy recommendation might not work for all farmers.

Our assessment appraises the current status of livestock production systems in Ethiopia and highlights potential income sources from livestock, including positive synergies between these income sources to help reduce poverty and to promote economic growth in rural communities.

#### INTRODUCTION

Growth in agriculture in Ethiopia has been significant over the last decade, benefitting from a greater emphasis in government policy on development of the sector. Such policies targeted rural poverty and aimed to increase smallholder farmers' productivity. In parallel, the Ethiopian government made large investments in rural infrastructure, education, and other social services. Within agriculture, the livestock sub-sector is the least developed. Most growth in agriculture between 2003/04 and 2013/14 is due to growth in crop production, with growth in livestock output lagging behind. Despite the relatively poor performance of the sub-sector, Ethiopia has considerable potential in livestock production. The cattle population in Ethiopia is the largest in Africa and the fifth largest in the world. Ethiopia also is endowed with some of the largest numbers of other livestock.

This study documents livestock production and productivity in Ethiopia to fill knowledge gaps on the potentials and constraints in the sub-sector. This information can inform the design of effective rural development interventions around livestock.

#### DATA AND METHODS

This study uses data collected in the Agricultural Growth Program (AGP) baseline survey fielded in May 2011. The AGP operates in woredas (districts) with high potential for the production of grain crops within four regions of the country – Tigray, Amhara, Oromia, and Southern Nations, Nationalities, and Peoples (SNNP). The four regions account for a large majority of households engaged in mixed crop-livestock production and for a large majority of the livestock population of Ethiopia.

The study mainly uses descriptive analyses. In addition to simple averages, the study employs methods appropriate to measure levels of commercialization and input intensification in crop and livestock production; gross commercial sales and slaughter (off-take), purchases (intake), and net commercial off-take rates of livestock; and diversification of income sources and income inequality. The paper discusses the results of these analyses across regions, gender of household heads, and across income, land, and livestock ownership. This synopsis mostly focuses on the results for the aggregate sample.

#### RESULTS

##### Smallholder livestock systems characteristics

On average, 92 percent of farm households own at least one animal (Table 1). The proportion and number of livestock owned vary across livestock species considered. Moreover, patterns of livestock ownership vary across regions, gender of household head, and distribution of income and land. A larger proportion (82 percent) own cattle, while less than half of the households own all other livestock types except chickens (54 percent). An average household owned 3.8 cattle, 1.8 sheep, 0.7 goats, 2.8 chickens, and 0.7 of either a horse, mule, donkey, or camel (only 70 percent of households owned at least one).

Measured in terms of tropical livestock units (TLU), which normalizes households' livestock holdings in camel units<sup>1</sup>, cattle accounted for 74 percent of the livestock owned by households (Figure 1). Notably, the contribution of chickens to total TLU holdings is twice as high in female-headed households as for male-headed households. However, female-headed households generally have more limited access to all livestock species.

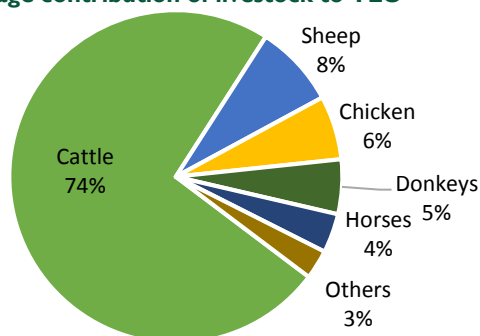
<sup>1</sup> TLU is calculated as: TLU = camels + (0.7\*cattle) + (0.8\*horses) + (0.5\*donkeys) + (0.5\*mules) + (0.1\*sheep) + (0.1\*goats) + (0.01\*chickens).

**Table 1: Livestock types and ownership (percentage)**

Livestock type	Households that own livestock (%)	Number owned (headcount)	Number owned (TLU)
All	92	--	3.3
Cattle	82	3.8	2.7
Sheep	40	1.8	0.2
Goats	17	0.7	0.1
Chicken	54	2.8	0.03
Horses	14	0.3	0.2
Mules	2	0.0	0.0
Donkeys	26	0.4	0.2
Camels	0.2	0.0	0.0

Source: Authors' computation using the AGP baseline dataset (2011)

A significant proportion of households neither own sufficient cattle stock nor have reproductive capacity in their herd for replenishing their stock of cattle. This has important implications on access to milk and milk products and, thereby, on the nutritional status of children, as well as on access to oxen for drafting purposes and, therefore, on crop productivity. An average household owns less than one calf, bull, or heifer, and the average holding of cows and oxen is one head per species per household. In general, the size of holdings of different cattle species is too low for sustainable breeding and to provide an adequate supply of draft oxen.

**Figure 1: Average contribution of livestock to TLU**

Source: Authors' computation using the AGP baseline dataset (2011).

## Livestock technical performance parameters

We consider three important technical parameters: **annual calving rate**, **annual death rate**, and **annual herd or flock growth rate**.

The average annual calving rate of cattle is 46.5 percent for the whole sample. Breeding potential increases with an increase in the number of livestock a household owns. In general, the annual calving rates are low relative to rates seen elsewhere in Africa.

High annual death rates of 20 percent and above are observed for small ruminants and calves, while death rates were 11 percent in cows, 10 percent in bulls, and 8 percent in heifers. We observe a generally high death rate in our sample, which declines with livestock ownership in almost all species. National statistics indicate that, out of the cattle that died in 2010/11, 84 percent were afflicted by a disease. Better livestock management and veterinary services provision could reduce these death rates.

Annual herd and flock growth rates were negative in all livestock species, except for calves.

