

The Looming Threat of Overgrazing: Effects and Recommendations

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Executive Summary

Livestock in Ethiopia has an important economic, functional, and cultural significance. Various functions of livestock include dairy production, meat production, draught labor and transportation. Economically, livestock production accounts for nearly 80% of farmer income¹ in the country. In addition, livestock serves as a “savings account” or a way of building assets. Culturally, in many parts of Ethiopia ownership of livestock denotes social status and is important for marriage. However, much of Ethiopia’s livestock is low producing in terms of milk production and weight gain and do not reach their maximum potential. Due to disappearing grazing lands, livestock is forced to trek further and further to reach feed. Therefore, animals are using a significant portion of their gross energy (total energy content of feed) for basic maintenance (walking to grazing lands) instead of productivity (milk production and weight gain).

Considering the great importance of livestock in Ethiopia, assessing ways of improving livestock management and decreasing pressure on natural resources (grazing systems) is critical. The United Nations Environmental Programme funded the International Soil Reference and Information Centre (ISRIC) to produce the world’s first global survey of soil degradation from 1988-1990² (most recent data available). The study, entitled Global Assessment of Human-induced Soil Degradation (GLASOD), cited overgrazing as the cause of nearly 50% of soil degradation in Africa. Currently, over one-third of the continent is threatened by desertification due to soil erosion.³ Broad-reaching policy to address the enormous pressure on natural pasture and arable land and to improve livestock management practices in Ethiopia and throughout Africa is of the utmost importance.

Livestock, Land Degradation and Population: The Facts

Ethiopia’s estimated livestock population is often said to be the largest in Africa, at approximately 150 million head in 2009/2010.⁴ The recent census estimates there are over 50.9 million cattle, 25.9 million sheep, 21.9 million goats, 1.9 million horses, 5.7 million donkeys and almost 400,000 mules. In addition, there are approximately 800,000 camels, and 42 million poultry. Approximately 40% of Ethiopia’s land is classified as agricultural land (productive land under use for crop cultivation or animal pasture). Although exclusive pastoralists only account for approximately 10% of the population, most of the population engages in agro-pastoralism, combining small scale crop cultivation and livestock herding. Agriculture contributes to 43% of the GDP (2010 estimate), but accounts for 85% of total employment in Ethiopia (2005/06 estimate). Currently, 38% of the population is living below the poverty line⁵ and 77 million

¹ Mengistu, Alemayehu Forage Production in Ethiopia: A Case Study with Implications for Livestock Production.

² http://www.isric.org/sites/default/files/ExplanNote_1.pdf

³ http://www.globalchange.umich.edu/globalchange2/current/lectures/land_deg/land_deg.html

⁴ Federal Democratic Republic of Ethiopia Central Statistical Agency, Agricultural Sample Survey 2009/2010, Volume II, Report on Livestock and Livestock Characteristics

⁵ <https://www.cia.gov/library/publications/the-world-factbook/geos/et.html>

Ethiopians are threatened with food insecurity and famine.⁶ The quality of Ethiopia’s productive land continues to decline due to varying soil erosion, desertification and poor and unsustainable crop management practices. In addition, Ethiopia’s ever-growing livestock population has led to overgrazing in much of the country. As population grows, so does its need for arable cropping land. A swelling human population also leads to an increase in livestock for labor use and for perceived financial and social security.

As shown in the table below, human and livestock growth rates are increasing rapidly, while available land productive agricultural land shows no growth.

Annual growth rate	Human population	Livestock population	Agricultural land
	3.2% (2011 estimate) ⁷	1.5% (growth between 1993-2000) ⁸	0% growth between 1993-2000) ⁶

It will be crucial to identify new methods of animal feed production or new alternative livelihood sources for livestock rearing households. If not addressed, grazing land shortages will have devastating effects on food security, the environment and peace and security.

Implications of Overgrazing

Food Security Implications

Approximately 75% of the Ethiopian population suffers from preventable communicable diseases and/or malnutrition. Twenty-seven percent of adult women in Ethiopia are classified as energy deficient and approximately 47% of children under five are stunted, 11% are wasted and 38% are underweight. In addition, child malnutrition is one of the five main causes of child mortality in Ethiopia.⁹

Throughout Ethiopia, there is a high demand for livestock and livestock related products. Agricultural, agro-pastoralist and pastoralist groups are highly dependent on their livestock for labor, dairy products, meat and live animal sales. Many vulnerable households sell livestock for cash or trade animals for staple crops during times of need. However, most are unable to maximize benefits from the high market demand as their animals suffer from low productivity due to inaccessible feed supply and distant and unproductive grazing lands. Unproductive livestock reduce the potential of selling animal products, as there is little milk to sell, and underweight animals fetch lower prices at market. In addition, malnourished animals are at a higher risk for disease and death than healthy well-nourished animals.

