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Pastoralist policy paradoxes in the Anthropocene. Relational ontologies and the marginalisation of lifeways among the Maasai (Tanzania), Hamar (Ethiopia), and the Fulani (the Sahel)

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African pastoralists such as Fulani, Hamar, and Maasai have long been entangled in global narratives that misrepresent their ecological practices, moral worlds, and adaptive strategies. Within Anthropocene discourse and climate-policy frameworks, they are either being portrayed as vulnerable victims of the climate change crisis, or as culprits of ecological degradation, or security threats that destabilise fragile states. Such framings revive colonial tropes, reinforce climate determinism, obscure the political and historical drivers of inequality and devalue local livelihoods. Drawing on ethnographic, linguistic, and historical research, this article argues that pastoralists' relational ontologies, rooted in mobility, multispecies cohabitation, ritual, language, and moral ecologies, offer alternative socio-ecological knowledge that challenge technocratic and reductionist approaches to climate governance. Through cases from Fulani (Sahel), Hamar (southwest Ethiopia), and Maasai (northern Tanzania), we demonstrate how pastoralist lifeworlds cultivate ways of living with uncertainty and unpredictability, which remain undertheorised and misrecognised in dominant policy frameworks and scientific narratives. Recognizing pastoralist modes of knowing and being in this world is thus not merely an ethical imperative; it is foundational for developing more fine-grained, situated, just, and pluriversal Anthropocene futures.

KEYWORDS

African pastoralism, Anthropocene, climate determinism, environmental semantics, mobility and adaptation

Introduction: anthropocene narratives and the marginalisation of pastoralist lifeworlds

“The rainfall patterns might have changed over the years, but it is hard to tell because we have changed too. We used to follow the clouds, now we have settled”.

Maasai pastoralist, Terrat village, northern Tanzania (adopted from de Wit, 2018b: 178)

The Anthropocene refers to the idea that humanity has become a geological force in its own right, having caused the planetary predicament that is characterised by the triple crisis of biodiversity loss, climate change and pollution. The concept has been critiqued by social scientists as it suggests the illusion of a unified human subject, which masks profound global inequalities and long histories of oppression and exploitation, notably in the Global South (Yusoff, 2018; Hecht, 2018). Within this homogenizing narrative, African pastoralists occupy a paradoxical position. They have contributed least to the carbon-intensive political economies and planetary destruction, yet appear disproportionately within environmental and climate change policy narratives of vulnerability, degradation, and crisis.

Pastoralism, especially in Africa's drylands, has long been misunderstood in policymaking and scientific paradigms. For over a century, pastoral mobility and livestock-based livelihoods have been framed through colonial imaginaries of disorder and irrationality, ecological fragility, destruction and backwardness. These narratives are reproduced, albeit in new technocratic forms, through climate-change discourses that cast pastoralists as emblematic victims of environmental collapse or as contributors to rangeland degradation, conflicts and even climate change (Houzer and Scoones, 2021). Such framings obscure historically produced vulnerabilities through conservation enclosures, land grabs, sedentarisation schemes, agricultural expansion, infrastructure development, and state territorial projects that have profoundly reshaped pastoralist worlds (Benjaminsen, 2024; Brockington, 2002; Gabbert et al., 2021; Abbink et al., 2014).

Pastoralists' own conceptualisations of climate, weather, rainfall, God, landscape, environment, and multispecies relations remain too often misrecognised in climate change governance and policy framings. Yet their relational ontologies, encoded in linguistic worldviews, cosmologies, moral ecologies and economies, systems of reciprocity, and ritual practices, offer nuanced ways of living with uncertainty and unpredictability. These ontologies challenge the implicit assumptions of global-climate adaptation frameworks, which privilege prediction, technological intervention, and universal categories of vulnerability and resilience. Drawing on long-term ethnographic research among Fulani (Sahel), Hamar (southwest Ethiopia), and Maasai (northern Tanzania), we articulate how pastoralist lifeworlds illuminate conceptual and practical alternatives for Anthropocene narratives.

We argue that pastoralists' socio-ecological knowledge and experience are not only adaptive strategies in face of unpredictable climate change (Scoones, 2020), but provide fertile ground for deep interdisciplinary theoretical reflections, revealing the limits and problems of climate determinism and reductionist policy models. We posit the pastoralist here as the radical interdisciplinary expert, and argue that the perpetual misrecognition and marginalisation of the pastoralist in policy narratives stems from a similar marginalisation of the social sciences and the humanities from such narratives, as well as misappropriation and misconstruction of science.

In this paper we identify some key interrelated pastoralist policy paradoxes in the Anthropocene: 1) conflict, climate and mobility: climate and mobility are often seen as the cause for conflict, yet pastoralists often employ mobility as a way to avoid conflict; 2) development policies have structurally focused on improving

pastoralists lives, yet have had the opposite effects (Salih et al., 2001); 3) diversification to remain pastoralists: pastoralists have always diversified their livelihoods (e.g., through farming), not as a move away from pastoralism but rather to remain cattle keepers (McCabe, 2003; McCabe et al., 2010). These paradoxes inform our analysis and allow us to trace how pastoralist lifeworlds are repeatedly misrecognised across climate, development and security frameworks. While these frameworks are often treated in isolation, we bring them into conversation as they form a part of the same top-down policy-expert nexus.

Next, we explore the dominant Anthropocene narratives by exploring the political work these discourses perform, and how climate determinism, resilience and vulnerability frameworks have shaped the ways pastoralist worldviews and knowledge systems are represented, what is obscured and which forms of expertise and knowledge hierarchies are established. We then build our critique of this human centred framework from the bottom-up, and juxtapose the Anthropocene through pastoralists' relational ontologies as expertise, lived experiences and moral scripts for fostering ties in a constantly changing and unpredictable world.

We open up the possibility of reimagining the Anthropocene from the perspective of those who have long lived with uncertainty and unpredictability. We first examine how dominant narratives about pastoralism are produced before turning to pastoralists' own socio-ecological worlds. We develop the relational ontology approach as fluid ways of perceiving and being in the world in which humans are co-constitutive of their environments. We draw on Ingold's approach to dwelling in nature, and what it means to *inhabit* an environment and *grow* skills (Ingold, 2000) through unfolding practices, herding, moving and effectively managing resources. This means that nature is never a static externality, but is afforded agentive potential that needs to be related to, through higher moral and cosmological orders. How we come to 'know' climate change, is not just about knowledge but also about ontologies, or the simultaneous enactment of knowledge and reality (climate) (Goldman, et al., 2015).

We address four interrelated questions. First, how are African pastoralists represented in climate policy narratives, and how do these narratives reproduce enduring paradoxes of blame, vulnerability and control over resources, and impact land tenure? Second, how do pastoralists themselves experience and narrate climatic and socio-ecological transformations through their own emic categories of knowledge? Third, what can these pastoralist ontologies, rooted in languages, rituals, social relations and moral ecologies, teach us about alternative ways of living in and knowing the Anthropocene? Finally, how can insights from these pastoralist communities be translated into more just policy narratives that recognise pastoralist lifeworlds, as valid ways of knowing and being in the world? Taken together, these questions move from dominant policy narratives to pastoralist experiences and finally to the broader implications of relational ontologies for Anthropocene governance and inclusive interdisciplinary research agendas.

This paper concludes with a reflection on interdisciplinarity, knowledge hierarchies and how the social sciences and humanities can contribute to more fluid, equitable, just and pluriform policy narratives, which can only be achieved if the politics of knowledge is taken into account. The article proceeds in six sections. Section *Methods and comparative approach: studying socio-ecologies through*

interdisciplinary encounters explains our comparative approach and methodology. Section *Genealogies of blame and environmental degradation* traces the colonial and climate-scientific crisis narratives that continue to inform pastoralist misrecognition as translated into policy narratives. Section *Techno-politics, conservation and security* examines technopolitics, conservation regimes, and climate–security narratives that reproduce pastoralist marginalisation in the Anthropocene framework. In Section *Climate–conflict assemblages and the securitisation of pastoralism* we detail the climate–conflict nexus and how such securitisation framings have an impact on the ground. Section *The lived Anthropocene: relational ontologies beyond policy narratives* discusses pastoralists’ relational ontologies as manifested in cultural and linguistic practices, foregrounding these as alternative conceptualisations and adaptations to unpredictable climate variability and environmental change. Section *Relational ontologies against Anthropocene reductionism* concludes by outlining the need for a pluriversal Anthropocene grounded in relational ontologies and recognises African pastoralists not only as masters of living with uncertainty, or as ‘reliability professionals’ (Roe, 2020) but also as interdisciplinary experts.

Methods and comparative approach: studying socio-ecologies through interdisciplinary encounters

This paper draws on long-term ethnographic research conducted over multiple decades and disciplinary traditions among Maasai communities in northern Tanzania, Hamar communities in southwest Ethiopia, and Fulani communities in Mali and the wider Sahel. The paper brings together longitudinal ethnographic, linguistic, historical and ecological approaches that evolved independently and were subsequently placed into dialogue through interdisciplinary collaboration. Rather than treating climate change as an external variable, we foreground lived experience, relational ontologies and emic categories through which people understand and enact their environments. We analyse policy and scientific narratives alongside pastoralist lifeworlds to develop the concept of relational ontology from the bottom up.

The comparative framework is not intended to homogenise pastoralist experiences. Fulani, Hamar and Maasai communities differ markedly in history, language, mobility patterns and political context. However, they face strikingly similar pressures: land alienation, restrictions on mobility, conservation enclosures, development interventions and climate–security narratives that marginalise their livelihoods and worldviews. By analysing these cases side by side, we identify shared policy paradoxes while remaining attentive to local specificity.

Our collaboration emerged through sustained interdisciplinary dialogue, collaborative interpretation and iterative comparison of independently-generated ethnographic material. This process enabled us to revisit familiar ethnographic material through unfamiliar analytical lenses and move beyond discipline-specific explanations. The comparative analysis proceeded through iterative thematic comparison centred on recurring dimensions emerging across the cases, including mobility, relationality, environmental

knowledge, uncertainty and encounters with policy regimes. The aim was not statistical representativeness but analytical transferability grounded in ethnographic depth and long-term engagement.

De Wit employs a multi-sited ethnographic approach carried out between 2013 and 2017 to examine how climate change adaptation discourse circulates across policy arenas, NGOs, scientific institutions and pastoralist communities. Her work traces how adaptation is translated from national and international climate negotiations to everyday life in Maasai villages in northern Tanzania, using a “nodal ethnography” (Hodgson, 2011) focused on sites where different worlds and knowledge systems intersect (de Wit, 2018a).

