

Total Economic Valuation of Agro-pastoral and Pastoral Systems of Ethiopia

INTRODUCTION

In Ethiopia, two extensive livestock production systems, agro-pastoral and pastoral, are prevalent in the lowland (lower altitude) part of the country which covers an estimated area of 572,556 Km². The two systems remain the main source of live animal and meat for both export and domestic consumption.

Pastoralism¹ is a livelihood and production system as practiced on communal land, involving livestock rearing and benefiting from other non-livestock products and services of their land.

Table 1: Land Use of Pastoral & Agro-pastoral Areas in Ethiopia

Land cover type	Area, Km ²	%
Barren or sparse vegetation	56,848	9.93
Open and closed shrub land	348,356	60.84
Cropland	25,230	4.41
Forest	8,757	1.53
Grasslands	97,377	17.01
Water bodies & wetlands	79	0.01
Savanna	14,914	2.60
Woody savanna	20,995	3.67
Total area	572,556	100%

Source: ICPALD, 2020

Pastoralism in Ethiopia entails huge capital assets of social, economic and environmental importance for both the households and the country. This capital stock can be measured by quantifying goods and services, which include livestock

production – generated in the pastoral land and water bodies that contain the different ecosystems.

However, pastoral land is gradually degrading, productivity is declining, and the government is contemplating policy shifts to alternative land use.

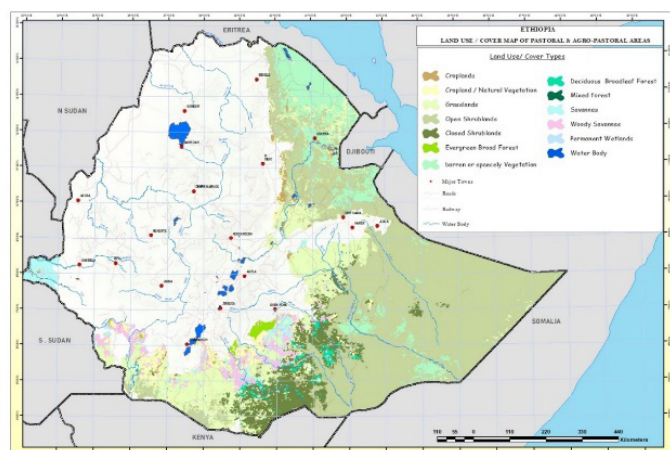


Figure 1: Lowland Agro-pastoral & Pastoral Areas of Ethiopia

It has been widely documented that pastoralism is under-valued due to lack of empirical evidence. As a result, and for a long time, it lacked supportive public policy, appropriate investments and led organization to coordinate its endeavour for sustainable use. Many have continued to view pastoralism as being backward, conflict-prone, destructive to the environment, and holds back the country from developing a modern livestock sector. These are myths. No evidence has been produced to back these allegations. This has in turn had a direct impact on policy.

We need to monetise the benefits of pastoral and agro-pastoral systems and provide good evidence for policy decision. As such, it is important to extend the concept of pastoralism's economic benefits beyond the value of livestock and livestock products

¹ Jenet, A., et al. 2016. The path to greener pastures. Pastoralism, the backbone of the world's drylands. Technical Report. VSF-International. Brussels, Belgium.

by including any “values” associated with the land – direct and indirect benefits.

APPROACH: AN INTEGRATED BIO-ECONOMIC MODELLING

A framework dubbed Total Economic Valuation (TEV) was applied to generate more comprehensive information about values and benefits of pastoralism its overall contribution to household, society, the national economy and the environment. Then an integrated bio-economic model was adopted to provide the evidence.

First, using a herd growth model, the required livestock data to calculate TEV was obtained over a period of 20-years. Estimates obtained included outputs from animal production including live animals off-take (and its meat equivalents), milk, manure and draught power production. Thereafter, an economic model was used to compute TEV based on capital budgeting approach where stream of current and future costs and benefits were reduced to a comparable present worth using the process of discounting. Thus this TEV of pastoralism takes into account the growth dynamics of livestock population and its long-term production².

In terms of animal species, TEV considered cattle, camels, goats and sheep. Equine and poultry were omitted because there was no sufficient data. It is important to note that, agro-pastoralists also cultivate land for cropping and generate benefits. However, this was not accounted for.

