



Implications of Constrained Mobility on Livestock Production and Pastoral Livelihoods of Borana Plateau, Southern Ethiopia

EA TIRI Scholar: Beyene Teklu Mellisse, Wageningen University

Co-PI: Yibeltal Tebikew Wassie, Hawassa University, Wondo Genet College of Forestry and Natural Resources

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Feed the Future Innovation Lab for Collaborative Research on Adapting Livestock Systems to Climate Change

Abstract

Pastoralists in the Borana Plateau of Southern Ethiopia employ mobility in order to adapt to and survive the impacts of climate variability, which is characterized by erratic and unpredictable climatic conditions. These pastoralists traverse large areas in search of pasture and water for their livestock, which they depend upon for their livelihoods. Although mobility has long been serving as a pastoral adaptation mechanism to efficiently utilize rangeland resources spatially and temporally, in the past few years it has been constrained by different forms of land fragmentation. This research brief presents the results of household surveys, personal observations and focus group discussions to determine the implications of mobility constraints on livestock population dynamics and pastoral livelihood assets. 🐄

Factors causing rangeland fragmentation induce mobility constraints on traditional pastoral systems

In the arid and semi-arid pastoral systems of Borana, livestock mobility has been a means of utilizing pasture and water available across heterogeneous landscapes. Even though mobility has long been the key to maintaining pastoral livelihoods in dynamic rangelands characterized by high climatic and ecological uncertainty, expanding crop cultivation in pastoral areas is causing land fragmentation and thereby removing the most productive lands from the grazing herds. Moreover, fragmentation of rangelands in Borana has been aggravated by bush encroachment, sedentarization and excess fencing around private grazing lands. As different forms of land fragmentation subdivide more areas, pastoralists' ability to track environmental conditions and mobilize herds to seek pockets of good forage is limited and the total area of the remaining rangelands has declined. Consequently, pastoralists are forced to stay around encampments or move long distances to cross protected (private enclosure) and occupied (bush encroachment and cropping) rangelands. With very little existing research on the impacts of land fragmentation on mobility, the main objectives of this study were to assess patterns and trends of mobility constraint and its drivers and to evaluate the implications of constrained mobility on livestock population and pastoral livelihood assets in the Borana Plateau of southern Ethiopia.

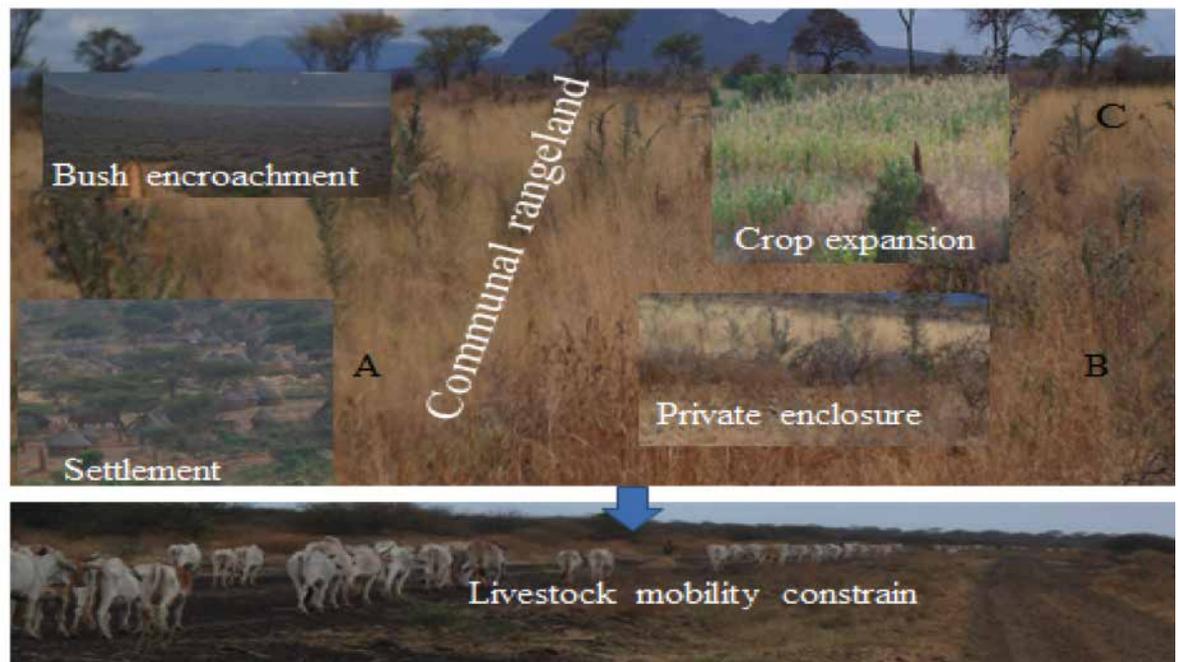
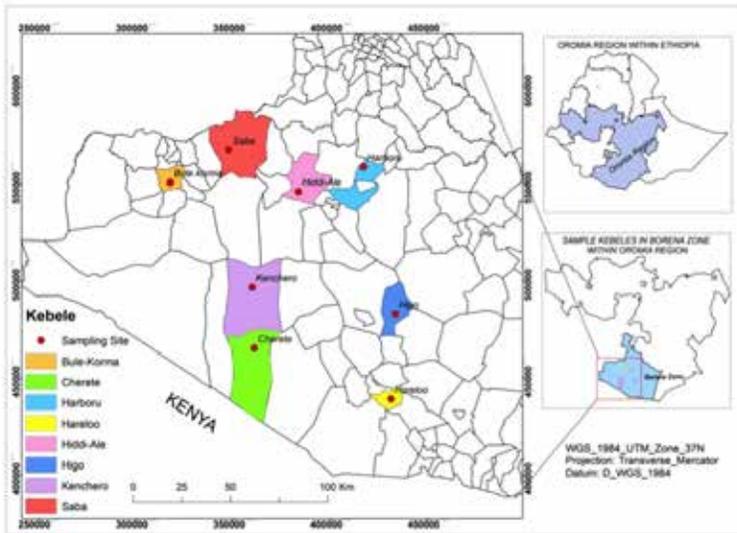


