SPARC
Supporting Pastoralism and Agriculture in Recurrent and Protracted Crises

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POLICY BRIEF

FORECASTS FOR PASTORALISTS

Increasing demand for weather forecasts to support adaptation in northern Kenya

Ellen Reid

Recommendations

- **Weather information services must be designed to fit within pastoralist systems.** Delivery should better match how information passes between pastoralists through formal and informal systems.
- **Careful consideration should be given to how women access and act upon forecasts.** Forecasts must be designed and delivered based on the information needs of pastoralist women, how information reaches them, what decisions they make, and the sensitive power dynamics at play in local contexts.
- **Forecasts need to be accessible and relevant to decision-making.** Efforts are needed to improve forecast literacy and to link information to the types of decisions and trade-offs that end users are making for climate adaptation and resilience.
- **Traditional information pathways should be utilised.** Delivery models that draw on the methods used to share traditional forecasts in pastoralist communities, such as participatory scenario planning, may increase demand for science-based forecasts.

Photo: Ezra Millstein/Mercy Corps

Introduction

When weather information does not reach end users, it is often due to a mismatch between supply and demand. In Kenya, the strength of the Kenya Meteorological Department (KMD) and the growing supply of climate and weather information services suggests there is currently weak demand for such information. This begs the question: Particularly in the harsher climate of northern Kenya, an arid and semi-arid region with variable rainfall, why are pastoralists generally not seeking out forecasts to inform decisions that could protect their livelihoods and well-being?

A technological revolution in forecasting, expansive observation networks and collaboration have brought better forecasts to the Horn of Africa (Voosen, 2023; Gudoshava et al., 2024). As discussed in a recent SPARC policy brief (Bedelian, 2024), weather and climate information services, particularly seasonal forecasts, seem an obvious tool to support pastoralist decision-making and resilience.

With resource constraints, public hydrometeorological agencies like KMD may lean on private and non-profit partners to extend the reach of their weather information. These services and products often fill the intermediary steps of translation (i.e. tailoring information to specific uses) and transfer (i.e. delivery of information) in the weather and climate information value chain, leading to the use of information (Vogel et al., 2019).

Delivery models based on text messages and apps have proliferated as mobile phone coverage and ownership has spread across the region. While most of these models have targeted smallholder farmers, several have tried to reach pastoralists, such as AfriScout, Kaznet, and MyAnga.[1] However, discussions with experts dampen the promise of these solutions and instead point to a need to change how information is made relevant for and delivered to pastoralists.

Semi-structured interviews were held with 18 researchers and technical experts working to better understand and increase the adoption of weather information, and those working to design products and services for pastoralist communities.[2] In these conversations, the question of low demand was framed as a mismatch between a) the information needs and systems of pastoralists and b) how weather information is translated and transferred in northern Kenya.

Forecasts do not match pastoralist needs and systems

The first step in translating and transferring forecasts is to ask: who is the end user? The term 'pastoralist' is a catch-all term. In its use, information is lost about the diversity of roles and the dynamics in pastoralist systems. Each pastoralist differs in their access to weather information and their power to make decisions based on it. Their diversity in role, gender, ethnicity and religion makes it hard to succinctly define a pastoralist as an end user, even when focusing on a specific geography like northern Kenya.

With the overall goal of supporting regional resilience, it is key to work through the traditional, informal and formal systems in northern Kenya in order to increase the demand and use of weather information.

To better reach pastoralists, weather information providers (public, private or non-profit) should co-design the translation and transfer of forecasts with local pastoralist communities. Seasonal forecasts offer an opportunity to prepare and proactively adapt to more variable rains that increasingly fail to offer water and forage for herds. With the overall goal of supporting regional resilience, it is key to work through the traditional, informal and formal systems in northern Kenya in order to increase the demand and use of weather information.

Interviews with experts identified four challenges and opportunities to improve the translation, transfer and use of weather information among pastoralists. Together, these four factors provide a basis for co-designing initiatives with pastoralists to build demand for weather information: delivery models, the inclusion of women, linking forecasts to decisions and traditional ways of sharing information: delivery models, the inclusion of women, linking forecasts to decisions and traditional ways of sharing information.