Petrollino’s contribution is based on ongoing linguistic fieldwork (2010–present) among Hamar and neighbouring pastoralist groups in southwest Ethiopia. Using anthropological linguistics, cognitive semantics, and participant observation, her research documents how environmental perception, cattle categorisation and visual experience are structured through language. Particular attention is given to how ecological knowledge and classificatory systems are learned, transmitted and enacted through herding practices and everyday interaction (Petrollino, 2021; Petrollino, 2023; Petrollino, 2024).

Van Dijk and de Bruijn draw on long-term ethnographic and agro-ecological research among Fulani communities in the Sahel since the 1990s, tracing how nomadic and agro-pastoral livelihoods respond to ecological variability, political marginalisation and, more recently, violent conflict. Their work combines ecological analysis, historical ethnography and attention to religious and social transformations, situating contemporary dynamics within longer trajectories of mobility and inequality (de Bruijn and van Dijk, 1995; van Dijk and de Bruijn, 2022; de Bruijn, 2022).

Policy analysis has been carried out systematically across the different case studies with a focus on international and national climate change adaptation documents, which are linked to the wider development and conservation sector. NAPAs and subsequent NAPs were selected through purposive sampling because of their prominence in climate adaptation discourse and relevance to pastoral regions discussed in the paper.

Given the longitudinal and cumulative nature of the research, the article draws on published and unpublished ethnographic materials, historical sources, and archival research generated through long-term engagement with pastoralist communities. Formal and informal semi-structured interviews and focus group discussions were conducted across diverse socio-economic, age-groups, gender, and occupational categories.

While grounded in different disciplinary traditions, our approaches converge in treating pastoralists as knowledgeable actors embedded in dynamic socio-ecological systems. Rather than positioning pastoralists as objects of adaptation or vulnerability, we approach them as interdisciplinary experts whose practices integrate ecological, social and moral dimensions. This perspective challenges entrenched epistemological hierarchies that privilege technocratic and natural-scientific knowledge in climate governance.

Social science critiques of development and environmental policy have long exposed the gap between local realities and dominant narratives, yet these insights have often failed to

reshape policy practice. We suggest that this persistence reflects not only power asymmetries but also disciplinary silos that marginalise social sciences and humanities. By explicitly foregrounding relational ontologies and interdisciplinary analysis, this paper seeks to develop conceptual registers that are both analytically rigorous and translatable across disciplinary and policy divides. This means we need to reflect on ways to move towards deeper and more radical forms of interdisciplinarity (Peša, 2022: 387).

Genealogies of blame and environmental degradation

Colonial origins: the desertification myth and the “irrational cattle-keeper”

This section traces the historical emergence of dominant narratives that continue to frame pastoralists within Anthropocene governance, showing how older colonial assumptions are reproduced in contemporary environmental discourse. Through tropes of modernity, pastoralism in Africa (and elsewhere) has been prey to misjudgements and negative stereotypes but it also continues to be largely mischaracterised by foreign policymakers, scientists and experts in fields like development, climate change and biodiversity conservation (Igoe, 2002). Colonial scientific narratives have contributed to their stigmatisation by ‘misreading’ pastoralist landscapes and producing nature narratives of blame. Starting from the “Desertification myth” of the 1930s when British and French foresters already warned about the advancing desert (Davis, 2016), European colonial administrations conceptualised African rangelands through a lens of degradation, fragility, and decline. Especially as it has been applied to African drylands and pastoral societies, it is empirically weak, analytically misleading, and politically consequential (Behnke and Mortimore, 2016). In the “Cattle complex”, East African pastoralists were seen as irrational cattle keepers, maximizing herds at the expense of the environment (Herskovits, 1926).

Colonial ecological science relied heavily on equilibrium models, positing a fixed carrying capacity beyond which rangelands would collapse (Scoones, 1995; Scoones, 2009). This resulted in postcolonial narratives of overgrazing (Lamprey, 1983; Du Toit and Cumming, 1999; Geist and Lambin, 2004), to the “tragedy of the commons” (Hardin, 1968) especially around the droughts of the 1980s. Research shows that these negative misconceptions have led to political oppression and catastrophic interventions, including land dispossession (see. e.g., De Bruijn and van Dijk, 1999). Since conceptualisations of ecological dynamics could not capture the non-equilibrium nature of dryland ecosystems, this led to a paradigm shift in which variability, not stability, is the ecological norm (Scoones, 1995; Helldén and Tottrup, 2008), although this is not always translated into policies. Pastoral mobility, rather than degrading land, was shown to be a rational adaptation to environmental unpredictability (Turner and Schlecht, 2019), and grazing does not do irreversible damage to rangelands (Hiernaux et al., 2009). Although views of pastoralism’s ecological impact have become more positive (FAO, 2018; Houzer and Scoones, 2021; World Bank, 2016), evidence such as studies on the greening of

the Sahel continue to be ignored in policy formulation (Helldén and Tottrup, 2008; Davis, 2016). These (post-)colonial frames, which may be termed the “social construction of ignorance” when uncomfortable knowledge is strategically ignored (Rayner, 2012), continue to shape global policy landscapes, as we detail below.

The re-emergence of climate determinism within the anthropocene framework

Pastoralist lands and livelihoods are increasingly under threat worldwide. This is largely due to agricultural and industrial expansion, socio-ecological change, land grabs in the name of nature conservation or development, and nationalist, ethnic and religious ideologies, yet scholarly and policy literature increasingly frames the fate of the pastoralist through the single prism of the climate change crisis, through narratives of blame (FAO, 2006), vulnerability (IPCC et al., 2022) and resilience frameworks (FAO, 2018). We argue that the rise of climate determinism, in which climate is elevated as the single or most important variable determining human life (Hulme, 2011), to explain vulnerability or blame, obscures complex and structural drivers of vulnerability, inequality, and long histories of marginalisation (cf. Benjaminsen, 2024); it also overlooks lived experiences and vital local knowledge embedded in ontologies of pastoralists themselves (Houzer and Scoones, 2021).

One increasingly common rendition of climate reductionism is that climate change, or conditions of drought and climate turbulence, directly lead to conflict or civil war, migration (McGuirk and Nunn, 2025) and even famine (Asiamah et al., 2023). Yet, social scientists have long contested such views by showing that there is no such a thing as ‘natural’ disasters, as there are no disasters without people, but they always mark the interface between an extreme physical phenomenon and a vulnerable population (O’Keefe et al., 1976; de Waal, 2018; Boas et al., 2019). These dynamics are structurally ignored, including in the latest Intergovernmental Panel on Climate Change 6th assessment report (Otto and Raju, 2023).

Despite longstanding misconceptions of pastoralists as “irrational cattle keepers”, they have not contributed to the global human footprint that characterises the Anthropocene era, yet the effects of the Anthropocene are increasingly felt and are encroaching on pastoralists’ lands and livelihoods. Such realities are perpetuated by crisis narratives about biodiversity loss that justify afforestation or other forms of land use restriction resulting in continued loss of pastures and livestock corridors (Benjaminsen, 2024: 107; van Dijk and de Bruijn, 2022). New global agendas perpetuating old discourses of modernity, in the name of nature and biodiversity conservation, climate change mitigation (carbon colonialism) and adaptation (sedentarisation and agricultural expansion), developmentalist projects of modernity (hydropower, sugar plantations, tree planting projects), land appropriation and alienation for safari hunting and tourism, all leads to further marginalisation and the underdevelopment of pastoralists (Warner et al., 2022). Malthusian explanations of overpopulation of cattle, and climate deterministic framings of arid lands as hotspots of desertification, are now being revitalised within Anthropocene frameworks.

TABLE 1 Adapted from “Rendering the World Unsafe: Vulnerability as Western Discourse” (Bankoff 2001: 28, in de Wit 2018b: 40).

Concept	Period	Condition	Cure/Technology
Tropicality	17th-19th/early 20th century	Disease	Western medicine
Development	Post-Second World War	Poverty	Western investment/aid
Natural disasters	Late 20th century	Hazard	Western science
Adaptation	21st century	Climate change (exacerbating a range of societal ills)	Science, technology (expertise) and funds provided by the “developed nations”

Crisis thinking as cultural discourse and the (Anti-)politics of adaptation

“Vulnerability is high for many food producers dependent on rainfall and temperature conditions, including subsistence farmers, the rural poor, and pastoralists”.

IPCC et al. (2022): 1202

Within development and climate governance, African pastoralists are persistently framed through narratives of crisis, vulnerability and impending collapse. As Roe (1999) argued, Africa has long been rendered exceptional through doomsday narratives that depict livelihoods as perpetually on the brink of failure. In the Anthropocene, such crisis thinking has been revitalised through climate change discourse, particularly within adaptation policy frameworks.

Drawing on Bankoff's (2001) analysis of vulnerability as Western discourse, climate adaptation narratives reproduce older tropes that portray large parts of Africa as inherently disaster-prone (Table 1). From early tropicality discourses to contemporary notions of an “adaptation deficit” (IPCC and Niang, 2014), crisis is constructed as a natural condition rather than as the outcome of historical and political processes. These framings lend legitimacy to external intervention, technocratic expertise and solutionism, while masking structural inequalities and power relations (de Wit, 2018b).

Critical scholarship has shown how adaptation often operates as a relabelling of existing development agendas (Klepp and Chavez-Rodriguez, 2018; de Wit, 2018b). By framing vulnerability as a technical problem to be solved through expert intervention, adaptation discourse depoliticises the root causes of inequality, echoing Ferguson's (1990) critique of development as an anti-politics machine.

Crisis narratives perform important political and epistemic work by simplifying complex socio-ecological realities and privileging particular forms of knowledge over others (Roe, 1991; Krätli, 2013). Pastoralist ways of knowing and living with uncertainty are rendered invisible, even though non-equilibrium ecology has demonstrated that variability, not stability, is the norm in dryland environments (Scoones, 1995; Scoones, 2009). Crisis is a *cultural discourse* (Beck, 2009; Roitman, 2013; Massumi, 2015) that shapes both policy and scientific predictions overly focused on Africa's vulnerability.

The rise of resilience frameworks illustrates this paradox. While resilience is often framed as empowering, it frequently reproduces colonial power relations by shifting responsibility for adaptation

onto vulnerable populations without addressing structural drivers of marginalisation. In pastoral contexts, resilience discourse simultaneously acknowledges historical adaptability while positioning pastoralists as deficient subjects in need of modernisation (Campbell, 2022). The paradox is that frameworks designed to support adaptation may simultaneously reproduce the conditions of marginalisation they seek to address (Amponsah, 2025). Against these crisis framings, pastoralist lifeworlds reveal a different orientation to uncertainty. Variability is not an anomaly to be corrected but a condition to be navigated. As we show in later sections, pastoralists' relational ontologies offer alternative understandings of climate and adaptation that challenge the technocratic logic of crisis-driven policy.

