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The Tendency of Livestock Growth in Ethiopia: A Review

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ABSTRACT

Ethiopia ranks first in Africa and 5th in the globe in its livestock population. The livestock subsector is immensely contributing about 60-70% to the population's livelihood and about 80% of the farmers use animal traction to plough their croplands. This study involved gathering livestock-based data from the Central Statistical Agency (CSA) for the years 2004/05 to 2018/19. Additionally, information on livestock holders was systematically organized and analyzed to track progress over the years. Quantifiable values indicating increases were presented in tables and figures. The relationship between cattle numbers and livestock owners' growth trends was tested using the Pearson correlation. The findings were further supported or challenged through a comprehensive literature review. The data show that the cattle population grew by 57% in 2018/19 than the number it was at the end of 2004/05 and the number of cattle owners increased by about 53%. Likewise, the total number of sheep population grew by 82.69% and their holders by 53%, the total goat heads grew by 162.2% and the camel population by 284%. From the total stock of cattle, 97.92% and 99.72% of sheep and all the goats and camels were identified as indigenous, respectively. The study found a significant and strong correlation ($p<0.01$) between the number of animals used for production and the number of holders. This suggests that the growth in livestock population is primarily due to an increased number of livestock owners, rather than an increase in the number of animals per holder. The work identifies bottlenecks in livestock development and provides insights into growth trends and underlying causes. It highlights opportunities for policy interventions to enhance sustainable livestock production. Further research is recommended on addressing feed and water shortages and evaluating policy and institutional setup effectiveness.

Key words: Cattle, Growth, Holders, Policy, Sheep, Size, Stock.

Ethiopia is believed to have the largest livestock population in Africa and fifth in the world (CSA, 2022). There are 61.5 million cattle, 33 million sheep, 38.9 million goats, 1.76 million camelsand over 59.4 million poultry (CSA, 2022). The country has about 14 million livestock-keeping households (CSA, 2022; FAO, 2018). The livestock subsector contributes to the livelihoods of about 60-70% of the Ethiopian population. Livestock provides food in the form of meat, milk, eggsand honey and non-food products like draught power for crop cultivation, transporting goods and people, source of foreign exchange earnings, input to agro-processing industriesand manure for crops and fuel for cooking (FAO, 2018). The subsector accounted for about 10% of Ethiopia's export income in 2015/16 (Bachewe *et al.,* 2018). In the pastoral management system of the country, livestock provides milk as a means of subsistence and cash to cover family expenses for food grainsand other essential consumer goods (Behnke and Metaferia, 2013; Asresie *et al.,* 2015). The livestock serves as hedges/ insurance against risk and disaster for those beyond the reach of banking institutions and the source of social respect and recognition (Shapiro *et al.,* 2017) that determine social status within the community. About 80% of Ethiopian farmers use animal traction to plough their fields. Furthermore, 26.4% of the value of annual crop production and 31% of the total gross value of livestock output is due to the value of the animal draught power (Behnke and Metaferia, 2011).

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Nevertheless, the livestock subsector's contribution to the rapid economic growth in the last decade was reported as insignificant (Bachewe *et al.,* 2018). This is despite the large stock of livestock in the country. Low genetic productivity of the animals, poor husbandry, seasonal shortage of animal feeds and their poor management, poor animal health services, inadequate extension, *etc.* are factors contributing for factors for the subsector's little contribution to the country's economic growth (Asresie *et al.,* 2015). On the other hand, there is an increasing human population and improved living standards in the country that demand more animal products. To cope with these two recently emerging phenomena, there must be a corresponding increase in livestock products that can be possible through increased number and productivity. Understanding the livestock growth trends and the causes behind along with the available

opportunities and constraints is very timely to indicate where the potential remains to transform livestock production and productivity. Furthermore, the information is useful for guiding and formulating proper development policies, strategiesand plans for enhancing the production of livestock products. The objective of this work is to evaluate the growth trends of livestock and livestock holders by analyzing 15 years of CSA data (2004/05-2018/19), providing valuable information for evidence-based decision-making in livestock policy development.