[1] See: https://www.sparc-knowledge.org/innovations/afriscout; https://www.ilri.org/news/harnessing-digital-connectivity-pastoralists-close-data-gaps; and https://ustadi.org/2020/07/myanga-app-a-game-changer-for-pastoralist-climate-resilience/.

[2] Semi-structured interviews were conducted in Nairobi in May 2024 with 18 researchers and technical experts from Mercy Corps, the International Livestock Research Institute (ILRI), KMD, Indigenous Women and Girls Initiative (IWGI), Pastoralist Girls Initiative (PGI), and the Center for Research and Development in Drylands (CRDD).

Harnessing pastoralist information flows

Forecast delivery models can be misaligned, or they can contradict the collective decision-making processes that pastoralism is based on. Decisions on grazing areas, for example, are often influenced by collective action at the ward (sub-county) level in response to current conditions and competition. These decisions are based on real-time water and pasture information collected by scouts or other observation networks.

Other decisions may be made at the individual or household level, including hay stockpiling, negotiating access to grazing areas outside of the immediate area, and selling older or non-productive animals.

Water and forage are scarce resources in northern Kenya, especially after lower-than-average rains or drought. When competition for resources can spur conflict, what information should be shared? In the worst case, delivery models may even stoke intra- and inter-communal tension. Several experts cited crowd-sourced information as a failure. Fearful of losing limited water and forage in their areas, some users have submitted false information to the AfriScout app to lure others away from good grazing sites.

Despite the risk of misinformation and misalignment, mobile phones are powerful and emerging tools that connect pastoralists to information and to each other (Teyie, 2023). Mobile phones may be a successful way to reach and deliver weather information directly to end users, but this should not be the only method used.

There are various intermediaries operating along pastoralist value chains and social networks who could pass weather information to end users. These intermediaries could be first adopters like 'telephone' pastoralists, who manage their herds remotely via hired herders or family, or those closer to urban centres. They could also be community health workers, mobile veterinarians or other extension service providers in contact with pastoralists at key decision points in the season. Forecast delivery models should capitalise on the ways in which information flows through pastoralist networks, with or without mobile phones.

The challenge of reaching pastoralist women

The recommendation to work within existing pastoralist systems comes with a caveat – we must consider how women are included and excluded in these systems, and their power to make decisions based on forecasts (Bullock and Katothya, 2022).

Decision-making in pastoralism is largely dictated by cultural norms. The Executive Director at the Pastoralist Girls Initiative summarised household power dynamics in the north: 'As long as you don't own anything, the decisions are zero'. In the pastoralist systems of northern Kenya, most women own very little. Some women may only make decisions around goats, sheep, poultry and small crops, while herds of larger livestock and land are often in the male domain, and therefore remain outside of women's decision-making power.

However, cultural norms are never binding and can change over time. Researchers from ILRI gave examples of a handful of pastoralist women who do make significant decisions regarding their household's livestock, despite men being present. These women take animals to graze, hire herders, and even negotiate access to grazing areas with farmers and national park guards. Other interviewees cited examples of educated women, widows and those who tend to crops, as pastoralist women with relative decision-making power.

Indeed, ILRI researchers cautioned against over-correcting for gender inequities by relying too heavily on women. Delivery models that target women exclusively, independent of the formal and informal systems through which they share information and make decisions, may be ineffective. Working against existing systems, aiming for household uptake and use of weather information primarily through women, could increase the burden of their responsibilities, upset existing roles, and even lead to intra-community and household conflict. These types of designs contribute to the paradoxical discourse of women as both virtuous caretakers and vulnerable victims, simultaneously ignoring the ways in which women have power and adding to their workload (Rao et al., 2017).

In the translation and transfer of forecasts, weather information providers must consider gender dynamics. Depending on the community, the best delivery method to reach women may be through radio, savings groups, or community health workers. Other delivery methods could encourage information sharing and collaborative decision-making based on forecasts between spouses, for example. For women to access and use forecasts, weather information providers must design their systems around how information reaches pastoralist women, how women participate in decision-making, and what information is most relevant to the decisions they make.

