

Shocks and Cultural Adaptations: A Case Study From Northern Kenya*

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ABSTRACT

This paper examines how the Rendille pastoralists of Northern Kenya navigate environmental and political shocks, offering a lens for understanding governance and resilience under stress. Drawing on ethnographic fieldwork, I show how legal pluralism, patronage networks, and culturally grounded adaptation strategies intersect to shape local responses to drought, resource scarcity, and inter-tribal conflict. Rendille practices reveal the limitations of models that treat resilience as a function of centralized state capacity, emphasizing instead the role of Indigenous and Local Knowledge (ILK), selective cooperation, and information-sharing networks in generating adaptive outcomes. Micro-level decisions—such as herd mobility guided by foretellers, environmental scouting, and cooperative clusters—produce macro-level system dynamics, including both public and secret informational registers that regulate access to resources and coordinate collective action. Interactions between opportunistic, patronage-based interventions and locally rooted strategies create unpredictable and nonlinear outcomes, suggesting the relevance of complexity theory for understanding adaptation at the system level. The findings point to the need for policies that are context-sensitive, flexible, and informed by local knowledge—capable of supporting structural resilience without reinforcing dependency on clientelist networks. This ethnographic case study contributes both to debates on pastoralist adaptation and to broader discussions on governance, resilience, and the design of inclusive, adaptive interventions in socially and ecologically complex systems, through hybrid epistemologies.

INTRODUCTION

The pastoralist tribe of Rendille in Northern Kenya represent an emblematic example for understanding how environmental, social, and political shocks shape forms of community adaptation. This paper contributes to debates on governance under environmental stress by showing how legal pluralism and patronage networks weaken local configurations of cooperation and governance. Drawing on ethnographic fieldwork, I treat the Rendille case not as an isolated episode, but as a heuristic observatory for mapping mechanisms that generate collective behaviors—sometimes producing systemic cascades, sometimes mitigating crises through locally grounded strategies.

From this case, several general principles emerge:

- The differentiated nature of shocks. Distinct events mobilize different networks and strategies: some are adaptive, such as the strategic fragmentation into clusters that makes the system connected, heterogeneous, and capable of diversified reciprocal learning; others prove non-adaptive, such as patterns of clientelism and patronage, which, though preserving interconnections and interdependencies, block transformative capacity and leave the system in a complicated but inert condition.
- The weight of interdependencies. Environmental, social, and institutional dimensions do not operate in isolation; rather, they interact to produce nonlinear and often unpredictable outcomes. “Fitness landscapes,” even within the same community, are dancing: the transformation of one changes the evolution trajectory of the others.
- The force of history. Past conflicts, forged alliances, and mobility trajectories during previous droughts delineate present vulnerabilities and orient strategic choices, mapping out pathways of adaptation that are safe but low-rewarding, risky but high rewarding, or abrupt phase transitions.
- The ambivalence of external interventions. Policies that ignore local rules and practices tend to exacerbate conflicts and inequalities rather than strengthen collective management. Even more problematic are those that overlook uncertainty and the internal reshaping of rules, ultimately limiting adaptive capacity at critical junctures and intensifying latent tensions.
- The value of situated analysis. Even within northern Kenya, differences between groups, villages, and households are profound, such that research cannot flatten these distinctions into generic categories like “pastoralists of northern Kenya”. Resilience and vulnerability are instead articulated along specific historical trajectories, contingent opportunities, and future perspectives, intertwining multiple levels: from the everyday life of households to inter-tribal relations, from national electoral strategies to international alliances. In this sense, it becomes necessary to recognize and valorize those differences that truly “make the difference.”

Three structural factors shape pastoral life in northern Kenya: climate change, fragile or negligent policy frameworks, and evolving land tenure regimes. These drivers produce recurrent resource disputes—especially during drought—and inter-tribal conflicts, which are cyclical and structural rather than episodic. The responses of the Rendille move along two main trajectories. On the one hand, there is recourse to patronage networks, practices of corruption, and opportunistic ties with politicians or non-governmental organizations: mechanisms that reinforce isolated top-down interventions and personalistic benefits. These often prove ephemeral and fragmentary, feed internal tensions, and consolidate logics of dependency that hinder long-term transformative processes. On the other hand, communities activate adaptation strategies rooted in Indigenous and Local Knowledge (ILK), at times enriched by selective innovations, capable of confronting both the challenges posed by conflict and those generated by climate change.

In the context of conflict, local strategies take on distinctive forms. Collective rituals, dense with imaginative power, strengthen social cohesion and reinforce the idea of belonging to “a single tribe” ready to defend itself to the death. Councils of elders offer traditionally recognized and structured spaces for inter-community negotiation, while advocating for access to arms, and obtaining it through illegal means, becomes an element of strategic parity, indispensable for negotiating with better-armed neighboring groups.

With regard to climate change, the Rendille rely on an articulated corpus of Local Indicators of Climate Change Impact (LICCI) and observation of Cultural Keystone Indicator Species (Reyes-García et al., 2020; Echeverría et al., 2020), like variations in vegetation, behaviors of livestock and wildlife, but also foretellers’ predictions and information from personal environmental scouting activities. These heterogeneous sources compose a body of plural knowledge, that is contextually relevant and, crucially, the only trusted basis for meteorological forecasting, planning, and adaptation decisions. Yet research on pastoral ILK remains strikingly scarce — only 3% of ILK studies and 1% of rangeland research focus on pastoralists (Sharifian et al., 2022). This gap highlights the need for alternative frameworks

that take pastoral culture and knowledge systems seriously while addressing socio-environmental challenges in equitable ways.

Alongside ecological knowledge, social strategies of cooperation and strategic information sharing also emerge. During droughts, the Rendille form small cooperative clusters, in which what I identified what I call “direct informational mutualism”: processes of co-construction of, and joint action around, strategic knowledge that circulate only among trusted members and their households, grounded in long-standing ties of trust, shared needs, and intimate familiarity. In times of extreme scarcity, these selective circuits become critical for both livestock survival and household food security. From such micro-level decisions, system features at the macro-level emerge, including two distinct informational modalities: a generalized and public register, adaptive for organizing behavioral coordination during conflict and building consensus that can also draw politicians’ attention to disrupted public resources. The other is a secret, strategic register, activated primarily under climatic stress and intense competition over scarce resources—particularly given the community’s full dependence on livestock products and the differing needs of various livestock species

The interaction between the two forms of adaptation — on the one hand patronage and opportunistic ties, on the other local strategies based on ILK and social clustering — generates environments characterized by strong unpredictability. This unpredictability is not the product of chance, but of the very complexity of the interactions, in which the actions of one agent redraw the possibilities of choice of others, continually altering the range of outcomes. In such systems, according to complexity theory, there is no guarantee that the distributions of outcomes observed today will be replicated in the future, because the very structure of the rules is dynamic and mutable (Page, 2009).

In the following sections, I focus on traditional practices and future projections, to show how existing community assets require genuinely “needs-based” policies: not in the narrow sense of immediate and short-term relief, but as flexible responses to contingent and non-recurrent needs, capable at the same time of producing structural impact and preventing dependency on personalistic and clientelist networks from becoming the only feasible horizon.

METHODS

The research presented here is based on fieldwork I conducted in Ngurunit and the surrounding villages—Lependera and Namarei—during March and August 2025. The methodological approach intertwined participant observation with systematic data collection: on the one hand, immersion in the daily practices of the pastoralists allowed the difficulties experienced to be grasped not only through discussions but also through embodied, situated experience; on the other hand, the investigation was enriched by more structured tools.