The politics of knowing climate: translating global science

Beyond representations of vulnerability, climate governance also shapes whose knowledge becomes authoritative. Not all forms of knowledge are granted equal authority (Hulme, 2017: 37). Modern climate science has come to dominate public and policy understandings of climate through processes of quantification and modelling which resulted in the idea of climate becoming almost exclusively known in global terms (Edwards, 2001: 32-33). From the nineteenth century onward, statistical climatology enabled the construction of climate “normals” (Brückner in Hulme, 2017: 33), while late twentieth-century climate modelling produced a planetary view of climate that appears universal and placeless (Hulme, 2010). This globalisation of climate knowledge has profound epistemic consequences, as abstract climate models offer what Hulme (2017) describes as “a view from nowhere”, erasing geographical, cultural and experiential differences. In this process, local and indigenous ways of knowing climate are marginalised, despite their fine-grained relevance for lived adaptation.

For pastoralists, the notion of a stable climate normal (Hulme, 2020) is largely meaningless. Climate is known and enacted through embodied practices, long-term observation and relational engagement with landscapes, animals and spiritual forces. As Goldman et al. (2015) demonstrate, meteorological drought does not necessarily correspond to pastoralist experiences of drought, which are shaped by pasture conditions, mobility options and social relations rather than rainfall metrics alone.

Despite well-documented uncertainty in climate projections, particularly for African drylands, policy narratives continue to rely

on simplified climate scenarios. In East Africa, rainfall projections remain contradictory, producing what has been termed the “Eastern African climate paradox”, where models predict increasing rainfall while local observations point to altered seasonality and shorter rainy periods of the long March April May (MAM) rains. However, seasonal maximum in daily rainfall remains consistent, and partial recovery of this shorter rainfall trend can be observed since the late 2000s (Wainwright et al., 2019). These findings are consistent with local observations of Maasai pastoralists. Many studies based on Regional Climate Models predict a significant increasing trend in future annual rainfall and temperature for the drylands in Northern Tanzania (Mwabumba et al., 2022). Yet such nuance rarely informs policy documents. These examples illustrate that uncertainty is not only ecological but also epistemic, raising questions about whose interpretations of climate become policy relevant.

In Ethiopia, this selective use of climate knowledge is particularly evident. While climate models project increasing rainfall for large parts of the country, the National Adaptation Programme of Action (NAPA) foregrounds drought and flood risk, framing vulnerability as primarily climatic rather than political. Structural factors such as land grabbing, hydropower projects or restrictions on pastoral mobility are largely absent, rendering vulnerability a naturalised condition. Since droughts will likely occur in agro-pastoral areas, the promotion of drought-resistant seeds to promote agriculture as outlined in the NAPA begs the question whether this is the most appropriate policy response, or is it rather a way to serve the interests of multinational seed companies like Monsanto who have a strong foothold in Ethiopia (and Tanzania alike) (see ABNE, 2015).

Similar dynamics can be observed elsewhere. In the Sahel, desertification narratives have persisted despite satellite evidence of greening (Helldén and Tottrup, 2008; Davis, 2016). As Fairhead and Leach (1996) have shown, such misreadings of African landscapes are not merely errors but forms of “uncomfortable knowledge” that are strategically ignored because they challenge established power relations and policy agendas (Rayner, 2012). Uncertain or partial scientific evidence is mobilised to legitimise interventions that restrict mobility, promote sedentarisation or justify land appropriation. As Campbell (2022) shows, climate narratives are increasingly used by states and elites to advance long-standing development and governance agendas under the guise of adaptation.

Climate change discourse simultaneously invokes pastoralists’ resilience and denies their expertise, reinforcing hierarchical distinctions between scientific knowledge and lived experience. It is a question of power: whose knowledge counts, under what conditions, and with what consequences. Recognising pastoralist ways of knowing climate requires moving beyond technocratic models toward an understanding of climate as relational, enacted and embedded in specific ontologies.

Local ways of knowing and enacting climate: relational ontologies as adaptation

Against abstract climate models and global metrics, pastoralist experiences reveal locally grounded forms of environmental knowledge. In this section we show how pastoralists come to know weather, climate and their environment and show that their ways of knowing the world (epistemologies) are intimately

bound up with their ways of enacting climate (ontologies and socio-cultural practices), and have to be understood as vital adaptation skills. Instead of abstract climate models’ view from ‘nowhere’, pastoralists’ knowledge is ‘a view from somewhere by someone’ (Hulme, 2017).

In northern Tanzania, the Maasai argued that weather forecasts and seasonal climate forecasts produced by meteorologists were not very useful, due to the broad geographical scope and temporal variation in their climate. Their own forecasting skills, for instance, are based on detailed observations of cloud and weather patterns, wind direction, insect behaviour, flowers, birds, trees, soil moisture, and even star constellations etc. Such forecasts are more meaningful to the Maasai than abstract medium-range weather forecasts and were corroborated by national climate scientists and meteorologists. This example demonstrates that environmental expertise emerges through situated engagement rather than detached prediction.

Pastoralists are not passive victims in this policy landscape, but are actively countering such disempowering discourses through collective action and political representation. For example, among Maasai communities in northern Tanzania, critical counternarratives have emerged by grassroots organisations that frame and position themselves as “masters of adaptation”. Maasai representatives argue that policymakers fail to understand pastoralism as a highly adaptive livelihood system in the face of unpredictable climatic conditions (A).

This is in line with critical scholarship that has demonstrated how pastoralism is a livelihood system that should be understood in its full complexity, within which livelihood diversification (crop production and wage labour), mobility and large herd management are among key coping mechanisms for cattle to survive during severe droughts (Leslie and McCabe, 2013; Goldman and Riosmena, 2013; de Bruijn and van Dijk, 1995). To put it in the words of a Maasai pastoralist: “We are used to adaptation since we can remember; movement is our way of life”. Oral histories show that as long as they can remember, they have followed the rain and green pastures with their herds, which has always enabled them to adapt to the highly variable and unstable climates. Fulani in central Mali refer to variability in climate and how they adapted to it, also with the breeding of cattle, and for agro-pastoral groups to change and use a variability of millet seeds stored in their granaries as a fallback, when they move with their animals.

A telling example of relational ontology as a vital adaptation strategy is described by Goldman et al. (2015), who observed contradictory responses to drought as defined by science. In 2008/9 a severe drought hit much of Eastern Africa, and the Maasai were badly affected. The problem was not so much the rainfall quantity but its distribution over the season and the non-linear relation between rainfall patterns and pasture production. For the Maasai it was the worst drought in living memory and they reacted by moving with their cattle. In 2010/11 another drought hit the region. According to rainfall data this drought was the worst in the region in 60 years. Yet, for the Maasai and regional NGOs it was not a drought, because of the rainfall distribution by mobilising herding strategies and systems of reciprocity they were able to manage. As the authors have rightfully observed in the context of different responses to drought in Maasailand: conflicts over knowledge are usually about a lot more, about ontological

differences (Goldman et al., 2015). Here, drought becomes not simply a meteorological event but a relational condition mediated through mobility and social institutions.

Despite climate variability, the long history of drought in East and Southern Africa and the Sahel reveals the resilience of pastoral livelihoods and customary institutions; these often re-emerge after periods of duress and climatic stress (exceptions exist of social tipping points, meaning that social institutions could no longer be sustained due to complex stressors, see Menestrey, this volume). Scholars have shown that in the face of globalisation and government reforms, local natural resources management strategies and pastoral livelihoods continue to endure and their institutions have often been strengthened rather than weakened (Salih, 2001).

Drawing insights from organisational management, Roe (2020) sees pastoralism as a “global critical infrastructure” and pastoralists as “reliability professionals.” Just like in the water and energy sector, in which infrastructures seek to provide participants with the stable and safe supply of vital services, notably in turbulent times, pastoralists can be similarly seen to use this “high reliability mandate.” They do so by expanding their management options and responding effectively to increasing variability (Roe, 2020: v).

Roe’s reconceptualisation of pastoralists as ‘reliability professionals’ offers a crucial counter narrative to dominant risk-based approaches (i.e., pastoralists’ behaviour depicted as highly risk-adverse). Our contribution makes a similar point, by showing that reliability is not only a matter of skilled practice, but is grounded in relational ontologies articulated through language, ritual, and cosmology. Where Roe reframes pastoralism as infrastructure through an organisational theory lens, we demonstrate how pastoralists themselves inhabit worlds in which uncertainty, climate, and wellbeing are constituted through relations rather than variables (i.e., rainfalls, pasture biomass, resilience indicators).

Techno-politics, conservation and security

Techno-managerial solutionism and the governance state

We first examine how Anthropocene governance increasingly relies on technical interventions designed to anticipate and control uncertain futures. One of the biggest paradoxes is that in the fields of development policy and humanitarianism we witness the proliferation of more technologies and discourses of control, prediction and anticipation in the name of climate change adaptation and mitigation or sustainable development (Klepp and Chavez-Rodriguez, 2018). These depoliticizing tendencies point to another fundamental paradox characteristic: that to fix the Anthropocene, we need more control and impact—further anchoring the Anthropos through solutionism—rather than less human relationality and connection with nature.

The Great Green Wall of Africa (GGW) is the most ambitious tree planting project on the continent, stretching some 8,000 km across the entire Sahel. This megaproject that was initiated by the African Union in 2007, and funded by an array of multilateral organisations, is in many ways iconic for the Anthropocene era. It is

telling that the region’s traditional inhabitants, the pastoralists and their resource use have not been considered, and entirely excluded from decision making (Turner et al., 2021; Zhu et al., 2025), thereby reproducing colonial imaginaries of wastelands as if these landscapes were ‘empty’ or void of people, and even biodiversity (Davis, 2016). The quick-fix appeal and techno-managerial ambition of the project becomes clear in the case of Ethiopia, for example, where the government tried to make people plant 566 million trees in 1 day. Two decades after the inception of the GGW, and the “takeover” by developed nations through billions of euros and dollars of funding, the project showed disappointing results and is not meeting the expectations of the IPCC and other expert bodies (Allouche, 2024).

These outcomes reflect a long tradition of externally imposed development schemes that neglect local values and ways of being in the world (Salih et al., 2001; De Bruijn and van Dijk, 1999). Noting that the largest funders of the GGW are a mix of international development banks, The European Union, bilateral donors, UN agencies, private actors and philanthropists like Jeff Bezos, this environmental megaproject to combat desertification is a prime example of a global network of neoliberal governance (Duffy, 2006).