Lost in translation: forecast literacy and links to decisions

Seasonal forecasts cover the most relevant timeframe and weather information for pastoralists. Predictions for seasonal rain have direct implications for pastoralist decisions and adaptation. For example, KMD's seasonal forecast rainfall predictions for the longer and more important rainy season spanning March to May predicted rainfall as 45% above average, 35% near average and 20%

below average. On top of these probabilities, the forecast predicted 'poor distribution' of rainfall. What does this forecast mean, and what decisions could be made based on the predicted rainfall? Pastoralists may decide to stock or destock animals, where to migrate for forage and water, what crops to grow, and how to invest their limited resources to protect future food security and livestock assets.

By only focusing on weather information, those interested in increasing pastoralist climate adaptation and resilience may be missing what pastoralists really need.

In the seasonal rainfall forecast, terms like 'above', 'near' or 'below average' and 'distribution' require explanation. Interviewees stressed the need to improve pastoralists' understanding of forecasts and how to make decisions based on them. Even with the most current forecasting methods and delivery models, forecasts are inherently uncertain. ILRI's Country Coordinator for Kenya cautioned, 'One bad forecast can ruin trust for years', laying out the challenge that weather information providers face. Forecast literacy training might improve understanding of terms, communicate the inherent uncertainty of forecasts, manage expectations, and advise how pastoralists can make decisions with this uncertainty in mind.

Currently, forecasts rarely include recommendations that are actionable for pastoralists. Several respondents suggested combining forecasts with guidance to support pastoralist decision-making (e.g. predicted forage availability in different locations). However, this idea is more complex in pastoralism than in crop-based agriculture, for example, where decisions around timing and crop type are better evidenced. Another issue is how weather information can worsen competition for resources. These challenges point to a need for localised scenario planning based on forecasts and collective decision-making instead of recommendations produced externally.

Even if a pastoralist has a forecast, understands it, and wants to act, the question remains: do they have the resources to make that decision? One of the worst impacts of drought is livestock disease, which can wipe out a household's wealth. A bad season can destroy savings, investments and income. Knowing that drought is coming or has arrived, a pastoralist may seek out veterinary services and medicine. However, ILRI researchers highlighted that these crucial resources may be out of reach for rural pastoralists geographically or economically. By only focusing on weather information, those interested in increasing pastoralist climate adaptation and resilience may be missing what pastoralists really need. Instead, forecasts could be communicated via trusted intermediaries as part of, or bundled with, resources needed to act on information, such as livestock vaccines, to improve uptake and to support pastoralist adaptation.

Traditional forecasts and information sharing

Weather information is not new to pastoralists. Pastoralists have built up traditional and indigenous knowledge to predict weather for millennia. Some of these traditional methods find their counterparts in science, such as plant phenology and wind patterns (Chisadza et al., 2015; Balehegn et al., 2019). Traditional forecasts still guide the decisions of pastoralists today – yet weather information providers often overlook these parallel knowledge systems.

For many pastoralists in northern Kenya, science-based forecasts are new and they compete with traditional forecasts deeply rooted in indigenous knowledge. Many will cross-check science-based and traditional forecasts. When the information tallies, pastoralists may feel more confident in their decisions; but when in conflict, the traditional forecast is often relied upon. Several interviewees shared stories of family members who have chosen traditional predictions over science-based forecasts, due to a lack of trust or confidence in newer information sources.

However, the prevalence of traditional knowledge is waning and, with it, the ability to forecast based on traditional methods is also fading away. At the same time, the awareness and accessibility of science-based forecasting is growing. This presents an opportunity for weather information providers to reach out to those pastoralists with less skill in traditional forecasting and slowly build demand for science-based forecasts.

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Some literature recommends co-producing forecasts using both traditional and science-based information (Kalanda-Joshua et al., 2011; Wasonga and Arasio, 2022). Other sources go further and suggest centring design around traditional knowledge, like designing apps to crowdsource traditional observations (Balehegn et al., 2019).

In interviews, only one model was identified as being active in northern Kenya for including traditional forecasts, namely participatory scenario planning

(Ambani, 2018). Based on CARE's decade of implementation and testing of this model in Kenya (Gbetibouo et al., 2017), KMD county directors organise fora in which meteorologists, sector representatives and community leaders come together to deliver and discuss the latest seasonal forecast. Traditional forecasts may be compared to science-based forecasts in these discussions, but they are not included in the final forecast products.