The March fieldwork was primarily exploratory, designed to engage the community in shaping the research process, including discussions about questions, methods, and objectives. The August fieldwork implemented a more structured approach, conducting systematic interviews alongside continued participant observation, which was conducted with heterogeneous groups across villages (including women, elders, and youth), allowing for broad contextual insights into daily practices. However, in-depth interviews were conducted exclusively with men across the five age-sets, as men are the sole decision-makers for livestock management in Rendille society. This focus reflects the specific locus of authority over adaptation and resource governance. In total, forty-five in-depth interviews were conducted, lasting between one and a half and two hours, with herders and livestock owners, belonging to the five agesets of Rendille society. These were complemented by five focus group discussions, each composed of 5 to 7 male participants, bringing together volunteers from different villages and age groups. The group sessions employed the participatory net-mapping technique, useful for tracing the reconfiguration of information and cooperation networks in response to different shocks, outlining

empirical rules that could feed algorithmic simulations of the broader system. Also, they produced ethno-maps and historical timelines of a shared geography and memory of places, times, and dynamics connected to climatic shocks, diseases, and conflicts, using Indigenous calendars. These maps were enriched with narratives documenting the peculiarities of each crisis, adaptive strategies, key actors, causes perceived as objective and those experienced as subjective, together with the cultural interpretations that give meaning to such events, as well as historical trends of different shocks accumulating in certain areas.

This is therefore a short-term case study, authorized by the Institutional Review Board (protocol no. 25-0210-1), conceived as a basis for a longer-term ethnography and for subsequent comparative analyses.

CLIMATE CHANGE

“Drought is an enemy like any other—it takes away the life of people and animals.”

With this image, the Rendille condense the most pervasive experience of drought, not perceived as simple rain failure, but as an active adversary that erodes life itself, affecting together economy, health, and sociality. Without pasture there is no milk nor meat to consume; livestock weakens, loses value, and is quickly sold in the markets at negligible prices. Families see their herds die, children cannot afford to remain in school, daily life contracts into an incessant struggle for survival.

The impacts of climate change are described as visible and rapid, inscribed in a trajectory of increasing uncertainty. Elders remember that, in the past, rains were abundant and regular, variable but readable within a predictable order: severe droughts were rare and brief, and pasture regeneration happened in rapid times. Today, instead, the cycles have lengthened: ever harsher and more frequent dry seasons alternate with scarce and irregular rains.

“Now it is difficult to distinguish between the short dry season and the long one.”

Rivers and mountain streams, once permanent, dry up just one month after long rain seasons, forcing the digging of shallow wells in the dry riverbeds. Life is unanimously described as “more difficult.”

Environmental degradation and settlements

The climate crisis is overlapped by demographic pressure. Open grazing lands (*hosom*) have been converted into permanent settlements or abandoned and polluted (*Nijioni*), becoming foci of recurrent diseases. “Goats and camels now eat plastic and metals, waste from the settlements. A calf died a few days ago, and when we slaughtered it, we found a bucket of plastic in its intestine.”

The growth of human and animal population rapidly consumes the remaining pastures. In Ngurunit the forest has reduced, in Namarei the trees are cut for constructions and fences. “Settlements cut all the trees around, creating open spaces where the wind takes away the pasture, the flowers, the pods. Wild fruits no longer grow.”

Settlements reduce pastoral mobility: they prevent wide pasture rotations, generate overgrazing, and undermine vegetation regeneration. Animals coming from multiple settlements meet forcibly in the same water points, increasing competition and conflict. “From Ngurunit to Lmoti there are 13 km... the animals of these different settlements meet along the path. There is no longer enough pasture. I just avoid letting the other come too close to me.”

The installation of schools, dispensaries, and boreholes fixes the settlements, making it impossible to return to more mobile modes. “There is free settlement: people can settle even in grazing areas. After that, a school is built, then water points, and the settlement becomes fixed. This demonstrates weak policy.” It seems an irreversible process: “The problem is that the government or the NGOs have already invested. Dismantling all this and rebuilding... would be a problem now. They should have thought about this 15, 20 years ago, when all this started”.

Human and ecological dynamics

During droughts, pastoralists converge on the same water points, with outcomes of overcrowding, overgrazing, conflicts, and diseases. Traditional herbaceous species for grazing have disappeared, replaced by invasive plants such as *Prosopis juliflora*, which reduce forage quality and compete with native varieties. Even grasses known to improve milk yield and quality no longer exist. To compensate, during the peak of the drought (*Amam*), pastoralists increasingly turn to mountain plants—*Lelei*, *Lmasei*, *Loisichi*, *Lawoo*, *Lowai*, *Lmomo*, and *Lmurgusan*—which were rarely used until two decades ago but are now disappearing under excessive pressure. Their collection requires long, arduous, and often risky journeys. “When I was a warrior, pastoralism was easier. Now, with reduced pasture, we have to find alternative feeds for animals during droughts... Everything has become more difficult. These are the real changes I have seen with my own eyes—practical effects of climate change.”

Even the human diet worsens: wild fruits, which provided a good alternative food source, and medicinal plants have disappeared. “In the past, wild fruits appeared during the wet seasons. From these, we produced Lpulle’ oil... Since these fruits have disappeared, Lpulle’ is no longer produced and we have lost our traditional medicines.”

Wildlife approaches the settlements. Elephants and hyenas now share space with humans and livestock, drawn by invasive plants and the wells dug for herds (I personally observed the effects in hyena attacks on herds and the pollution of wells). Some interviewees reported that wildlife is being displaced in larger numbers from neighboring conservancies into pastoral lands. For pastoralists, this causes immediate and personal costs: predation of herds, destruction of water infrastructure, contamination of wells, and the spread of zoonoses. “There is no compensation if livestock is killed, or if elephants break the water points. We cannot kill them.”

The concept of fiin

Finally, a crucial and elusive element emerges: fiin. It is not a tangible resource, but an invisible quality that allows animals to thrive even under scarcity conditions. The search for fiin combines explorations and information exchanges, but it is rooted above all in the observation of animal: “We look for fiin through information and scouting, but above all we observe it through our animals. Their health and production tell us whether we have found fiin or not.”

Fiin is a concept difficult to render in scientific terms, because it does not correspond to a measurable phenomenon or a tangible resource. It represents the presence of favorable conditions for the health and prosperity of livestock, tied to a kind of contingent blessing of the land. Herders carefully observe the animals — strength, milk production, fertility, behavior, mood — to perceive whether fiin is present or not. Even when pastures are abundant and water available, the absence of fiin can mean sick animals, families under stress, and forced mobility in search of more favorable places. “The dry seasons have changed. During the long dry season, there can be pasture everywhere, but there is no fiin... Even in the wet season, when there is pasture and water, animals are not healthy if there is no fiin.”

Analogous concepts in all pastoralist tribes of Northern Kenya testify to a worldview in which environment, livestock, and community are intertwined in a dynamic system of signals and interpretations. Fiin cannot be controlled: it is often described as an uncertain gift, capable of changing direction between short and long seasons of drought. Mobility, which follows fiin, thus becomes not

only a production strategy, but also a cosmological one: moving herds does not simply mean seeking pastures, but responding to invisible signals, anticipating contingent possibilities, maintaining the bond between the herder and the blessing of the land. When herders say “there is no fiin,” they mean there is a condition essentially equivalent to a drought, even if natural resources are available. Their observation thus becomes a vital indicator: public policy or development interventions must recognize the weight of this indigenous knowledge, otherwise they risk being ineffective, because they do not take into account the internal logic of pastoral systems, the rhythms of blessing, and the cultural management of uncertainty. One herder commented laughing: “Pastoralists always complain... But for me, fiin is the most important thing. Without it, nothing matters.”

Property, resources, conflict

Recurring droughts pose a cruel dilemma: stay local and lose the animals due to lack of resources and diseases, or move in search of pasture and fiin, but expose animals—and people—to attacks. The irregularity of rains produces insufficient forage, forcing increasingly long treks that wear down livestock and make the weakest vulnerable to new and recurring diseases. When the rains fail completely, the Rendille are forced to cross into other people’s lands, with a consequent increase in intercommunity frictions. Conflicts occur especially when entering others’ territories during periods of scarcity of resources in one place. An elder observes: “In the past, conflicts broke out only during droughts, and we fought with spears. Today, with more frequent and severe droughts, conflicts have increased. Now there are guns, and even the police become part of the conflict. In Baragoi a police helicopter was shot down”.