These policy spaces are neither entirely international, nor national but are hegemonic regimes comprising transnational geographies of power that have come to dominate environmental politics in developing countries. Such policy regimes may best be captured by *the governance state*, which is a new development of post-conditionality in North–South relations, where the boundaries of the nation state and multilateral organisations, including private companies, donors, NGOs, international financial institutions, and a strong relationship between environmental NGOs and the World Bank, have become entirely blurred (Harrison, 2004; Duffy, 2006). While the vocabulary of partnerships and participation may appear neutral, necessary and productive, as it is also part of the Sustainable Development Goals, we argue that such concepts can create the illusion that everyone has equal say, while knowledge hierarchies and power asymmetries are already established and become co-opted into the same process.

NAPAs: how international ‘expertise’ is constructed and gains authority

National Adaptation Programmes of Action (NAPAs) are presented as technical instruments designed to identify urgent climate adaptation needs in developing countries. NAPAs provide a particularly revealing entry point because they make visible how climate expertise is translated into policy. While their direct impact on the ground may be uneven, these documents show how climate expertise is constructed, how authority is assigned, and how pastoralist futures are imagined. Beyond their policy prescriptions, NAPAs function as sites where particular epistemologies are stabilised, others marginalised, and power relations naturalised.

Although framed as participatory and nationally owned, NAPAs are shaped by international funding mechanisms, technical guidelines and consultant-driven processes, primarily coordinated through UNDP and other multilateral organisations. They reflect what Massumi (2015) terms *ontopower*: a form of governance

oriented toward anticipating and pre-empting future risks. Recent analyses of Ethiopian climate policy help clarify the epistemic logic underpinning NAPAs more broadly. Campbell (2022) identifies three recurring narratives through which pastoralism is framed in climate adaptation policy. First, pastoralists are portrayed as inherently vulnerable populations, with exposure to climate risk treated as an internal condition. Second, pastoralism itself is increasingly cast as maladaptive under climate change, with mobility and extensive land use reframed as environmentally unsustainable practices. Third, adaptation discourse mobilises a longer-standing narrative of transformation, in which pastoralism can only persist through sedentarisation, livelihood restructuring and expert-led modernisation. Together, these narratives depoliticise vulnerability while legitimising intervention and reinforcing hierarchies between external expertise and pastoralist knowledge.

These framings are clearly visible in Tanzania's NAPA (Vice President's Office, 2007), which embeds pastoralists within a generic "livestock sector" and presents mobility as a problem to be corrected. The document proposes land-use change, education of herders, zero grazing and herd reduction, while asserting that livestock numbers exceed the land's carrying capacity. Such claims reproduce equilibrium-based ecological reasoning and revive the colonial trope of the "irrational cattle keeper". Ethiopia's NAPA similarly frames adaptation as a technological project aimed at transforming pastoral livelihoods through improved seeds, irrigation, insurance schemes and early warning systems (Ministry of Water Resources and National Meteorological Agency, 2007). While acknowledging that pastoralists have historically adapted to climate variability, pastoralism is rendered viable only insofar as it conforms to expert prescriptions, echoing Campbell's "pastoralism as transformation" narrative.

In contrast, Mali's NAPA (Government of Mali, 2011) adopts a more pastoral-friendly tone, recognising mobility, transhumance corridors and local resource governance as central to resilience. It proposes rangeland rehabilitation, water access, veterinary services and early warning systems, and acknowledges conflict risks associated with land-use change. The NAPA lacks operational mechanisms, and mobility is framed as a logistical challenge rather than as an adaptive system in its own right.

Across the three cases, a striking convergence emerges: pastoralist knowledge is acknowledged rhetorically but translated into externally defined interventions. All NAPAs foreground climate hazards, drought, desertification, resource scarcity, as primary determinants of pastoralist futures. Pastoralists are positioned as vulnerable populations in need of education, technological support and behavioural change. Their relational ontologies, institutions and historical adaptive strategies are acknowledged only superficially before being translated into technical interventions such as irrigation, improved breeds or sedentarisation schemes. This paradox is central: pastoralists are simultaneously recognised as historically resilient and problematised as fragile, risky and in need of transformation. In this way, NAPAs reproduce a technocratic and reductionist discourse that obscures political-economic inequalities, marginalises pastoralist expertise and reinforces knowledge hierarchies.

Moreover, these policy processes increasingly open space for private-sector involvement. In both Tanzania and Ethiopia, climate adaptation agendas align with corporate interests promoting drought-resistant seeds, insurance schemes and climate-smart

agriculture, often without robust scientific evidence (ABNE, 2015). Such interventions risk deepening dependency, eroding autonomy and undermining local ecological knowledge. Climate change thus becomes a vehicle for reasserting older development agendas under a new moral imperative.

Taken together, the NAPAs illustrate how Anthropocene governance translates uncertainty into technocratic control. They privilege external expertise, naturalise crisis and depoliticise pastoralist marginalisation, while sidelining relational ontologies that have long enabled pastoralists to live with variability and unpredictability. Rather than recognising pastoralists as knowledge producers and adaptive experts, NAPAs render them objects of intervention, confirming the broader pastoralist policy paradoxes traced throughout this paper.

Africa's Eden: land tenure under neoliberal fortress conservation regimes

"The Government in this country (Tanzania) is using a lot of money to protect animals like giraffe, elephants, but it does not even use a single shilling to protect a person known as the pastoralist. We are in danger of being chased away by the government from our own land. The big threat to pastoralists is not climate change. The big threat is our own government".

(Maasai during an international climate change meeting (de Wit, 2018b: 49).

Another area where climate narratives have fused with neoliberal regimes of governance is the world of nature and biodiversity conservation and national parks. To understand why these nature policy narratives are so pervasive, we need to trace their colonial origins. The European encounter with Africa's nature has historically emerged as a wild and unspoiled Eden; a "paradigm of otherness" in which Africa came to figure as a natural backdrop against a civilised Western world (Garland, 2008). Colonial stereotypes imposed ideas of "wilderness" on African landscapes, animals and people that resulted in the separation between Nature and Culture (Neumann, 1998). These colonial "pre-modern" narratives that invoke a sense of primitiveness - landscapes void of people, or Africa's Eden - continue to be employed by post-colonial governments and international organisations today.

In this context, pastoralists are imagined both through romanticizing tropes as well as through the exoticisation for commodification (we all know the wandering or jumping Maasai in safari landscapes with their spears in tourist brochures) and negative ones (backwardness, causing climate change and hunting for lions etc.). These wilderness narratives have informed ideals of "fortress conservation" (Brockington, 2002) and continue to have devastating impacts on local pastoralist communities today, who are increasingly becoming "conservation refugees" in their own country. Since 1960, the amount of land under strict protection for conservation worldwide has doubled, which has resulted in Parks vs. People conflicts. These "conservation" groups fail to recognize that the native peoples are an essential part of the biodiversity in the very areas they seek to conserve (Dowie, 2009). It is likely that protected areas will only expand: all political agreements, economic

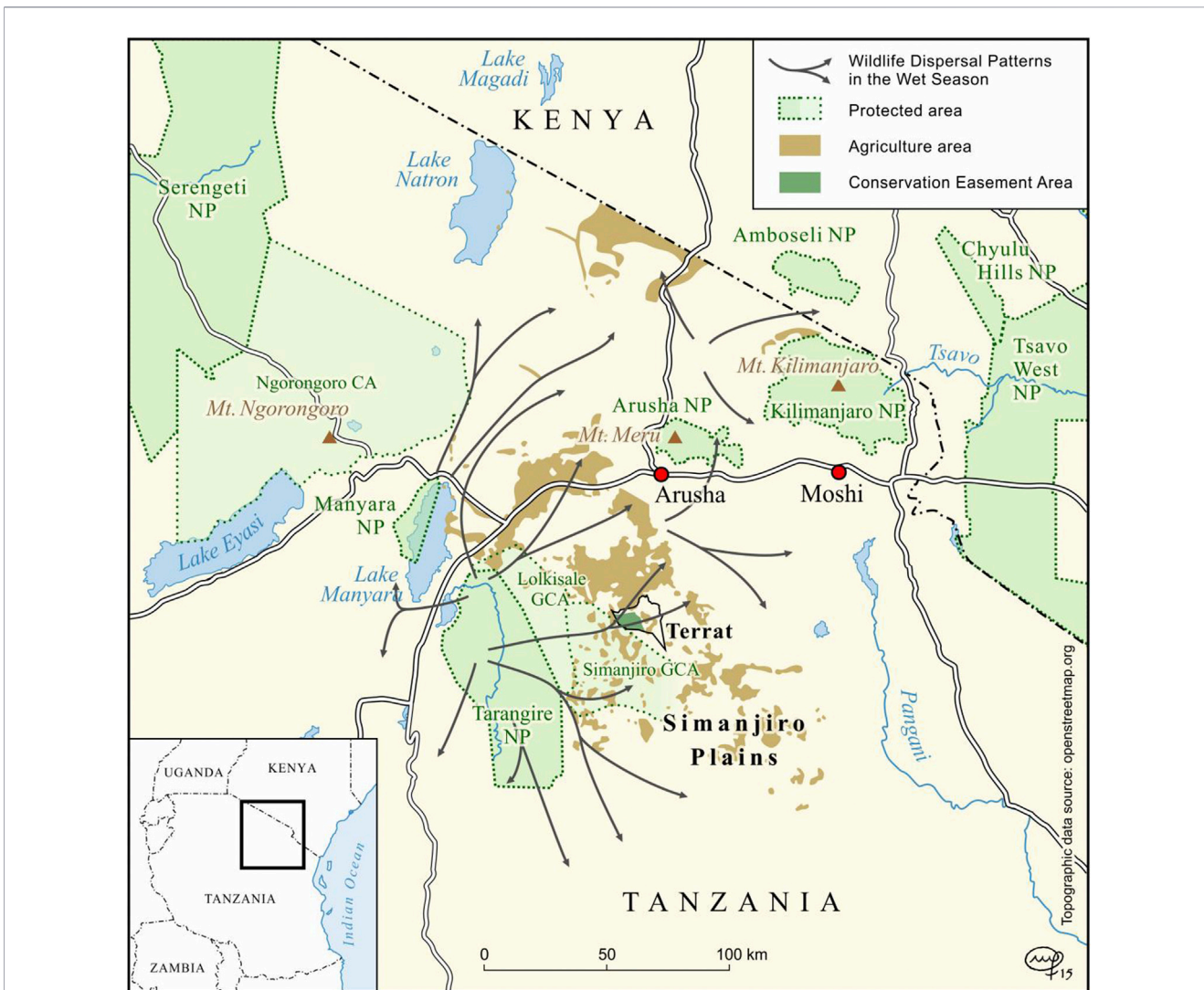


FIGURE 1 Wildlife dispersal into Terrat village during the rainy season. Credit: cartography Monika Feinen, University of Cologne. Adapted from "Wildlife dispersal into Terrat during the wet season" by Sara de Wit. Cartography: Monika Feinen, University of Cologne.

considerations, and much-highlighted contemporary global challenges within the Anthropocene framework—like biodiversity loss and climate change—point in this direction (Bollig, 2022).

