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Tahira Shariff Mohamed, Ian Scoones and Hussein Wario

Nairobi, Brighton and Marsabit, July 2023

2 Executive summary

This study explores the understanding of local practices of enhancing resilience in the face of challenges and variabilities in pastoral areas of Northern Kenya's Isiolo and Marsabit Counties. The pastoralists in this region depend on highly variable drylands that are vulnerable to unpredictable climatic conditions, social-political instabilities such as frequent conflicts, market volatility, animal diseases and land-use competition. Competing land uses include expansion of farming areas, conservancies, and large-scale infrastructure development, which often results in constrained pastoral mobilities. As their primary livelihoods, the communities depend on livestock, including cattle, camel, sheep, and goats. They strive to ensure a reliable food supply, nutrition and income for families to survive in the drylands. Livestock mobility, species diversification, herd dispersal, specialised herd management, labour organisation, investment in local moral economies, and social solidarities have been central to pastoralist strategies employed to produce quality livestock products in highly variable drylands.

Over time, as climate extremes worsened, external interventions through food aid, range infrastructure development including boreholes, livestock market, reseeded, and social protection in the form of livestock insurance and cash transfers have been introduced to support pastoralists' resilience to the different shocks and stresses. With recurrent vulnerabilities to drought effects, the question remains whether the short-term humanitarian support or the long-term development programmes have actually improved livelihood resilience or, to the contrary, actually undermined local capacities. To this end, this scoping study aims to understand how the local practices of resource redistribution, flexible labour arrangements, and investment in multiple relationships have contributed to enhanced resilience among the pastoralist's communities of Isiolo and Marsabit counties, northern Kenya. The study employed a 'high-reliability' perspective exploring the actions of high reliability professionals' networks, concepts originally used in the critical infrastructure and public administration and policy literature. Our aim was to understand how pastoralists avert disasters before they turn into emergencies, thereby generating reliable livelihoods and so enhancing resilience.

The study was conducted in two pastoral areas: Kinna, an urban, connected pastoral town in Isiolo and Bori, a remote village in Moyale sub-County, bordering neighbouring Ethiopia, part of Marsabit County. In both study sites, Borana communities were the predominant ethnic group and the area continue to experience multiple hazards, including severe droughts, livestock diseases, insecurity, livestock theft and raiding, land use competition, and the spread of the invasion plant species *Prosopis juliflora*, all constraining pastoral production. The study used qualitative data collection, combining mixed methods of data collection. The empirical data was collected through participatory historical event reconstruction, focus group discussions, key informant interviews, and in-depth narrative interviews with men, women, and young pastoralists. We also held a consultative workshop

in Marsabit town with stakeholders that included researchers, development practitioners, NGO officers, government officials, and local pastoralists to reflect on the different understandings of resilience programmes and the significance of considering local practices in resilience programme design and implementation. Finally, we reviewed multiple regional resilience programme documents and conducted key informant interviews with programme officers in different organisations.

The findings established that, although there have been significant donor investment in resilience programmes, especially after the 2011 drought, pastoralists remain vulnerable to the impacts of the increasingly frequent droughts and other variabilities, including the current drought crisis that resulted in huge livestock and livelihood loss. Amidst the intensified livestock production uncertainties and the highly individualised and commoditised pastoral production, significant capacities exist that could potentially enhance resilience. Through high-reliability networks involving investments in various social and economic relationships, reliance on different sources of knowledge for disaster response planning, adoption of technologies such as mobile phones and transport communication deployment, collective labour and resource sharing, pastoralists flexibly managed various droughts, conflict, and livelihood challenges. We argue that these networks and relationships embedded in social, cultural, religious, and economic ties provide access to resources in managing variable pastoral production. However, significant stratification exists due to differentiated resource access between richer and poorer pastoralists, between men and women, and between young and older people. Nonetheless, the customary communal collective solidarities, labour pooling, and redistribution continue to support low-income families through a range of high-reliability practices.

The study recommends that resilience-building programmes in pastoral areas should recognise and embrace different high-reliability professionals' networks that exist in pastoral settings, often specialised in managing crises as they unfold. These networks include the herd owners, the herders, traditional doctors and forecasters, mobile money service providers, agrovet dealers, brokers and NGOs, among others. In our participatory ranking exercises, some of these networks are highly ranked, while others are given a low ranking due to their absence when a crisis unfolds. The essence of a high-reliability professional is responding in real-time, just as events develop meaning that response is early and effective. Future studies should entrench a deeper understanding of who these high reliability professionals are, their networks and consider integrating them into resilience programmes for enhanced resilience, thereby generating reliable and flexible crisis management. Finally, we recommend looking into possible ways of strengthening these multiple high-reliability individuals and networks in a pastoral context. This should be prioritised through pilot projects, potentially uncovering new ways of thinking about resilience for pastoral development.

3 Background

Livelihoods in dryland areas are centred on pastoralism, which is extensive livestock keeping that relies on strategic mobility to produce various livestock species such as cattle, camels, and small stock (goats and sheep). Such systems of production are rooted in deep socio-ecological knowledge about animals and ecosystems (Sharifian et al. 2022). Livestock grazing mobility is managed through skilled herding that allows animals to track transient nutritious forage over space and time in highly effective ways, maximising production in ways that a standard, fixed approach to animal production could not.

Pastoralism in the dryland areas of East Africa is increasingly confronted by extreme climate uncertainties. In the past two years, the Horn of Africa region has suffered one of the worst droughts ever experienced. The impacts of the changing climate are exacerbating the frequency of drought disasters. According to the United Nations Office for the Coordination of Humanitarian Affairs, [UN OCHA](#), in the last ten years the region has suffered three severe droughts (2010-2011, 2016-2017 and 2020-2023) that has made it increasingly difficult for people to recover. This resulted in extreme deficiency of water and forage leading to mass deaths of livestock and a food crisis affecting [over 35 million people](#) in the region. The drought combined with other challenges such as conflicts, market volatility, land degradation, animal and human disease. Together, these are seriously affecting livestock production and pastoralists' livelihoods.

