



Pastoral Sedentarization and Community Resilience in Response to Drought: Perspectives from Northern Kenya

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Pastoral sedentarization is a major trend in East Africa, and there is debate about its social and ecological costs. Here we discuss relationships between sedentarization and well-being for pastoral households in northern Kenya. We used survey data collected from six sites from March 2000 to October 2001 in addition to other information sources. There are varied degrees of sedentarization and complex relationships among vulnerability, sedentarization, mobility, and household income diversification. First, we find that sedentarization does not necessarily reflect a complete departure from pastoralism, nor does it always jeopardize pastoral production. Second, sedentarization does not always imply a loss of access to livestock, nor a lack of mobility for livestock owned by settled households if satellite camps are maintained. Third, there is a great deal of diversification into non-pastoral activities by members of households while other members can remain engaged in mobile pastoralism. Lastly, there is a need to distinguish between increased vulnerability to livestock loss and increased vulnerability to food insecurity when households become sedentary. Overall, we find that what is often labeled sedentarization need not be antithetical with pastoral production. Households show great adaptability and innovation in adopting non-pastoral activities without fully abandoning mobile pastoralism. Three key recommendations that assist pastoralists to maintain mobility and sustainable lifestyles are: 1) educational facilities closer to key grazing and watering points; 2) mobile para-vet services; and 3) land tenure policies that allow access to key resources critical to pastoralists.

Background

Increased sedentarization of pastoral populations has characterized most arid and semi-arid regions of the world during the past two millennia. The origins of many urban areas in the Middle East, North Africa, and the Sudan stem, in part, from the historical process of pastoral sedentarization, whereby segments of mobile herders sought refuge or economic opportunity from settled life. Sedentary livelihoods have always been a survival strategy for impoverished pastoralists, while wealthy herders have pursued urban lifestyles to promote new investments and engagement in more lucrative economic activities (retail trade, irrigated agriculture) compared to the poor. The accelerated settlement of herder populations in sub-Saharan Africa during the past century provoked claims of “an end to pastoralism.” Diversification into town-based activities was seen as a departure from pastoralism, rather than a supplement or peripheral support (Government of Kenya, 1980; Snow and Morris, 1984). Northern Kenya is unique in this respect since most settlements and towns have only arisen in the past 50 years or so, and mobile pastoralism still characterizes large parts of the region. Increased sedentarization in the area also reflects a series of external influences, such as the widespread proliferation of food aid and other forms of development assistance, which complicates an understanding of longer-term trends toward settlement.

It also raises the question as to whether or not increased sedentarization among herders in the region really reflects an enduring commitment away from pastoralism or not.

Major Findings

Table 1 presents a summary of general features for the Kenyan sites where our data were gathered. Table 2 presents averages for a variety of measures by site that relate to the general themes of sedentarization and pastoral welfare. We discuss these findings by discussing each site in turn. Please refer to Tables 1 and 2 throughout.

In spite of losing over 80% of their livestock, the average household in Ngambo fared relatively well during the recent drought (1999-2000) in terms of food security and income. This is shown by their relatively high mean value for milk plus household expenditure. Households in Ngambo have access to work opportunities in the nearby town of Marigat, which has a lively market center and is connected by an all-weather road to the major city of Nakuru. People in Ngambo can also find work in a local irrigation scheme. Salary, wage labor, and trading account for over 60% of household income in Ngambo. Levels of formal education and current rates of school enrollment are the highest of any site in our study region.

Table 1: General features of sites studied by the PARIMA project in N. Kenya.

Site	District	Predominant Ethnic Group	Average Annual Rainfall in mm	Market Access
Dirib Gumbo	Marsabit	Boran	650	Medium
Ngambo	Baringo	Il Chamus	650	High
Sugata Marmar	Samburu	Samburu	500	High
Logologo	Marsabit	Ariaal	250	Medium
Kargi	Marsabit	Rendille	200	Low
North Horr	Marsabit	Gabra	150	Low

In contrast to Ngambo, although the average household at **Dirib Gumbo** lost over 80% of their livestock during the 1999-2000 drought, their well-being does appear to have been negatively affected by that drought. Although Dirib Gumbo is not distant from the major market town of Marsabit—and people at Dirib Gumbo have relatively high levels of education—they also have a relatively low share of their income from non-pastoral sources. Salary, wage labor, and trading account for only 30% of household income at Dirib Gumbo. This is probably because most of these households rely on rain-fed agriculture in “normal” years and seem to have relatively poor access to some types of wage employment. When the rains failed during the 1999-2000 drought, many of the households sold livestock to meet consumption needs, which may explain why the share of income from livestock and livestock products is relatively high.

