

Traditional coping mechanisms for climate change of pastoralists in South Omo, Ethiopia

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Pastoral groups in the Horn of Africa are marginalized and live under extreme poverty. Climate change brings newer and more complicated challenges. It is expected that the frequency and severity of extreme weather events will increase in the region. This will have devastating consequences for the peoples of the region in general and the pastoral communities in particular. This paper examines traditional coping mechanisms that the Dassanech and Nyangatom pastoral groups of the South Omo valley, southern Ethiopia use. These include: migration, herd diversification, herd splitting, income diversification, restocking and local alliances. The interventions of governmental and non-governmental actors by and large overlook the capacity of such traditional mechanisms. The Ethiopian government focuses on settlement in its development intervention and believes that settling pastoral communities through introduction of irrigation schemes would bring them a more 'stable' way of life. However, we contend that introduction of large-scale irrigation in the Omo valley would bring pastoral communities more challenges than opportunities. The paper's major conclusion is that the adoption of viable policies to cope with the adverse impacts of climate change in the Omo valley requires a concerted effort to recognize and to utilize efficiently the traditional knowledge of pastoral groups.

Keywords: Traditional knowledge, Coping mechanism, Climate change, Pastoralism, Migration

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Climate change has serious consequences in the pastoral lowlands of Ethiopia. A comparative study of adaptive capacity of regional states puts the Southern Nations Nationalities and People's Regional State (SNNPRS) as the most adaptive¹. However, pastoralists of the SNNPRS are among the most vulnerable of the region's peoples². Poor infrastructure, decades-long neglect, inappropriate development intervention and economic and political marginalization of pastoral communities have rendered pastoralists of South Ethiopia highly vulnerable to severe climate change impacts. Weak and ineffective state institutions force these communities to rely mainly on autonomous adaptation mechanisms, which are typically based on their traditional knowledge, institutions and resource use arrangements developed over past generations.

Pastoralists such as those of South Ethiopia have traditional coping mechanisms which have evolved

over centuries of experiencing environmental change. It is only because of these efficient, effective and sophisticated tools that these pastoralists have been able to survive the harsh and unpredictable climates of the lowlands. They also apply their knowledge in adapting to the adverse impacts of climate change and increased climate variability. Most of their coping mechanisms can be summarized as resource management mechanisms, which are flexible and help to spread risk across the community³.

The main mode of adaptation in pastoral areas remains autonomous—and has taken place with little or no help from the government. This makes traditional coping mechanisms even more important and relevant. Their main goal is to minimize losses or facilitate recovery after drought events⁴. Local innovations by pastoralists (for example purchasing water, purchasing with credit and adopting a cut-and-carry system of forage from protected areas such as parks) can also be seen as changes to traditional coping mechanisms that match current socio-economic realities and climate challenges⁵.

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Interventions by government, and non-state actors as well, should therefore build on what is already available in the stock of traditional coping mechanisms, or at least follow in line with these mechanisms. Informal strategies, not government or market-based instruments, are the main pathways through which pastoralists cope with climate-caused stresses⁶. Therefore, future adaptation schemes should not try to replace, but rather complement and strengthen these informal approaches⁷. To do this, a comprehensive study on traditional coping mechanisms and their effectiveness should be carried out. This will help identify those traditional coping strategies that could be incorporated into government policies. In this paper, we survey some of the most important coping mechanisms used by the Dassanech and Nyangatom pastoral communities of South Omo, Ethiopia.

Methodology

The study was conducted in the Dassanech and Nyangatom *Wereda* (an administrative tier, above the lowest tier of *Kebele*) of South Omo Zone, SNNPRS, Ethiopia (Fig. 1). These *Wereda* are located at the southern borderlands of Ethiopia, in the lower parts of the Omo-Gibe basin and at the mouth of the Omo River. While the first *Wereda* is inhabited solely by the Dassanech ethnic group, the latter is inhabited by three ethnic groups: Nyangatom (dominant), Koigu (also known as the Muguji) and Murle. The Dassanech and Nyangatom groups have their ethnic-kin across the boundary in Kenya and South Sudan, respectively.

The Zone is home to a total of 16 ethnic groups; most – with the exception of the Ari



Fig. 1—The study area: Omorate and Kungaten are the capitals of the Dassanech and Nyangatom *Wereda*. Source: UNDP website

(farmers, population of 290,453) and the Malie (agro-pastoralists, population of 98,114) – are pastoralists and have a total population of under 50,000⁸ (Table 1).