The Maasai are an iconic example of the simultaneous commodification and romanticisation of their culture. Hodgson explains these contradictory dimensions as follows: “Except for their photo opportunities, Maasai were generally out of sight and out of mind. Mocked by the elites as primitive, accused of cultural conservatism, and excluded from most state-sponsored development initiatives, Maasai became increasingly impoverished as their land, livestock, and possibilities for viable livelihoods continue to disappear” (Hodgson, 1999: 121). Notably in Tanzania, the semi-nomadic Maasai have experienced a long and violent history of land dispossession, evictions in name of conservation and marginalisation. Since 1992, the Maasai in Loliondo continue to face violent land evictions due to a neoliberal government and a lucrative safari business, which render pastoralism insignificant and frames the pastoralists once again as destroyers of the environment. This shows how environmental

narratives can simultaneously depoliticise land dispossession and legitimise intervention. While these discourses portray pastoralists as encroaching on the parks, socio-ecological studies have demonstrated that wildlife and cattle actually live very well together (Homewood and Rodgers, 1991). However, such scientific evidence is also structurally ignored and can be considered a form of ‘uncomfortable knowledge’ that is ironically enough in tension with conservationists’ interests and is therefore excluded (Rayner, 2012).

The Maasai who live in Terrat village have long been exposed to fortress conservation efforts and violent land evictions. Terrat is located on the outskirts of Tarangire National Park (see Figure 1), which became a game reserve in 1957 and was later “upgraded” to become a national park in 1970. The gazettement of Tarangire as a national park remains a painful memory for people who were evicted (Igoe and Brockington, 1999; Igoe, 2002). The area that is now Tarangire was central to their system of transhumant pastoralism, since the most important and reliable dry-season water points in the entire ecosystem—the Tarangire river and

Silalo swamp—are located inside the park. The co-habitation of wildlife with the Maasai cattle has proven to have substantial benefits for biodiversity and wildlife health. During dry seasons, the wildlife graze and calve in the Maasai areas, which not only depletes their grasses but also makes the area uninhabitable for cattle. When wildebeest give birth a substance is emitted that results in poisonous grasses, which are lethal to cattle or cause blindness. Due to the ever-encroaching national parks that have drastically reduced grazing and living areas for the Maasai, their transhumance pastoral mobility has been entirely disrupted, leaving them and their cattle without hardly any dry season water points or grasses.

Climate change discourses are a convenient scapegoat for government officials to blame nature, or depoliticise the vulnerable situation the Maasai find themselves in. As former President Kikwete stated when he addressed an international crowd during an environmental conference in Arusha about the impacts of climate change:

“This part of Tanzania [northern Tanzania] is home to the Maasai [...] We have a district called Longido. People lost close to 500,000 heads of cattle. The Maasai families became suddenly poor” (AMCEN conference, October 2012, Arusha, in: de Wit, 2018a).

This was a remarkable case of the Antipolitics at work. To deflect attention away from land evictions that were going on during the conference, as the president had just signed a contract to lease large parts of Maasailand to Ortello Business Corporation, owned by the royal family of the United Arab Emirates. After building their own airstrip, they were free to hunt for wildlife. The government justified the evictions by arguing that the Maasai are responsible for the killings of wildlife and environmental destruction. Villagers were outraged and felt utterly helpless, and many community protests followed.

The Maasai’s most serious concerns are not about climate change, but they feel continuously threatened in their existence by ongoing violent land evictions in the name of nature conservation that severely impacts their mobility and renders livelihoods impossible. During conferences Maasai frequently stated that animals have more rights in Tanzania than pastoralists. It was striking to say the least, that the fiercest opposition to this new climate change discourse came from the grassroots; a paradoxical situation in which the greatest resistance to this new paradigm comes from the very people it seeks to aid (ibid.).

Fulani nomads in the Sahel are also confronted with slow encroachment on their pastureland and increasing problems to access pastures in dry season pasture areas such as the Inner Delta of the Niger because of corruption and agricultural expansion (Benjaminsen and Ba, 2009; 2019; 2021). Powerful livestock owners increasingly try to get exclusive control over large areas of rangelands (Schareika et al., 2021.). Projects meant to improve pasture management are captured by elites (De Bruijn and van Dijk, 1999). All over West Africa, there is increasing evidence of agricultural expansion through investment in agricultural modernisation projects such as the Office du Niger in the Inner Delta of the Niger, but it is not yet very well documented. This leads to displacement and further land

occupation and the shrinking of space for pastoralists and the increase in conflict (Toulmin, 2020). There is an increasing push to create ranching and controlled grazing for example, in Nigeria (ICG, 2021), limiting the mobility of pastoralists and meant to control conflicts between farmers and pastoralists. Yet the research on the consequences of these tendencies is far from complete.

Eviction from pasture for wildlife conservation is less prominent in West Africa as there is little wildlife left. The situation of Binder-Lere National Park in Chad is a case where Fulani have been evicted from their lands. Binder is a Fulani chiefdom that was part of the 19th century Adamaoua empire. The king became the representative of colonial and post-colonial governments. Binder territory includes today’s Park. The chiefdom has good relations with transhumant Fulani nomads who transgress their territory. In February 2022 the Chadian Military transition government accepted *Loi, no 003, PCM/2022*, to establish the National Park Za-Soo, in the *réserve de faune Binder-Lere* (135,000 ha) that was established by the Chadian government in 1974 (*decrèt no. 169 PR*). The reserve did not forbid the activities of the population. In the National Park, however, *all* human activity is excluded from the park that is 81,500 ha. The park’s borders have become territorial control points that pastoralists are forbidden to transgress, controlled by the gendarmerie and military with the NGO responsible for the (tourist) exploitation of the park. As Figure 2 shows, pastoral transhumance routes are redirected around the park, where they have to negotiate new arrangements with the sedentary populations and often end up in violent conflicts. Similar to Maasailand, the main argument is that the cattle of the nomads would be competing with the wild animals for natural resources. The underlying argument relates to income from tourism and control of pastoral communities. Government officials and Fulani elites see the future of pastoralism as a rangeland economy (Bruls et al., 2024).

Also here, violence is legitimised by Anthropocene discourses of environmental destruction and the urgent need to control and protect nature from Africans. International NGOs do not represent Fulani nomads correctly, but rather pursue their own economic and political goals. One consequence is a further push of the nomads to the south where violent conflicts between pastoralists and farmers are increasing. This in turn, feeds into the argument that the climate armageddon is used to reframe conflicts related to pastoralism as a climate change issue (McGuirk and Nunn, 2025); an ironic case of climate determinism’s narrative full circle.

Climate–conflict assemblages and the securitisation of pastoralism

We now turn to a third policy paradox: although mobility is often framed as a driver of conflict, pastoralists frequently employ mobility to avoid violence and manage uncertainty. A central domain in which climate-determinist framings have gained particular traction is the climate–conflict nexus. In policy and security discourses, pastoralism is frequently positioned as a risk factor, and pastoralists as potential perpetrators of violence in contexts of climatic stress. Pastoral mobility, herd size, and alleged resistance to state authority are framed as sources of instability, particularly during periods of drought or environmental uncertainty. While pastoralists are indeed involved

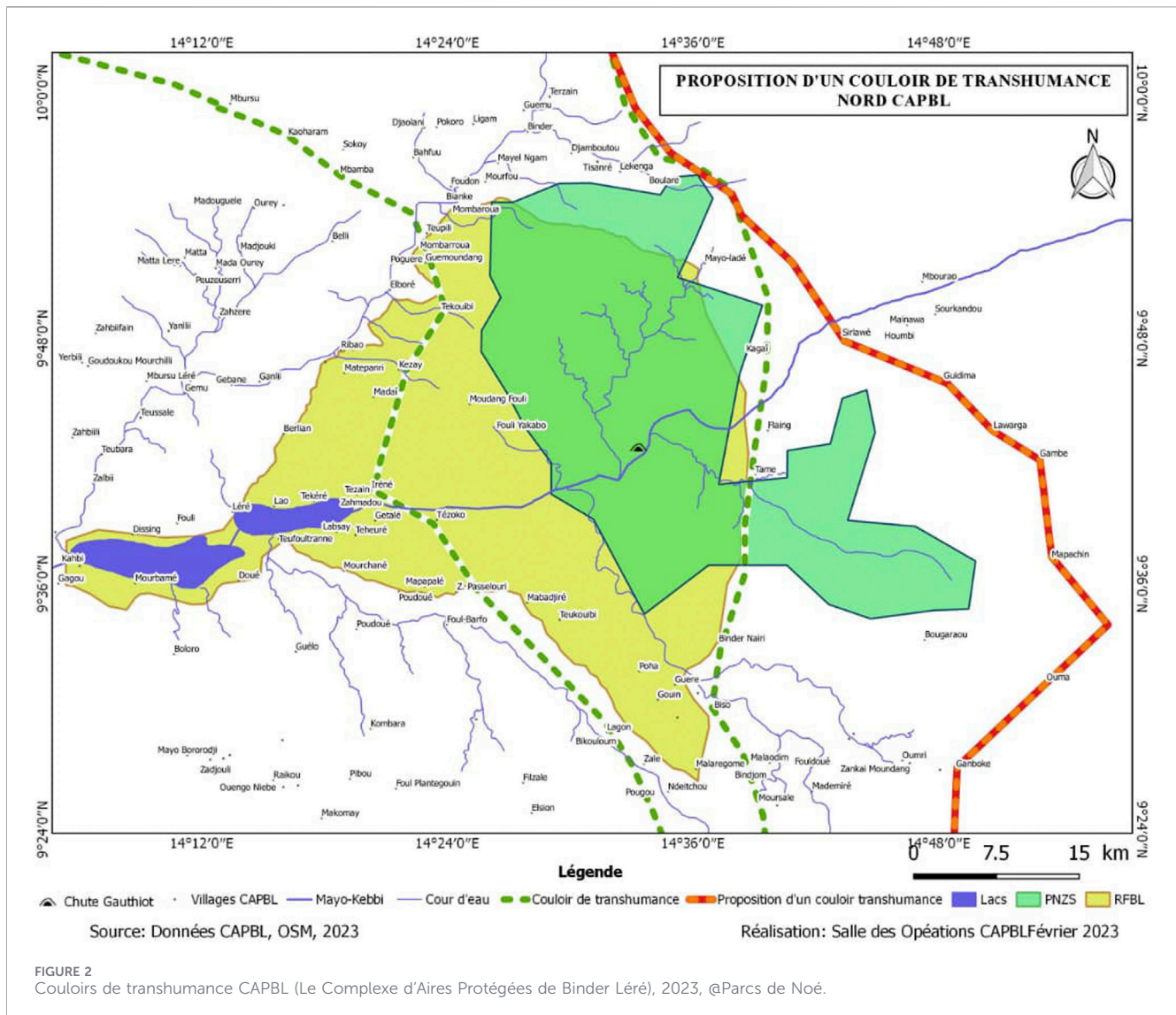


FIGURE 2 Couloirs de transhumance CAPBL (Le Complexe d'Aires Protégées de Binder Léré), 2023, @Parcs de Noé.

in many conflict settings across Africa, climate constitutes only one element within a far more complex assemblage of historical, political, economic and ecological relations (Benjaminsen, 2024).