A predisposing factor to drought vulnerabilities are many years of marginalisation, which has resulted in low development across the region. According to [World Bank 2021](#), over 57 million people in the Horn of Africa are affected by extreme poverty. In Kenya, it is estimated that people living in extreme poverty are [about 34%](#), with the counties in the drier north recording poverty rates of over 80% ([Marsabit 85.3%](#), [Turkana 86.2%](#), [Mandera 90.2%](#), and [Wajir 89.2%](#)). This is regardless of the millions of dollars' worth of externally funded projects on 'resilience'. Resilience is understood as the ability of a system to bounce back after a shock/disaster, aimed to support livelihood diversification, climate adaptation, and resilience building in the region over the long term. These programmes range from humanitarian responses, social protection measures, climate-smart agriculture approaches, and livestock insurance, amongst others provided through government and Non-Governmental Organisations (NGOs). The argument for such project-based development interventions is that such efforts improve production efficiencies and reduce risk so therefore improve resilience. But is this always the case?

Most of the responses to issues that affect pastoralism in the region do not take into account locally embedded and highly flexible adaptive practices that respond to uncertainty and unknown futures. They focus on different elements of the pastoral production system aiming to allow producers to manage risks and 'bounce back' from disasters. The interventions are based on the assumption that

pastoralism is ‘inherently vulnerable’ and thus requires recurrent food relief and that pastoralists need to abandon pastoralism for presumed ‘better’ options to ensure resilience. Pastoralism is seen as an inefficient and often environmentally destructive form of livelihood where poverty persists. This narrative is based on a biased view entrenched in assumptions of the superiority of ‘settled’ agricultural systems, hence denying pastoralism the much-needed attention it requires.

Pastoralism has therefore been on the periphery of development policy frameworks with the main policy agenda aimed at replacing it with ‘modern’ alternative production systems such as irrigated crop farming. When disasters like the current drought strike, pastoralism is blamed rather than the lack of appropriate investment support and the negative effects of structural drivers of vulnerability that are constraining pastoral systems, such as increasing land and green ‘grabs’ leading to land fragmentation, restrictions on movements, and lack of buffers during droughts (Fratkin 2014; Lind et al. 2020).

In addition, the economic potential of pastoral areas and the contribution of pastoral production to national and household economies has been grossly under-estimated (IGAD [2010](#), [2013](#), [2015](#), [2017](#)). Pastoral areas are therefore not attracting investment commensurate with their economic and social cultural importance. Even in the context of Kenya’s devolved system of governance, pastoralism/livestock production is still not prioritised in budget allocations despite the large numbers of people dependent on the system.

However, there has been a shift in the understanding of pastoral production systems in recent years, with wider acknowledgement that pastoralism is the most viable livelihood system in the drylands and that it is not inherently vulnerable but rather has emerged as an adaptive livelihood in the context of uncertain, high variability settings (Scoones 2023, 2022). Pastoralists are acknowledged as making variability an opportunity to produce quality products and contribute significantly to economies of countries providing employment opportunities to millions (Kratli 2019; Catley et al. 2012). Although this realisation has resulted in policy improvements at regional and national levels, notably the African Union’s 2010 policy and IGAD’s Transhumance Protocol from 2020, development projects in pastoral areas remain fragmented initiatives largely designed with the old mindset aimed at moving people towards alternative livelihoods.

Furthermore, pastoral areas have now become investment frontiers attracting increased attention in economic development (Lind et al. 2020). An example is the multi-country infrastructure development project – Lamu Port South-Sudan-Ethiopia Transport (LAPSSET) Corridor – a US\$25 billion project being implemented to link the northern parts of Kenya to neighbouring countries, in order to allow exploitation of extractives such as oil to improve the country’s economy. In addition, the Lake Turkana wind power project in Marsabit - the single largest private investment in Kenya at about US\$700 million - has demonstrated the strategic importance of this region to the country’s economy. This increase in investment however is not providing opportunities for socioeconomic

transformation of pastoralist communities due to land dispossessions and so increased vulnerability, particularly where the projects illegally acquired large amounts of land (Waters-Bayer and Wario 2022).

Over the past four years, we have been studying how Borana pastoralists in Isiolo county in northern Kenya manage drought, conflict, and other uncertainties. In recent years, the area continues to suffer recurrent droughts, alongside locust and animal disease outbreaks. Pastoralist livelihoods are increasingly vulnerable. Land is being encroached from all sides by neighbouring groups and conservation areas are expanding and taking over grazing areas.

Therefore, building resilience in the face of these intersecting shocks and stresses is a vital development imperative. This means generating reliability in the face of uncertainty – where we don't know future outcomes and cannot predict them (Scoones 2019; Scoones and Stirling 2020). This has major implications for development programming (Caravani et al. 2021). To this end, our research lays the foundation for understanding pastoralist's ability to prepare for and respond to droughts and other shocks through the lens of a 'high reliability' perspective focusing on high reliability professionals and their networks. This scoping study provides a baseline to anchor the future planning study on uncovering 'resilience from below' exploring pastoralists flexible networks in Northern Kenya's Isiolo and Marsabit Counties as well as neighbouring areas in Southern Ethiopia. This research was undertaken through the Centre for Research and Drylands Development, Marsabit, in collaboration with researchers from the Institute of Development Studies, Brighton, under the auspices of the European Research Council PASTRES programme (www.pastres.org), which co-funded inputs from Professor Ian Scoones.

4 Objectives

The scoping study had the following aims:

- Explore and map the key uncertainties that undermine livestock production in pastoral areas of Northern Kenya's Isiolo and Marsabit Counties.
- Document pastoralists' reliability network professionals through participatory network mapping.
- Investigate local forms of resilience among pastoralists in Isiolo and Marsabit Counties in northern Kenya through a 'high reliability' lens.
- Present the findings in a series of blogposts and a final report.