The Zone is characterized by weak physical and socio-economic infrastructure and poor integration with the national economy. Pastoral conflicts, usually over scarce natural resources—mainly pasture and water for livestock—are the norm in the area, often involving cross-border issues. In particular, there is a bloody feud between the Dassanech, Nyangatom and the Turkana. Contrary to past trends, however, currently there are only occasional conflicts between the Dassanech and Nyangatom.

The pastoral way of life followed by both ethnic groups (the Dassanech and Nyangatom) gives value to increasing the number of livestock in one's herd. For these societies, wealth is reflected in the number of livestock a person owns. Rangeland conditions, however, seem to be deteriorating, with a noted decrease in grass species and increase in shrubs, as observed by the majority of pastoralists in a study in neighbouring Hamer, Benna and Tsemay areas⁹.

Although pastoralism is the main livelihood activity in the two *Wereda*, both the Dassanech and Nyangatom ethnic groups practice flood retreat agriculture on the riverbanks of the Omo River and surrounding flats. The River divides the Dassanech-land in half, while it serves as the easternmost border of the Nyangatom-land. This settlement pattern offers

Table 1—Ethnic composition of the South Omo Zone

Ethnic Group	Livelihood	Total population
Ari	Farmers	290,453
Malie	Agro-pastoralist	98,114
Dassanech	Pastoralist	48,067
Hamar	Pastoralist	46,532
Bena	Pastoralist	27,022
Nyangatom	Pastoralist	25,252
Tsemay	Pastoralist	20,046
Mursi	Pastoralist	7,500
Bodi	Pastoralist	6,994
Arborie	Pastoralist	6,840
Brayle	Pastoralist	5,002
Bacha	Pastoralist	2,632
Koyego	Pastoralist	1,974
Karo	Pastoralist	1,464
Murle	Pastoralist	1,469
Dime	Pastoralist	891
Zone Total		590,252

Adapted from: Central Statistics Agency of Ethiopia (CSA) (2008)

the Dassanech greater opportunity than the Nyangatom to put more land under cultivation. Some *Kebele* in each *Wereda*, who are farther away from the River and with no direct access to flooded land, buy sorghum from those bordering the river. The diet shows significant change over the seasons: crops and milk dominate after harvest, traditionally at the beginning of December (called *akapuro* or 'time of plenty'), and dwindle with time. Meat dominates by June, as 'time of want'/*akamu* sets in¹⁰. Fishing is taboo in the area¹¹, and locals living close to the River break this taboo and consume fish only during drought times¹⁰. The Nyangatom have recently adopted traditional apiculture from the Murle ethnic group.

The fieldwork for this research in the Dassanech and Nyangatom *Wereda* was conducted in May 2011. Numerous interviews and focus group discussions were held with elders, shepherds, and *Wereda* administrators in and around Omorate and Kangaten. Content analysis of the transcribed documents was conducted in July 2011.

Results and discussion

The Dassanech and Nyangatom ethnic groups use a combination of nine major forms of traditional coping mechanisms (detailed below), to various extent, to help them withstand harsh environmental conditions. These mechanisms are well suited to the way of life and culture of these peoples, and have been passed on from one generation to the next.

Pastoral 'early warning' methods

If the Omo River doesn't overflow to surrounding flats, drought and food shortage will be eminent in the area. On the contrary, if it overflows too much, it will take with it livestock, houses and people. A traditional 'early warning system', which relies heavily on astrology and the careful observation of wild animals, especially birds, helps locals to prepare for the rise in water by predicting the coming of rains and their intensity. Based on this information, different decisions will be made. For example, people will move away from the Omo River, or from the islands in the case of the Dassanech, if severe flooding is expected. In such cases, the elderly reach a decision, based on predictions made by observing stars, wind and cloud patterns, behaviour of specific wild animals or the flowering of some plants, which will be passed to the youth of the group, who will then move the herd to a safe location. This has a preventive role, in the sense that

such predictions will give ample time for people to migrate to a wetter area in dry times or to higher ground if flooding is expected. Thus, elders with the skill of predicting seasonal weather variations are highly respected.

Migration

In the study area, the distance to be covered and direction of migration depends on many different factors. The most important input to this decision is the intimate knowledge that shepherds have of the entire landscape.

