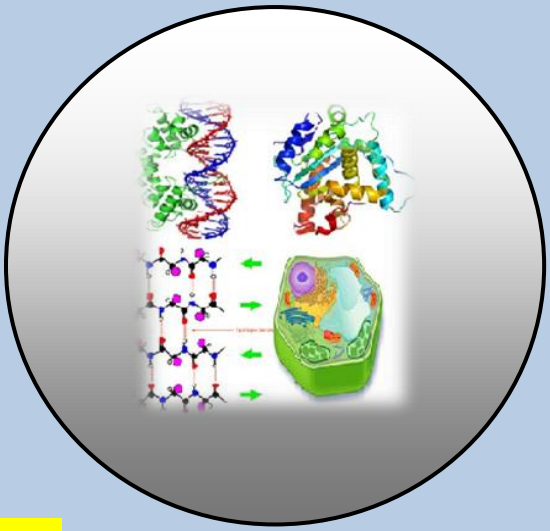
Assessment of the Role of Livestock in Ethiopia: A Review

By
Birara Endalew and Zemen Ayalew

ISSN 2319-3077 Online/Electronic
ISSN 0970-4973 Print

Journal Impact Factor: 4.275
Global Impact factor of Journal: 0.876
Scientific Journals Impact Factor: 3.285
InfoBase Impact Factor: 2.93
Index Copernicus International Value
IC Value of Journal 6.01 Poland, Europe

J. Biol. Chem. Research
Volume 32 (2) 2015 Pages No. 883-891



Journal of Biological and Chemical Research

An International Peer Reviewed / Refereed Journal of Life Sciences and Chemistry

Indexed, Abstracted and Cited in various International and National Scientific Databases

Published by Society for Advancement of Sciences®

J. Biol. Chem. Research. Vol. 32, No. 2: 883-891, 2015
(An International Peer Reviewed / Refereed Journal of Life Sciences and Chemistry)
Ms 32/2/90/2015

ISSN 0970-4973 (Print)
ISSN 2319-3077 (Online/Electronic)

Birara Endalew
http:// www.sasjournals.com
http:// www.jbcr.in
jbiolchemres@gmail.com
info@jbcr.in

REVIEW ARTICLE

Received: 10/09/2015 Revised: 31/10/2015 Accepted: 06/11/2015

Assessment of the Role of Livestock in Ethiopia: A Review

Birara Endalew and Zemen Ayalew

Department of Agricultural Economics, College of Agriculture and Environmental Science, Bahir Dar University, Bahir Dar, Ethiopia

ABSTRACT

The objective of the study was to assess the role of livestock as a source of income, food, power and organic fertilizer as compared to the livestock population of the country. The domestication of animals and plants is considered to be one of the most important prerequisites for the rise of human civilization; specially, in developing countries, livestock domestication is a foot step for the beginning of agriculture sector. In Ethiopia, agriculture is the main economic activity and more than 80% of Ethiopian population is dependent on agriculture of which livestock plays a very important role. Ethiopia is home to Africa's largest livestock population and it is the continent's top livestock producer and exporter. As different documents indicated, the country has about 53.9 million heads of cattle, 25.4 million sheep, 24.1 million goats, 0.91 million camels, 50.37 million poultries, 1.91 million horses , 6.74 million donkeys, 0.35 million mules, and 5.21 million beehives. Livestock contributes to the production of food (meat, milk, eggs, honey, cheese, and butter), source of power (for cultivation, threshing, transportation etc), means of income (national and household income), input for crop production (draught power and manure); and export earnings (live animals, meat, skin and hides). The livestock sector contributes much for the Economy of the country in general; and improvement of people's livelihood in particular. Therefore, policy makers, development agents, farm households and experts should encourage the livestock sector to bring the required output from the sector.
Key words: Agriculture Sector, Economy, Export, Livestock, and Crop Production.

