



About this Research

This briefing note summarises recent research into how communities in the Turkana region of northern Kenya are managing ongoing social-ecological change (Derbyshire *et al.* 2021). It describes changes to livelihoods that have been implemented by communities in the southern reaches of Turkana County to manage increased uncertainty in both rainfall patterns and the hydrology of major rivers. In doing this, it outlines how these contemporary adaptations articulate with the longer-term dynamics of livelihood change in the region.

The research was undertaken between 2018 and 2021 and involved semi-structured interviews, focus group discussions, participant mapping exercises and household and market surveys.

The central questions were:

- **How have livelihoods changed in relation to increased environmental uncertainty in the last few years?**
- **How do these recent changes relate to longer-standing modes of adaptation and strategies for managing uncertainty?**

Its findings align with now prevalent arguments in the sphere of drylands development for new interventions and programmes to support ongoing adaptive strategies, and to work with uncertainty, rather than against it (i.e., Krätli and Schareika 2010; Krätli 2015; Scoones 2019).



Figure 1. Topographic map of north-western Kenya showing the distribution of forest and rangeland and the rough parameters of the study area.

Context

Rainfall

Turkana County, which comprises over 68,000 km², is characteristically hot, arid and ecologically unpredictable. It has experienced recurrent droughts since well beyond living memory. Historically, precipitation, whilst low and extremely variable, has nevertheless tended to be more pronounced during certain months of the year (in non-drought years, at least). After these periods of substantial rainfall, annual grasses emerge which are critical for those maintaining herds of cattle.

However, over the last few decades, communities across Turkana and northern Kenya more broadly have reported a significant breakdown in seasonal rainfall patterns (Dabasso and Okomoli 2015), a phenomenon likely associated with global climate change. Broadly speaking, they have experienced a less pronounced division between the wet and dry seasons. By extension, many have described a reduced ability to produce surplus foods during the wet season for consumption during times of scarcity.

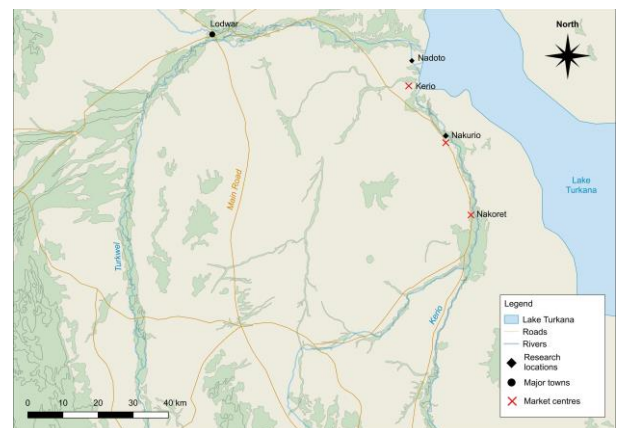


Figure 2. Closeup of study area showing key market centres and research locations.

Hydrological change

Turkana's two major rivers, the Turkwel and the Kerio, have both undergone substantial ecological and hydrological transformations in the last few decades.

The Turkwel, which was formerly dry in its lower course for parts of the year, now flows year-round to Lake

Turkana due to the flood mitigation effect of the Turkwel Gorge Reservoir (fed via a dam constructed in 1991). As a consequence, areas along the Turkwel have seen substantial growth in irrigation agriculture in recent years.

The Kerio, by contrast, now remains dry for several years a time, despite once flooding on an annual basis. The breakdown in the Kerio's flood cycle is likely a result of multiple factors, including the recent spread of the invasive species *Prosopis juliflora* (see Box 1). Another key factor is the significant expansion of irrigation activities taking place in upstream parts of the Kerio Valley, which are diverting unprecedented volumes of water into farmland.

Box 1. *Prosopis juliflora*: an invasive species

- *Prosopis juliflora* is a drought-resistant shrub (a kind of mesquite) native to South America, Central America and the Caribbean.
- It was introduced to northern Kenya via international organisations and government agencies in the 1980s in response to concerns about desertification, deforestation and fuel wood shortages.
- It is highly invasive and has spread rapidly since its introduction.
- The shrub poses a significant problem for farmers because it grows rapidly and makes land clearance more time and labour intensive.
- Although the shrub's pods are eaten by small livestock, and are an important resource during times of scarcity, they also cause serious tooth and gum problems.
- Its deep root system, combined with its rapid spread, is likely to have affected groundwater recharge rates (Le Maitre *et al.* 2015).

Economic change

Turkana County's population has grown substantially over recent decades; a census undertaken in 2019 has put it at 926,000, compared with 450, 860 in 1999. In the same period the region has also seen pronounced growth in its urban centres and improvements in telecommunications infrastructure. In rural areas, these changes have manifested in the expansion of market centres, the proliferation of small businesses (aided by the 'Mpesa' mobile money platform) and the consolidation of the cash economy (with livestock markets now common throughout the region).

Key Findings

Across southern Turkana, the combination of sweeping changes in rainfall patterns, hydrological shifts affecting major rivers and the emergence of a range of new economic opportunities has raised serious challenges both for how people pursue their individual livelihoods and how different livelihoods interact with each other.

In analysing these processes, it is important to remember that the forms of subsistence pursued in Turkana have been open-ended and flexible since beyond living memory. Movement between different livelihoods, practices and resource bases has long been an important aspect of the regional pastoral economy. Single families have tended to be involved in a wide range of activities exploiting many different resources, in different places and at different times of year (Derbyshire 2020). The flexibility and diversity of Turkana livelihoods continues to serve as the basis for dynamic adaptation, engendering a sense of resilience over the long term.