The average household in **Sugata Marmar** was not severely impacted by the drought in terms of livestock loss, food insecurity, or income. Partially, this may reflect the fact that rainfall data from the area suggest drought was less severe in Sugata Marmar than in other areas of northern Kenya. It may also reflect the fact that households in Sugata Marmar have access to income-generating opportunities arising from a large weekly market. They also live close to markets where food can be purchased. Households in Sugata Marmar earn a relatively higher share of their income from trading (25%) compared to that from any other site. Combined with income earned from selling their own livestock and livestock products (45% of income), residents of Sugata Marmar earn considerable revenue from trade. The mobility of livestock in this area differs from that in others—perhaps because there are more water points available in the Samburu grazing lands. By relying on satellite camps and multiple established households (i.e., a family head with multiple spouses maintains at least one domestic dwelling near an education facility), families at Sugata Marmar appear to have found a compromise between mobility and education, as is seen by the relatively high rates of school enrollment.

The average household in **Logologo** lost roughly half their livestock in the 1999-2000 drought, but this does not appear to have severely impacted welfare as measured by mean

income, mean expenditure, or variability in expenditures. Logologo is the only site where the income share from salary (42%) outweighs the income share from livestock and livestock products (35%). Just over half the salary earners in our sample worked outside the area and were employed by NGO's, the Kenya Police, the Kenyan Armed Forces, the Kenya Wildlife Service, or as night

watchmen in urban areas. Schools, government departments, and the police employ local salary earners. Households in Logologo have established links to the larger national economy that allowed their welfare levels to be relatively unaffected during the recent drought.

The results from **Kargi** provide an interesting nuance to our understanding of the process of sedentarization. Although Kargi households have settled, their animals remain highly mobile through an effective system of herding camps. The Kargi results show that pastoral production remains a viable strategy in some areas. Kargi herders are relatively well-off in terms of the mean and variance of the expenditure plus milk value measure, and they lost a relatively small percentage of their livestock to drought. Their isolation from market forces actually seems to have allowed them to pursue a form of mobile pastoralism that is well-suited to their environment.

Contrasting the **North Horr** results with those from Kargi provides a fuller understanding of these points. Households in North Horr appeared more mobile than households in Kargi. Many households in North Horr still shift their entire household to a new area in search of forage, while in Kargi only the animals were dispersed. However, results show that Kargi livestock were more mobile than livestock in North Horr. This means that grazing resources may be more evenly utilized by the inhabitants of Kargi. With regard to the viability of pastoral production, it should be noted that the main difference in the welfare measures between North Horr and Kargi is the larger—yet less variable—milk production in the latter site. Although it is not well reflected in the rainfall data for 1999 to 2001, the spatial distribution of rainfall observed in this area during the study period appeared to create more abundant forage in key areas used by herds from Kargi compared to those used by herds from North Horr.

Practical Implications

Income diversification is frequently discussed as an alternative to pastoralism. Our findings suggest it may be more useful to think of how income diversification can be used as a supplement to pastoralism rather than a

replacement. Thus, the key is to provide sedentary-type services (for example, education and veterinary services) that benefit pastoral populations without jeopardizing mobile pastoralism and creating unwanted concentrations of people and animals around fragile settlement environments.

Education. In northern Kenya, education up to secondary school increases one's chances of obtaining employment in the formal sector. Our data suggest this is particularly true in higher rainfall sites (Ngambo and Suguta Marmar) where sedentary forms of pastoralism have evolved and access to town-based education facilities is generally good. In other, more mobile and drier sites like North Horr and Kargi, such opportunities have not evolved as rapidly due to less complementarity between mobile forms of pastoralism and town-based facilities for formal education. In these areas effort should be made to move education facilities nearer to key grazing and watering points and/or adjust school calendars to account for seasonal movements of animals and people. Herders should not have to make a choice between the pursuit of pastoralism and sending children to school. Finally, for reasons bearing further investigation, educational investments in the sedentary community of Dirib Gumbo

do not appear to have had a large payoff in terms of employment.