The Dassanech have the geographical advantage of access to one of the islands on the northern tip of Lake Turkana during dry times, while their neighbours, the Hamar and Nyangatom, migrate to Mago and Omo National Parks, respectively. The easy access to water on the numerous small islands, and the relatively better protected pasture in the Parks, sustain the livestock until the rains start. In times of severe drought, the Dassanech migrate deep into the borderlands of neighbouring Kenya and the Nyangatom into Omo National Park, increasing the risk of conflict with the Turkana and Mursi respectively. A Nyangatom elder asserted that, in times of drought, "we will go wherever there is grass, to the lands of the Dassanech, Hamar, Karo and Mursi. We also go to Kenya and the Sudan. We do that irrespective of the conflict that our movement brings to us."

Migration is not only a coping strategy for drought or shortage of pasture but also a method the Dassanech use to minimize flood impacts. At times of flooding, the Dassanech move into Hamar and Nyangatom lands. Migration to towns, to find work as petty traders and daily labourers, is not very common in the study area, mainly because there are no major town centres nearby.

Mobility basically defines the pastoralist way of life and is critical to the viability of pastoralism^{12,13,14}. Herd owners move their herds in search of water and pasture to different locations during different times of the year. This has also the benefit of reducing pressure on the marginal ecosystems in which they live. Migration is possible due to communal ownership and management of natural resources, which is not recognized by Ethiopia's constitution. Before embarking on a seasonal migration, pastoralists estimate how far they will have to go (farther in drier years) and also weigh the relative numbers of livestock deaths from migration versus

staying on the sub-optimal lands⁴. In recent years, pastoralists (like Somalis in Ethiopia) have started taking diesel fuel when migrating, so as to ensure easy access to water from deep boreholes by using motorized water pumps⁵. Such pumps are especially mandatory in times of drought, as the water table drops and it becomes impossible to manually take water from the deep wells.

However, migration often brings contact with other pastoral communities and/or farmers, and this can lead to resource competition and social tension. Traditional mechanisms, such as the creation and maintenance of grazing corridors, have proved crucial in reducing the risk of, and resolving, violent conflict.

Consumption of wild fruits and roots

The consumption of wild fruits and roots, which are not consumed under normal conditions, is a common coping mechanism in the study area as in many pastoral communities in East Africa¹⁵. These edible wild plants are better able to resist drought than domesticated food crops. These wild plants are usually consumed by human beings, not livestock; as an interviewee said, "cattle are picky". Sheep and goats eat branches, and herders cut down high branches from shrubs and trees for them. Interestingly, an informant mentioned that eating fish, especially in the case of the Dassanech, could be seen as a coping mechanism; normally, fish are not consumed, although both the Dassanech and Nyangatom ethnic groups have sub-clans who eat fish. Additionally, as stored cereals are used up, meals prepared from meat and butter will dominate. The meat will be dipped in butter to preserve it, giving it a storage life of more than a month.

Selling livestock

As it is the case with pastoralist communities, both study communities do not rear livestock for commercial purposes, thus selling animals is not a common practice. Furthermore, in both communities, a pastoralist who often sells his cattle will be ostracized. During extended droughts, however, people in both communities will sell their livestock. In the past, as access to markets in Ethiopia was limited because of poor infrastructure, pastoralists in the Zone used to go to the Kenyan side to sell or barter their animals. Now, both communities sell their cattle in nearby markets (Omorate and Kangaten) within Ethiopia.

Herd diversification

Pastoralists keep a mixed herd, especially of grazers and browsers, to take advantage of the heterogeneous nature of the environment and to use different resources (grasses, shrubs, twigs, etc.) efficiently. Moreover, herd diversification helps prevent a total herd loss by keeping animals with a range of tolerance levels to climatic stresses^{4,16}. Shifts in composition of herds sometimes occur in response to changes in environmental circumstances: while the herd composition of Somalis has changed from camels to shoats (sheep and goats), that of the Afar has shifted from cattle to goats and camels⁵. The Borana of Ethiopia, who traditionally are averse to camel husbandry, have also started keeping camels due to their resilience to drought and climatic stress.

Traditionally, herd diversification is not practiced to a great extent in the study area. Herd composition mainly consists of cattle, sheep and goats. It is only after the 2006 floods of the area, and after encouragement from the government and NGOs, that pastoralists of the study area started keeping camels. The Dassanech used to raid camels from the Turkana in the past, but the Hamar and Nyangatom got their first camels (originally bought from the Borana zone) with NGO support. In Nyangatom *Wereda*, however, adoption of camels is so slow that most camels are still in government hands.