5 Methodology

Introduction

In this scoping study we utilised the concept of ‘high reliability management’ and applied it to a process oriented/relational understanding of resilience in Isiolo and Marsabit Counties, both of which are in the pastoral areas of Northern Kenya. Following a mapping of ‘shocks’ (uncertain events) over the last five years that have affected pastoralists, making use of a participatory timeline analysis in a series of focus group discussions (of both men and women, as the experience of uncertainty is highly gendered), we asked:

- Who are the high reliability professionals who were able to navigate the particular shocks?
- What networks/relationships are they embedded in?
- What practices and in what sequence were deployed in relation to each chosen shock?
- How do the responses to particular shocks draw on existing forms of ‘moral economy’ (the social basis for redistribution and sharing within society)?
- How were responses differentiated a) by type of shock and b) by social group (especially by gender)?
- How did the responses transform the system, and what were the outcomes from the actions deployed?
- How do these responses contrast with more standard project-based interventions under livelihoods/reliance/livelihoods programmes?
- What would an alternative approach to resilience building (reliability generation) look like for the drylands?

Study Area

In Isiolo County, the main study site was Kinna, a semi-urban pastoral town some 500 kms from Nairobi, while in Marsabit County, the main site was Bori, a village in Moyale sub-County - about 800 kms from Nairobi. Kinna is a semi-arid region receiving annual rainfall between 400mm-600mm, and is populated by the Borana pastoralists, traders, agro-pastoralists, and small-scale vendors. Although the climatic condition in Kinna support agro-pastoral production, a large percentage of the population practise livestock husbandry and only a few people engage in farming through irrigated schemes around Rapsu and Malka Daka. Kinna is a small town with electricity and mobile phone connections, bordering other pastoral counties such as Garissa. It is proximate to the Eastern lowlands of Mount Kenya, Meru National Park and larger towns, including Isiolo, Meru, and Maua. As a result of Kinna’s proximity to diverse land use systems (farming, national parks, and

pastoralism), there is significant land use pressure and competition over limited resources. As such, pastoralists grapple with inter-ethnic conflict, resource competition, and human-wildlife conflict. Equally, drought and animal disease are substantial uncertainties that affect pastoral production in the region.

On the other hand, Bori is small village with a population of 9, 571 (KNBS, 2019), spread between two sub-villages, Bori Junction and Qate. Bori is located some 40 kms from Ethiopia in Moyale sub-County. The population depend on livestock production as the main livelihood supplemented with other limited alternative livelihood options such as charcoal-making and small-scale trade. The area receives an annual rainfall ranging between 300mm and 600mm. Marsabit County borders the neighbouring country Ethiopia and other pastoral counties in Northern Kenya, including Samburu, Wajir, Mandera, and Turkana. The most substantial uncertainties identified in the focus group discussions include persistent drought, animal disease, inter-ethnic conflict, infestation by invasive plant *Prosopis juliflora*, and livestock burglary. The pastoralists in Bori depend on the cross-border market in Ethiopia and other markets in Moyale town for livestock and milk sales. Equally, there are limited social facilities including schools, health centres, and veterinary services, and hence pastoralists travel to the neighbouring Moyale town to get services. Due to the proliferation of motorised transport through motorcycles, pastoralists can now easily move around, although the cost is high and only two vehicles serve the areas. Unlike Kinna, with electricity and mobile phone connectivity, Bori is not connected to electricity, there is no mobile phone network, and the road leading to the main centre does not have tarmac.

Study Design and Methods

In this scoping study, we undertook qualitative research that combined different data collection techniques. These included participatory event mapping, focus group discussions, key informant interviews, network mapping, in-depth narrative interviews, mapping of resilience programmes, and review workshops. The combination of different techniques has been essential in exploring different forms of reliability management and the diverse high reliability professionals' networks in the study sites. Through focus group discussions, we mapped the key uncertain events over the past five years and identified crucial reliability professionals who help to navigate the given events. The key informant interviews with officials from government ministries, international organisations and NGOs provided a baseline of the existing resilience programs and their significance in enhancing reliability. On the other hand, key informant interviews with pastoralists provided a follow-up on how different people - men and women, young and old - establish relationships and networks to enhance resilience in the face of cascading uncertainties.

The in-depth narrative interviews provided detailed case studies of how individuals enhanced reliability by utilising multiple networks, resources, and information sources. Finally, in a review workshop, we brought together different groups including government officers, NGO officials

working on resilience programmes, other researchers, a representative from ACIAR, and the local pastoralists to understand the meaning of resilience from diverse perspectives. The feedback from the workshop confirmed the importance of exploring ‘resilience from below’, given the failure of past and existing approaches. Participants acknowledged the many gaps between the programme ambitions aimed at building resilience and the local practices that pastoralists make use of in navigating different circumstances, and hence building resilience.

Research Process

The study was organised into two fieldwork phases, each consisting of 22 days including the traveling. The first fieldwork period took place from 7th to 28th December 2022. We travelled from Nairobi on 7th in the morning and arrived in Kinna at 2pm on the same day. The first fieldwork was undertaken by Tahira Mohamed with the support from two field assistants, Nura Edin and Fatuma Hussein. This phase of the fieldwork covered the first and the second objectives, focusing on understanding the key uncertain events in pastoral production and mapping the crucial people essential in navigating the said event. We conducted participatory event mapping, focus group discussions, key informant interviews, and a few preliminary in-depth narrative interviews with selected reliability professionals. The findings from this phase provided an overview of the uncertainties in the two sites and the list of the persons that pastoralists consider as ‘reliability professionals’ in managing crisis.

Phase two took place between February 13th and 4th March 2023, and included field visits to Kinna, Isiolo town, Marsabit, Moyale and Bori. This second fieldwork phase was undertaken by Tahira Mohamed and Ian Scoones, and it involved in-depth narrative interviews with the identified reliability professionals in Kinna and Bori. During this fieldwork we undertook follow-up interviews with a number of the highly ranked individuals/categories to explore what they did in relation to particular drought/conflict shocks/events and how they mobilised networks and resources to respond. In addition, we undertook multiple interviews with researchers, NGO officials, and personnel in government ministries in Isiolo, Marsabit, Moyale and Nairobi. These discussions provided an understanding of the resilience building framework and assumptions used in existing projects and the types of resilience programme developed by various organisations and entities.