The information shown here is based on livestock-based CSA gathered data from 2004/05 to 2018/19. These CSA yearly reported data were imported to Microsoft Excel, organizedand calculated. These meticulously gathered and organized figures were methodically analyzed to provide growth patterns for each livestock species. Similarly, the livestock holders' information was systematically organized and scrutinized for yearly available progress in line with each livestock species. All of the quantifiable values in this document that have an increasing value (whether expressed in terms of number or percentage) reflect changes that have occurred between the years 2004/05 and 2018/19 and their values are presented in the form of tables or figures. The relationship between the number of cattle and the growth trends of livestock owners was tested using the Pearson correlation. Furthermore, a thorough literature review was carried out to either support or argue the findings obtained through analyzing the CSA data from 2004-2019.

Progresses in livestock sizes

The data show that all the species of the cattle population in the country have shown an increasing tendency. The cattle stock has grown from 38,749,310 head in 2004/05 to 61,510,258 head in 2018/19 (by a 58.7% increase) with an average yearly increase of 3.4%. In a similar vein, the number of sheep increased from 18,074,721 to 33,020,392 (82.7% increase), the goats from 14,858,646 to 38,963,879 (162.2% increase) and the camels from 458,576 to 1,760,870 (284% increase) (Table 1). On average, the sheep, goat and camel, have recorded 4.6%, 7.3% and 12.3% growth, respectively. The overall livestock growth notion was documented as attributed to an increased number of holds, without considerable productivity progress (Shapiro *et al.,* 2017; Bachewe *et al.,* 2018). The analysis indicated the goat heads grew from 14.85 to 39 million (162.2% increase, with 10.8% mean annual growth). The sheep population in Ethiopia was about 33 million in 2019 and the sheep heads grew from 18 to 33 million (82.69% increase, with an annual mean 6% increase). The trend analysis indicated that the camel population increased from 458,576 to 1,760,870 (284% increase) and the chicken from 30.9 million to 59.4 million (92.5% increase) at the end of the analysis year (Table 1).

Livestock population growth trends from regional perspectives

The Oromia region has the most cattle overall, followed by the Amhara and SNNP regions. These three regions together make up around 87% of the nation's entire cattle stock. However, some regions showed fast progress in the cattle population. For instance, there were over 100% changes in cattle population from 2004/05 to 2018/19 in Afar, Benshangul Gumz (B/Gumz) and Harari regional states and considerable changes in Amhara and SNNP regions. In terms of sheep, Oromia, Amhara and SNNP

Table 1: Livestock population growth trends over 2004/05-2018/19.

Years	Livestock types				
	Cattle	Sheep	Goat	Camel	Poultry
2004/05	38,749,310	18,074,721	14,858,646	458,576	30,868,525
2005/06	40,380,098	20,733,913	16,364,048	437,606	32,222,477
2006/07	43,124,582	23,633,010	18,559,730	616,396	34,199,484
2007/08	47,570,675	26,117,272	21,709,428	1,009,040	39,563,902
2008/09	49,297,898	25,017,218	21,884,222	759,696	38,127,504
2009/10	50,884,005	25,979,919	21,960,706	807,581	42,053,263
2010/11	53,382,194	25,509,004	22,786,946	1,102,119	49,286,932
2011/12	52,093,652	24,178,318	22,566,057	979,318	44,893,009
2012/13	53,990,061	25,489,204	24,060,792	915,518	50,377,142
2013/14	55,027,280	27,347,933	28,163,332	1,098,312	51,350,738
2014/15	56,706,389	29,332,382	29,112,963	1,164,106	56,866,719
2015/16	57,829,953	28,892,380	29,704,958	1,228,023	60,505,327
2016/17	59,486,667	30,697,942	30,200,226	1,209,321	59,495,026
2017/18	60,392,019	31,302,257	32,738,385	1,418,457	56,056,778
20018/19	61,510,258	33,020,392	38,963,879	1,760,870	59,420,092
% change of 2018/19/2004/05	58.7	82.7	162.2	284	92.2

Source: computed in this study from CSA, 2004/05-2018/19 data on sheep.

regions have shown very positive signs of progress. Afar, Somali, Gambella, SNNP and Tigray regional states have registered significant improvement in goat number at the end of 2018/19 than they were in 2004/05. In terms of changes in poultry, Oromiaand Amhara regions have made considerable progress (Table 2). These changes in the livestock population across the regional states might spring from recent attention compelled by market demand for livestock and livestock products following a rise in human population and improved income (Shapiro *et al.,* 2017; Sewunet, 2015) and probably due to an increased number of holders as new entrants to the business. Increased demand for livestock products offers chances for producers to use livestock as a pathway out of poverty and food insecurity (Kebebe 2019).