Locals have started consuming camel meat and drinking camel milk, appreciating the drought resistance of camels and their high milk production per animal. In Dassanech *Wereda*, a clear increase in the proportion of camels is seen as one moves away from the Omo River, reaching as high as 20% of the total herd in some locations. Camels and donkeys are not treated as well as cattle and goats, as the former are more resilient. To a lesser extent, the Dassanech and Nyangatom have also started raising poultry and practicing apiculture.

Herd splitting

The impact of extreme climate events (like drought), outbreaks of disease epidemics and risk of raiding is not equally felt across the entire territory of the pastoral community. Splitting up a herd will decrease the impact of de-stocking and allow easy restocking following extreme weather events^{4,14}.

Herd splitting is uncommon in the Dassanech culture, but is practiced to a limited extent, although not in the exact sense of the term, by the Nyangatom.

If a pasture becomes poor in their locality, the Nyangatom send their cattle to relatives to graze in areas with better pasture, especially to a place called Naita for an extended stay—thus, taken as a different coping mechanism than migration. A variant of herd splitting was also recorded in the study area: the paying of bride wealth under numerous instalments. This creates the possibility of claiming the ‘unpaid’ livestock as though the father of the bride has placed it under the protection of his son-in-law. After a severe reduction in herd size following a drought episode, the son-in-law will make the next instalment of bride payment, and thus help his father-in-law re-stock.

Income diversification

During severe droughts pastoralists cope by engaging in non-pastoral activities and increasing their off-farm income^{13,17}. Examples of such activities include charcoal making, seeking employment and raiding⁴. Other activities include collection of wild fruits^{14,18}, living on remittances from relatives who have migrated to towns and cities, engaging in petty trade and sale of assets¹⁴.

These livelihood diversification schemes usually constitute a shift into low income and unsustainable use of environmental resources, which could be taken as maladaptive practices¹⁹. Most of the aforementioned coping practices are more possible for those pastoralists located closer to urban centres, but have little relevance to the Dassanech and the Nyangatom. In comparative terms, the Dassanech are better positioned for these activities than the Nyangatom, as Omorate town is much older than Kangaten and has a higher number of residents and civil servants.

Taking advantage of ‘good’ years and restocking

Given the highly unpredictable environments they live in, pastoralists take the opportunity during the ‘good’ years to prepare for ‘bad’ times. In the ‘good’ years, they increase the proportion of productive female livestock in their herd. This ensures the easy replacement of lost livestock, in addition to the nutritional benefits—increased milk production—it has⁴. Moreover, increase in herd size (during the ‘good’ years) serves as insurance against future losses^{4,12} and decreases the vulnerability of the pastoral household. However, high livestock population numbers have been blamed for the degradation of rangelands and numerous calls have been made for de-stocking⁴.

Restocking takes pastoral households many years; thus, predicted increases in frequency and severity of climate variability due to climate change will make pastoralists more vulnerable if their effort to restock is not supported. In the study area, different actors have contributed to support the restocking of herds of the Dassanech after the severe flooding of August 2006. After the provision of relief aid, government and non-governmental organizations distributed livestock to the affected groups of pastoralists.

Alliances with neighbouring communities

The first impact of drought on pastoral households is a reduction in milk production and, thus, in levels of nutrition. Pastoralists, in such times, supplement their diet by exchanging livestock products for cereals^{4,16} or consuming edible wild famine foods¹⁵.

In the study area, the Dassanech produce more sorghum and maize, due to their favourable settlement pattern, and the Nyangatom buy cereals from the Dassanech to supplement their diet. The Nyangatom, especially in the 1980s and 1990s, were efficient at utilizing their close linguistic affinity with the Toposa of South Sudan and their ethnic kin across the border. They could graze their livestock closer to and well over the border in times of drought without fear of stealing and/or conflict. This still continues to some extent.

Conclusion and policy recommendations

Climate change is one of the many challenges that humanity is facing today. Increase in temperature, unpredictability of weather patterns and flooding, prolongation of the dry season and recurrence of drought are some of the major aspects of climate change in the Horn of Africa. In particular, the Horn of Africa is one of the sub-regions of the world that is highly affected by recurrent drought and the resultant famine. Countries like Ethiopia, whose economies are reliant on rain-fed agriculture, are particularly vulnerable to the adverse impacts of climate change. In spite of this, there is limited institutional and technical capacity to either manage the adverse impacts of climate change or maximize the opportunities climate change provides. Of greater concern is that little attention is given to the impacts of climate change for most vulnerable social groups like pastoralists.