If households lose animals to death and disease and are unable to sell livestock or if they are forced to undersell at market, the household’s ability to provide for itself is severely diminished. Supply and expense related to animal healthcare present challenges for vulnerable households. Access to animal healthcare services including veterinary care is limited due to a number of reasons. Many households live in remote areas and cannot access peri-urban areas where animal healthcare is available. Government extension services are available but often do not have

⁶ http://www.populationaction.org/Publications/Fact_Sheets/FS30/Summary.shtml

⁷ <https://www.cia.gov/library/publications/the-world-factbook/geos/et.html>

⁸ http://www.fao.org/ag/againfo/resources/en/publications/sector_briefs/lsb_ETH.pdf

⁹ <http://www.measuredhs.com/pubs/pdf/FR179/FR179.pdf>

resources to provide vaccinations and other healthcare. Nomadic pastoral communities on the move are difficult for government extension workers and other providers to access. Coupled with malnutrition, animal diseases like trypanosomiasis, anthrax, contagious bovine pleuropneumonia (CBPP), contagious caprine pleuropneumonia, black leg, mange mites, and internal parasites not only cause a lack of productivity but also leads to extreme sickness and death.

Another issue is that currently, the potential of animal sourced products has not been exploited as a source of nutrition for households. Animal products like dairy can offer an important source of nutrition for food insecure, undernourished or malnourished individuals. However, due to poor pasture management and shocks like drought and animal disease, many animals are not productive enough to provide adequate dairy for household consumption and nutrition. Meat can also supply nutritional value to households, although vulnerable households are unlikely to slaughter livestock for consumption. As livestock is considered a valuable asset and an important determinant of social status and wealth, most poor livestock owners will not slaughter one of his/her animals to meet household nutritional needs. In most poor households, meat is only consumed one to two times per year, for holidays and celebrations.

Environmental Implications

Desertification and land degradation is another devastating impact of overgrazing. In a recent study, 91% of subsistence pastoralists, adept at recognizing land changes, reported that rangeland conditions have worsened in recent years and identified overgrazing as one of the three main causes.¹⁰

The Ethiopian land tenure system was nationalized in 1975, and all land is owned by government and cannot be sold or exchanged. Commercial farms may acquire long leases from the government. Smallholder farmers inherit leased lands and are permitted to rent or sharecrop government leased land. This policy may contribute to households over-exhausting land through livestock ownership as land resources are shared and not individually owned. There is no formal grazing use policy in place to curb overgrazing.¹¹ Shared grazing land is poorly managed, while livestock ownership continues to increase resulting in a shortage of natural grazing pasture for animals. In addition, pasture management and forage production is not widely exercised by smallholder and commercial farmers. These factors have contributed to a shortage of animal feed in natural pasture and in the marketplace.

¹⁰ <http://www.lrrd.org/lrrd21/7/abat21101htm>

¹¹ http://www.fao.org/ag/againfo/resources/en/publications/sector_briefs/lbs_ETH.pdf



Illegal cut and carry of grasses protected in Nechisar National Park

Prone to drought, Ethiopia's crops often fail resulting in a shortage of human and animal feed. Even in major cities, concentrate feed,¹² improved fodder and factory by-products from cereals (often used for animal feed) are completely unavailable. Since January 2011, Ethiopia has been facing a devastating animal feed shortage, due to a failed wheat crop. Unavailability of retail feed and depletion of pasture causes livestock dependent households to rely heavily on illegal grazing practices and illegal foraging of protected land (when available). Many people resort to grazing their animals in protected national parks, which are intended to protect rare endemic flora and fauna. Petty traders further encroach on natural environments as they collect grass in protected national parks to sell in urban areas to livestock owners.

These practices result in depletion of natural resources including land, water, soil, plants and land. Eco-systems protected in Ethiopia's national park system preserve important habitats for unique plant and animal species, many of which are endemic to the country. Encroaching livestock threatens the habitat and range lands of entire species, furthering endangering Ethiopia's ever diminishing wild animal population.

Implications for Peace and Security

Competition over resources like water and grazing land is a major source of conflict between agriculturalists, agro-pastoralists and pastoralists. Pastoralist areas of Ethiopia include the Afar region, Somali region and the Southern Nations, Nationalities and People's (SNNP) region and also Borena in the Oromo region. Naturally, pastoralists frequently enter agro-pastoralist and agriculturalist areas and farmers settle in pastoral regions. As viable rangeland rapidly decreases, competition over land and water becomes fierce and often results in conflict. In recent times, violence has worsened as arms are readily available. Like livestock ownership, gun ownership has become an important part of cultural identity. In pastoralist communities, men view themselves as warriors and value guns as integral in protecting themselves and their family.



Girls from the Boddi pastoralist tribe

In Mursi and Boddi pastoralist tribal groups, an AK-47 is a requirement for marriage and also indicative of social status. In addition, sedentary farmers in areas inhabited by both pastoralists and agriculturalists also own arms to protect their land. For example in the SNNP region, sedentary agriculturalists, resettled by the government have an ongoing conflict with pastoralists over land use. In the town of Gio Dakuba, in the South Omo Zone of Ethiopia, agriculturalist settlers reported that 30 people were killed in a conflict with Boddi pastoralists over land use.