INTRODUCTION

The domestication of animals and plants is considered to be one of the most important developments in history, and one of the prerequisites for the rise of human civilizations. These developments triggered the uptake of crop farming, and affected the distribution and

density of the wild species hunted for food. In this situation, the main driver of animal domestication may have been the desire to secure the availability of foods with the potential of some domesticated species to provide support to crop farming, or as pack and riding animals. In Ethiopia, agriculture is the main economic activity and more than 80% of Ethiopian population is dependent on agriculture of which livestock plays a very important role (Duguma *et al*, 2012). It is an integral part of agriculture and the contribution of live animals and their products to the agricultural economy accounts for 40%, excluding the values of draught power, manure and transport of people and products.

According to the report of MacDonald (2011), Ethiopia is home to Africa's largest livestock population, and it is the continent's top livestock producer and exporter. Although domestic demand for animal products in Ethiopia is increasing driven by the urban middle and upper-classes, export potential is the key force encouraging expansion and intensification of livestock production. It is the source of many social and economic values such as food, draught power, fuel, cash income, security and investment in both the highlands and the lowlands/pastoral farming systems (FDRE, 2001). On the other hand, livestock serve as a source of food, income and foreign exchange to the Ethiopian economy, and contributes to 12 and 33% of the total and agricultural GDP, respectively, and accounts for 12–15% of the total export earnings (Ayele *et al*, 2003).

Livestock perform multiple functions in the Ethiopian economy by providing food, input for crop production and soil fertility management, raw material for industry, cash income as well as in promoting saving, fuel, social functions, and employment (Ministry of Economic Development and Cooperation, 1998; APBMDA, 1999).

In the majority of the rural areas of Ethiopia, livestock production plays important role in the provision of draft power, food, cash income, transportation, fuel, and, especially in pastoral areas, social prestige. In the highlands, oxen provided draft power in crop production. In addition, dairy production plays significant role as a source of additional income to the farming community through sale of raw milk, processed milk products and live animals (EEA, 2002).

The objective of the study was to assess the role of livestock as a source of income, food, power and organic fertilizer; and the livestock population of the country.

THE ROLE OF LIVESTOCK

Source of income: Livestock and their products 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 (FAO, 2013). On the other hand, Central Statistical Agency report indicated, livestock plays an important role in providing export commodities, such as live animals, hides, and skins to earn foreign exchanges to the country. Meat export volume increased from 870 tons in 2000/01 to 7,468 tons in 2008/09. The country's export performance reached its peak in 2005/06 by exporting 7,917 tons of meat. In the same period, the meat export value has picked up from USD 1.7 million to USD 27 million (CSA, 2013).

Similarly, the number of live animals (cattle, camels, sheep and goats) export has also recorded a dramatic increment during this period by rising from 4,919 to 241,683 and reached its peak in 2007/08 by exporting 297,644 head of live animals. The export value mounted from USD 0.2 million to USD 53.1million.

Livestock is central to the Ethiopian economy, contributing 20% of the GDP, supporting the livelihoods of 70 % of the population and generating about 11% of annual export earnings. The country has been earning foreign currency by exporting meat and live animals namely cattle, sheep, camels and goats to major destination markets (Trade Bulletin, 2010).

Livestock are of economic and social importance both at the household and national levels, and have in the past provided significant export earnings. Livestock contributes 15 to17% of GDP and 35 to 49% of agricultural GDP, and 37 to 87% of the household incomes. In 2008, livestock accounted for approximately $150 million in formal export earnings, making up 10% of formal exports. Roughly half of this value comes from live animal and meat exports, the remainder being from hides and skins. Formal live animal exports are predominantly cattle (70%), meat exports are almost entirely from sheep and goats, and hides and skins are primarily from cattle. Trends over the last 10-20 years show meat and live animals becoming increasingly important to livestock exports relative to hides and skins (Samuel *et al*, 2010). Similarly, beyond formal sector trade, there is significant informal cross-border trade in live animals, which substantially increases livestock's export importance. Estimates of informal trade volume vary widely (e.g., between 250,000 and 500,000 head of cattle per year), but the formal exports (84,000 head in 2008. Ethiopia earned USD$ 105 million from export of 8,013 tones of meat and 244, 862 head of live animals. Of the total live animals exported, 43%, 22%, and 34% were cattle, camels and shoats, respectively. Trends of annual earnings from meat and live animal export have been positive during the last three years, with $ 125 million, $79 million and $62 million earned in 2009/10, 2008/09 and 2007/08, respectively (Trade Bulletin, 2011).