The herding-cultivating relationship

Communities settled along Turkana's major rivers have tended to practice flood-recession farming to raise crops of sorghum along meander scars, exchanging surplus sorghum with seasonal visitors from the herding sector for livestock (see OTuRN Briefing Note #3 "Flood retreat agriculture"). Communities located along the Kerio have faced significant challenges in recent decades due to the breakdown of their river's flood cycle (unlike those settled along the newly perennial Turkwel, who have experienced a drastic growth in agricultural activities and investment). The Kerio farmers are no longer able to regularly cultivate their land, with several years now often passing between successful crops. The incursion of *Prosopis juliflora* has comprised an additional pressure, making farm clearance extremely labour intensive and time consuming.

In the past, regular sorghum-livestock exchanges took place at nodal points along the Kerio (usually near to areas of concentrated farming), including Nakurio, Nakoret, Kangarisae and Nakaalaei (see Figure 2). These locations have more recently developed into small but apparently permanent settlements, oriented around market centres where a much broader array of commodities is bought and sold, many of them imported via Lodwar, the regional capital.

Many of the farmers who were historically involved in flood-recession cultivation on the Kerio have taken a leading role in the development of these market centres, establishing new businesses and transportation

links. The emergence of cash-based livestock markets has also attracted specialised herders to frequent them.

Presently, market centres along the Kerio continue to serve as important nexuses facilitating the flow of livestock (and, by extension, meat and milk) into more sedentary river-based families, and grain into more mobile, herding families. A relationship established through previous seasonal exchanges has been reformulated in light of new environmental conditions; whilst it no longer comprises seasonal exchanges of sorghum on a regular basis, it has the same geographical orientation and continues to be of critical nutritional and economic importance to all involved. Cultivators who once traded surplus grain from their own farms, now import a wider variety of grains from external production zones and sell them to herders who raise cash primarily through the sale of livestock.

Changes to patterns of mobility amongst herders

Many herding communities in southern Turkana have responded to heightened uncertainty in patterns of precipitation by substantially changing their migration patterns and generally reducing the frequency of longer distance movements. In turn, herd sizes have reduced significantly in many locations (due to a reduction in available forage) and the scarcity and unpredictability of grasses has led to a significant reduction in numbers of cattle. These smaller herds now often tend to primarily comprise goats, sheep, and camels.

Many of the participants in this research highlighted the government administered distribution of 'relief food' (mainly during times of drought) as a key factor influencing their decision to move less often. Remaining in one place increases the likelihood of being included on lists of names that are collected by representatives of the local government for the allocation of portions of grain.

However, many also underlined the more general importance of proximity to small market centres, which have grown substantially in the last two decades. Even in times when there is no relief food distribution, these settlements provide an opportunity for herders to raise cash by selling livestock and to purchase foodstuffs imported via Lodwar, the regional capital.

Nutritional surveys undertaken amongst herd owning families emphasised their close involvement with these growing settlements (Bleasdale *et al.* forthcoming), their regular consumption of foods imported from external farming zones and their dietary similarity to permanently settled families, particularly during the dry season. The adaptation thus generally appears to have been successful in allowing people to maintain a degree of food security that would have otherwise been

impossible amidst new forms of environmental volatility.



Figure 3. The Kerio River near to Nakurio, dry, with *Prosopis juliflora* growing along its bank in areas that previously comprised riverine gallery forest and farmland.

Concluding Remarks

Over the past decade, scholars have highlighted pastoralists' unique capacity for dynamically exploiting spatially and temporally variable resources and, in so doing, remaining productive in conditions of environmental uncertainty. Accordingly, calls have been made for development programmes and projects to work *with* uncertainty in the same way as pastoralists, as opposed to implementing 'single path' approaches that are assumed to be more stable and uniform but regularly result in failure. The findings from this research align with these arguments and accentuate the need for future interventions in Turkana to support the ongoing strategies of communities mitigating climate change on their own terms.

Recent, community-driven changes to subsistence practices in south-eastern Turkana do not constitute a significant departure from a longstanding orientation towards uncertainty (i.e., embracing it and working with it). Amongst herders, patterns of mobility and consumption have always been carefully managed and open to significant change in tune with shifting contextual factors. The recent reduction in movement reported by several communities in this study is one such change. It articulates with the growth of commercial centres nearby, the emergence of new resources to be exploited and recent constrictions in the ability to produce surplus products such as milk (to be dried in the sun for later consumption) due to less pronounced wet seasons.

Likewise, communities along the Kerio, historically involved in flood-recession cultivation, have embraced new commercial opportunities to manage a less

regularly flooding river. In doing this, they have refashioned their economic relationships with more specialist herders and, in many respects, made them stronger. As a result, the flow of grain into herding families from riverside locations endures, as does the flow of livestock and animal products into communities settled at nodal points along the river. This has engendered a degree of food security that would have otherwise not been possible, whilst at the same time serving as an opportunity for local communities to capitalise on new educational and employment opportunities via stronger connections to larger urban settlements (facilitating further livelihood diversification).

Both substantial livelihood shifts have been proactively enacted by the communities involved in them in a manner that does not diverge from a long history of similar adaptive transformations. Moreover, in keeping with this history, neither shift should necessarily be envisioned as representative of permanent change. It is clear that the communities involved in this study, and across southern Turkana more generally, continue to forge their livelihoods in a dynamic manner, exploiting heterogeneous and fluctuating resources. Their ability to refashion longer standing relationships and institutions is partly what allows them to do this so successfully.

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