The combination of climate change and population growth further restricts the willingness to share already limited resources, but it is the issue of land that imprints a radical transformation: the introduction of private property and centralized management of common goods—categories foreign to the traditional pastoral cultural horizon—imposes boundaries that generate new lines of division. “People no longer move, because land ownership—something that did not exist before—has created barriers. When I go elsewhere, they tell me: ‘No, the land is ours.’” The privatization of pastoral space, reinforced by its framing within nationally imposed county boundaries, grants other communities the authority to deny access to pastures during droughts, disregarding vital needs and undermining long-standing practices of cooperation and reciprocity during climate-driven resource hardships. The expansion of the Gabbra and Borana into Rendille lands, combined with denial of access by Samburu, Turkana, and others, increases the new scale of violence, fueled by the abundance of firearms and the growing militarization of resource competition. At the same time, governance processes have reshaped authority, reducing the traditional role of elders as dispute mediators and guarantors of pastoral regimes. As one pastoralist suggests, “Things would improve if the government stayed out of these issues. Elders should first find mutual agreements, and only then invite politicians as observers.”

Even within the Rendille society itself, forms of exclusion emerge: wells dug by individuals or families become private local resources, with access rules that discriminate against Rendille coming from neighboring settlements. Water from dug wells in dried-up riverbeds has become a contested resource, forcing “outsider” herders to wait until night to water their animals, meaning skipping daytime grazing, which in turn further weakens livestock. Conflicts over pastures and water among the Rendille cannot be read as “natural” outcomes of drought: they are intertwined with politics, land appropriation, and the logics of electoral competition, which replace the pillars of pastoralism—mobility, reciprocity, and sharing—with exclusion, sovereignty claims, and armed conflict. Environmental Management Committees (*masingira*), introduced by NGOs and composed of volunteers selected and led by politicians or local chiefs, have displaced elders from their traditional role as custodians of pastures and water sources, generating conflicts and delaying the opening of grazing areas. The central problem lies in implementation: committee members receive no compensation, leaving them with little incentive to sustain the system, to supervise vast territories, and often creating quarrels with other community members in doing so.

POLITICS AND PATRONAGE

The role of political leaders becomes most visible in times of crisis, when they bring food aid, deploy police, or convene peace meetings. Yet such interventions are widely seen as reactive, incapable of affecting the long term: “They do not provide lasting solutions. When the livestock is at the borders, they arrive with food and patrols. But they do not stay. After a short time, they leave.” Political interventions are late, often activated only after drought has already caused livestock losses and conflicts: “They do not plan in advance. They arrive only after the death of animals or people.” Rather than strengthening resilience, these crisis-oriented interventions reinforce perceptions of inequality and partiality. Access to resources depends less on collective need than on political connections, “Only those who contact politicians from conflict areas receive aid. The others, who stay at home, receive nothing.”

The vacuum left by politics is filled by an expansion of firearms, much more widespread than security forces. Recovering raided livestock has become almost impossible. Vulnerability is worsened by cross-border alliances with armed groups from Ethiopia and South Sudan, who cross the borders to raid and then retreat beyond the frontier: “Tribes along the borders have direct access to weapons. The Gabbra and Borana in Ethiopia, the Turkana in South Sudan. Sometimes they join those on the other side of the border to steal livestock, then disappear beyond the frontier. It has become a business. The government cannot recover the animals.” Firearms, in addition to multiplying raids, have fueled road insecurity, reducing the presence of NGOs and discouraging investments. Other voices directly accuse politicians of fueling the cycle of violence, providing weapons to their ethnic groups or facilitating the passage of illegal cargo through customs corruption: “Many trucks carrying weapons and drugs pass without problems. Just pay the police. They are like dogs.”

The perception is that of abandonment: the Rendille remain without effective protection, with few police patrols and poorly equipped Kenyan Police Reservists (trained and armed community members). Politics, at the family level, appears distant and impersonal. Collective requests are channeled through public councils (*baarasa*), which decide which politician to contact. But responses arrive only if the problem is recognized as communal, never on an individual scale, often by then, too late. At the same time, the most pressing needs, whether water when a well breaks, food aid, veterinary care, or mediation in conflicts, remain largely unmet. One pastoralist recalled: “We sent alarms via radio, signaling the spread of an unknown disease. No one intervened. We tried on our own, asking the shopkeeper of the vet dispensary for advice. If it didn’t work, we returned to our traditional knowledge.” When infrastructures fail, communities must self-organize. The recent repair of a broken well in Namarei required, for example, a collective fund-raising of 300,000 KSh among three settlements, excluding the poorest families, despite repeated appeals to politicians. Yet, when political promises are kept, they remain imprinted in memory. This is the case of the Trusi well, drilled by a Rendille politician. It saved many animals during drought but soon became a site of conflict with the Borana, who first tried to claim the land and were eventually admitted to the water only under armed escort. A paradigmatic example of how a political action can at the same time save and divide, protect and destabilize. As one elder put it, “The government should drill the wells, but leave them to the elders to manage. It does not know the grazing cycles nor the watering rules. When it intervenes, it creates conflicts and destroys harmony.” Indeed, many interlocutors emphasized that the State does not understand pastoral regimes of resource management.

Political divisions aggravate these tensions, fueling insecurity and ethnic fragmentation: “The Gabbra MPs [members of Parliament] do not cooperate with the Rendille ones. If only they asked the elders to meet, there would be peace. But they buy votes, they do not seek advice.” The essence of State politics is thus felt as personal electoral maneuvering, not representation. The widespread sentiment is that politicians have neither the will nor the capacity to improve pastoral livelihoods. Electoral promises dissolve quickly: “During elections their words are sweet. Then they disappear”. Even everyday forms

of political communication reflect this vertical and intermediated logic. Aid arrives through relatives or local brokers linked to politicians, figures who mediate access to resources and security in exchange for electoral loyalty. This dynamic reproduces a clientelist model that differs radically from the horizontal solidarity networks described elsewhere in pastoral contexts, such as the “high-reliability network” found among the Gabbra in matters of animal health (Tasker and Scoones, 2002—although the sampling and modularity methods were quite problematic).

Generally, water projects are the emblem of this politics. Appeals circulate on social media showing people forced to drink contaminated water alongside animals, addressed directly to politicians. Responses often come only during election campaigns, when wells are drilled to secure votes. Resources are distributed through a few strategic elders in local social networks, paid to support the project, while critical voices—especially those raising concerns about well location, warning that their presence will cause overcrowding, pasture degradation, and new disputes over access rights—find no space in collective debate. On the contrary, they are systematically silenced through practices of public shaming: those who warn are accused of “opposing development” or ridiculed as backward, discredited in front of others by the authority of elders paid by politicians. In this way, the very possibility of deliberative confrontation is extinguished, and the political arena shrinks to a forced, fragile consensus, under individual payments, producing adherence more from fear of exclusion than from real sharing. Thus, wells become instruments of inequality, consolidate clientelism, and undermine customary authority. Van de Walle (2001) emphasizes the reproduction of clientelism under weak State capacity, Rendille dynamics show how patronage logics directly compete with, and sometimes undermine, indigenous governance practices rooted in elders’ authority. This reveals an underexplored dimension of climate adaptation: the state does not merely fail to provide capacity, but actively reshapes adaptation strategies through patronage incentives, undermining and humiliating community agency in the process. Several interlocutors recalled pressures to take on formal local leadership positions, like village chiefs, and refused because perceived as sources of problems and conflicts. Better to organize from below, informally, bypassing bureaucratic mechanisms and dependence on political “charities,” which undermine dignity and cultural autonomy.