During this phase, we had a workshop in Marsabit organised by the Centre for Research and Development in Drylands for different practitioners, local pastoralists, and the representative from government ministries. Subsequently, Ian Scoones, Tahira Mohamed and Hussein Wario spent two days in Marsabit, reflecting and synthesising the emerging research findings and the discussions from the workshop. During these two days, we jointly brainstormed and developed a preliminary draft proposal for the follow-up project. Finally, Ian and Tahira spent two more days in Nairobi visiting various offices exploring the general framing of the resilience programmes for pastoral production

as well as establishing a potential network for the future study. The table below summarises the methods used for the data collections during the two fieldwork phases.

Table 1: Summary of Data Collection Techniques

Methods	Number	Place
Focus group discussion	7	Kinna and Bori
Key informant interviews	12	Kinna, Bori, Isiolo, Marsabit, Moyale, Nairobi
Stakeholder Interviews	12	Nairobi, Marsabit, Isiolo
In-depth interviews	12	Kinna and Bori
Ranking of reliability professionals	7	Kinna and Bori
Review Workshop	1	Marsabit
Writing and synthesis Workshop	1	Marsabit



Women's Focus Group Discussions, Bori, December 2022



Elders Ranking High Reliability Professionals, Kinna, December 2022

The key themes that emerged during different discussions included:

- The importance of mobilising specialist knowledge/expertise (such as traditional forecasters, local healers, elders, and observing human and animal behaviour) to help with both early warning and response.
- The role of social relations, including kin and clan identities and investment in diverse networks allowing for rapid responses to help build resilience. These social relationships enhance various redistribution and reciprocity mechanisms, including the customary livestock and resource transfers and newer form of redistributions based on religion and collective solidarities, including through *harambee* fund-raising
- The role of technology, notably mobile phones and motorbikes, in facilitating exchanges of knowledge, funds and allowing mobility was significant in enhancing pastoralists' capacity to build resilience was seen as important.
- The reliance on informal credit and loan systems, facilitated by key actors, such as agrovets and MPesa (mobile money) agents came out strongly too.
- The important differences in networks amongst women and young people, and the significance of key brokers within communities of connecting diverse networks to allow

for collective responses and solidarity in the face of crisis enhanced flexible livelihood production, hence generating reliability.

6 Achievements against activities and outputs/milestones

The main project outcome of the scoping phase was the preliminary documentation of pastoralists' practices in enhancing resilience to the key uncertainties identified. This confirmed the framework for the proposed larger project, and findings were incorporated into the new project proposal. By documenting the variations in pastoralists' networks and relationships central to building resilience in response to different uncertainties, the study suggests a relevant perspective for designing resilience programmes in pastoral areas. The study established that locally generated approaches to reliability management and resilience building contrasted with existing projects/programmes and that developing a 'high reliability' approach as an alternative would be an interesting and important focus for a larger, longer-term project.

Project outputs includes a series of five analytical blogposts reflecting on the findings. Three were published on the PASTRES blog, while one was published by *The Elephant* and another by *The Conversation*. A further blog is forthcoming with *The New Humanitarian*. Together they have generated significant interest, with many follow-ups. The blog published by *The Conversation* has attracted around 6,500 views so far.

The blogs highlighted a) the framing of existing resilience programmes and their contrasts with pastoralists' practices; b) how 'early warning' systems need to articulate with pastoralists' own approaches for anticipation and forecasting; c) how pastoralist reliability professionals and networks operate, acting to avert disasters through their practice. In the same way as how reliability professionals manage crises in critical infrastructures before they turn into a disaster, pastoralists adopt flexible, adaptable, and reliable approaches that at once scan the horizon for future dangers and operate in real time to manage uncertainties hence generating resilience. The blog outputs are included in the outputs table below, along with others.

Table 2: Summary of Scoping Study Outputs

no.	Activity	Outputs/ Milestones	Completion date
1.1	Explore and map the key uncertainties faced by pastoralists	Mapping of key uncertainties that undermined pastoral productions in the two study sites for the past five years	December, 2022

1.2	Assess local forms of resilience among the pastoralists in Isiolo and Marsabit through reliability professionals network lens and contrast with standard resilience programs	<p>Mohamed T. and Scoones, I. (2023). Local Knowledge is Crucial for Crisis Preparedness. <i>The Elephant</i>, https://www.theelephant.info/features/2023/04/14/local-knowledge-is-crucial-for-crisis-preparedness/</p> <p>Mohamed T. and Scoones, I. (2023). Kenya Drought: Pastoralists Suffer Despite Millions of Dollars Used to Protect Them-What Went Wrong?, <i>The Conversation</i>, https://theconversation.com/kenya-drought-pastoralists-suffer-despite-millions-of-dollars-used-to-protect-them-what-went-wrong-200838</p>	<p>14/04/2023</p> <p>21/03/2023</p>
1.3	Document pastoralists' reliability networks through participatory mapping	<p>Mohamed T. and Scoones I. (2023). Building Resilience from Below: The Vital Role of 'Reliability Professionals' and their Networks. <i>PASTRES Blogpost</i>, https://pastres.org/2023/05/19/building-resilience-from-below-the-vital-role-of-reliability-professionals-and-their-networks/</p>	19/05/2023
1.4		<p>Mohamed T. and Scoones I. (2023). <u>The failure of 'resilience' projects in northern Kenya: what can we learn? – Pastoralism, Uncertainty and Resilience – PASTRES,</u></p> <p>Mohamed T. and Scoones I. (2023). <u>Local early warning systems: predicting the future when things are so uncertain – Pastoralism, Uncertainty and Resilience – PASTRES</u></p>	<p>05/05/2023</p> <p>12/05/2023</p>

PC = partner country, A = Australia

7 Key results and discussion

The study's findings are organised based on the research questions.

1. *Explore and map the key uncertainties that undermine livestock production in pastoral areas of Northern Kenya's Isiolo and Marsabit Counties*

Through a series of participatory event mapping exercises with men, women, and young pastoralists in the two study sites, the research established that pastoralists grapple with a combination of unpredictable events that undermine livestock production. These include extreme climatic variabilities that results in repeated droughts, spread of animal disease associated with hunger and malnutrition, spread of invasive plants such as *Prosopis juliflora* replacing the traditional shrubs, and insecurities from neighbouring pastoral communities, farmers, and wild animals. The table below summarises these findings for the two study sites respectively.