Climate change is thus mobilised as an explanatory shortcut through which conflict is rendered natural, inevitable and externally driven. As Campbell (2022) shows for Ethiopia, climate narratives translate political struggles over land, mobility and authority into technical problems of vulnerability, risk and adaptation, thereby depoliticising conflict and legitimising state and donor intervention. Climate discourse does not merely describe conflict; it actively reshapes how pastoralist regions are governed, securitised and rendered legible (Scott, 2008).

This depoliticising logic has been powerfully critiqued by Benjaminsen (2024) in his analysis of climate security and climate justice in the Sahel. He demonstrates how dominant climate–conflict narratives foreground drought, scarcity and environmental stress while others obscure the material politics of land dispossession, state coercion and militarised conservation (McGuirk and Nunn, 2025). These framings reproduce colonial tropes of degraded drylands and unruly nomads, with tangible

consequences: restrictions on mobility, violent interventions and the further marginalisation of pastoralist livelihoods and knowledge. In this sense, climate security discourse functions less as an explanation of conflict than as part of the assemblage through which insecurity itself is produced.

Contrary to deterministic claims, climate stress does not automatically generate violence. Extensive scholarship shows that pastoral mobility is frequently used as a strategy to avoid conflict rather than to provoke it (Boas et al., 2019; Boesen et al., 2014; De Bruijn et al., 2016). Periods of ecological uncertainty often intensify relations of care, reciprocity and negotiation that function as key adaptive strategies (Goldman et al., 2015; de Wit, 2021). Yet these relational responses remain largely invisible within securitised climate narratives, which continue to frame mobility and pastoral institutions as threats rather than as resources for navigating uncertainty.

Despite this evidence, pastoralists across Africa are recurrently depicted through a narrow repertoire of securitising tropes: as expansionist drivers of farmer–herder conflict, as inherently violent “warrior nomads”, or as security threats inhabiting

supposedly ungovernable drylands. These framings are not merely descriptive. They shape policy, justify military intervention, restrict movement and contribute directly to the escalation of violence in regions such as the Sahel and the Horn of Africa. Longstanding representations of Fulani as mobile, uncontrollable “others” have facilitated their collective stigmatisation as terrorists, building on tropes found in pre-colonial, colonial and post-colonial literature, and policy reports (Amselle, 2022). This process of demonisation has been amplified through media, policy and academic narratives, crystallizing what Malian academics and journalists have referred to as ‘*la question peule*’ (Thiam, 2017; Sangare, 2019; Cissé, 2019).

The Sahel has become the paradigmatic space in which climate–conflict narratives converge. Long-standing European imaginaries of the Sahara and Sahel as hostile frontier zones inhabited by dangerous nomads were consolidated through the droughts of the 1970s and 1980s and the Tuareg rebellions of the 1990s, producing a durable image of the region as marginal and unstable (Amselle, 2022; Benjaminsen, 2024). Since 2012, conflict in the western Sahel has intensified, and Fulani pastoralists have been disproportionately accused of filling the ranks of jihadist movements. Such claims obscure demographic realities and long histories of political neglect, land dispossession and violent repression that have shaped Fulani marginalisation (de Bruijn and van Dijk, 1995; Benjaminsen and Ba, 2019; van Dijk and de Bruijn, 2022).

As Benjaminsen demonstrates, conflicts labelled as “climate-driven” or “farmer–herder” in Mali are more accurately understood as insurgencies shaped by counterinsurgency politics, elite capture of land and resources, and militarised conservation regimes (Benjaminsen, 2024). Climate narratives naturalise violence while diverting attention from governance failures and political-economic inequalities. For some pastoralists, engagement with armed groups has emerged as a response to cumulative exclusion rather than as a direct outcome of climatic stress. These representations do not merely describe pastoralists: they actively shape policy responses and conditions on the ground.

Similar dynamics are evident beyond the Sahel. Campbell’s analysis of Ethiopia shows how conflict in pastoral regions is routinely framed as environmentally driven, obscuring the institutional and political drivers of violence within ethnically governed territories (Campbell, 2022). In the context of Ethiopia’s ethnic federal system, pastoralists are governed as territorially bounded ethnic populations, rendering mobility increasingly problematic (Alene et al., 2022; 2023). Climate discourse provides a technocratic language through which struggles over land, authority and autonomy are reframed as environmental and security concerns.

Among the Hamar of southwest Ethiopia, long-standing representations of pastoralists as backward, violent or resistant to governance have shaped state–pastoralist relations for decades. Processes of incorporation into the Ethiopian state disrupted key institutions (Lydall, 2010), while development and conservation initiatives undermined local moral economies (Yitbarek, 2020). The violent confrontations of 2015 were not the result of climatic stress alone but emerged from the erosion of pastoralist autonomy and relational modes of governance (ibid.). Climate narratives, in this context, serve to depoliticise conflict while legitimising intervention. The Hamar case similarly demonstrates how climate narratives may obscure deeper transformations in governance and social relations.

Pastoralist worlds nevertheless also offer alternative models for understanding and managing conflict. The 1993 peace ceremony in southwest Ethiopia, documented in *Bury the Spear!* (Pankhurst and Strecker, 2004), illustrates how conflict can be transformed into a shared moral project through ritual, public deliberation and cosmological invocation. Rather than suppressing difference through force, elders enacted peace by re-establishing reciprocal relations among humans, ancestors and the land. Such practices challenge dominant depictions of pastoralists as inherently violent and demonstrate the capacity of pastoral institutions to generate durable forms of peace grounded in dialogue, reciprocity and moral accountability.

The lived Anthropocene: relational ontologies beyond policy narratives

Relational ontologies to navigate ecological uncertainty

Having examined how pastoralists are represented within policy discourse, we now turn to pastoralists’ own ways of inhabiting and making sense of uncertain worlds. Living with uncertainty and unpredictability is at the heart of pastoralists’ livelihoods and worldviews, as is evident in their mobility patterns, culture, languages and institutions. Accordingly, worldviews, knowledge and technologies of adaptation are not set in stone but continually evolve (Ingold, 2000). Being a herder in a pastoral landscape is thus a form of movement in which pastoralists, animals and landscapes co-constitute one another. Rather than corresponding to an Anthropocene imaginary in which humans create, control and negatively impact the environment, pastoralism can be understood as a form of “being” grounded in the continuous fostering of relationality between humans, animals and the environment. To see this we need an ontology that appreciates non-linear processes of co-construction rather than cause-effect relations. We label this as a relational ontology: an ontology that focuses on processual mutual relations.

This relational orientation becomes clear, for example, in the ways in which the Maasai in northern Tanzania translate climate change in their own vernacular, consistently referring to *Eng’ai*, a term that simultaneously denotes rain, God and sky/heaven (see section *Maasai Eng’ai and how climate change invokes a moral universe of love and respect*). Climate, in this sense, is not an atmospheric reality detached from social life; rather, talks about climate change are always moral commentaries about society (Van Beek, 2000), referring to changes in respect, love and social relations.

Historical research shows that pastoralists have long adapted to extreme climatic conditions across diverse ecosystems, including deserts, mountains and polar regions. Long durée history reveals that the emergence and spread of pastoralism in Africa are intricately intertwined with major climatic fluctuations during the Holocene (Kuper and Kröpelin, 2006; Smith, 1992). Archaeological research further demonstrates that adaptations to arid and semi-arid environments have always been diverse, unstable and contingent (Bollig and Schnegg, 2013: 1; Galaty, 2013; Sadr, 2013). These insights suggest that pastoralist livelihoods have historically been shaped by uncertainty rather than stability.

A relational ontology approach shows that pastoralists do not conceptualise climate as an external force acting upon a passive environment. Climate emerges through interactions among humans, cattle, land, landscapes, atmospheres and moral orders. Uncertainty is therefore not a problem to be solved but a condition to be navigated, mediated through relations of care, mobility and reciprocity. The following cases show how relational ontologies are not abstract philosophical systems but practical ways of navigating ecological uncertainty.

Linguistic relationalities across pastoralist worlds

Relational ontologies refer to pastoralist understandings and enactments of the world in which humans, animals, landscapes and spiritual forces are interconnected through relations of care, reciprocity and obligation. These relationships are not metaphorical but constitutive of emerging socio-ecological realities, shaping how people perceive, categorise, adapt and act within their environments. Linguistic practices are a key site where these ontologies become visible, as pastoralist lexicons, metaphors and semantic fields encode multispecies worlds in which people, cattle, landscapes and cosmological forces are mutually constituted. These linguistic practices are living technologies that adapt to change while sustaining relational worlds.

Insights from environmental semantics (Bromhead and Levisen, 2022; Burenhult and Levinson, 2008) underscore that vocabulary related to “environment” or “climate” is not universal but encodes culturally specific ontologies. Terms in pastoralist cultures such as *eng'ai* in Maasai, *barjó* and the cattle-appearance lexicon in Hamar, or the Fulfulde noun class that groups “cattle”, “sun”, “fire” and “light”, reveal relational worlds that resist translation into Eurocentric categories. These linguistic architectures encode specific ontologies of environment, personhood and multispecies life, revealing how language materialises the relationships through which pastoralists inhabit and make sense of their worlds.

Understanding these linguistic categories requires situating them within broader epistemologies and ontologies. Hamar speakers, for instance, do not use a category equivalent to English “nature”. When talking about nature and environment, they rely on a term that encompasses “fate”, “life” and “state of wellbeing” (Strecker, 1988; Strecker, 2016), indicating an environmental ontology in which the world is an active force sustaining reciprocal bonds. The Hamar way of talking about what might be glossed as “nature” thus reflects a relational understanding in which environment and social life are inseparable.