In 2009 the official estimate of the livestock contribution to agricultural GDP was slightly more than 32 billion Ethiopian birr or $3.2 billion US dollars. In the same year, livestock contributes a total 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 (FAO, 2013).

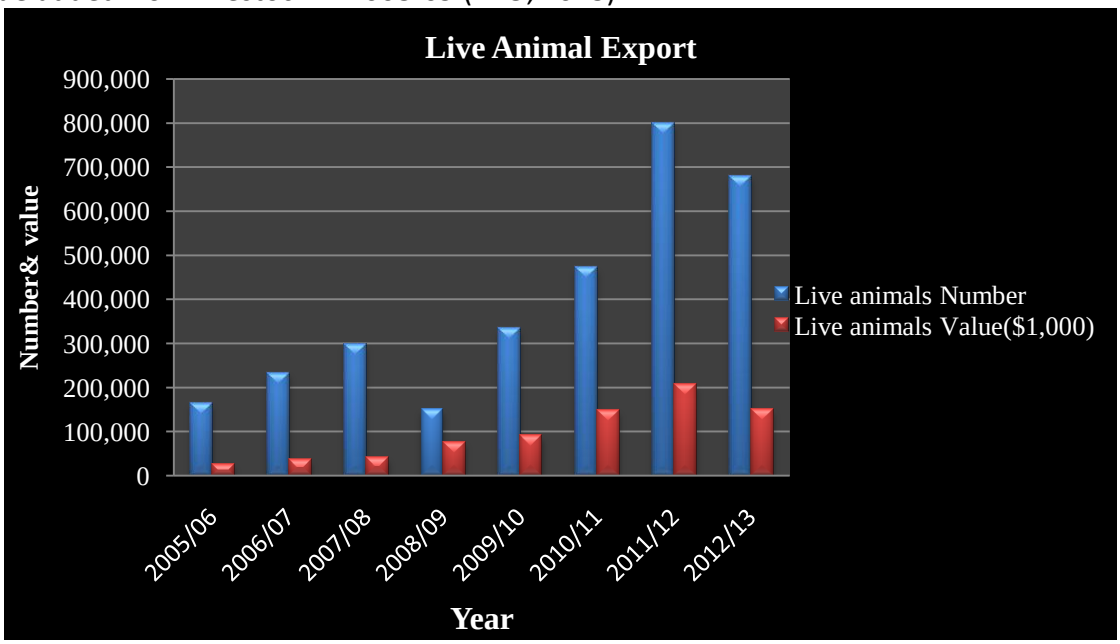


Figure 1. Live animal export in Ethiopia from 2005-2013 (Future Agriculture, 2014).