Table 3: Livelihood Uncertainties Affecting Pastoral Production

What are the most important uncertainties (shocks) affecting livestock production and pastoral livelihoods?		
Item	Kinna (Isiolo)	Bori (Marsabit)
Youth	Drought: exacerbated by land pressure Livestock influx National Park access restrictions Insecurity	Drought Disease Livestock theft <i>Prosopis</i> infestation
Women	Drought Land use pressure Insecurity Animal disease	Drought Disease Insecurity <i>Prosopis</i> infestation
Elders	Drought Livestock influx Insecurity	Drought Disease <i>Prosopis</i> infestation Livestock theft

In the two sites, though far apart and having different environmental and land use contexts, the uncertainties affecting the pastoralist communities were very similar. Drought emerged as the most commonly experienced disaster, with livestock diseases and insecurity being the other.

2. *Document pastoralists' reliability professionals' network through participatory network mapping*

The study asked: *who are the high reliability professionals who were able to navigate the shocks and what networks were they embedded in?* We explored who were the reliability professionals and the actions they undertake to transform 'high variance' conditions (very uncertain rainfall, insecurity) to a more stable supply of goods and services, and hence generate reliable and sustainable livelihoods despite the turbulence. We further explored how, through these reliability professionals' networks, different forms of resilience around access to relevant information, resources, market and navigating insecurity occurs. The study established that resilience is not built in one go, it is a continuous process, always requiring special negotiations, establishing network, and adapting as crises transform. In further discussions, we asked whether reliability professionals and their networks are essential to generating resilience from below and an alternative entry point to the standard, top-down resilience projects that have so often failed.

Pastoralism, as described by researcher Emery Roe, can be seen as a "critical infrastructure", where "high reliability professionals" ensure that the system does not collapse. Such professionals are central to pastoral systems. They connect herders through diverse social networks; for example with motorbike transporters, those who offer credit, and local specialists such as healers and forecasters. In a series of focus group discussions in Kinna and Bori, we asked the participants to identify the potential individuals considered to be the 'high reliability professionals' in pastoral production. The participants then ranked these individuals based on their immediate importance and their differentiated capacities and contributions in enhancing reliable supply of goods and services in pastoral production. The table below summarises the results.

Table 4: Ranking of High Reliability Professionals by Different Groups (Numbers of votes from participants)

Who are the essential reliability professionals in managing the shocks?		
Item	Kinna	Bori
Youth	<ol style="list-style-type: none"> 1. Tissa (herder) 11 2. <i>Boda-boda</i> (motor-cycle riders)10 3. Traders 8 4. Religious leaders 7 5. <i>Dedha</i> elders (grazing elders)7 6. Family members 7 7. <i>Chibra</i> (defence team) 6 8. NGOs 5 9. Agrovets 4 	<p><i>Haada</i> (mother)11</p> <p><i>Abba</i> (owner)11</p> <p><i>Tissa</i> (herder)11</p> <p><i>Chilres</i> (traditional vet/doctor)10</p> <p><i>Dedha</i> elders (grazing elders) 8</p> <p>Religious leaders 7</p> <p>Youths 7</p> <p><i>Boda-boda</i> (motorcycle riders) 7</p>

	<p>10. <i>Chilres</i> (traditional vet/doctor) 3</p> <p>11. Politician 3</p> <p>12. Neighbours 3</p> <p>13. Veterinary 1</p> <p>14. Government 1</p>	<p>Chief 6</p> <p>Market 5</p> <p>Veterinary 5</p> <p>Traders (<i>Nagade</i>) 4</p> <p>Brokers 3</p> <p>Agrovet shop 3</p> <p>Politician 2</p> <p>NGOs 1</p> <p>Government 1</p>	
Women	<p>1. <i>Abba</i> (owner) 11</p> <p>2. <i>Tissa</i> (herders) 11</p> <p>3. <i>Dedha</i> elders (grazing elders) 10</p> <p>4. Religious leaders 10</p> <p>5. National Park 9</p> <p>6. <i>Chilres</i> (traditional vet/doctor) 9</p> <p>7. <i>Boda-boda</i> (motorcycle riders) 8</p> <p>8. Neighbour 8</p> <p>9. Family 8</p> <p>10. Chiefs 7</p> <p>11. Government 3</p>	<p>12. Veterinary 7</p> <p>13. Agrovet 6</p> <p>14. M-Pesa dealer 5</p> <p>15. Meru farmers 5</p> <p>16. NGOs 4</p> <p>17. Park Scouts 3</p> <p>18. Traders 3</p> <p>19. Government 2</p> <p>20. Politician 2</p>	<p>Haada (mother) 11</p> <p><i>Abba</i> (owner) 10</p> <p><i>Tissa</i> (herders) 9</p> <p><i>Chilres</i> (traditional doctors/vet) 8</p> <p><i>Dedha</i> elders (grazing elders) 8</p> <p>Religious leaders 7</p> <p>Youth 6</p> <p>Phone/radio/mpesa 5</p> <p><i>Boda-boda</i> (motorcycle riders) 5</p> <p>Chiefs 5</p> <p>Market 4</p> <p>Veterinary 4</p> <p>Livestock traders 3</p> <p>Brokers 3</p> <p>NGOs 2</p> <p>Politicians 1</p> <p>Agrovets 1</p>
Elders	<p><i>Abba</i> (owner) 11</p> <p><i>Dedha</i> elders (grazing elders) 10</p> <p><i>Tisa</i> (herders) 9</p> <p><i>Boda-boda</i> (motorcycle riders) 8</p> <p>Mobile phone 7</p> <p><i>Chibra</i> (defence team) 6</p> <p>NGOs 5</p> <p>Agrovet 4</p>		<p><i>Abba</i> (Father) 11</p> <p><i>Haada</i> (wife/mother) 11</p> <p><i>Tissa</i> (herder) 10</p> <p><i>Boda-boda</i> (motorcycle riders) 9</p> <p><i>Dedha</i> elders (grazing elders) 9</p> <p>Chief 8</p> <p><i>Chirreyi</i> (traditional doctors) 7</p> <p>Religious leader 6</p>