Progresses in improved livestock species

The significance of creating an understanding of the status and progress of improved livestock in terms of formulating policies and developing appropriate development plans is immense. It was with this perspective that this study analyzed the progress and status of genetically improved livestock species in the country. Genetic improvement of indigenous breeds through crossbreeding with improved bulls to enhance the productivity of local cows was started more than 40 years ago (Gebreyohanes *et al.,* 2021). According to this analysis, there was very slow progress in a general number of improved livestock in the country. So far, about 2.08% of cattle and 14% of the chickens were registered improved at the end of the analysis period. Almost all sheep, camels and goats were assessed as indigenous (CSA, 2019). The fast changes in improved chicken might be due to the sector's demand for a relatively small capital investment and small land to serve as employment and entrepreneurship opportunities particularly attractive for young people and women (FAO, 2019; Wodajo *et al.,* 2020). However, the steady progress of improved livestock numbers and the prevalence of under-improved stock that are with low productivity genetic makeup indicates a lack of policy and technology support (Ashley, 2019; Jemberu, 2014; Kebebe, 2019; Bachewe, *et al.,* 2018; Gebreyohanes, *et al.,* 2021).

Trends in livestock utilization

The total number of livestock utilized to produce products was also analyzed to understand if the trends go in line with

Table 2: Livestock population progress by region (from 2004/05-2018/19).

Regional states	% Change 2004/05 to 2018/19			
	Cattle	Sheep	Goat	Poultry
Tigray	78.73	6.91	102.55	3.60
Afar	447.25	13.55	1,961.94	0.10
Amhara	69.24	29.23	65.92	9.91
Oromia	42.37	29.61	87.31	12.89
Somale	28.23	4.12	334.18	0.13
B/Gumz	103.48	0.44	114.38	0.54
SNNP	55.25	15.79	123.41	5.40
Gambella	36.70	0.12	143.87	0.20
Harari	120.39	0.02	202.75	0.05
Dire Dawa	27.30	0.21	56.61	0.07

Source: computed in this study from CSA, 2018/19 data.

Table 3: Trends in the number of livestock used for meat and milk production.

Years	Cattle used for		Sheep used	Used goats		Used camels for	
	Meat	Milk	for meat	Milk	Meat	Milk	Meat
2004/05	267,572	5,896,408	9,422,526	510000	4070000	137,830	7,516
2005/06	290,425	6,221,593	10,606,449	490000	3940000	129,583	5,256
2006/07	308,900	6,314,638	12,366,280	580000	4660000	207,996	4,907
2007/08	393,744	7,198,027	13,778,918	700000	5630000	346,494	48,251
2008/09	415,260	7,022,004	13,704,648	680000	5440000	272,023	29,864
2009/10	332,130	6,727,303	14,325,360	660000	5280000	239,708	11,181
2010/11	463,918	7,447,238	13,581,234	710000	5640000	365,939	25,897
2011/12	497,471	7,172,478	13,052,365	870000	6980000	227,786	44,862
2012/13	437,968	6,747,005	13,456,639	670000	5340000	281,852	15,872
2013/14	424,377	6,675,466	14,430,527	980000	7840000	265,439	21,917
2014/15	445,407	6,497,362	15,250,263	850000	6760000	306,940	22,607
2015/16	510,483	6,742,217	14,979,952	1280000	10230000	316,999	12,209
2016/17	477,265	7,155,114	15,964,599	1260000	10070000	279,999	23,060
2017/18	486,753	6,659,362	16,343,456	890000	7130000	294,071	26,275
2018/19	570,877	7,090,619	17,715,589	2360000	18860000	658,409	27,338
% Changes from 2004/05 -2018/19	113	20	88	0.92	120.2	377.7	263.7

Source: computed in this study from CSA, 2004/05-2018/19 data.

the livestock population. Accordingly, the number of cattle used for milk and meat production indicated a significant increase from 267,572 and 5,896,408 to 570,877 (113% increase) and 7,090,619 (20% increase), respectively (CSA, 2004-2019). Even if there is an increase in the number of milking cows and cow milk remains the sole source of milk accounting for over 92% of the total milk, only a 20% change has been recorded in cattle milk output and this is in line with numerous research findings (Bachewe *et al.,* 2018; Mihret *et al.,* 2017; Kebebe, 2019; Yimam *et al.,* 2021).