## Livestock market participation

The study characterizes farm households in terms of the **frequency** and **intensity** of their transactions in livestock markets. We also examine dairy production and sales.

## Frequencies of participation

The frequency of household livestock sales ranged from 1.8 percent in calves to 13.7 percent in sheep. The proportion of households that sold all types of livestock generally increases with land and income. Farm households are more likely to slaughter goats and sheep than cattle. The proportion of households that slaughtered all livestock types generally increases with income, land, and livestock herd size. Households purchase livestock for breeding, draught use, or for consumption. The proportion of households that purchased calves and oxen was the lowest and highest, respectively.

## Intensity of participation

The highest sales off-take rate is observed in sheep at 15 percent, followed by goats at 13 percent, and 11 percent for oxen. Off-take rates of all livestock types mostly increase with land size and per capita income. Households with larger herds sell a lower proportion of their livestock than households with smaller herds. The highest commercial intake rate is observed for oxen (9.5 percent), followed by sheep (8 percent) and goats (6 percent). These generally increase with land size. Net commercial off-take of most livestock types generally increases with household income. Rates for heifers, cows, sheep, and goats increase with landholding size.

## Milk production, consumption, and sales

Average productivity of livestock measured in terms of meat and milk yield per animal as well as per capita livestock product consumption in Ethiopia has remained low compared to other east African countries over the last few decades. There is some variation across regions in per capita milk production and consumption. SNNP has the highest production of milk per cow as well as the highest consumption of milk per household and per capita. Milk output per household and per capita generally increase with land size. Almost all of the milk produced is either consumed (38 percent) or processed into other products (61 percent). However, milk sales accounts for less than one percent of the milk produced.

## Households' participation in different income generating activities

The survey results indicate that an average household is engaged in about two income-generating activities. A large majority of households engage in crop production (91 percent). About 67 percent of the households participated in livestock production, 28 percent generated income from wage employment, and 23 percent from business (non-farm) activities.

Per capita annual income averaged just over 1000 Birr. Female-headed households earn lower income per capita and participate in fewer income-generating activities as well as have fewer assets. As expected, income from crop and livestock production increases with land and livestock herd size.

The share of livestock income increases with livestock herd size, although this pattern is not observed with income and land size. The share of off-farm wage income in total income uniformly declines across land, income, and livestock herd size, indicating the importance of this income source for households endowed with few agricultural assets. The share of non-farm (business) income generally declines with an increase in livestock holdings. There are strong correlations between type and number of income generating activities, age of household head, and land and livestock assets, such that younger household heads with smaller land holding resort to alternative income sources.

The overall *income diversification index* is lower for female headed households, differing slightly across regions. Poorest

households have the least diversified income sources, indicating the importance of income diversification in reducing poverty.

## Market orientation of crop and livestock production

We find generally low levels of crop commercialization, based on an *input* and *output commercialization indices*. Although smallholder farmers are characterized by low levels of commercial crop output, there is variation across households. We find a positive correlation between households' level of commercialization and resource endowment and welfare. The results suggests that farm households follow a less intensive crop production strategy as their income increases.

The *livestock input commercialization index* indicates that households' use of purchased inputs in livestock production generally increases with land and livestock herd size, while it first decreases and then increases with income size.

## Role of income sources in income risk and inequality reduction

Income diversification reduces the risk of total income decreases. All income sources are positively and significantly correlated with per capita total income. Livestock income is positively correlated with crop income. However, off-farm and non-farm income are not correlated with both crop and livestock income, suggesting that the former income sources are not related to decreasing risk in total income due to decreases in crop income or livestock income.

Per capita total income is highly unequally distributed among smallholder farmers. The highest correlation between the inequalities of individual income source and per capita total income is observed for crop income, while the lowest correlation coefficient is observed for livestock income. In general, increases in livestock and off-farm income results in increases in income and decreases in income inequality, while crop and non-farm income are activities that increase inequality, indicating that crop and non-farm incomes favor the rich more than the poor.

## CONCLUSIONS AND POLICY IMPLICATIONS

Despite the rapid growth in Ethiopia in domestic and export demand for live animals and animal products and the considerable potential for livestock production, growth in livestock production

was slower and the importance of livestock outputs in agriculture declined throughout the 2004/05 to 2013/14 period.

This study finds that a low proportion of households have access to most livestock species and that the average livestock holding also is small. Livestock production is characterized by low productivity with low calving rates and high mortality rates, such that annual growth rates are negative in almost all livestock species. Milk productivity averaged less than half a liter per cow per day. Less than one percent of milk produced is sold. Net commercial off-take rates of livestock is low because sales off-take rates are low, on-farm slaughter is negligible, and farmers' purchases of different livestock species accounted for at least half of total sales. Moreover, this limited market orientation with livestock means that farmers' capacity to take advantage of emerging livestock market opportunities is limited. However, the same results also imply that there is a room for improving the productivity of smallholder livestock production by increasing calving rates or by reducing mortality rates and by improving farmers' market orientation.

These descriptive analyses indicate the existence of a high degree of heterogeneity in access to livestock assets, production practices, and marketing and livelihood strategies among the households studied. This finding implies that a single blanket policy recommendation might not work for all farmers. The data also indicate that a limited number of farm households generate their livelihood from off-farm and non-farm activities. While the share of off-farm and non-farm income sources in total income of an average household is low, the share of income from these sources is considerably higher for households with few agricultural assets. This fact highlights the need for rural and agricultural development strategies that promote non-farm and off-farm employment opportunities, and the importance of exploiting the positive synergies between the means of livelihoods for different households.

## REFERENCES

Refer to [ESSP Working Paper 101](#) for a full list of references used in this study.

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