LOCAL ADAPTATIONS TO CONFLICT

Among the Rendille, conflict is perceived simultaneously as an intrinsic condition of pastoral life and as a contingent resolvable event, provided it is addressed with the appropriate customary tools. From the interviews, two main responses emerge: on one hand, weapons; on the other, negotiations guided by the elders. They do not only represent practical strategies, but configure two moral imaginations of what peace can mean. For many, the possession of weapons is not associated with aggression, but with the very possibility of survival. Without weapons, the Rendille consider it impossible to sit at the negotiation table with surrounding better-equipped groups—such as the Gabbra, the Borana, or the Turkana—because the asymmetry would make any agreement vulnerable to deceit or agreement violation. In this logic, the weapon is conceived as a preliminary condition for equity and peace: not what destroys it, but what makes its existence credible. While the state can deploy weapons through police patrols, many interlocutors described the police as distant, corrupt, and incapable of understanding pastoral logics—outsiders to pastoral life who can be easily bribed. By contrast, locally trained and armed units such as the Kenya Police Reservists were often regarded as more legitimate, precisely because they are composed of pastoralist men who “feel the pain of the animals” and know every owner. However, the pre-existing imbalance in the possession of illegal weapons still makes peace negotiations untrustworthy: “If the government provided us with armed people or legal weapons, there would be more peace. Food aid during drought is a short-term solution. I would choose weapons for everyone, so we would have power in negotiations with the other tribes. We could finally speak as equals and share resources without fearing deceit or raids. Gabbra and Borana are already occupying our lands.” Mobility—central to pastoralism—is intertwined with armament: possession of arms does not eliminate risks, but reduces the fear of moving during droughts and allows one to venture into

remote, even forested, areas where predators threaten the animals. The memory of the spear as a traditional weapon becomes a metaphor for a lost balance: as long as all communities were equipped in the same way, no one could dominate the other, and resources could be negotiated on a basis of relative equality. “It would be better if all the pastoralists had weapons—there would be complete peace! Like when we all had a spear and equivalent armed power. If I have weapons, I can save the animals from drought, or move to bush areas protecting my herd from wild animals.”

In parallel, however, another register asserts itself: that of pastoral diplomacy, built on ritualized negotiations, conducted by elders in public meetings. Here, armed conflict is not denied, but subordinated to trust and face-to-face dialogue between peers (elders), which continues to represent a shared culturally legitimate path toward peace: “The solution is to build peace with the elders from both sides and permanent government security at critical points. But because the other tribes have many more weapons, they often deceive after agreements and raid anyway. Peace lasts only a short time if the government does not maintain it.” However, new fragilities are emerging: the politicization of negotiations and the influence of younger generations of warriors—who pursue their own agendas and show less respect for traditional hierarchy in a gerontocratic society—have weakened the effectiveness of these long-standing traditions: “Weapons for everyone? No—because people could still fight even after the talks. Young people do not respect the elders, so they can still create conflict.” The elders themselves recognize the precariousness of their role. Their authority, once based on unity and intergenerational respect, is now continuously challenged: by politicians’ interests, by fragmentation of the agaset system, and by the speed with which climate crises and globalization transform behaviors and priorities. “In the past, elders’ decisions were respected. Today neither the community nor the government follows instructions. This is because conflict is no longer only between pastoralists; it is also within the State. The lack of unity at the top reflects among ordinary people.”

A paradox results: elders are still imagined as central figures of peace, but the social foundations that supported their legitimacy—cohesion, ritual authority, no ownership of the land—have cracked. Peace, though still possible, appears conditioned by factors beyond their control: availability of weapons, intervention (or absence) of the State, the ambivalence of the new generations of warriors. In this scenario, conflict remains at the same time inevitable and manageable, but its management tools appear increasingly uncertain, and the margins of action for traditional actors are narrowing.

LOCAL ADAPTATIONS TO CLIMATE CHANGE

Mobile pastoralism, the foundation of Rendille identity, today faces a silent but radical transformation: the shift toward stable settlements, attracted by schools, health centers and fixed water sources, the growing institutionalization of land ownership, and the shrinking availability of rangelands. For the young, life in the stable settlements appears as a promise of modernity; for the elders, instead, it is configured as an irreversible loss of the pastoral essence. At the same time, the large herds—once a sign of wealth and resilience—are progressively replaced by the idea of “manageable herds,” shaped by shrinking pasture availability, the pressures of urban expansion, labor scarcity, costs of maintenance, and the increasing threats of wildlife. In the collected narratives, certain numbers repeatedly emerge as “optimal” for withstanding drought: one hundred goats, ten cows, and fifty camels. Others instead speak of a “vital maximum”: fifty goats, twenty cows, and about thirty camels.

The main strategy during the onset of drought is herd splitting: the stronger animals are pushed far in search of pasture, the weakest and youngest stay home with supplementary feeds and medicine, if not too costly to purchase. It is, however, a fragile balance, which puts into tension the responsibilities toward livestock and those toward the family. “The division between family and herd is not easy to manage”: the schooling of children, the need to ensure them daily food, not assured with weak animals, often prevents long movements, generating pressures and daily dilemmas. “When I move with the animals,” recounts a pastoralist, “I have to send money to the children, but often I do not even have

connection to know how they are. If I stay, the animals die, become weak, produce neither milk nor meat, are worth nothing in the market. So the children still remain without food. We are stuck in this dilemma.” The chain of decisions is marked by questions with no simple answers: Where did the last rain fall? How far can we push? Who can move, and who must stay? There is no linear calculation—only a constant negotiation between family needs, labor capacity, herd size, risk of conflict, and the hope for fiin. And when the drought intensifies, the crossroads become extreme: stay and lose the animals, with the hope of few surviving, or leave and face the risk of armed raids, with the hope they won’t be lethal. Choices diverge. Some call home all family members and animals: “At least we eat from the same plate,” explains a pastoralist, “so that my two hands can manage everything.” Reunification decreases complexity, but increases vulnerability: if the herd dies, it dies entirely, and with it the family falls into extreme poverty and food insecurity. Others go into debts with traders to stay home and buy food for the children when animals die. Others calculate with paradoxical lucidity: “If I stay here, the animals will die 100%. If I leave, I have two possibilities: I am attacked or not. Better to go, in large numbers.” The search for pasture is never separated from the threat of violence: “We can fight with the enemy, but not with the drought.” However, the fear of conflicts often forces retreat into areas already devastated by drought, with enormous livestock losses. Public negotiations among elders rarely offer solutions; the ability to guarantee access depends on the discretion of host communities. “If you move,” notes a pastoralist, “you lose the right to your well and must borrow water elsewhere.”

Integration into markets also opens ambiguous possibilities. Some attempt casual work in towns, but soon discover that wages are not enough to compensate for the loss of animals: “In the end you lose both: work and livestock.” Others resort to supplementary feed or buy maize to support weakened camels. These are temporary solutions, inaccessible to the poorest families and rarely available in remote areas like Ngurunit.

Decisions remain intertwined with faith: “You can pray to God and go far,” recounts a man, “sometimes you find hospitality, sometimes not.” Some stay, trusting that “God is still here.” But the psychological pressure is deep: “Drought takes away half the brain—and those who had only half, lose it completely.” Stress, fear, and exhaustion dig into consciousness, making behaviors erratic, to the point that men try to read signs in the sky to predict rains from the erratic behaviors of people formally very reliable.

What emerges clearly is that strategies are never fixed. People adopt different approaches: one large group moves toward the borders; others split their herds; some remain at home, selling animals or accepting poor pastures. Yet all converge on one principle: “We look for ways not to reach zero animals.” The logic is minimal but vital: keeping something alive — even a reduced and fragmented herd — means preserving the possibility of recovery. This flexibility is, at the same time, an indicator of resilience and a measure of inequality. Wealthier families, with labor, liquidity, or access to weapons, can diversify strategies; poorer families remain trapped between hunger and conflict.

CURRENT ACTIONS, FUTURE VISIONS

Asked about the future, the Rendille offer reflections dense with history, lived experience, and anxieties of the present. They do not trace linear predictions: they modulate scenarios, measure margins of maneuver, weigh constraints and possibilities within a landscape where political, ecological, and demographic pressures intertwine. The result is a picture in which no single metric of “resilience” is sufficient: it is historical relationships, local practices, and the specific geographies of conflict that shape vulnerability and adaptive capacity.