	Government 3	Agrovet 5 Youth 5 Ngo 4 County 4 Government 3 Traders 2 Brokers 2
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NB: The ranking number ranges between 1-11 (this is based on the number of the initial participants and used across all the rankings for uniformity)



Ranking High Reliability Professionals discussion, Bori, December 2022



Ranking High Reliability Professionals, Kinna, December 2022

In summary, the findings revealed that at the centre of any response is the herd owner, including the man (*Abba*) and the woman (*Haada*) pastoralist. These owners are central in sourcing information, resources, employing herders, purchasing feeds and medicines, and establishing rapport with different network to ensure continued access. At the same time, the herders (most of whom are hired) remain the second most important reliability professional after the herd owners as they manage in real time during crises, including addressing insecurity, disease outbreaks and managing the livestock on the move. However, these herd owners and herders are not alone, they must work with others, including, the traditional doctors, grazing management elders, motorcycle riders, M-Pesa (mobile money) operators, national park scouts, agrovet dealers, brokers, and farmers. For instance, the motorcycle riders (the *boda-boda* boys) support scouting for grazing, transporting fodder, and link people in remote places, sometimes operating as local defence teams, while the agrovet dealers supply drugs and medicines, but also advise on various diseases and provide small amounts of credit to facilitate responses. While the chiefs are essential in connecting local pastoralists to the government and mediating conflict between the pastoralists and the neighbouring communities.

Equally, the M-Pesa (mobile money agents) can advance funds, facilitating rapid response, especially when livestock are reprimanded by the national park rangers demanding fines for illegal grazing. On the other hand, the traditional doctors (*chilres*) could treat different diseases and conditions including breech birth, bone setting, and removing tick from the animal's eye. While the religious leaders/preachers (*qalole*) can provide spiritual intervention praying for rain, against disease

outbreak and providing holy water used for spreading the animals to prevent evil eye and treat diseases. In addition, other traditional local experts provide advice when challenges arise. These include the (*dedha*) elders giving guidance on the rangeland conditions and the grazing management, the predictors of hazards through reading intestines (the *Uchu*) and the astronomers (*ayaanttu*) who predict from looking at the stars and foretell drought conditions. Finally, the combination of NGOs, government, veterinary support, politicians, and market brokers were considered important, but with great contestation on their rankings. During the ranking exercise, men, women, and youth provided similar results, as shown in the table. The government and NGOs were consistently ranked low compared to the other reliability professionals.

The participatory ranking of the pastoralist reliability professionals was fascinating and the discussions about the rankings were animated, but everyone agreed on the bottom ranks: “These people don’t come”, they said. “Why are we even giving them one point? Can we not give negative scores?”. Another participant commented, “We are left on our own, they sometime come after the vultures have feasted on the remains of our livestock.” Equally, a substantial number of participants acknowledged the significance of long-lasting infrastructures established through government and NGOs, particularly strategic boreholes that have been serving the community during severe droughts. However, challenges of breakdown, low-maintenance, and rising fuel costs continue to undermine the operation of such infrastructure, especially in dry seasons, when large livestock number depend on a single water source.

3. Investigate local forms of resilience among pastoralists in Isiolo and Marsabit Counties in northern Kenya through a ‘reliability professionals’ network’ lens.

The study observed that applying ‘high reliability professionals’ concept in pastoral production reveals the significant of hidden potentials that enhance the reliable supply of goods and services in highly uncertain settings. As [studies of other critical infrastructures](#) (electricity or water supply systems, for example) have shown, such professionals must, at the same time, scan the horizon for emerging threats and respond in real time to challenges on the ground, steering the system away from danger whilst managing uncertainty. It is skilled and usually unrecognised work (especially by outsiders) and is reliant on networks as such individuals connect with others, drawing on different knowledges – including tacit, experiential knowledges – diverse skills and impressive communications capacities. Those identified as important are connected, working with each other sometimes within a local community, at other times linked through phones. WhatsApp and M-Pesa as routes to reliability management is essential. It is through this continued networked and negotiated processes linked to access to vital resources, information, and support that reliability is generated, and disasters continuously averted.

The in-depth narrative case studies revealed that resilience and reliability in pastoral production is built through networked processes, with the reliability professionals centre stage. One participant

noted, “What makes pastoral production resilient are four things that should always hold hand together and are tightly connected, if you remove one, the connection is lost. These four include:

1. Pasture/land: enough food, this is the main fuel which determine the success and failure of the system. These resources must be accessed through various networks for resilience to be generated.
2. Herd owner: he is key because he provides resources that connect the four together. He must establish relationships with all the reliability professionals, from top to down and ensures every service is accessed in real time, otherwise the system shuts down.
3. Tissa: herders, either hired or owners in combination with other form of partnership is crucial. These herders are like all time engineers, scouting for diseases, changes in animal behaviours, insecurity, good pasture, water sources and communicating with the owners. Although some herders might not be reliable, establishing good relationships through incentives and a good salary ensures a long-lasting herder-owner relationship.
4. Supportive wife: Although her effort is always hidden under the guise of household carers, women are very instrumental in ensuring reliability in the face of calamities. They combine their household care role with managing sick animals at home, managing the milk market, providing veterinary support through her savings, and sometimes moving out to manage the animals.”

However, these four resources/individuals must function in well-coordinated network and relations based on kins, friendships, economic ties, and social association. These relationships and networks are utilised by the herd owners in flexible, adaptable and reliable ways. As a Borana saying goes “*warri ak Abban jiru Jiraa, yoo Abban jabaa, horiin jabaa, yoo Abban laafa hoorilen laafa*” (The household is like how the head/owner manages; if the owner is strong, the livestock will be strong, and if the owner is weak, the livestock will be weaker). This strength also includes women because, “*jabbeeni warra, haad jabdu olla maamultu qaabuu*” (The strength comes from having a strong woman who manages the households). The father or the wife should always enquire about *booba* (grazing) and *galchuum* (return from grazing) to ensure the continuity of livestock management, and plan accordingly. This means that managing livestock requires continuous supervisions, alliance formation and responding to crisis as they unfold, always preparing for the unknown.