The number of goats used for milk production has increased by 363.3%. However, the national goat milk share is very low and constitutes only about 5% of the total milk at the end of the analysis year. According to different sources (Hagos, 2017; Mestawet *et al.,* 2012), goats contribute over 10% of milk production and milk consumption. The number of milking camels increased by 377.7% and the milk output by 157.3% despite the worthy progress of contributions of camels to the total milk production still did not exceed 10% (maximum 8.5%).

Similar to the progress in the number of milking livestock, the number of livestock reared for meat purposes has increased (Table 3). Goat's contribution to the total meat production of the country has increased from 13% to 20% and reports are revealing about 14% of meat products comes from goat and this increases stems from the wide recognition of goat's socio-economic importance (Negassa Asfaw and Gebremedhin, 2011; Sewunet, 2015; Wodajo *et al.,* 2020) and their full potential contribution to poverty reduction and food security (Solomon *et al.,* 2014). The analysis also revealed an increase in the number of camels utilized to produce meat, from 7,516 to 27,338. (263.7% increase) and this could signify camel camel-based livelihood system is becoming more feasible in drylands than other agricultural-based livelihood systems due to their more adaptive nature to rangeland resources where climate change is often practiced (FAO 2010b; Asresie *et al.,* 2015).

Trends in livestock age and sex progress

The analysis of the cattle age and sex group shows the majority of the population (*i.e.* accounting for 62.21% of the population) falls within the age group from 3 to 10 years. of the total population, about 55.67% were femalesand 44.32% were males (CSA, 2019). The analysis of the sheep population showed 27.14% and 72.86% of the male and female, respectively and the majority (53.65%) were 2 years and older from which 50.59% of them used for breeding and only 2.3% for mutton purposes. The goat population aged two years and older accounts for 62.4% of the total and 42.8% of the goats for breeding (CSA, 2019).

Livestock owner analysis

Analysis of CSA data on livestock owners revealed a 53% increase in the number of cattle owners, from 11.3 million to 17.3 million, with a 3.5% mean yearly increase. Additional analysis of the holding patterns by the head of cattle showed that households with 50-99 head of cattle have expanded significantly, from 5,673 to 26,871 (373.7% increase) and were followed by those with 20-49 head of cattle. In general, households with large numbers of cattle heads have experienced more growth than households with smaller and medium numbers of cattle heads. Given the growing demand

Table 4: Number of holdings by size of cattle (2004/5- 2018/19).

Years	Number of holdings by size/ head of cattle (million)							
	1-2	3-4	5-9	10-19	20-49	50-99	100-199	≥200
2004/05	3.11	2.90	2.37	0.52	0.08	0.01		0.0000
2005/06	3.05	3.01	2.49	0.57	0.08	0.01	0.001	0.0000
2006/07	3.30	3.14	2.63	0.59	0.10	0.01	0.002	0.0003
2007/08	3.48	3.36	2.91	0.66	0.12	0.01	0.002	0.0005
2008/09	3.78	3.59	2.95	0.72	0.11	0.01	0.001	0.0001
2009/10	3.75	3.71	2.93	0.71	0.11	0.01	0.006	0.0025
2010/11	4.09	3.94	3.10	0.76	0.13	0.01	0.002	0.0002
2011/12	4.16	3.78	3.12	0.75	0.11	0.01	0.002	0.0009
2012/13	4.17	3.94	3.09	0.75	0.14	0.01	0.003	0.0006
2013/14	4.20	4.05	3.29	0.75	0.13	0.01	0.002	0.0003
2014/15	4.32	4.14	3.40	0.79	0.13	0.01	0.002	0.0000
2015/16	4.35	4.30	3.45	0.78	0.13	0.01	0.002	0.0011
2016/17	4.44	4.28	3.58	0.82	0.13	0.01	0.004	0.0011
2017/18	4.48	4.43	3.76	0.87	0.12	0.01	0.000	0.0000
2018/19	4.43	4.37	3.56	0.86	0.14	0.03	0.005	0.0005
Change 2004/05 to 2018/2019	42.8	50.7	50.5	65.6	73.1	373.7	176.8	104.2

Source: Computed in this study from CSA, 2004/05-2018/19 data.

for meat and milk as a result of the rapid growth in human population and rising per capita income, the trend of improved semi-commercial cow-rearing appears to be market-oriented (Table 4).