A recurring theme is uncertainty. “We know nothing nowadays,” “We wait for God. Personally, I believe things will get worse”: phrases that give form to the anxiety produced by rapid changes in climate, land use, and social behaviors. Life itself is rendered metaphorically: “We are like birds—jumping from one branch to another. This is how we, the parents, live.” The unpredictability of grazing

cycles, droughts, land availability, and insecurity reflects the widening gap between a past perceived as more cohesive and the present, in which social roles are less clearly defined: “Until yesterday I was a warrior, and everything was different. How will it be for the next generation?”

Uncertainty, however, does not generate inertia. Families actively seek to fill knowledge gaps and create conditions for action, combining indigenous knowledge and new strategies. Livestock management is the first laboratory. Instead of extensive accumulation, many experiment with “manageable herds,” small but selected, robust against drought, and less exposed to conflict: “My herd is modest—3 or 4 cows and 1 or 2 high-quality camels, easy to manage but productive... maintaining a small productive herd reduces the risks of conflict and drought.” Others systematize grazing rotations and seasonal movements, avoiding overuse of water points during the rains and returning during the dry season. Some value mobility and diversification, while others insist on locally calibrated management: “Even if this means less health and production, we must remain local and manage resources well. It is about knowing where to graze within your own territory.” In all cases, pasture ecology and movement choices remain at the heart of survival.

Adaptation exceeds pastoralism. The integration of knowledge becomes crucial: indigenous ecological experience, modern livestock and farming practices recombine. “Every cultivable plant, I will plant in my farm,” says a man, defining cultivation as a complement, not a replacement. The education of children becomes a vector of hybridization: “They should also teach children additional knowledge to share with the community. We know our indigenous knowledge, but we can also benefit from other types of knowledge.” In this sense, intergenerational transmission is not merely about preserving knowledge; it is a deliberate combination of different repertoires.

Deep historical awareness shapes every decision. Memories of past conflicts, patterns of mobility, inter-village pacts, cycles of rivalry and cooperation, and even rituals and prophecies all guide actions today, providing interpretive frameworks. During the Ilkileku age, prophecies were made for eight generations ahead: “There will be a time when the youth will have no ears (will not listen); people will wear too many beads; droughts will be frequent; and you will see a living tree eaten by a dry one.” Today this last image is interpreted as milk and fat animals, the backbone of pastoralist livelihood, exchanged for “dry” goods (processed foods). For some, climate change itself is linked to moral and ritual decline: “The drought is because the Rendille are no longer united and are not performing the OOR ceremony as it was done before... If they found again a ‘single heart,’ perhaps it would rain.” In other accounts, colonialism, monetization, and electoral politics erode ancient protections: “Drought now finds us naked... the Europeans brought disorder, money... Now it is all election campaign, like Trump. Before there was specific knowledge from the elders, now everyone says something. The Rendille were the ones in Kenya who could manage climate change through the OOR ceremonies.” These narratives are not mere nostalgia: they codify a logic of action under uncertainty. By relating environmental disturbances, social fragmentation, and economic pressures with the erosion of rituals and collective norms, they indicate which practices and dispositions (mobile pastoralism, herd management, community ceremonies) support long-term resilience. It is also a subtle critique of extractive and consumptive logics, dissonant with pastoral rhythms: the emphasis returns to relational knowledge, intergenerational continuity, and local adaptation strategies. Modernity presents itself as concrete ambivalence. “This modern life has advantages and disadvantages. On one hand, people now earn money instead of relying only on meat. On the other hand, the lifestyle is no longer truly pastoral.” Herd reduction, more widespread and new diseases, environmental degradation, and demographic pressure redesign livelihoods. Mobility and sedentarization contest uncertain grounds; innovation and tradition chase each other without displacing each other.

Ultimately, Rendille trajectories suggest that “adapting to climate” is not a state labelable as resilience, but a situated process—sometimes effective, sometimes not—shaped above all by social configurations, before environmental variables. Adaptations to conflict, in particular, must contend with institutional confusion and historical stratifications. Scientific practices that compress this complexity into universal categories or abstract metrics risk erasing what they claim to explain. A more rigorous and responsible

approach must reckon with contradiction and power, with the fine weaving of relationships and the long memory of communities, instead of reducing pastoral experience to neat but misleading labels opposing resilience and vulnerability.

SOCIAL STRATEGIES

The Rendille, of course, do not act in isolation, nor merely as individual households. Adaptation is rarely purely individual. Social networks, trust, and collective memory shape what is possible and sustainable. On closer examination, what appears as a “personal decision” is actually a negotiated, context-specific act with cascading effects. Interview results indicate that cooperation and information circulation are structured through diversified social networks, which operate according to a dual adaptive regime.

Information seems to circulate on two levels: public and open, ensuring collective awareness of climate, markets, or emerging risks, potentially reducing uncertainty at the group level, and private, retained within trusted networks, for the strategic management of scarce resources such as pastures and water when competition is high and when behavioral homogeneity is not adaptive. In this context, knowledge may function as social capital, filtered by criteria of trust, observed reliability, and generational solidarity, based on the ageset system, which is often more binding than biological kinship. As a Rendille saying goes: “Take away my mother and father, but not my agemates.”

Similarly, in matters of cooperation, only exceptional events — such as disruptions of public resources or outbreaks of armed conflict, which potentially affect the entire tribe — generate large-scale behavioral coordination. By contrast, during ordinary life or climate shocks, which fragment already scarce environmental resources, cooperation tends to remain selective and confined to trusted circles. This apparent selectivity may allow the Rendille to modulate collective action according to the scale of impact: in times of conflict or crises involving public resources, centralized mobilization fosters cohesion and coordination; in the everyday management of resources or during droughts, cooperation appears conditional on familiarity, proven ability, and reliability, producing a system of conditional cooperation that intertwines practical and moral logics.

Diversified cohesion among the Rendille might be interpreted through the lens of identity fusion theory, according to which emotionally intense bonds with the group can motivate extreme sacrifices, including risking one’s life for the collective (Swann et al., 2009; 2012; Whitehouse, 2018; Whitehouse & Lanman, 2014). Ritualized experiences, particularly imagistic ones, may leave deep memories and consolidate durable solidarity among participants (Páez et al., 2015; Swann et al., 2012), potentially strengthening cooperation in contexts of conflict or crisis (Whitehouse et al., 2017; Buhrmester, Newson et al., 2018). Among the Rendille, the transition to moran (warrior) status provides a paradigmatic example: painful, collective and public ritual circumcision ceremonies, as imagistic experiences, appear to consecrate individual courage and moral continuity between generations. Indeed, every interviewee indicated they were ready to die for the tribe, follow the majority decision even if they personally disagreed, and help any unknown Rendille, even at high personal cost, providing material resources. However, strategic information about precious resources for the livestock during droughts would remain secret, circulating only within trusted networks of people who would act on that information together. Following initiation, morans live in mobile communities, sharing labor, responsibilities, and livestock management strategies, developing selective cooperation grounded in daily trust and mutual knowledge. Interestingly, all relations of deep trust and intimate knowledge that form clusters of confidentiality and cooperation rest on the same principle: the division into age-sets and their capacity to generate friendships and closeness. Everyone reported preferring to share and cooperate with kin and carefully selected non-kin from the same age-set whom they know well — and, at most, with a few individuals from the age-set immediately below them, as these have long been their pupils in herd management. In this way, they are assured of a shared mindset and common knowledge,

reinforced by everyday proximity, since these trusted individuals usually live as neighbors. Communication is also organized on a dual register, distinguishing horizontal peer-level interactions — seemingly free and responsive, where one is able to explore, innovate, dare, and argue, — from vertical interactions with elders — deferential and formally regulated.