LIVESTOCK POPULATION

Livestock population of pastoral and agro-pastoral systems represent large numbers in Ethiopia. In 2019, the estimated population of cattle was 14.1 million, camels 4.5 million, goats 20.4 million and sheep 15.7 million. This constituted 23, 100, 62 and 50 percent of the national livestock population, respectively.

Table 2: Livestock Population of Pastoral and Agro-pastoral Areas in Ethiopia

Livestock Species	Sub-system	Population	%
Cattle	Agro-pastoral	5,807,145	41.2
	Pastoral	8,273,155	58.8
	Total	14,080,300	23%
	National	60,392,019	
Camels	Agro-pastoral	1,245,604	27.6
	Pastoral	3,264,000	72.4
	Total	4,509,604	100%
	National	4,509,604	
Goats	Agro-pastoral	7,051,256	34.7
	Pastoral	13,288,493	65.3
	Total	20,339,748	62%
	National	32,738,385	
Sheep	Agro-pastoral	3,305,784	21.1
	Pastoral	12,381,229	78.9
	Total	15,687,013	50%
	National	31,302,257	

Source: ICPALD 2020

Sixty-five percent of the livestock population is located in the pastoral production system while 35 percent is in the agro-pastoral system.

VALUE OF LIVESTOCK ASSET

Livestock is the main capital stock for pastoralists and agro-pastoralists. The monetary value of livestock asset (cattle, camels, goats and sheep) in pastoral and agro-pastoral systems in 2019 is estimated at ETB 256.0 Billion (\$US 8.5 Billion). Cattle account for almost 50 percent followed by camels which stand at 19 percent. Goats and sheep together account for 31 percent of the monetary value of livestock assets. The livestock assets as capital stock support household investment, saving and cushioning pastoralists’ risks and financial emergency needs.

² ICPALD (2020): Total Economic Valuation of Pastoralism in Ethiopia. Technical report. IGAD Regional Pastoral Livelihoods Resilience Project (RPLRP). Nairobi, Kenya.

Table 3: Monetary Value of Livestock Assets in Agro-pastoral and Pastoral Areas, Based on 2019 Market Price

Livestock species	Annual Economic Value (10 ⁹ US \$)		
	Agro-pastoral	Pastoral	Total
Cattle	1.71	2.44	4.15
Camels	0.45	1.20	1.65
Goats	0.52	0.95	1.47
Sheep	0.26	0.95	1.21
TOTAL	2.94	5.54	8.48
Percent	35%	65%	

NB: Exchange rate 1 US \$ to 30.18 ETB on 20th November 2019 is used

Source: ICPALD 2020

VOLUME OF LIVESTOCK PRODUCTS

Pastoral and agro-pastoral systems provide significant live animal off-take for both subsistence consumptions and commercial sales. The aggregate annual live-animal equivalent off-take is estimated at 958,490 heads of cattle, 238,917 heads of camels, 2,787,661 heads of goats and 1,021,601 heads of sheep. The annual raw milk production from cows is estimated to be 701.2 million litres while the corresponding figures for camels and goats stand at 967.8 and 130.9 million litres, respectively. The annual manure production is estimated at 62 billion tons, while the quantity of draft power supply is estimated at 17.8 million oxen days (ICPALD, 2020).

ANNUAL MONETARY VALUE OF LIVESTOCK PRODUCTS

The total annual monetary value addition by agro-pastoral and pastoral systems due to live animal off-take for subsistence consumptions and commercial sales was estimated at ETB 23.13 billion (\$US 0.77 billion) in 2019 market prices. In terms of the livestock species considered, cattle, camels, goats and sheep accounted for 38, 14, 23, and 25 percent, respectively.

Additionally, milk off-take for subsistence consumption and commercial sales estimated at ETB 46.89 billion (\$US 1.55 billion) in 2019 market prices. Cattle, camels and goats accounted for 21, 50 and 29 percent, respectively.

The annual economic value addition due to manure was estimated at ETB 12.59 billion (US\$ 0.42 billion) while for draught power was estimated at ETB 0.68 billion (US\$ 0.02 billion).

It is important to note that the above economic value estimation of livestock and livestock products was based on farm gate prices. It does not include value addition along the chain.