Figure 1: Factors that cause mobility constraints.

Source: Beyene Teklu Mellisse. Designed from pictures taken during survey.



Map of Ethiopia with highlighted areas studied.

Pastoralists from traditional mobile pastoralism and agro-pastoralism systems reveal impacts of land fragmentation

Located in the southern tip of Ethiopia, the Borana zone is made up of 13 districts or woreda, divided between two agro-ecological zones, the semi-arid lowlands to the south and the more humid lands at higher altitudes to the north. Researchers randomly selected 120 households from four districts in the Borana zone to participate in a detailed household survey. Survey participants represented pastoral communities, which still practice traditional mobile pastoralism, and agro-pastoral communities, which have highly constrained mobility. Participants were also split across three socio-economic classes. Interviews were held with the household head and took up to three hours to complete for each household. Respondents were asked to recall herd histories and mobility routes from 2008 to 2013. More specifically, they were asked to recall introductions of cropping and pastoral associations, banning of fire, occurrence of bush encroachment and fencing for ranches and kalo (bush-fenced community grazing sites) from 1974 to 2013. Researchers also conducted four focus group discussions with elders, development agents and key informants in each of the selected districts. A total of 10-12 participants representing all socio-economic classes and genders were included in each of the discussions. Participants were asked to map the trend and pattern of herd mobility, its drivers and implications on livestock population, composition and their livelihood. Lastly, researchers made participatory field visits to six of the thirteen districts in Borana to understand existing conditions, such as rangeland management and utilization, livestock composition, herd mobility, pastoral settlements and feasibility of cropping in pastoral areas.

Reduced mobility has potential to increase pastoral vulnerability to climatic uncertainty

After analyzing collected data, the major outcomes of rangeland fragmentation were determined to be:

- An attitudinal change from a sense of communalism to individualism or privatization;
- A system change from pure pastoralism to agro-pastoralism;
- A shift in diet from milk to crops;
- A change in herd composition from cattle to small ruminant and camel;
- Mobility constraints; and
- Changes in livelihood strategy from livestock keeping to crop cultivation.

Generally, the dynamics of system change in Borana can be classified into four major contexts: rangeland fragmentation, mobility constraints, vulnerability and livelihood assets (Figure 3).

Rangeland fragmentation: The fragmentation of communal rangelands into distinct pieces of landscape has caused mobility constraints and, in effect, reshaped livelihood assets. Whenever communal rangeland declines in size or changes into other forms of land use, it compromises mobility as access to resources becomes increasingly limited. For example, Dillo is a place where salts are easily accessible for all kind of animals, but it is about 100 km away from Yabello and Dire, therefore mobility is the only way of accessing minerals located in distant places like Dillo. In agro-pastoral systems, the distance of regular mobility decreased by 7 percent between 2010 and 2013, which consequently compromises herd access to resources like pasture and water. This has a profound implication on pastoral livelihood assets, such as livestock holdings, communal rangeland, watering points and income, which, in turn, make pastoralists increasingly vulnerable to food self-insufficiency and famine.