Coussi-Korbel and Fragaszi (1995) distinguish two forms of social learning: directed, filtered by pre-existing social relationships, and non-specific, transmitted more diffusely via temporal and spatial alignments with random individuals. It seems that directed social learning, anchored in the proximity of kinship, age classes, herd sizes, management practices, and friendships—which often translates into geographical closeness, such as neighbors—facilitates the transmission of information about premium pastures and other strategic resources during droughts. I describe this as directed informational mutualism, to emphasize that knowledge in this context is co-constructed, co-shared, and co-acted, reflecting the peer-to-peer style of exchange. This regime differs from informational predation, in which insights from others are copied without reciprocity. Predation, however, is not an alternative but a complement: it integrates mutualistic learning with knowledge from individuals perceived as more expert about environmental signs — elders, foretellers, travelers. Furthermore, personal observations through scouting always verifies socially acquired information, particularly in this info-predation regime, where one cannot fully rely on others' reports due to the lack of such “proximity”.

From this exploratory first case study, the Rendille appear to optimize a dynamic balance between public transparency and selective confidentiality, between widespread solidarity and strategic protection, shaping an adaptive network able to respond to the ecological and social complexity of their environment. The cultural institution of age-sets plays a central role in this balance, generating cohesion through mechanisms reminiscent of fission–fusion dynamics. On one hand, collective fusion enables coordinated mobilization in response to external threats, conflicts, or crises, defending land, livestock, and social integrity. On the other hand, fission cooperation governs the management of scarce resources, where support and information circulate only within networks consolidated by relational and cognitive proximity.

It also appears that the social cohesion underpinning behavioral choices and information circulation varies with the nature of ecological or social shocks, producing emergent macro-level effects. Collective emergencies encourage openness and transparency, whereas everyday management of scarcity favors selectivity and secrecy. This duality blends universalist solidarity with pragmatic exclusion strategies, reinforcing both systemic resilience and local effectiveness. For example, during droughts, strategic diversification of behaviors may enhance robustness by generating dense local networks with weak links to peripheral nodes—resembling small-world configurations. In contrast, in conflict situations, social learning may favor centralized, scale-free structures that enable rapid mobilization. (These remain preliminary qualitative observations; modeling analysis would be needed to confirm small-world versus power-law dynamics.)

Eventually, one preliminary observation from this case study is that social relationships and culturally defined age-set classes in ordinary circumstances form the substrate that regulates differentiated access to knowledge and critical infrastructures during crises, thereby shaping how high-risk decisions are coordinated and explaining why responses differ depending on the type of shock. This is important because it provides a foundation for interventions or support systems that align with, rather than disrupt, existing adaptive networks.

INTERACTIONS OF EMERGENT ADAPTATIONS AND TOP-DOWN INTERVENTIONS

Conflicts over natural resources often begin quietly, as disagreements over access to land, livestock, water, or other essential resources, and may later escalate into open disputes between individuals or groups (Gado, 2002). Such conflicts are shaped by overlapping principles, including claims of

autochthony—which may cross ethnic boundaries—and locally specific norms tied to shifting administrative borders (Le Meur, 2006). Resource scarcity amplifies the contradictions between these normative repertoires. In the Rendille context, for example, the recent introduction of private land ownership has disrupted traditional systems of cooperation and shared territory use. When Rendille from other villages travel to Ngurunit to water their animals, they appeal to a supra-village ethic of sharing. The Ngurunit inhabitants, however, treat shallow wells as private property—“whoever digs it is the owner”—and require outsiders to wait until all locals have watered their animals, even if no one is physically present at the well. This creates a dilemma: waiting until evening to access water means losing a full day of grazing, generating disputes at the tribal level. Conflicts over natural resources among the Rendille are not only about access to pastures or water, but also about the boundaries of belonging, as disputes between villages often return to the catchphrase: “We are one tribe — why don’t we share?” This case illustrates not only normative pluralism, in which actors draw on moral and customary repertoires to claim rights over resources, but also highlights a dynamic in which struggles for access to resources reinforce internal divisions and transform moral ethnicity into political tribalism (Lonsdale, 1992). Interestingly, in the case of inter-tribal conflicts—often labeled as “ethnic” or “tribal”—competition over increasingly scarce resources such as land, water, and minerals appears instead to be the actual driving factor (Richards, 1996). Importantly, I add, this dynamic is not the consequence of climate change, but of the introduction of private property logics. In the Rendille case, for example, herders entering the lands of other communities often invoke moral and religious principles, saying things like “resources are given by God — they do not belong to you” or “drought is like a war, you must help your neighbor.” In practice, however, access is sometimes denied when outsiders in need arrive. Promises and agreements made by elders of different tribes thus coexist with potential exclusions enforced by communities on the principle of land ownership. Analyzing conflicts over land and water therefore requires attention to the dialectic between rights and powers, claimants and institutions, and access and control (Le Meur et al., 2006).

Ethnic rhetoric, in these cases, appears to be leveraged primarily by politicians. Parliamentarians who are “sons of the village” often intervene in conflicts not as neutral arbitrators, but as patrons pursuing electoral strategies. In inter-tribal conflicts, several Rendille accounts suggest that such politicians have even facilitated arms smuggling across the borders with Ethiopia and Sudan, arming their communities. The resulting escalation of armed violence demonstrates how seemingly local disputes over resource access are deeply intertwined with national politics, representation, and patronage networks.

Previous research shows that the negotiation processes producing new land-use rules are often conflictual, and the boundary between regulation and dispute is thin (Lavigne Delville & Hochet, 2005). Under pressures from climate change and rapid social transformations, land and resource management among the Rendille has become experimental and adaptive rather than strictly following fixed traditions. Regulation occurs through a mosaic of institutions, including traditional councils of elders, elected bodies, community committees, and NGO-supported projects. For example, when three Rendille villages close a pasture during the rainy season, disputes frequently arise over when to reopen it. Villages have differing needs: some still have nearby pastures, while the largest settlement, Ngurunit, has none. Elders must negotiate to reconcile these differences and reach compromise. In these situations, people also strategically select among different authorities depending on which forum is most likely to support their claims—a practice known as forum-shopping—which can add further complexity (Benda-Beckmann, 1985). The legitimacy of any institution depends on its continued use by the community to resolve disputes (Lund, 2002; Le Meur, 2006), while authorities may simultaneously leverage conflicts to reinforce their own legitimacy (Hagberg & Lund, 1998). The introduction of new regulatory frameworks not only produces legal pluralism, but also creates opportunities for actors with social, economic, or political capital to exploit openings, challenge existing rules, and establish new ones aligned with their own interests. Another striking example of this complexity among the Rendille, amplified by the involvement of external authorities such as politicians, administrators, and NGOs, can be seen in disputes over the construction of new boreholes around grazing lands. Often, only a few politically well-connected individuals initiate requests for drilling, but politicians promote such projects in exchange for electoral support. As a result, these initiatives

frequently bypass the community public councils and operate instead through individualistic networks linked to Nairobi parliamentarians seeking political advantage.

At the local level, conflictual social relations often operate on the frontier between tension and open conflict, where social actors manipulate situations through symbolic actions and threats that exert pressure without escalating into physical violence. For example, elders may curse those who enter closed pasture areas or impose fines of two or three goats on those who refuse to vacate them. Similarly, curses may be cast against individuals who fail to assist the community in times of need. These represent symbolic tensions—internal conflicts within the tribe—whereas active conflicts become more apparent in disputes with neighboring communities or other tribes. Yet even in such cases, elders across different groups assume a comparable social role as peacemakers, drawing upon their experience and the authority of their cursing powers. Among Rendille, people emphasize that what they desire is for elders and youth of conflicting tribes to meet directly. Politicians are expected only to facilitate logistics (transport, food) and act as observers or symbolic authorities, not as decision-makers. Such an approach would help close the open moments of opportunism, replacing them with guiding principles for managing uncertainty around resources. These principles could be grounded in intra-tribal commonalities, such as shared hardships linked to climate change, political marginalization, land expropriation, pastoral herd management practices, and historical and ancestral knowledge of the land. By understanding the interests of outgroups while ensuring their own group's needs are acknowledged, a rare type of leader—the barrier-crosser—can create the conditions for collective action (Buhrmester, Cowan, & Whitehouse, 2022). Such leaders cultivate what Putnam (2000) terms bridging social capital: relationships of trust that enable joint action with former strangers, rivals, or enemies. Historically, Rendille accounts indicate that this mediating and boundary-crossing role was primarily the prerogative of elders. Leveraging such cultural roles could support more flexible, need-based arrangements of conflict negotiation and resource governance. In this light, challenges such as climate change, political marginalization, and struggles over imposed boundaries and land ownership may provide fertile ground for the emergence of future commonalities and new political identities and programs across pastoral tribes.