There were around 6.13 million sheep-holding households (HHs) at the end of the analysis period (2018/19). With yearly mean growths of 3.8%, the population increased from 3.9 million in 2004/05 (a 57.5% rise). The percentage of HHs having a big number of sheep significantly grew in the growth trends. To this fact, HHs holding 50-99 and 100-199 sheep increased significantly during the years of 2018/19 than in 2004/05, nearly by 500-660%. However, small-scale owners with 1-4 sheep are still responsible for around 62% of sheep production, indicating the existence of plenty of potential for commercial sheep production (Table 5).

Similarly, HHs holding goats increased by 70.4% with a mean annual growth rate of 4.7%. Further study on the goats holding categories revealed the number of HHs holding 50-99 and 100-199 goat heads has increased from 8463 to 66983 and from 2042 to 16483 with goats from 100-199, indicating 691.5 and 707.2% increase, respectively. This might be due to the recently increased demand for goat meatand business for goat production becomes easier to start and less capital intensive. This offers an opportunity for producers to be involved in large-scale business (Kebebe, 2019; Tilahun and Schmidt, 2012; Wodajo *et al.* 2020). However, 80% of the HHs still manage less than 10 goat heads, on average and they are the largest goat meat producers in the country.

For every species of livestock, there was a strong correlation with significant ($p<0.01$) values showing a strong association between the number of animals and the livestock owners (Table 6). This showed that the benefits of modern inputs, such as superior breeds and food, were significantly less in explaining the livestock growths and that an increase in the number of holders has produced an increase in the number of livestock (Bachewe *et al.,* 2018; Gebreyohanes *et al.,* 2021; Mestawet *et al.,* 2012; Shapiro *et al.,* 2017).

Table 5: Sheep holdings by size categories (million).

Years	Heads					
	All sheep holders	1-4	5-9	10-49	50-99	100-199
2004/05	3.890	2.547	0.971	0.368	0.004	0.000
2005/06	4.275	2.717	1.080	0.475	0.003	0.001
2006/07	4.806	3.038	1.250	0.512	0.005	0.001
2007/08	5.164	3.209	1.360	0.583	0.010	0.002
2008/09	5.309	3.386	1.416	0.501	0.006	0.001
2009/10	5.300	3.409	1.371	0.506	0.012	0.003
2010/11	5.274	3.441	1.282	0.540	0.010	0.001
2011/12	5.015	3.285	1.223	0.496	0.008	0.003
2012/13	5.193	3.348	1.300	0.530	0.013	0.002
2013/14	5.475	3.486	1.409	0.567	0.011	0.002
2014/15	5.696	3.503	1.534	0.644	0.014	0.000
2015/16	5.722	3.610	1.503	0.598	0.011	0.001
2016/17	5.860	3.603	1.554	0.685	0.015	0.003
2017/18	6.097	3.761	1.627	0.695	0.012	0.002
2018/19	6.128	3.773	1.629	0.694	0.025	0.006
Change from 2004/05 to 2018/2019	57.5	48.1	67.8	88.8	499.5	660.3
Mean annual growth	3.8	3.2	4.5	5.9	33.3	44.0

Source: Computed in this study from CSA, 2004/05-2018/19 data.

Table 6: Colorations between the number of livestock and the livestock holders.

Livestock types	N	Pearson correlation	P-value Sig. (2-tailed)
Cattle Population vs. Holdings	14	.994**	.000
Sheep Population vs. Holdings	14	.977**	.000
Goat Population vs. Holdings	14	.974**	.000
Camel Population vs. Holdings	14	.968**	.000

**Correlation is significant at the 0.01 level (2-tailed).

Source: Computed in this study from CSA, 2004/05-2018/19 data.

CONCLUSION

There has been a consistent increase in the number of livestock species in Ethiopia and this growth is strongly associated with the increasing number of livestock owners. Local livestock species are the primary source of highly nutritious animal products, with over 99% of these products being supplied by indigenous animals. The majority of livestock keepers in Ethiopia are small-scale producers, with holdings of less than 10 animals on average. However, these small-scale producers play a central role in the livestock industry, providing over 98% of animal products. This signifies the significant contribution of small-scale producers to the overall livestock sector. The findings indicate substantial opportunities for investment in livestock commercialization, given the increasing demand for animal products and the presence of small-scale producers who can benefit from targeted support and interventions. To address the challenges and maximize the potential of the livestock sector in Ethiopia, comprehensive livestock policies and robust structures must be implemented, focusing on improving husbandry practices, genetic potential, feed and water availability, capacity building, organized services, research and innovationand value addition.

Conflicts of interest

The authors declare no conflicts of interest.

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