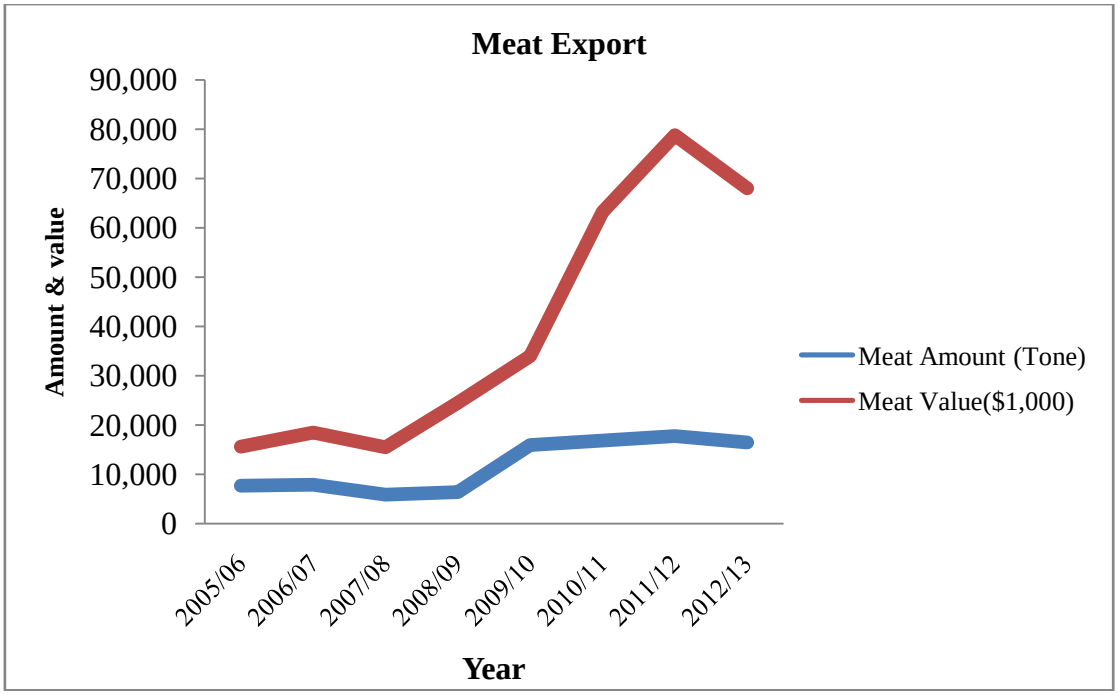


Figure 2. Meat export in Ethiopia from 2005-2013 (Future Agriculture, 2014).

Source of Food: Growing consumption of livestock products are bringing important nutritional benefits to large segments of the population of developing countries, although many millions of people in developing countries are still not able to afford better-quality diets owing to the higher cost (FAO, 2013). Livestock are important source of meat, milk and eggs, which are parts of the food chain and, which provide high value protein. They have long played a key role in supplying calories and protein for human food in virtually all parts of the world, both directly (in the form of animal products), and indirectly (from the contribution of manure and draught power to crop production and generation of income to enable purchase of food (Animal agriculture and global food supply, 1999). It is eminent that livestock products and by-products in the form of meat, milk, honey, eggs, cheese, and butter provide protein that contributes to the improvement of the nutritional status of the people (CSA, 2013). Ethiopia's domestic meat consumption for 2006/07 is estimated at 2.4 kg/capita/year for beef, and 0.7 and 0.4 kg/capita/year for sheep and goat, respectively. Total meat consumption was close to 276 MT in 2006/07, of which beef and mutton account for 68% and 21%, respectively. Pronounced differences have been identified between rural and urban patterns of meat consumption, particularly for beef (1.7 kg/capita/year and 7.0 kg/capita/year, respectively). Cattle produce a total of 3.2 billion litters milk and 0.331 million tones of meat annually (CSA, 2008). Similarly, meat, eggs, dairy, and other livestock products together account for about 12% of the value of total household consumption (Gelan *et al*, 2012). Livestock products are crucial to provide different nutrients for human nutrition. Milk contains numerous nutrients and it makes a significant contribution to meeting the body's needs for calcium, magnesium, selenium, riboflavin, vitamin B12 and vitamin B5; on the other hand, meat is an important source of protein and certain essential nutrients including iron, vitamins B, zinc and vitamin A (FAO, 2013; FCRN, 2014).

Livestock products are often used for household consumption and/or sold to finance the purchase of basic household commodities such as coffee, salt, cooking oil, sugar, etc (CSA, 2015). According to the report of the same source, out of the total annual livestock products, 46.36% of milk, 59.24% of butter, 79.89% of cheese, 41.22% of honey, 44.13 % of wax, and 26.84 % of egg was used for household consumption.

Table 1. Livestock product utilization (%).