Climate change is not only transforming ecosystems but also reshaping the very fabric of sociality, resource management, and political behavior. For the Rendille, as for many pastoralist groups, adaptation unfolds less through technological fixes than through evolving social strategies—balancing public solidarity with selective secrecy, cultivating conditional cooperation, and drawing on ritualized forms of cohesion. These adaptive strategies, however, are increasingly entangled with shifting institutions of authority, land registration processes, and broader political arenas. External interventions often fail to account for village-level tensions while introducing material, political, and social resources without implementing local regulatory frameworks. As a result, a single water point shared by neighboring villages can quickly become a flashpoint. Although official discourse emphasizes a formal hierarchy—elders, councils, chiefs, parliamentarians—in practice, the precedence of any authority is often redefined during conflicts. Politicians, largely absent from daily pastoral life and appearing mainly during electoral campaigns, nevertheless exert decisive influence. Far from acting as neutral arbiters, state actors often encourage patronage-based interventions that are disconnected from local social logics. These moments create opportunities for local actors to leverage rival authorities, pursue individual strategies, and establish new rules. Consequently, conflicts do not merely undermine institutions; they also produce new, often fragile and unstable ones, deepening uncertainty while linking local conflicts to national arenas. Mapping future risks and pathways for adaptation, therefore, requires more than cataloging local disputes over land or water. It demands attention to the layered histories of settlement, mobility, and conflict, as well as the moral logics and customary institutions through which belonging and justice are negotiated. A superficial mapping of local disputes risks missing the broader dynamics: pastoral accounts indicate that the real epicenter of many conflicts often lies elsewhere—in Nairobi—where members of parliament, aligned with tribal constituencies, mobilize strategies for electoral gain. Approaches that focus solely on the “local” may overlook these “de-localized” or “multi-localized” arenas of action (Le Meur et al., 2006). The challenge, then, lies in recognizing that resilience is produced across scales: in the trusted networks that circulate strategic knowledge; in the ritual and

generational practices that sustain cohesion; and in the broader political structures that can either amplify divisions or create conditions for bridging social capital. Adaptive responses to climate change will be most effective when they build on local embedded histories and moral frameworks, while also confronting the de-localized arenas of power that shape the distribution of resources. If interventions are to be effective, they should follow what Richards (1996) calls “smart relief”: discreet assistance that supports culturally informed analysis of decisions and resource conflicts while strengthening local mobilization. In this sense, climate change calls not only for technical solutions but also for a rethinking of social contracts, where solidarity and reciprocity extend beyond tribal or ethnic boundaries, offering new grounds for cooperation in an increasingly uncertain environment.

PROPOSALS FOR BROAD FORMS OF INTERVENTION

These proposals originate from informal discussions, interviews, and focus groups, capturing community perspectives on potential and ideal forms of policy support. They are framed not as reactive measures to crises, but as proactive strategies aimed at sustaining Rendille livelihoods under conditions of environmental and social stress.

Markets

Pastoralists dependent on livestock as their main source of livelihood. Pastoralists adopt sophisticated economic strategies based on practical and adaptive logic. Goats meet immediate daily needs, small purchases, or social obligations; cows serve as medium-term resources, providing milk and income for larger family expenses; camels constitute long-term capital, sold only for major obligations, such as school fees, marriages, or emergencies. Markets perform a dual function: on one hand, they address immediate cash needs, such as school fees or shop purchases; on the other hand, they act as a natural destocking mechanism, gradually reducing pressure on herds during times of scarcity. However, the Rendille perceive markets simultaneously as part of the problem and part of the solution. The lack of adequate infrastructure limits trading opportunities: Ngurunit, for example, has only one butcher shop and lacks spaces for selling hides, leather, or milk. Strengthening weekly markets in Pareu, Merille, Ilaut, Ngurunit, Namarei, and Korr is seen as a strategy to consolidate local trading capacities and reduce dependence on urban middlemen, who are often accused of exploiting privileged information on demand and lowering prices to their advantage. Information flow represents a central issue: currently, intermediaries monopolize knowledge of demand, seasonal price fluctuations, and consumer needs, forcing pastoralists into reactive, blind sales. Community information centers, integrated with mobile platforms designed for local languages, literacy levels, and trust networks, could democratize market access, enabling collective and informed livestock management decisions, especially linked to seasonal planning, that in turn could strengthen traditional species-based liquidity strategies, supporting deliberate choices on which animals to sell, when, and for what purpose, without compromising long-term herd security. Insurance mechanisms or livestock savings schemes could provide additional protection against droughts and market fluctuations, allowing families to preserve key animals, particularly camels, safeguarding both immediate subsistence and cultural capital. Pastoral markets, transformed through shared information flows and integrated traditional strategies, can shift from tools of exploitation and frustration to levers of structural resilience, supporting not only economic survival but also the identity and cultural autonomy of Rendille communities, which to not adopt a strict centralized demand-offer logic.

School Fees

School fees amount to around 25,000 KES per term, or about 75,000 KES per year per child, not including transport and additional expenses. These costs burden families who must simultaneously care for livestock and secure food. During droughts, many families are forced to withdraw children from school, resulting in dropout. Youth who leave school often reject pastoral life, turning to small urban trades, such as selling water, or to micro-criminality and violence. Local observers note that these urban trajectories reflect the erosion of pastoral livelihoods. Reducing or subsidizing school fees, along with

complementary support for family subsistence during crises, could have transformative effects, keeping youth in school and connected to sustainable life paths, while mitigating social vulnerability and the loss of pastoral knowledge.

Veterinary services

Another critical challenge concerns veterinary services, closely linked to increasing sedentarization and the emergence of poorly understood livestock diseases. Droughts, pasture loss, and border conflicts have forced many herders into permanent settlements, increasing exposure to new diseases. In permanent settlements, animals confined in enclosures contribute to soil contamination with feces, increase tick infestations and rapid disease transmission, especially during drought when the health of animals is already weakened. Faced with uncertainty, pastoralists often rely on indigenous knowledge. For example, they may discover medicinal plants through trial and error, spreading knowledge within the village over time. However, such experimentation is slow, and timely veterinary intervention is often absent or politically mediated through clientelist ties. Radio broadcasts in vernacular languages provide guidance, but access to the right drugs remains limited: currently there are no reliable veterinary services capable of on-site diagnosis, laboratory analysis, and effective treatment, and drugs remain expensive for the majority.

Transformative solutions require sustainable, long-term veterinary services. Veterinary students and researchers should maintain a constant field presence with genuine community engagement, avoiding episodic data-collection interventions. Funding should support local private or government clinics, ensuring access in zoonotic risk areas, laboratory facilities, and timely disease interventions. These actions would directly enhance food security, reduce conflicts, and strengthen pastoral livelihoods.

Indigenous perspectives

Among the Rendille, indigenous knowledge is a living system for navigating environmental uncertainty. Elders consult local foretellers, the *Mooro*, before making herd mobility decisions. These predictions focus on three key questions: will it rain, will there be fiin, and will there be conflict? Western scientific knowledge is often not integrated into these decision-making processes. For policy and intervention design, it is therefore essential to understand how communities make adaptation decisions based on indigenous systems concerning early warning signs, environmental scouting, climate indicators, and routes to make decisions about herd movements. These choices generate cascading effects on mobility, herd management, and the emergence of hot zones of conflict.

Land and resources

Some pastoralist families participate in programs that teach drought-resilient seed techniques, simultaneously transmitting this knowledge to children and bridging traditional knowledge with innovative practices. Structural limitations, however, remain: farms capable of producing supplementary forage are few, and individual plots are too small to support large, diversified herds. Consequently, small-scale initiatives, such as drought-resistant forage cultivation, currently benefit only a limited number of families. More ambitious proposals, including large communal ranches, face significant obstacles due to population pressure and land access constraints.