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Mobility constraints: Mobility has been significantly altered in recent years in both agro-pastoral and purely pastoral systems, but in opposite ways. The distance of regular mobility in agro-pastoral systems has decreased, thus agro-pastoralists are forced to stay in restricted or confined areas of settlement. This is because the rangeland that has been managed communally for centuries has been allocated to individual pastoralists. Consequently, the long-practiced tradition of communal land management has been deteriorated and replaced by private ownership. As a result, individual households have started to practice their own type of livelihood strategies, such as cropping, handicrafts etc., to create additional income. In this system, the extent of livelihood diversification is highly dependent on the working labor force and climate conditions at a particular time. For example, if rainfall availability is good enough to cultivate crops, pastoralists choose to plant more than one kind of crop; if conditions are not ideal, pastoralists tend to concentrate more on livestock feed conservation by extending private enclosures because mobility is limited.

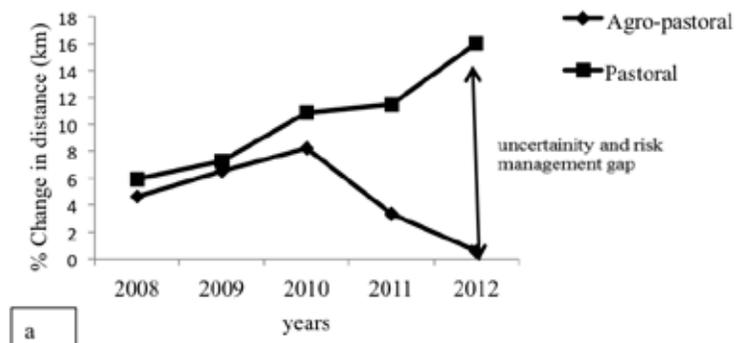


Figure 2: Percent change in regular mobility in agro-pastoral and pastoral system and change in distance of regular mobility as system shift from pastoral to agro-pastoral system

In contrast, the distance of regular mobility in purely pastoral systems has increased. This, however, does not mean accessibility to pasture and water has improved. For example, pastoralists may be forced to bypass areas occupied by private enclosures and crops in order to access pasture and water, which significantly increases the distance of mobility. This process influences the pastoralists in two ways. First, the land occupied by private enclosures and crops reduces the size of available grazing land, which results in grazing pressure and degradation. Secondly, private enclosures and crops have disconnected the landscape, limiting resource accessibility and resulting in a diminished interaction between pastoralists and the landscape. Traditionally, herders in arid ecosystems minimized risk and uncertainty by increasing their mobility in response to low rainfall. In addition, traditional mobile systems involved common property regimes, thus pastoralists shared in a mutual risk and burden. But now, as systems change, any form of rangeland fragmentation puts pastoralists at an increased risk.

Pastoral livelihood assets: Rangeland and livestock are the two keystone livelihood assets of pastoralists in Borana. This is because livestock, from which pastoralists' entire livelihood derives, is entirely dependent upon rangeland. If rangeland size decreases or changes into other land-use types, it will have a direct repercussion on livestock numbers, herd composition, income and overall production. For example, the number of cattle and income from livestock were significantly higher in pastoral systems where mobility is slightly constrained and pasture is not fully limited in comparison to agro-pastoral systems where agro-pastoralists are confined to a specific area and mobility has significantly declined. In addition, agro-pastoralists were more likely than pastoralists to reduce herd size, move out of towns (thus abandoning livestock keeping and crop cultivation) and shift their diets (from milk to food crop). The decline in herd size and income from livestock could exacerbate vulnerability of agro-pastoralists to famine and poverty in the long run.

Vulnerability: Living in an arid and semi-arid region with increasing climatic uncertainty, reducing vulnerability is the only way pastoralists can survive and thrive. Livestock mobility is a means of managing that uncertainty and risk in prevailing harsh and erratic conditions of the region. Therefore, mobility constraints could influence the livelihood activities pastoralists adopt in order to maintain their livelihoods. The degree to which pastoralists or agro-pastoralists are exposed to shocks or risk entirely depends on the amount and status of people's assets. Any process that deteriorates these livelihood assets increases vulnerability. Therefore, in this study, rangeland fragmentation and mobility constraints were identified as factors that have reshaped the status of pastoralist's livelihood assets in Borana.

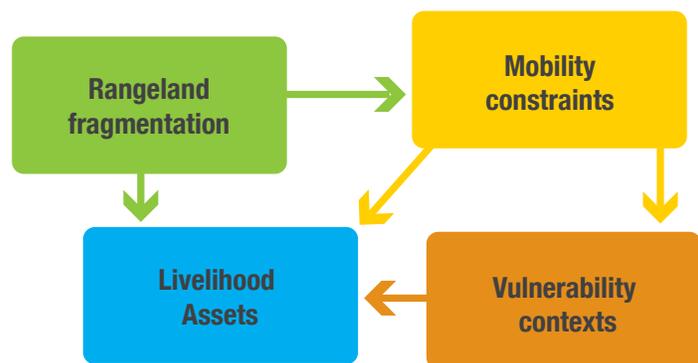


Figure 3. The interlinked associations of rangeland fragmentation, mobility constrain and vulnerability as determinates of livelihood asset in Borana. Source: Beyene Teklu Mellisse. Design summarized from Teklu et al (2014).