Veterinary Services. The advent of para-vet ("barefoot") animal health services in northern Kenya is a welcome addition to pastoral systems and should be increasingly supported (para-vets are local people trained in basic aspects of animal health diagnosis and treatment and serve their communities). Often, pastoral animals are untreated—or treated by untrained herders—because distances to town-based veterinary services are often prohibitive. If an important goal for rangeland management is to keep animals widely distributed and feeding on the best forage rather than concentrated around settlements, then mobile para-vet services are critical to achieving this. Efforts should be made to increase the training support to para-vets and change government policies to recognize para-vets as legal service providers. This would allow para-vets to better access medicines and vaccines than is currently the case.

Land Tenure and Planning. Increased sedentarization can aggravate land conflicts in the vicinity of settlements. This often pits local groups against new immigrants and herders

Table 2: Ranked order of Kenya study sites with respect to different measures of human welfare and involvement in pastoral production. From top to bottom, sites are ranked from highest to lowest for each respective measure (with the exception of the herd loss column).

Higher mean milk value + expenditure ¹	More stable milk value + expenditure ²	Higher mean income ³	Higher non-pastoral income % ⁴	Higher average herd size ⁵	Lower maximum herd loss ⁶	Higher water points used ⁷	Higher enrollment in 2000 ⁸
Ngambo	Ngambo	Logologo	Ngambo	Kargi	Kargi	Kargi	Ngambo
Sugata M.	Logologo	Sugata M.	Logologo	North Horr	Sugata M.	Logologo	Sugata M.
Logologo	Kargi	Ngambo	Sugata M.	Logologo	North Horr	North Horr	Dirib G.
Kargi	Sugata M.	Kargi	Dirib G.	Dirib G.	Logologo	Ngambo	Logologo
Dirib G.	Dirib G.	North Horr	North Horr	Sugata M.	Ngambo	Sugata M.	Kargi
North Horr	North Horr	Dirib G.	Kargi	Ngambo	Dirib G.	Dirib G.	North Horr

Notes:

- 1 Defined using household level, two-week expenditure data and adding in the value of two weeks worth of home-consumed milk defined using the local market value of milk. The maximum is \$31, the minimum \$10.
- 2 Defined as the household-level coefficient of variation over time periods for the measure described in (1). The maximum is 78%, the minimum 50%.
- 3 Defined as total household cash income for a three-month period. The maximum is \$125, the minimum \$32.
- 4 Defined as the share of the measure described in (3) that is not accounted for by livestock or livestock product sales. The maximum is 82%, the minimum 40%.
- 5 Defined in terms of Total Livestock Units. The maximum is 20, the minimum 2.
- 6 Defined as the maximum decline in the average of the household observations for (minimum herd size / maximum herd size)-1 during the period March 2000 to September 2001 of the measure used in (5). The maximum is -85%, the minimum -5%.
- 7 Defined as the average number of water points visited by a household herd over a three-month period. The maximum is 3.3, the minimum 1.1.
- 8 Defined as the percent of school age children who were enrolled in formal schooling in 2000. The maximum is 91%, the minimum 16%.

against farmers. Agricultural encroachment onto rangelands has been associated with certain patterns of sedentarization and can instigate conflicts related to land use and tenure, often to the disadvantage of local herders. Policies should be developed that recognize the rights of herder groups to customary water points and grazing areas and delimit the extent to which sedentary farming can expand into rangelands.

Further Reading

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The GL-CRSP Pastoral Risk Management Project (PARIMA) was established in 1997 and conducts research, training, and outreach in an effort to improve welfare of pastoral and agro-pastoral peoples with a focus on northern Kenya and southern Ethiopia. The project is led by Dr. D. Layne Coppock, Utah State University, Email contact: lcoppock@cc.usu.edu.



The Global Livestock CRSP is comprised of multidisciplinary, collaborative projects focused on human nutrition, economic growth, environment and policy related to animal agriculture and linked by a global theme of risk in a changing environment. The program is active in East Africa, Central Asia and Latin America.

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