Adaptive strategies such as intercropping drought-resistant forage, rotating plots near temporary pastures, agroforestry with fodder trees, community seed banks, and low-water forage production, could complement rather than replace mobile grazing systems. These strategies require local experimentation to determine effectiveness and, importantly, time to establish. Decisions can be guided by qualitative data reflecting village differences, livestock species, herd sizes, and climate fluctuations. Modeling tools can support scenario planning only if they are grounded in local knowledge and community priorities; otherwise, even advanced technologies risk ineffectiveness.

Security

Ensuring permanent security along border areas is a strategic priority for fostering trust and cooperation among pastoralist communities. Even during wet seasons, these areas remain sensitive: inter-tribal cattle raids, historically regulated through norms of balance, reciprocity, and ritualized caution, reduce

willingness to share resources during times of need. Historically, raids served as restocking mechanisms among groups with roughly equal manpower and armament; today, larger, heavily armed groups attack less equipped communities, reflecting a rupture between traditional conflict regulation and contemporary violence, amplified by external factors such as border dynamics, territorial disputes, population growth, climate change, and access to heavy weapons.

Security in these areas is predictable, not improvised. The state can play a discreet but strategic role by patrolling critical zones, providing communication and early warning systems, documenting escalations, and supplying resources—without supplanting local decision-making. Safe grazing corridors, protected water points, and logistical support for seasonal mobility help sustain livelihoods. Controlled training and arming of KPR units—pastoral community defense groups—provide minimal self-defense rather than offensive power. When integrated into elder-led observation and mediation systems, these measures allow communities to protect livestock and families while maintaining control over conflict dynamics and preserving traditional governance legitimacy.

FUTURE RESEARCH

This study is based on qualitative ethnography, but in future work I plan to extend these insights in two directions. First, through the participatory production of public historical maps—published online, periodically updated, and recording Rendille experiences otherwise transmitted only through oral stories often dismissed by policymakers—together with a digital archive of ILK to be displayed in schools and local forums with the active participation of communities, as well as a short documentary video on climate-related knowledge. Second, through the construction of computational models informed by complexity theory. These models will aim to capture processes of self-organized criticality and the emergence of macro-level characteristics, such as tipping points or systemic robustness. I turn to complexity theory because it treats societies not as linear cause–effect chains but as adaptive systems in which interdependent actors, resources, and institutions coevolve, generating emergent outcomes that cannot be reduced to micro-level interactions. In pastoral contexts, small, local choices—when and where to move herds, whom to share information with, how to interpret ritual or ecological signals—combine through feedback loops (trust gained/lost, pasture recovery/overuse) to produce nonlinear effects such as cooperation, sudden breakdowns of conflicts, or path-dependent governance of resources. Complexity theory offers concepts and tools that match these realities: heterogeneity (households differ by herd mix, age-set, connections), adaptive networks (ties form, dissolve, and rewire under stress), multi-scale dynamics (household, clan, administrative levels), thresholds and tipping points (e.g., below a water/forage threshold, movement cascades; above a patronage incentive, norms erode), and multi-stability (the same setting can stabilize in cooperation or destabilize into conflict, depending on sensitivity to initial conditions). Methodologically, this lets me encode ethnographic insights — such as *fiin* as a culturally grounded welfare signal and “direct informational mutualism” as selective sharing rules — into agent-based simulations and adaptive-network models that explore which combinations of adaptive choices, shocks, and institutional responses cumulatively produce system robustness versus collapse. The goal is not point prediction, but mapping conditions under which particular patterns are likely. This joint use of ethnographic observations, local narratives, and modeling ensures that models are not built on abstract assumptions but rooted in lived realities, and, at the same time, qualitative insights can acquire explanatory power for generalization while avoiding the risk of “cherry-picking” individual stories or overlooking the power dynamics and historical relationships that shape adaptation choices.

By combining ethnographic insights, participatory mapping, and complexity-informed modeling, policymakers can design interventions that are context-sensitive, robust, and adaptive, supporting locally legitimate pathways for cooperation, conflict management, and resource governance rather than

relying on rigid, top-down solutions. Such modeling functions as a policy-relevant simulation laboratory, allowing policymakers to explore hypothetical scenarios, identify vulnerabilities, and test the robustness of different strategies before implementing them in the field. For example, policy actions informed by these models could:

- Promote diversity without fragmentation: encourage multiple livelihood and governance strategies while maintaining social cohesion.
- Calibrate selection mechanisms: small adjustments in incentives, such as who mediates disputes or allocates resources, can redirect system dynamics without authoritarian control.
- Manage interdependencies: strengthen the balance among overlapping social and ecological ties, rather than focusing on a single resource or formal agreement.
- Use modularity as a safeguard: implement timely control points, such as elders' councils or community committees, to prevent localized shocks from cascading across the system.
- Cultivate synergies and reduce rigidity: enhance adaptive ties, including youth-elder knowledge exchange and cross-border leadership, while loosening rigid or antagonistic alliances.
- Maintain safety margins: preserve overlapping institutions and parallel negotiation pathways to buffer communities against environmental, social, or political shocks.

CONCLUSIONS: IMPLICATIONS FOR POLITICAL SCIENCE

Understanding division and disorder requires particular sensitivity to how local shocks intertwine with governance, legal pluralism, and external interventions. What may appear to an external observer as minor infractions — the temporary violation of grazing rules, the passage of a herd across defined boundaries — takes on crucial weight in daily life: it erodes trust, limits cooperation, and defines the margins within which communities can negotiate their future. Local conflicts, in this light, are not accidental episodes, but deep manifestations of institutional structures, cultural norms, and power relations sedimented over time. At the same time, market pressures and infrastructure expansion reshape not only material access to resources, but also the collective perception of the future and community self-governance. Shocks can act as catalysts and reveal cultural adaptations, trigger innovations, and stimulate institutional experimentation.

From this perspective, politics must be rethought starting from local practices, and remain flexible: it must accommodate herd mobility, seasonal resource fluctuations, and local conflict resolution mechanisms, instead of imposing “one-size-fits-all” models. Effective politics means negotiating solutions based on what already exists — institutions, values, and practices through which communities self-govern. Legitimacy derives from respect for shared norms; public spaces, new or adapted, become places to express claims, contestations, and solutions. But opening such spaces remains empty without mechanisms of legitimate recognition. Access to natural resources as a matter of human rights requires inclusive dialogue and institutions capable of ensuring equity; without this, governance risks generating uncontrolled competition and amplifying inequalities.

Micro-level studies, such as this one, illustrate how communities collectively navigate uncertainty, and how local actors negotiate meaning, secrecy, and legitimacy under stress. They remind us that conflict is not an anomaly but a normal feature of social life, to be channeled and negotiated rather than suppressed. The Rendille concept of *fiin* exemplifies a culturally grounded measure of ecological well-being, showing that adaptation is interpreted through cosmological and embodied lenses rather than purely material indicators. Social configurations, such as those enabling “directed informational

mutualism,” reveal that selective secrecy in information sharing operates as a political strategy under scarcity, challenging resilience models that assume naïve notions of moral economies, transparency, and collective pooling.

Together, these findings indicate that climate adaptation is shaped less by resource scarcity per se than by the interplay of patronage politics, legal pluralism, and cultural logics of uncertainty. The broader lesson is that resilience to conflict and climate change emerges from the ground up—through negotiation, adaptation, and interactions among actors at multiple levels, especially non-state actors—and depends less on state capacity than on how local actors navigate and strategically leverage plural authorities. Approaches that view adaptation only as a technical problem or as something managed solely by formal institutions—top-down “engineered” solutions—can backfire. They may weaken the community’s own adaptive strategies, introduce unintended complexity, and lead to outcomes that are unpredictable and counterproductive. For political science, the study of local adaptations is at the core of understanding resilience, rather than a marginal concern or a complementary exploration.

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