For example, one of the female participants in an in-depth narrative interview described how she managed her livestock through different droughts and insecurities. Habiba is a 58-year-old herd owner whose husband has been slightly disabled for about 17 years. They have about 100 cattle and since 2009 Habiba has been managing the animals, including herding them, especially in severe droughts. In February 2023, Habiba was in a very uncertain condition not knowing whether it will rain in March or not. As such, she has invested in multiple plans, establishing relationships with different Meru farmers for feeds, sharing information with fellow herders on animal behaviours that

could translate to failure of rain, and sending out herders for scouting potential places in the national park, all part of anticipatory planning in the context of planning for the unknown. Equally, Habiba has established a long-term relationship with multiple reliability professionals, including an M-Pesa service provider for emergency cash needs, traditional doctors for treating different animal disease, and two motorcycle drivers that facilitate her mobility. Finally, she has hired four herders managing the livestock in different locations, separating the weak and strong herds accordingly, and a daily labourer helping in collecting feeds. It is through these interconnected plans and reliable investment that Habiba managed different droughts, now and in the past.

Habiba's case provides one example among the numerous discussions we had in the field, all relating to similar flexible arrangement, embedded in communities' moral economy and collective solidarity (Mohamed, 2022). Here, collective information sharing, scouting the rangelands and national parks is a communal practice, not implemented by a single individual, but through collaboration. Due to intensified insecurity and competition over the limited resources, collaboration with different networks, including with the potential 'enemy' is essential to access insecure resources such as the national parks and the Meru farmers, who could be a threat to livestock theft. It is through this collaboration and collective solidarities that the less endowed herd owners survive by establishing symbiotic relationships with relatives, friends, and kin, in turn mobilising labour and other support.

For instance, Dima had a few animals and he sought the help of brother for herding support. Dima stays in town engaging in menial work to support his family, while his brother manages the animals for him. On the other hand, Qalla, a low-income herd owner partnered with his brother in-law Guracha, providing herding services, in order to survive a more commoditising and turbulent livestock production. In return, Guracha provides for Qalla's family, including schooling his children and supporting the herds through feeds, medicines, other resources.

Therefore, as shown by case examples discussed, resilience in pastoral production is built through a process, reliant on social, economic ties, and drawing on multiple knowledge from the elders, forecasters, observing animal behaviour, and planning accordingly. Equally, mobilising different resources including, pasture, feed, water, labour, veterinary services, transport technology and mobile money transfers is essential in enhancing reliability amidst uncertainties in pastoral livelihoods. Although access to resources is highly stratified with most resources held by the wealthy herders, others rely on a wider moral economy of resource sharing and labour pooling. Despite the increasing significance of individualised and more commoditised approaches to surviving crises in pastoral settings, the collective solidarities and resource sharing practices still persist as part of the collective cultural and religious practices and help the communities manage variable livestock production, and generate reliability and resilience in the face of continuous crisis.

8 Impacts

This scoping study aimed at understanding an alternative way of thinking about resilience building in pastoral contexts through the high reliability lens. To this end, we considered pastoralists as highly adaptive and flexible professionals, deploying multiple knowledge and resources in order to avert disasters and enhance reliable livelihood production, in the face of recurrent challenges related to climate-induced drought, flood, animal disease, insecurity, and social economic instability.

8.1 Scientific impacts – now and in 5 years

Through a series of five blogposts published in online platforms, active conversation on the subject has been initiated. The blogposts were meant to spur rethinking around the subject of resilience in the face of continued high impacts of disasters despite the large investments. The blog posts particularly resonated with the conversations following one of the worst droughts in the Horn of Africa that exposed the high level of vulnerability that persists. The blogposts will provide a reference point for continued engagements as the articles remain active on the sites. They will be used as the foundation for the launching of the main project, if approved.

8.2 Capacity impacts – now and in 5 years

In collaboration with the Centre for Research and Development in Drylands, we established positive engagements with pastoralist communities in the area. Identification of the high reliability professionals within the pastoral systems informs better targeting and partnerships for resilience building in the pastoral context. The information will help development practitioners and governments to rethink their approaches to resilience building. The scoping work will provide a good basis for planning the main project, with contacts already established in the study sites. Demand for training and further discussion around this topic was evident during our interactions with policymakers, NGOs and others.

8.3 Community impacts – now and in 5 years

By recognising the idea of ‘resilience from below’, we aim to shift the narrative from the mainstream resilience building framework, always aimed at fixing problems through a top-down approach that uses solutions sourced from outside the communities. The results of the scoping study provide a frame for the larger study that will bring out the internal community networks that act as the front line of response to disasters, aiming to learn from pilot projects on the ground. By doing so, the study will provide a framework that places pastoralists at the centre of response and recovery from disasters.

8.3.1 Economic impacts

Our blogpost series has highlighted the failure of resilience project over the past 20 years. Potentially shifting the core design and including the reliability professionals as central to resilience programmes will save on the massive, wasted investments in inappropriate resilience building programmes in pastoral areas.

8.3.2 Social impacts

Our scoping study has highlighted how resilience building processes are social differentiated and highlight the significance recognising the wealth, gender, and generation differences in designing resilience building programmes for pastoral society. Through the proposed broader study, this social differentiation will be highlighted.

8.3.3 Environmental impacts

The results of the study places local knowledge and their practices in the use of environmental resources centrally. Adoption of co-produced knowledge system is expected to inspire sustainable use of environmental resources for more resilient livelihoods.