¹² Feed enhanced with nutritional supplements and additives

Policy Recommendations

The overall policy recommendation is to increase government funding to agriculture, specifically livestock management. In 2004, the last year for which statistics are available, only 5% of recurrent expenditure was allocated to agriculture, and 0.3% allocated to livestock.¹³ This number should be increased to reflect the large livestock population in Ethiopia and the current impact of overgrazing. In addition, international NGOs can provide resources focusing on livestock management. In order to improve the food security, safety and quality of life for its people, the government, donors and communities must prioritize controlling overgrazing through prevention, maintenance and rehabilitation. The stakes are high and a failure to stop land degradation will only further entrench Ethiopia in poverty and hunger.

More resources should be put toward improved livestock management techniques through extension work and incentives including:

- **Forage development.** Forage refers to un-harvested plant materials (grasses, legumes or shrubs) that are available for livestock consumption. Forage can be established or improved with seed or vegetative materials and good management practices. With use of forage, farmers are better able to control their animals' diets and ensure that they have necessary nutrition for dairy production or weight gain.
- **Zero grazing.** Zero grazing is a grazing system that prevents livestock from grazing freely in open pasture. In this system, livestock is confined to a stall and fed with cut and carried fodder (harvested forage plant material) and other types of feed (concentrate, wheat bran etc.). Zero grazing systems help address issues of lack and degradation of grazing land, low productivity of dairy cows, low quality fodder and disease spread between free grazing cattle. It is also the ideal way to maintain improved breeds.
- **Access to improved livestock breeds.** Improved breeds of livestock increase the production of animal sourced outputs. They also incentivize livestock owners to engage in improved management techniques. Artificial Insemination (AI) is a process by which semen is collected from the male, processed, stored and artificially introduced into the female reproductive tract for the purpose of conception. Improved breed semen plays an important role in supplying more productive animals.

¹³ http://www.fao.org/ag/againfo/resources/en/publications/sector_briefs/lbs_ETH.pdf

- **Intensified small ruminant, poultry and beekeeping.** Cattle have the highest feed and water requirements of all ruminants; they require about six times the amount of feed, and a minimum of at least double the amount of water per day than sheep and goats do.¹⁴ In Ethiopia cattle are still the preferred livestock as demonstrated by population numbers and growth rates in the table below:¹⁵

Species	Population (values expressed in 1,000) in year 2000	Growth rate between years 1993-2000
Cattle	35,840	1.9%
Sheep/Goats	39,500	0.3%
Poultry	55,600	1.5%

Small ruminants like sheep and goats should be exploited for dairy and meat production as an alternative to cattle. In addition to being easier to keep, sheep and goat milk both have higher nutritional value than cow's milk as shown in the table^{16 17} below.

Component	Cow	Sheep	Goat
Fat (%)	3.34	7.52	3.21
Protein (%)	3.29	3.35	2.87
Calcium (mg)	119	193	134
Energy (k/cal per 100 mL)	61	108	69

Intensified poultry farming also presents an opportunity to improve household livelihoods and nutrition. Chickens are easier to manage, less harmful to the environment and less expensive to keep than their ruminant counterparts. In addition, poultry can offer households an important source of nutrition through products such as eggs and meat.

Bee-keeping is another high potential livestock opportunity. Ethiopia is the largest producer of honey and beeswax and contributes 1.6 million dollars annually to the economy. Ethiopia has the capacity to produce 500,000 tons of honey and 50,000 tons of beeswax, but currently only produces 43,000 tons of honey and 3,000 tons of beeswax.¹⁸ In addition, there is a high demand for honey in the international market. Aside from offering an opportunity for income generation, bee-keeping is minimally time consuming for the profit it generates. Bees also have a positive impact on the environment, creating important eco-systems, and play an important role in cross-pollinating crops.

- **Land rehabilitation.** Interventions focusing on improving water and soil conservation techniques and reforestation must be implemented on a large scale to revitalize degraded lands. Abatu, Ebru and Negate (2009) state “with the current condition of the communal

¹⁴ http://www.clemson.edu/extension/ep/food_water_req.html

¹⁵ http://www.fao.org/ag/againfo/resources/en/publications/sector_briefs/lbs_ETH.pdf

¹⁶ <http://www.smallstock.info/issues/sheepmilk.htm#table12>

¹⁷ http://food.oregonstate.edu/faq/milk/faq_milktype.html

¹⁸ <http://www.oxfam.org.uk/resources/learning/livelihoods/downloads/pi-engaging-smallholders-in-value-chains-110411-en.pdf>

grazing lands; the sustainable utilization of the rangeland ecosystems is not possible.”¹⁹ Practices like reforestation, soil conservation and water management are also crucial to sustain existing agricultural land.

- **Livelihood Diversification.** Livelihood diversification can also aid in decreasing pressure on grazing lands. Industries such as tourism and non-agricultural livestock related businesses can alleviate pressure on Ethiopia’s grazing land and natural resources. The cultural mindset throughout Ethiopia equates livestock with wealth, and prioritizes quantity vs. quality. As households continue to engage in diversified industries and are able to improve their income and quality of life, livestock’s association with wealth will gradually decrease.

¹⁹ <http://www.lrrd.org/lrrd21/7/abat21101.htm>