Participatory scenario planning is an example of how the translation and transfer of forecasts can be tailored to pastoralist culture and how information is passed through communities. This model mirrors Kenyan *barazas*, or community gatherings, held to share information. Introducing science-based forecasts and discussing the implications for pastoralist decisions through community gatherings may foster a sense of ownership, turning the external into something that comes, at least in part, from within pastoralist communities.

Conclusion

Climate adaptation and resilience in northern Kenya can be supported through weather information services that are better designed for pastoralists and the ways in which they share and act on forecasts. To improve demand for science-based forecasts and their use and trust among pastoralists, our evidence suggests that weather information services must align with pastoralist systems, be designed around local gender dynamics, be better tailored to pastoralist decisions and needs, and incorporate traditional knowledge sharing.

Increasing demand for weather information among pastoralists is possible and is already happening. KMD has already disseminated seasonal forecasts across northern Kenya through scenario planning fora and radio programmes. These methods aim to make information more relevant to pastoralists and to transfer forecasts via appropriate media. For some pastoralists, this has been enough to increase demand. Indeed, KMD's Assistant Director for Seasonal and Sub-Seasonal Forecasting scrolled through a WhatsApp group where area representatives asked for updates on the most recent county-level seasonal forecast. When it arrived, the forecast was met with a stream of gratitude.

Recommendations

- **Weather information services should be designed to fit within pastoralist systems.** To improve weather information services for pastoralists, delivery models must align with collective decision-making structures and information sharing. While mobile phones are helpful, weather information should also be shared through intermediaries like 'telephone' pastoralists, health workers and veterinarians, who can deliver accurate information across their networks at key decision points in a season.

- **Careful consideration is needed on how women may access and act upon forecasts.** To improve the accessibility of weather forecasts for pastoralist women, providers must consider cultural norms and their influence on women's decision-making power. Forecast delivery should account for these dynamics without overburdening women or disrupting existing systems, which could lead to conflict. Effective methods might include delivery via radio or women's groups, or delivery methods that encourage joint decision-making between men and women.

- **Forecasts must be made more accessible and relevant to decision-making.** Efforts are needed to improve forecast literacy, while linking information to practical decisions is crucial. Seasonal forecasts, such as those predicting rainfall patterns, directly affect pastoralist choices like stockpiling animals, migration and crop planting. Training could help pastoralists interpret forecasts and make informed decisions despite inherent uncertainties.

  Additionally, forecasts should be paired with localised guidance to support decision-making rather than offering blanket recommendations, which can be complex in pastoralism. It is also essential to recognise that even with forecasts, many pastoralists lack access to resources like veterinary services, which limits their ability to act. Integrating forecasts with access to resources, such as livestock vaccines, through trusted intermediaries can enhance climate adaptation and resilience.

- **Weather information services should work through traditional information pathways.** Pastoralists have relied on indigenous knowledge to predict weather for millennia. Today, many pastoralists cross-check traditional and science-based forecasts, favouring traditional methods when the two conflict. However, as traditional forecasting knowledge wanes and science-based forecasts become more accessible, there is an opportunity to bridge the gap. Participatory scenario planning, which brings together meteorologists and community leaders to discuss seasonal forecasts, aligns well with traditional gatherings like Kenyan *barazas*. This approach fosters trust by blending new forecasts with traditional practices, while also encouraging greater community engagement and ownership of science-based forecasts.

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About SPARC

Climate change, armed conflict, environmental fragility and weak governance, and the impact these have on natural resource-based livelihoods, are among the key drivers of both crisis and poverty for communities in some of the world's most vulnerable and conflict-affected countries.

SPARC aims to generate evidence and address knowledge gaps to build the resilience of millions of pastoralists, agropastoralists and farmers in these communities in sub-Saharan Africa and the Middle East.

We strive to create impact by using research and evidence to develop knowledge that improves how the FCDO, donors, non-governmental organisations, local and national governments, and civil society can empower these communities in the context of climate change.

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