Harrison’s (2023) notion of environmental linguistics captures this dynamic well: languages do not merely describe environments but function as tools for living within them, embedding ecological knowledge and ecocentric worldviews into grammatical and semantic structures. From this perspective, pastoralist languages such as Hamar, Fulfulde or Maasai are world-making, as their semantic architectures instantiate relations of reciprocity, care, and observation that are themselves socio-ecological acts.

Among the Hamar, this relational structuring is embedded within linguistic practices in which people, cattle, colours and patterns are interconnected through relations structured through care, reciprocity and embodied attention to animals and land.

Together, these relations organise how environment, nature and climate are perceived, valued, and navigated, embedding environmental knowledge within everyday practices of care, naming, and attention to animals.

Seen comparatively, Hamar, Maasai and Fulfulde linguistic practices articulate distinct yet comparable relational ontologies in which resilience emerges not from individuals but from ongoing co-creation with cattle, environment, ancestors and God. These linguistic worldviews challenge the reductionism of global climate policy and affirm the plurality of ontologies in the Anthropocene.

Hamar *barjó*: relational wellbeing, rhetorical ontology and multispecies sociality

Among the Hamar of southern Ethiopia, relations between people, cattle, and the environment cannot be understood without attending to speech. As Strecker’s long-term ethnography shows, Hamar culture is constituted rhetorically: words, silences and gestures generate social life, moral order and cosmological connection. Central to this rhetorical ontology is *barjó*, often glossed as “fate”, “luck”, “life”, “wellbeing” or “God”, translations that obscure its generative force (Strecker, 1988; 2016). *Barjó* refers to the continual creation of harmony among people, cattle and the cosmos. Every living being, people, animals, plants, clouds, rain, stars, possesses *barjó*. Elders call *barjó* through stylised chants to ensure rain, fertility and health; women invoke it through everyday acts of care (Strecker, 2016). Wellbeing is thus not an individual state but a distributed condition forged through speech and reciprocity.

Hamar speech is therefore not merely a medium of information exchange but a technology of creation. Following Strecker’s insight that culture is not only expressed through rhetoric but is continuously created through it (ibid.: 2016), Hamar speech can be understood as a technology of creation through which social, moral and cosmological relations are enacted and sustained. Public oratory, everyday verbal duels, and healing performances illustrate how rhetoric simultaneously enacts political authority, social bonding and affective repair. In this light, *barjó* complicates dominant Anthropocene narratives that frame pastoralists as passive victims of environmental stress. For the Hamar, nature, fate and society are inseparable, and uncertainty is transformed through rhetorical and relational practices rather than endured as external threat. When *barjó* is reduced to policy-friendly categories such as “wellbeing”, its ontological force disappears, erasing the relational practices that sustain resilience. This example illustrates how resilience emerges not as an individual capacity, but as a distributed achievement grounded in speech and rhetorical practices. The 1993 Arbore peace ceremony documented in *Bury the Spear!* (Pankhurst and Strecker, 2004) offers a clear illustration: elders from multiple pastoralist groups enacted peace through ritual speech, debate and cosmological invocation, demonstrating how words and gestures can realign social and ecological relations and create moral order.

Relational ontology through the Hamar cattle lexicon

As widely reported in the anthropological literature for many African pastoralist lingua-cultures, the Hamar possess an extraordinarily fine-grained descriptive system for cattle appearance,

encompassing terms for colour, pigmentation, patterns, and horn shapes, yielding over 150 descriptive expressions (Petrollino, 2021). This system is not only aesthetic but pedagogical and ontological, a shared cultural knowledge that organises how people perceive animals and transmit classificatory principles across generations. From these expressions derive cattle titles (for parous cows, draft oxen, or “favourite animals”), which in turn generate honorific titles for humans, known in Hamar ethnography as *calf names* and *favourite animal names* (Dubosson, 2014; Lydall, 1999; Petrollino, 2023).

A man’s initiation into adulthood culminates in leaping across a line of cattle, an institution known as *ukulí bulá* (Lydall and Strecker, 1979a; Lydall and Strecker, 1979b; Lydall and Strecker, 1979c). The colour-pattern of the first heifer calf he steps on generates his calf name, a teknonymic title that marks him in society henceforth. Thus, if he leaps on a white-bellied cow, he becomes *Galtémba* “father of the white-bellied cow”. These titles are not merely nicknames but status markers, mnemonic devices, and ontological links between human persona and bovine phenotype (Petrollino, 2023). Similarly, “favourite animal” names tie a man’s social identity to a beloved ox or goat, itself beautified with trained horns, brands, and bells, further fusing aesthetic labour, speech, and identity. This form of identification resonates with earlier ethnographic observations that pastoralist personhood in East Africa is constituted through enduring identification between humans and cattle (Seligman and Seligman, 1965).

The implication is that Hamar identity is co-authored across human and bovine lives. Names are not arbitrary labels but semiotic acts that connect persons to animals, age-mates, and environments. These naming systems also encode flexibility and non-linearity: because cattle appearances fall along a continuum, calf names adapt to the ever-changing diversity of cattle coat phenotypes, accommodating ambiguity and preventing name repetition within families (Petrollino, 2023). Identity thus emerges as a dynamic process, continuously recalibrated through the interplay of cattle appearances, names, and social relations.

The Hamar cattle lexicon thus functions as a tool for interpreting and inhabiting the living environment. Each term is both descriptor and relational marker, naming not static features but positions within an ecological network. Together, *barjó* and cattle-centred naming practices demonstrate that Hamar ontology is fundamentally relational: speech and naming do not merely reflect social life but actively create and sustain it by binding humans, cattle and environment into a shared moral-aesthetic field. This stands in stark contrast to policy framings, such as Ethiopia’s NAPA, which treat pastoralists as atomised “vulnerable individuals” and cattle as “livestock assets”.

Maasai *Eng’ai* and how climate change invokes a moral universe of love and respect

Among the Maasai, we see a similar ontological orientation in which climate is intricately linked to *Eng’ai*, the female supreme being: this is an all-encompassing life force referring simultaneously to rain, sky, heaven and God, revealing its intricate bond and relationship. When asking the Maasai about the weather and climate (for which there is no equivalent in the Maa language) they refer to *Eng’ai* which is illustrative of a relational ontology as it speaks to the active bond between society, climate and God. In other words, talks about changes in the weather are never about an external

atmospheric reality, but about changes amongst their culture and society at large: climate change becomes a moral meta-commentary upon society (van Beek, 2000; de Wit, 2019). The inseparability between nature and culture makes sense since in Maasailand climate variability has gone hand-in-hand with profound socio-economic and political changes and powerfully impinged on the key social and religious institutions of pastoralists in East Africa. Most Maasai have embraced Christianity, which means that their key religious institutions and ritual practices have changed while interestingly, their notion of the female deity *En’gai* as their supreme being has remained consistent. There is a gendered conception of morality, as historically women were considered to be closer to *Eng’ai*, and they saw it as their responsibility to ensure the moral order of the daily world; a role that they continue to fulfill today (Hodgson, 2011). This means that women as moral arbiters of society, through their bond with *En’gai* need to uphold morals and strive for justice collectively, while keeping society together in face of societal and climatic turbulence (de Wit, 2021).

Lack of rain means that society needs to restore societal values. Tales about climate thus invoked not only a sense of environmental decay (pastures were greener and more abundant in the past) but also ideas of moral decay and a nostalgia to the universe of love (*engarotto*) and respect (*enkanyit*) that needs to be revitalised (de Wit, 2020). Women lamented and emphasised their ritual and moral role as guardians of society. In other words, it is not just the climate that has changed but also people’s relation to the environment and climate because people have settled and have been exposed to modernity and globalisation. The Maasai used to be mobile, but historical developments forced them to settle. Discussions about the climate speak about moral and temporal dimensions in which a somewhat utopian and timeless culture of the past is imagined, mirroring ecologies of abundance (ibid; Van Beek, 2000).

This local understanding of climate change must be understood not only in its political historical context, but also as part of the ways in which people relate to nature, their environmental experiences and ideas of cultural decline. For the Maasai for example, a clear notion of the future is absent, and even probing futures, weather patterns or climates is seen as blasphemy, only belonging to the realm of God—or the weather prophets who only gain a glimpse of the cosmos (Spencer, 2003) – which is a testimony to the inherent unpredictability of the (semi)-arid lands. Oral histories also revealed a lot about past hardships and how they survived in years of extreme drought. Asking informants whether they had observed changes in the rainfall, or seasons compared to when they were young, their social memory echoed many dry spells, climate fluctuations and variability, environmental catastrophes, hunger, and events that were remembered by specific names. When they heard about climate change (which came with inherent translation challenges), it was often understood as a repetition of the past.

Translating climate change and the purification of Maasai cosmologies

In Terrat, climate change as a new discourse of doom and decay has gradually dawned upon the village around 2010.

Disseminated by government officials, educators, international NGOs and the radio station, which is located in Terrat and is the only radio station in Tanzania that broadcasts programmes in Maa (the Maasai language). Listening to the radio, villagers in Terrat hear about a global crisis that is affecting their locality, which will only become worse in the future. While it is explained that the main culprits of the crisis is the Global North with their polluting industries, they also hear that the Maasai will suffer the most. At the same time, their government tells them that they are part of the problem, because they cut down trees for firewood and have too many cattle. They are told to plant trees, and explain that carbon dioxide is dangerous, that God has nothing to do with it, and that science is real (more real than God), among many other things.

Through the radio, listeners are informed about the dangers of globalisation. For example, people hear about scientists who reject the existence of God, nuclear wars, environmental destruction, industries, explosive weapons, air pollution, cancer, and climate change. NGOs explained to the group that they should “stop praying to God for it is not God’s fault”, and that they have to plant trees instead, since humans, including the Maasai, are responsible. But for the Maasai, climate has everything to do with God, and they do not blindly accept apocalyptic climate change discourses as this scientific message can be another way to erase their worldviews and livelihoods (de Wit, 2020). While scholars have critiqued religion for the basis of climate denial and skepticism, and it stands in the way of a ‘correct’ interpretation of climate science, to the Maasai climate change only makes sense through their own religious and spiritual registers. This is what Fair has called: “the potential for more-than scientific yet not anti-scientific responses that are locally meaningful and morally compelling” (Fair, 2018: 11; de Wit, 2019; 2020).