Products	Livestock product utilization (%)		Total (%)
	Consumption	Sale	
Milk	46.36	5.98	52.34
Butter	59.24	35.49	94.73
Cheese	79.89	15.22	95.11
Beef	52.93	33.18	86.11
Mutton	90.04	3.42	93.46
Egg	26.84	39.55	66.39
Honey	41.22	54.68	95.9
Bees wax	44.13	25.22	69.35
Sheep hair	53.25	42.8	96.05
Skin	55.37	38.68	94.05
Hide	40.02	53.94	93.96
Arera	63.12	2.78	65.9
Camel meat	45.53	29.19	74.72

Source: CSA, 2015

Source of power: The cited evidence of Teleni (1991) indicated that draught animals provide the power for the cultivation of nearly 50% of the world cultivated land and the hauling of 25% carts. In Ethiopia, 14 million tones of manure are used annually primarily for fuel (Azage, 1998; Befekadu, 2000). In Ethiopia, the vast majority of rural people comprising 85% of the total population depend on animal power for cultivation, weeding, threshing and transportation. As elsewhere in developing countries, use of tractors is very insignificant in the highland production system, for reasons of economy, topography and highly fragmented land holdings (Cheeke, 1993). Where as the result of Hadera (2001) reported that draught animals provide power for about 96% of the cultivated land in the highland areas. Work animals can be also used to cultivate arable land inaccessible to tractors, relatively affordable and do not require inputs, which tractors would require such as fuel, repairs, and spare parts. About six million oxen provide the draught power required for the cultivation of crop land (Azage, 1998; Befekadu, 2000). In many mixed crop-livestock systems, larger animals function as farm equipment, providing traction power for transportation and crop production, and to be hired out as well (Hadera, 2001). Similarly, draught animals provide power for the cultivation of the smallholdings and for crop threshing virtually all over the country and are also essential modes of transport to take holders and their families long-distances, to convey their agricultural products to the market places and bring back their domestic necessities (CSA, 2013).

Source of Organic Fertilizer: Livestock plays a significant role in maintaining soil fertility, increases soil organic matter, and improves soil texture (Azage, 1998; Befekadu,2000) .Chemical fertilizer use in Ethiopia was only 17 kg/ha in 1999/2000, which is very low, indicating the potential role of animal manure as accessible, cheap and valuable fertilizer (Hadera, 2001). As the same source discussed, generally as source of organic fertilizer, livestock plays great role in boosting crop production. This is crucial not only to improve soil fertility but also ensure food availability and preference, which are elements of food security.

Livestock waste is often an important input for maintaining soil fertility; contributes to greater crop production for food and income (T. F. Randolph *et al*, 2006). In some areas, dung is also used as a fuel; and dung is also used for fertilizer, fuel, and building material is often a marketable commodity.

Livestock population in Ethiopia: The Ethiopian Central Statistical Authority estimated 35.1 million cattle, 12.2 million sheep, and 9.5 million goats only in the highlands and mixed farming systems, home and 75–80% of cattle and sheep and 30% of goat population in the country (CSA, 1999).

Table 2. Livestock population in Ethiopia.

Year	Livestock population in number(000)								
	Cattle	Sheep	Goat	Camel	Poultry	Horse	Donkey	Mule	Beehives
2004	38,103	16,575	13,835	471	35,656	1,447	3,770	321	-
2005	38,749	18,075	14,859	459	22,605	1,518	3,930	318	4,546
2006	40,380	20,734	16,364	438	32,222	1,569	4,289	341	4,020
2007	43,125	23,633	18,560	616	34,199	1,655	4,498	326	4,884
2008	47,571	26,117	21,709	1,009	39,564	1,776	5,573	377	4,800
2009	49,298	25,017	21,884	760	38,128	1,787	5,422	374	4,600
2010	50,884	25,980	21,961	808	42,053	1,995	5,715	366	4,598
2011	53,382	25,509	22,786	1,102	49,286	2,028	6,209	385	5,130
2012	52,129	24,221	22,613	979	44,893	1,961	6,438	368	4,993
2013	53,990	25,489	24,060	915	50,377	1,909	6,748	350	5,207

Source: Own review

Ethiopia ranks top of the list of African countries with large livestock population. There are 41.1 million heads of cattle, 23.6 million sheep, 18.6 million goats, 0.62 million camels, 34.2 million chicken, 1.7 million horses, 4.5 million donkeys, 0.33 million mules (CSA, 2008).