Pastoralists, because of their historic marginalization from the politics and economies of the countries of the Horn of Africa, including Ethiopia, are in fact highly vulnerable to the adverse impacts of climate change.

The same is true of the Dassanech and the Nyangatom of the South Omo valley.

Dramatic climatic changes are threatening the normally resilient pastoral way of life. In the face of the adverse impacts of climate change, the Dassanech and the Nyangatom communities use time-honoured traditional coping mechanisms such as migration, use of wild fruits and other edible plants at times of food shortage, herd diversification and splitting, taking advantage of good years, selling livestock, and income diversification.

In spite the availability of accumulated traditional knowledge about efficient use of scarce resources and also coping with drought and climate change among pastoralists, governmental and non-governmental actors do not harmonize their development interventions with the existing indigenous knowledge. In Ethiopia, the major policy goal of successive regimes (past and present) is 'transforming' the country's pastoral groups into 'sedentary agriculturalists' which is erroneously considered more advanced and more stable than pastoralism. The emphasis that is given to settlement reduces the crafting of policies and practices that would take advantage of pastoralism, in which the people of the region are well versed.

Permanent settlement of pastoral communities due to government pressure and force leads to the loss of knowledge and skill in animal husbandry and pastoralism in arid and semi arid areas. Moreover, it introduces new social, political and economic difficulties to pastoral communities. The government of Ethiopia in its bid to transform the economy is currently implementing an ambitious project of expanding the sugarcane plantations and industry. With an infusion of more than 4 Billion USD, the Sugar Corporation of the government is erecting ten new sugar factories in different parts of the country. With the completion of the project (in ca. 2016), the country aims to take 2.5 percent of the world sugar market. Several of the new sugar mills are going to be established on the banks of the major rivers of the country. Most of the areas which are now slated for the expansion of the sugar industry are inhabited by pastoralist groups. Of the ten sugar factories in the pipeline, six are planned for South Omo. This means that the several pastoralist groups of the South Omo zone are going to be massively affected by the sugar industry. One could expect loss or reduction of access to grazing land and water, displacement and conflicts between new and traditional users of resources.

Even if the realization of the plan to erect large sugar mills across the country could help absorb hundreds of thousands of unemployed youth and to generate foreign exchange, at local levels in such areas as South Omo, it will bring several challenges. Most importantly, it would weaken pastoral institutions and their knowledge of coping with climate change. Planned introduction of large-scale irrigated agriculture will have similar effects, forceful settlement of pastoralists in the region, weakening their traditional knowledge of pastoralism and increasing the vulnerability to climate change.

To allow pastoral communities like those in South Omo cope with the challenges of climate change, it will be important to mainstream traditional knowledge and institutions into development interventions. For instance, one of the major instruments through which pastoralists overcome drought and shortage of pasture is migration/transhumance. This should be recognized by governments, and policies that help support this practice should be adopted. With the increasing shortage of pasturelands, ethnicization of territory, and insecurity and recurrence of conflicts, pastoral migration is becoming more difficult. Governments should recognize this problem and adopt policies that help reduce conflict among common resource users. At the regional level, the governments of Ethiopia, Kenya and South Sudan should also develop policies that recognize the movement of pastoralists along their shared borders across national boundaries and develop appropriate policies and practices to minimize conflicts among different pastoral peoples.

There is also a need to synchronize traditional pastoral early warning systems with modern climate prediction models in order to provide the best possible anticipation of and preparation for extended periods of drought or flooding. In addition, the contribution of the government and other development agencies in the provision of camels as a way of herd diversification is something that should be encouraged. The same approach should also be extended to the identification, study and domestication of edible wild plants that pastoralists use to survive during extended periods of drought.

What emerges from the above discussion is, though pastoral communities have extensive traditional knowledge which enabled them to survive the harsh climatic conditions of their territories for ages, there has been little effort, and if not none, by development agents to complement their intervention by

indigenous knowledge. This partly helps to explain the successive failure of government development intervention in pastoral lowlands. To overcome this predicament, state and non-state actors should work towards the better understanding of traditional coping mechanisms, investigate their effectiveness and augment those that function well, if not adopt and disseminate and encourage these coping mechanisms.

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