Fulani relational worlds: reciprocity, space and cosmology

Among the Fulani, long-standing social systems of reciprocity constitute central mechanisms for mitigating loss and navigating periods of crisis. These institutions are designed to anticipate the fluctuations and unpredictability that characterise pastoral life, redistributing resources in ways that stabilise households and sustain social cohesion. One such institution is *habaane*, meaning “what we give that binds”, derived from *habude*, “to bind”. Through *habaane*, a household that has lost its herd receives cattle from kin or neighbours, which they keep until they are able to rebuild their own herd. This practice establishes enduring social bonds between givers and receivers, materialising a relational ontology in which wellbeing is collectively produced and pastoral livelihoods depend on sustained mutual care (Scott and Gormley, 1980). The concept of reciprocity thus functions simultaneously as a social institution and adaptive infrastructure.

Fulani pastoral nomads cannot live without the outside world. Access to pasture and grain requires long-standing exchanges with sedentary farming communities, resulting in durable interdependencies structured around seasonal mobility. In Mali, such relationships are institutionalised through the *yaatigi* system, in which pastoral households maintain host relations with sedentary villages that benefit from manure and trade in dairy products. Even in the context of ongoing conflict in central Mali, Fulani herders continue to rely on markets in Dogon farming villages with whom they have long-standing ties. While farmer–herder conflicts do occur, these older patterns of reciprocity often endure, demonstrating the resilience of relational systems that pre-date contemporary violence.

Over time, Fulani systems of mutual support have blended with Islamic principles of care, including *zakat* and gifts for the poor. These Islamic ethics have not replaced pre-existing forms of reciprocity but intermingled with them, creating layered regimes of care that tie social, moral and religious obligations together (De Bruijn and van Dijk, 1995; De Bruijn and van Dijk, 2009).

Fulani ecological relations further reflect a relational understanding of space. A distinction exists between *wuro*, the camp where cattle and people come together, and *ladde*, the bush or open pasture conceived as an unbounded domain related to freedom (Riesman, 1977). Since colonial times, however, the *ladde* has undergone progressive restriction as states have sought to territorialise and regulate pastoral mobility, an example of what Scott (2008) terms the state’s drive to render space “legible”. These transformations have profound implications for Fulani relational worlds, as the shrinking of *ladde* constrains not only movements and grazing strategies, but also the cosmological meanings attached to open space.

Fulani linguistic categories also encode culturally specific ways of grouping beings and forces in the world. A particularly revealing example is the *NGE* noun class, whose core semantic domain consists of cattle terms (Breedveld, 1995: 347–351). Yet this class also includes *naange* “sun”, *yiite* “fire”, and *jayoge* “light”, a grouping that has puzzled linguists and anthropologists but is consistently attested (ibid.: 347). Rather than being arbitrary, recent analyses propose that these associations reflect pastoral experience and cosmological logic. As Breedveld shows, classical Fulani myths narrate how cattle are linked to fire at night, drawn toward its warmth and light, and to the sun during the day, whose movement guides their own (ibid.: 348). In this interpretation cattle, sun and fire form a relational cluster tied to pastoral life: all are sources of orientation and movement. Mukarovsky’s proposal of an older “solar-bovine complex” further suggests that these associations may once have formed part of a wider pre-Islamic cosmology (Mukarovsky, 1962). Thus, the structure of the *NGE* class points not only to grammatical categorisation but to a culturally embedded ontology, in which linguistic classes reflect meaningful connections between beings whose interactions organise social, ecological, and cosmological life.

Relational ontologies against Anthropocene reductionism

The pastoralist policy paradoxes examined throughout this paper reveal a persistent mismatch between dominant, global

1 ResourceAfrica UK. “The World Has Malaria—ClimateConscious”, 7:30, posted online by Max Thabiso Edkins, YouTube, 15 August 2012, https://www.youtube.com/watch?v=_Ay1snaTl8&t=2s

climate narratives and pastoralist local realities. We critique the depoliticizing and reductionistic Anthropocene narratives and the technopolitics which undermine rather than empower pastoralists' livelihoods. By juxtaposing global narratives of control with pastoralists' fluid lifeworlds and relational ontologies we demonstrated that these ways of knowing and being in the world have to be understood as anticipation, and vital adaptation strategies that enable them to live with uncertainty, unpredictability and change. We argue that these relational ontologies form a critical, more hopeful and empowering antidote to reductionist Anthropocene discourses.

Nevertheless, as social scientists have long argued, the need for simplicity of policy narratives, ever more infused with crisis discourses, makes them very persistent (Roe, 1991). As such, they resist fluid and complex understandings of pastoralist realities and continue to marginalise pastoralists' lifeworlds. Moreover, most successful or "dominant" narratives are generally those that serve the interests of powerful constituencies. Through the social construction of ignorance, simplistic policy narratives refuse to engage with 'uncomfortable knowledge' as produced by social scientists and pastoralists. Rayner explains that institutions need to make sense of complexity by creating simplistic, self-consistent versions of the world. This means that knowledge which is in tension or contraction with that version, needs to be excluded or expunged (Rayner, 2012). We showed that not only local ways of knowing climate are marginalised in this process, but also scientific evidence is often selectively ignored, distorted or diverted.

This means that we not only have to develop more critical registers that debunk pastoralist policy paradoxes of control and security, but that more attention is needed to the politics of knowledge production and how these epistemological hierarchies come into being in the neoliberal governance state. We demonstrated how adaptation to climate change as an urgent development discourse, characterised by crisis thinking, depoliticises the underlying root causes of vulnerability, notably land grabbing. In a similar vein, governments and international and multinational development organisations, increasingly embrace private investors and actors, foreground technomanagerial quick-fixes, and top-down solutions that foreground certain forms of knowledge over others. In the case of the Great Green Wall of Africa, a quick-fix imaginary, historical knowledge is ignored, arid lands are rendered unproductive and pastoralists are not even considered.

Anthropocene challenges such as climate change (but also other wicked problems like the pollution and biodiversity crises) are shaped by pre-existing knowledge hierarchies that privilege natural sciences' epistemologies at the expense of SSH approaches (Hulme, 2009). We argue that many policy misunderstandings stem not only from the marginalisation of pastoralists themselves, but also from the structural sidelining of critical SSH scholarship. Across these Anthropocene narratives and techno-complexes a similar epistemological evolution can be discerned: 1) the agenda setting of a seemingly natural sciences problem and the rise of crisis thinking, which then 2) makes certain urgent (undemocratic), quick-fix, and techno-managerial interventions desirable over others, 3) this in turn results in the depoliticisation of the problem (and forms of determinism/reductionism) and the anchoring of business as usual

governmentalities (reproduction of the *status quo* and a strong presence of the private sector). It is only in stage 4) that the social sciences and the humanities are invited to the table, to become instruments or a corrective to natural sciences agendas and problem-solving, when in the last stage 5) local and indigenous knowledge are acknowledged as important interlocutors and sources of knowledge. While these stages are not as clear-cut in reality, they are helpful to explain how knowledge hierarchies are created and which forms of knowledge gain authority at the expense of others.

Questions around equal participation and inclusivity, are thus not just about who gets to sit at the table, but about: who gets to define the problem and articulate the answer, or which forms of knowing and being are taken seriously. Questions remain about the potential for equal participatory approaches in which pastoralists' voices are genuinely heard and recognised (Benjaminsen, 2024), rather than being co-opted into already predefined normative agendas of international development donors that are largely informed by (misconstrued) natural sciences' epistemologies. How can we at the same time invite pastoralists at the decision making table, and be attentive to power dynamics (Daly and Dilling, 2019; Blue, 2017) and different approaches to socio-ecological systems and how nature should be lived with. In the context of wicked problems like climate change, Rayner suggests that we need to work towards "clumsy solutions," to make sure that uncomfortable knowledge is not excluded from policy debates. Additionally, Davis (2016), Behnke and Mortimore (2016) and other social scientists already observed in 2016 that instead of pursuing ideals of managing and controlling or making drylands more efficient, it is more urgent that these socio-ecological worlds are being fully appreciated for their magnificence, unpredictability and rich biodiversity. By taking this observation as a starting point, pastoralists' lifeworlds and their relational ontology can be recognised more fully as ecologically sound ways of knowing and being that are attuned to unpredictability and scarcity, rather than as systems that need to be corrected and controlled through technical interventions.

The ethnographic insights drawn from Hamar, Maasai, and Fulani reveal a profound disjuncture between the relational ontologies that animate these societies and the linear logics of Anthropocene governance. Across the cases examined here, environmental knowledge emerges through mobility, reciprocity, and linguistic practices that go beyond dominant policy categories. This contrasts sharply with policy frameworks such as the NAPAs, where adaptation is imagined as a technical sequence (hazard, impact, intervention) predicated on universal categories of vulnerability and resilience. The comparative cases specify what a relational approach to climate governance entails. A relational approach to more just climate governance requires more than simply adding pastoralist voices to existing frameworks as an afterthought. Their expertise should form the backbone in policy discussions as it concerns their lands and lifeworlds. Across the Maasai, Hamar and Fulani cases, relational ontologies entail mobility practices, systems of reciprocity, linguistic practices and institutions that enable people to live with uncertainty rather than eliminate it. Taken seriously, these cases suggest several practical orientations for policy. First, mobility should be recognised as adaptive infrastructure rather than as a source of instability or risk. Second, pastoralist institutions and systems of reciprocity

should be treated as forms of ecological governance rather than informal residues of tradition. Third, linguistic practices and environmental concepts should be approached as forms of ecological expertise rather than translated into pre-existing technical vocabularies or treated as cultural supplements to technical expertise. Finally, policy frameworks should move away from prediction and control alone and develop approaches capable of working with uncertainty and variability.

Against this background, climate governance and policymakers must shift fundamentally to recognise mobility as highly adaptive, treat relational ontologies as ecological knowledge, embrace uncertainty as productive, integrate pastoralist institutions into governance, and understand pastoralist linguistic categories as climate theory. To engage seriously with this relationality is to move beyond translation as a one-way process and toward a politics of listening and dialogue: an approach that recognises speech, naming, and ritual not as cultural relics but as modes of environmental governance in their own right. In this sense, the pastoralist worlds examined here are not remnants of a premodern ecology but active interlocutors in reimagining and anticipating the Anthropocene, offering alternative perspectives on coexistence and care that unsettle the technocratic reductionism of global climate discourse. A just Anthropocene, from a pastoralist point of view, requires a move away from crisis narratives and opening up policy spaces for a multitude of knowledge regimes. This means that a broader understanding of justice is needed, which appreciates not only epistemic but also ontological justice, fully recognising pastoralists' lifeworlds as valuable ways of being in the world.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by University of Cologne, Leiden University and Wageningen University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their informed consent to participate in this study. Oral informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

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