Rangeland fragmentation may play a factor in increasing socio-economic inequalities within both pastoral systems

Constrained mobility has also had an affect on socio-economic quality, and thus the ability of poorer pastoralists to maintain their livelihoods. In terms of cattle holding, the gap between the wealthy and poor economic classes is about 83.6 percent and 93.7 percent in agro-pastoral and pastoral systems, respectively. This indicates a greater socio-economic inequality between households in both systems of the Borana Plateau. Pastoralists, during group discussions, explained that the expansion of private enclosures has favored rich pastoralists. With more grazing land than poor pastoralists, wealthy pastoralists have the opportunity to increase their livestock holdings. Therefore, as the household survey confirmed, greater socio-economic inequality may be the repercussion of communal rangeland fragmentation by dissection, decoupling or compression. The widening of cattle holding per household between the poor and wealthy economic class in both agro-pastoral and pastoral systems of Borana plateau could increase the vulnerability of the poor. This is because one of the main methods for self-insuring against risk is to accumulate food stocks and marketable assets. In this regard, livestock is the major form of wealth and insurance substitute across much of Sub-Saharan Africa due to the limited durability and storage costs of cereal crops. Therefore, mobility constraints by any type of communal rangeland fragmentation could exacerbate vulnerability and socio-economic inequality of rural communities who entirely derive their livelihood from livestock rearing and make a living in arid and semi-arid ecosystem where climate is uncertain. In addition, greater socio-economic inequality between households and divergent trends between communities could hinder cooperation in range management.

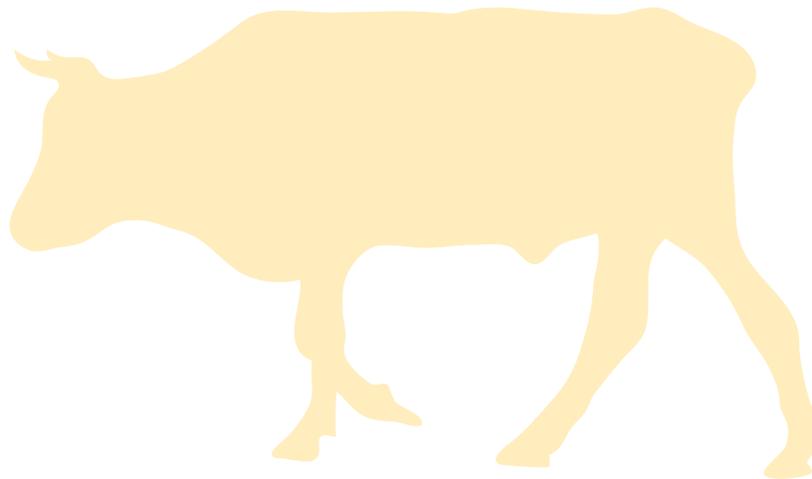
“The widening of cattle holding per household between the poor and wealthy economic class in both agro-pastoral and pastoral systems of Borana plateau could increase the vulnerability of the poor.”

More research is needed to investigate the future sustainability of both pastoral systems

Given the current trend of population growth and government policy (pastoral settlement) the continuation of mobility is unlikely. Investigation on the sustainability of both systems, equitable utilization of private enclosures and the tradeoffs between crop expansion and livestock holdings is recommended. Such kinds of investigations will be used as a benchmark for other pastoral areas in Ethiopia, such as Somali, Benishangul-Gumuz and the Afar region, where pastoral settlement is ongoing. 🐄

Further Reading

Teklu B, Tebikew Y, Hoag D and Desta S. 2014. Implications of Constrained Mobility on Livestock Production and Pastoral Livelihoods of Borana Plateau, Southern Ethiopia. Unpublished



TIRI, Targeted Investment for Research Impact, identifies early-career researchers who are interested in tackling livestock production problems through innovative approaches and fresh perspectives. This small-grant program is open to early-career researchers (five or fewer years into research career) in any discipline, from student to professor, and from any organization that is engaged in applied research on livestock production in South Asia and East Africa — colleges and universities, government research centers or laboratories, or non-profit organizations.

Proposals are selected based on their potential to make livestock production systems more resilient to increasing climate variability and severity. At the end of one year, TIRI scholars are expected to demonstrate concrete outcomes and real potential for future impact. The 10 selected East Africa TIRI scholars and the 18 selected Nepal TIRI scholars are addressing research problems on various livestock and climate research themes.



Feed the Future Innovation Lab for Collaborative Research on Adapting Livestock Systems to Climate Change is dedicated to catalyzing and coordinating research that improves the livelihoods of livestock producers affected by climate change by reducing vulnerability and increasing adaptive capacity.

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