The cattle populations have grown from 38 million in 2004 to 51 million in 2010. Similarly, the total number of shoats (sheep plus goats) has increased from 29 million to 47 million during the period. While the number of camels nearly doubled, the size of poultry population increased only by a relatively smaller amount (36 million to 42 million). Similarly, the increase in the number of equines have followed similar pattern of growth as that of camels. The number of bee colonies or beehives has increased only marginally during the period (Fitaweke *et al*, 2011).

The recent livestock population of Ethiopia estimates that the country has about 52.1 million heads of cattle, 24.2 million sheep, 22.6 million goats and 44.9 million poultry (Berihu *et al*, 2014; Minister of Agriculture, 2013).

CONCLUSION

Ethiopia is home to Africa's largest livestock population. The recent livestock population of Ethiopia estimates that the country has about 53.9 million cattle, 25.4 million sheep, 24.1 million goats, 0.91 million camels, 50.37 million poultries, 1.91 million horses , 6.74 million donkeys, 0.35 million mules, and 5.21 million beehives.

Livestock perform multiple functions in the Ethiopian economy by providing food, input for crop production and soil fertility management, income source as well as in promoting saving, fuel, social functions, and employment.

Livestock contributes 15 to17% of GDP and 35 to 49% of agricultural GDP, and 37 to 87% of the household incomes. In 2008, livestock accounted for approximately $150 million in formal export earnings, making up 10% of formal exports. On the other hand, Ethiopia earned $105 million from export of 8,013 tones of meat and 244, 862 head of live animals. The official estimate of the livestock contribution to agricultural GDP was slightly more than 32 billion Ethiopian birr or $3.2 billion US dollars. In the same year, livestock contributes a total of 113 billion Ethiopian birr, or roughly $11.3 billion US dollars at 2009 exchange rates.

Livestock products are often used for household consumption and/or sold to finance the purchase of basic household consumption commodities. Livestock products and by-products in the form of meat, milk, honey, eggs, cheese, and butter provide a different nutrient that contributes to the improvement of the nutritional status of the people.

In Ethiopia, the vast majority of rural people comprising 85% of the total population depend on animal power for cultivation, weeding, threshing and transportation. Similarly, livestock by products play a significant role in maintaining soil fertility, increases soil organic matter, and improves soil texture.

The livestock sector contributes much for the Economy of the country in general; and improvement of people's livelihood in particular. Therefore, policy makers, development agents, farm households and experts should encourage the livestock sector to bring the required output from the sector.

ACKNOWLEDGEMENTS

Behalf of the co-author, I would like to forward my sincere thanks to my colleagues who provided material and non-material supports for to accomplish this manuscript.

REFERENCES

Animal Agriculture and Global Food Supply, 1999. Council for Agricultural Science and Technology, task force report No. 135.

APBMDA, 1999. Market problems and measures to be taken. Animal Products and By-products Market Development Authority in Addis Ababa, Ethiopia.

Ayele, S., Assegid, W., Jabbar, M.A., Ahmed, M.M., and Belachew, H., 2003. Livestock marketing in Ethiopia: A review of structure, performance and development initiatives. Socio- Economics and Policy Research Working Paper 52. ILRI, Nairobi, Kenya.

Azage, T., and Alemu, G.W., 1998. Prospects for peri-urban dairy development in Ethiopia. In: Proceedings of 5th national conference of Ethiopian Society of Animal Production, 15–17 May, 1997, Addis Ababa, Ethiopia.

Befekadu, D., and Birhanu, N., 2000. Annual report on the Ethiopian economy. Volume, 1. The Ethiopian Economics Association, Addis Ababa, Ethiopia.