VALUE OF COMPLEMENTARY PRODUCTS

There are non-livestock products and services generated by the pastoral and agro-pastoral systems, complementing livestock production. For example, agro-pastoral and pastoral areas of Ethiopia harbour about 1.2 million hectares of dry forest with corresponding annual gum and resins production of 31,850 tons³. The potential annual farm-gate value from the gum and resin was estimated at ETB 8.76 Billion (US\$ 0.29 Billion).

The pastoralist area is also a tourist attraction site rich with national parks and sites of archaeological, geological and culture importance. The annual economic value of tourism from pastoralist areas was estimated at ETB 48.00 Billion (US\$ 1.59 Billion).

Table 4: Total Economic Value of Pastoral and Agro-pastoral Systems in Ethiopia

Categories		Value (US \$ Billion)
A. Livestock asset, 2019 market price		8.48
B. Livestock products	Value (US \$ Billion/Year)	Percent (%)
Live animal off-take	0.77	28%
Milk	1.55	56%
Manure	0.42	15%
Draught power	0.02	1%
Sub-total	2.76	100%
C. Some complementary products/services		
Honey	1.03	12%
Tourism	1.27	15%
Gum and resin	0.23	3%
Carbon sequestration	5.8	70%
Sub-total	8.33	100

NB: Exchange rate of 1 USD to 30.18 ETB for the date of November 20, 2019 is used

³ Alemu and Worku, 2017. Baseline study: sustainable production of myrrh in pharmaceutical quality from Ethiopia". Biodiversity and Forestry Program. GIZ. Addis Ababa. Ethiopia.

Pastoralism in Ethiopia, 2020.

Furthermore, the different land cover within pastoral and agro-pastoral systems is an important carbon sink. The annual potential monetary value of climate regulating services through carbon sequestration was estimated at ETB 173.8 Billion (US\$ 5.8 Billion).

Beekeeping is another complementary activity in the region. Honey production potential of the same was estimated at ETB 39.06 Billion (US\$ 1.29 Billion).

CONCLUSION

The evidence presented above indicates that pastoralism in Ethiopia is a multi-billion-dollar economy. It represents a significant source of wealth to individuals, households and the national economy. The results provide useful information for decision makers, planners, investors and other relevant stakeholders working on pastoralism.

However, this total economic value is by no means a complete picture of the value of pastoralism in Ethiopia. There are many gaps as far as data availability goes. Moving forward, future work should focus on enhancing data quality and information collection.

Additional work needs to be considered to include other ecosystem goods and services such as household wood consumption, bush meat, traditional medicinal and veterinary services, and crop farming in agro-pastoral areas. There is also need for data refining in the areas of tourism, beekeeping and carbon sequestration services.

POLICY RECOMMENDATIONS

The following are policy recommendations:

- Livestock production by pastoral and agro-pastoral in lowland Ethiopia generates tremendous wealth and income, to both the households and the national economy. The wise policy will be a strategic move to buffer livestock assets from natural calamities such as drought and animal disease epidemics, through micro insurance and other risk transfer schemes.
- Camel is one of the most neglected species yet it is a very important animal in the drylands. The Ethiopian Government needs to strengthen support for camel husbandry, disease control, value addition, research and trade.
- Application of Geographic Information System (GIS) might aid spatial depiction of total economic values and by so doing, support policy and investment choices.
- This baseline total economic value of pastoralism gives an indication for opportunity costs of changes in pastoral and agro-pastoral land uses.
- Policy moves that encourages land use changes in pastoral and agro-pastoral systems will undermine resilience building.
- Complementary products and services associated with pastoralism such as carbon sequestration services, tourism, gum and resins, honey production, etc need policy attention for sustainable production and use.
- Pastoralism supplies goods and raw materials along supply chains, such as butcheries, tanneries, restaurant operators, traders and transporters. These value addition benefits by pastoral and agro-pastoral systems need further research to fully capture the total economic value of pastoralism in Ethiopia.

Further Reading

ICPALD (2020): Total Economic Valuation of Pastoralism in Ethiopia. Technical Report. IGAD Regional Pastoral Livelihoods Resilience Project (RPLRP). Nairobi, Kenya.

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