8.4 Communication and dissemination activities

The five blogposts produced by the study have attracted massive interests within the academic community, media, researchers, and international development practitioners. We received much feedback and there was substantial interest in our findings around the substantial failures in previous resilience building projects and the need for a radical rethinking in resilience programming in pastoral areas. In publishing the blogposts, we targeted widely used platforms for dissemination. These include *The Conversation* and *The Elephant*, both known for their bold and thought-provoking outputs. We further republished the longer, original blogposts on the PASTRES site on three consecutive Fridays and hence diversified our outreach. The same blogposts were promoted on social media platforms including Twitter, LinkedIn, and several organisation including ILRI, Jameel Observatory and the FAO Pastoral Knowledge Hub republished posts on the social media platforms. Finally, we received a request from *The New Humanitarian* for a blogpost that draws from the PASTRES series. The wider interest and the feedback received confirms that there is indeed significant interest in the study topic and that the comprehensive research on learning resilience from below will substantially improve resilience programming in pastoral areas if the output is widely circulated and shared with policymakers, government officials, donors, and international agencies interested in pastoral development.

9 Conclusions and recommendations

Exploring the local practices of building resilience in the face of compounding uncertainties through the lens of a 'high-reliability professionals' network' perspective in pastoral areas of Marsabit and Isiolo Counties in Northern Kenya revealed that building resilience is not as often assumed. Resilience to evolving uncertainties such as drought is enhanced through multiple processes, often involving investment in diverse relationships, knowledge sharing, technologies, and access to resources, including pasture, water, and feed. Establishing 'modern' markets along the road, forming livelihood groups through short-term grants, intensifying diversification out of pastoralism or providing food relief does not result in resilience building but sometimes undermines local practices, leading to dependency and forced sedentarisation. Instead, our scoping research has pointed to the importance of wider networks of mutual support, local knowledge of the changing climatic conditions, and flexible deployment of resources, including mobile money services, transport networks for rangeland scouting, traditional practitioners' support in treating disease and collective labour sharing as significant factors to adapting to changing circumstances. The study suggests an alternative way of thinking about resilience in a pastoral context. We argue that there could be a step toward enhancing resilience to the uncertainties in pastoral production if the reliability professionals' flexibility and adaptability are recognised, supported, and embedded in resilience programming.

The study explored how pastoralists ensure reliable and resilient livestock production through a combination of data collection methods in two pastoral settings. Although significant social stratification as to wealth, gender, and generation exists, influencing how the wealthy compared to the poor command resources to survive, the study maintains that, despite these differences, substantial potential exists to build resilience from below. This is not to romanticise the local practices as the only avenue for enhancing resilience but encourages an acknowledgement of the existing systems and practices that should be recognised and supported by external support. The study has shown that, despite the long-standing droughts, animal diseases and socio-economic instability, pastoralism persists, and the role of the long-term repertoire of adaptive and flexible responses ensures the reliability of services in the pastoral economy. We conclude from our research that, instead of the deluge of external interventions and creating new resilience projects, ways must be found to build resilience from below, drawing on local practices and networks and centring on high reliability professionals and practices. Questions need to be developed around how these networks should be supported, what processes should be followed to combine these local practices with external interventions, and how the reliability professionals' networks should be recognised and strengthened. This is the focus of the proposed longer project, testing out propositions for enhancing pastoralists' high reliability management through a series of action research pilots, from which lessons will be drawn and shared.

9.1 Recommendations

The scoping research project aimed to understand the the role of high-reliability professionals and their networks and relate this to ways of enhancing resilience in pastoral systems. The project relied on the idea of pastoralism as a ‘critical infrastructure’ and pastoralists as reliability professionals, operating with tacit knowledge of complex systems, always acting in real-time, utilising multiple relationships and networks to avert disasters before they turn into an emergency. Although it is not easy to provide a comprehensive recommendation in a single short-span scoping study, applying the ‘high reliability’ perspective offers much potential in pastoralists’ management of drought and related challenges. The scoping work revealed a substantial agenda for future action research, focused on improving future programmes and projects aimed at building resilience.

- The study recommends the need to shift the focus of the resilience programmes from ‘risk’ management and instead embrace uncertainty – a fundamental lack of knowledge about the future - as central pastoralists’ everyday challenges.
- Instead of the deluge of external interventions creating new resilience projects, ways must be found to build resilience from below, drawing on local practices and networks and a deeper understanding of ‘high reliability’ management processes in pastoral settings.
- Future studies should be focussed more on unravelling who high-reliability professionals are, their abilities, capacities, networks and resource requirements when managing variabilities in pastoral production. The potential framework developed could guide interventions across pastoral development sectors in the fieldss of early warning, humanitarian relief, social protection support and resilience building.
- Attention should be given to the existing social-economic differentiation within and between high-reliability networks, including gender differences, wealth, and generational differences. Any framework developed to support these diverse networks for resilience and reliability must take such differences into account.
- Stakeholders, including government, development practitioners, researchers, humanitarian agencies, and academic institutions interested in pastoral development and resilience building, should share a platform for coordinating their programmes and exploring ways of embedding local knowledge and pastoralists’ high-reliability systems into the framing of interventions and programme implementation.
- Finally, a more comprehensive study should be designed to explore the significance of ‘building resilience from below’ and ways in which the local practices of enhancing resilience should be central to the long-term adaptation and disaster.

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10.1 List of publications produced by project

Mohamed T. and Scoones, I. (2023). Local Knowledge is Crucial for Crisis Preparedness. The Elephant, <https://www.theelephant.info/features/2023/04/14/local-knowledge-is-crucial-for-crisis-preparedness/>

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Mohamed T. and Scoones I. (2023). Building Resilience from Below: The Vital Role of ‘Reliability Professionals’ and their Networks. Pastres Blogpost, <https://pastres.org/2023/05/19/building-resilience-from-below-the-vital-role-of-reliability-professionals-and-their-networks/>

Mohamed T. and Scoones I. (2023). [The failure of ‘resilience’ projects in northern Kenya: what can we learn? – Pastoralism, Uncertainty and Resilience – PASTRES](#)

Mohamed T. and Scoones I. (2023). [Local early warning systems: predicting the future when things are so uncertain – Pastoralism, Uncertainty and Resilience – PASTRES](#)

Mohamed T. and Scoones I. (2023). [Local Knowledge is Crucial for Crisis Preparedness | The Elephant](#)