Berihu, H., Aleme, A., and Mulata, H., 2014. Constraints of Livestock Development in Eastern Zone of Tigray; the case of Ganta Afeshum Woreda Northern Ethiopia. Agricultural Science, Engineering and Technology Research; 2(1):1-9.

Cheeke, P. R., 1993. Contemporary issues in animal agriculture. Second edition, inter-state publishers, Danville, IL.

CSA, 1999. Agricultural sample survey report on livestock, poultry, and beehive populations. Statistical Bulletin 206; volume II. CSA, Addis Ababa, Ethiopia.

CSA, 2008. Statistical Abstract of 2007. CSA, Addis Ababa, Ethiopia.

CSA, 2013. Livestock and livestock characteristics. Agricultural sample survey 2012/13. Volume II.

CSA, 2015. Crop and livestock product utilization. Agricultural sample survey (September – January, 2014/2015); volume VII.

Duguma, B., Tegegne, A., and Hegde, B.P., 2012. Smallholder Livestock Production System in Dandi District, Oromia Regional State, Central Ethiopia. *Global Veterinaria*; 8 (5): 472-479, 2012 .ISSN 1992-6197.

EEA, 2002. A research report on land tenure and agricultural development in Ethiopia, October, 2002, Addis Ababa, Ethiopia.

FAO, 2013. The Contribution of Livestock to the Ethiopian Economy. Policy Brief No: ICPALD 5/CLE/8/2013.

FCRN, 2014. What is a sustainable healthy diet? Food Climate Research Network April, 2014.

FDRE., 2001. Ministry of Water Resources, National Meteorological Services Agency: 1-113.

Fitaweke, M., Thomas, C., Ayele, G., Fisseha, A., Agajie, T., Jemal, A., and Wondessen, G., 2011. A review to improve estimation of livestock contribution to the national GDP. Ministry of Finance and Economic Development and Ministry of Agriculture.

Future Agriculture, 2014. Pastoral livestock trade and growth in Ethiopia. Policy Brief 72.

Gelan, A., Engida, E., Caria, A.S., and Karugia, J., 2012. The Role of Livestock in the Ethiopian Economy: Policy Analysis Using a Dynamic Computable General Equilibrium Model for Ethiopia.

Hadera, 2001. Role of livestock in food security and food self sufficiency in the highland production system.

MacDonald, M., and Simon, J., 2011 . Climate, food security, & growth Ethiopia's complex relationship with livestock. Policy Brief 3. Brighter Green.

Minister of Agriculture, 2013. Major challenges and Achievements in Ethiopian Livestock production.

Ministry of Economic Development and Cooperation, 1998. Survey of livestock and fisheries development. MEDaC Agricultural Development Department, Livestock Team, Addis Ababa, Ethiopia.

Samuel, A., Derek, B., and Ayele, S., 2010. Diagnostic study of live cattle and beef production and marketing constraints and opportunities for enhancing the system.

T. F. Randolph, E. Schelling, D. Grace, C. F. Nicholson, J. L. Leroy, D. C. Cole, M. W. Demment, A. Omore, J. Zinsstag, and M. Ruel, 2006. Invited Review: Role of livestock in human nutrition and health for poverty reduction in developing countries.

Teleni, E, and Murray., 1991 . Nutrient requirements of draft cattle and buffaloes. Recent advances on the nutrition of herbivors. Malaysian Soc. Anim. Prod., Serdang, Malaysia.

Trade Bulletin, 2010. Focus on Ethiopia's meat and live animal export. Online: http://borlaug.tamu.edu/files/2012/03/Trade-Bulletin-1.pdf.

Trade Bulletin, 2011. Focus on Ethiopia's meat and live animal export. Online: http://borlaug.tamu.edu/files/2012/03/Trade-Bulletin-4.pdf.

Corresponding author: Birara Endalew, Department of Agricultural Economics, College of Agriculture and Environmental Science, Bahir Dar University, Bahir Dar, Ethiopia
Email: birara.endalew@gmail.com