Climate Adaptation as Relational Capacity:

an Intersectional Study of Pastoralist Women in Kajiado, Kenya

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ABSTRACT

Pastoralist women in Kenya's Kajiado County confront intensifying drought, yet adaptive capacity varies markedly. Using six focus group discussions across three ecologically distinct sites, this study applies an intersectional lens to explain that variation. Findings show that elders' ecological expertise stabilises herds only when labour and institutional recognition are available; livelihood diversification delivers secure gains for women with land, credit, or schooling, but channels the asset poor into precarious, time intensive work; and collective savings groups buffer shocks when fees and rules are inclusive but reproduce class and marital hierarchies when they are not. I reframe adaptation as a relational capacity involving the conversion of cultural, social, economic, and symbolic resources through everyday rules that allocate recognition and authority. My findings identify policy levers in labour support, collateral design, and group governance that can shift coping towards adaptation.

KEY WORDS

CLIMATE ADAPTATION, COLLECTIVE ACTION, INDIGENOUS KNOWLEDGE SYSTEMS, INTERSECTIONALITY, LIVELIHOOD DIVERSIFICATION, PASTORALISM

INTRODUCTION

Kenya's arid and semi-arid lands cover roughly four fifths of the country and receive low, highly variable rainfall (Akall, 2021; Omolo & Mafongoya, 2019). These drylands are inhabited mainly by pastoralist and agro-pastoralist communities whose mobility and livelihood diversification have historically enabled adjustment to harsh conditions (Ng'ang'a & Crane, 2020; Wangui & Smucker, 2018). This article intervenes in the everyday adaptation debate by reading climate response through ordinary practice and the relations of power that organise it (Carr, 2020; Nightingale, 2017). Pastoralism remains central to Kenya's economy, supporting about one third of the population and more than nine million direct dependents (Schilling & Werland, 2023). Within pastoralist livelihoods, women sustain livestock care, water provision, food processing, and household decision-making, although this labour often receives limited recognition (Anbacha & Kjosavik, 2019; Galwab et al., 2024). Viability depends on negotiated access to communal and private grazing and on flexible labour that redistributes effort within and beyond households (Camfield et al., 2020; Rao et al., 2017). Indigenous ecological knowledge guides herd movements and migration through close readings of vegetation and water points, as Tugjamba et al. (2023) note. However, prolonged droughts, erratic rainfall, and rising temperatures now strain these capacities and erode livelihoods in Kajiado County.

Policy texts frequently celebrate system resilience while leaving unspecified which actors are authorised to act and on what terms within daily pastoralist life (Akall, 2021). Without clear allocations of authority and recognition, responsibility diffuses across households, markets, and state institutions, and practical levers of response remain opaque (Carr, 2020; Rao et al., 2017). Furthermore, treating gender as a descriptive variable conceals how intersecting identities organise exposure to hazard, recognition, labour, and mobility (Carr & Thompson, 2014). Age, marital status, education, and socioeconomic position shape women's practical authority over assets, exposure to hazards and mobility options (Djoudi et al., 2016). These patterned positions govern who can mobilise Indigenous Knowledge Systems, who can pursue livelihood diversification, and who can participate in collective mechanisms on meaningful terms (Sithole, 2019). Intensifying climate pressures in Kajiado County magnify these inequalities and raise the stakes for who speaks, who decides, and who benefits.

Our inquiry examines three domains in which authority and recognition are produced in practice: Indigenous Knowledge Systems, livelihood diversification and migration, and collective action, within a literature where intersectional analyses remain scarce (Alare et al., 2022; Djoudi et al., 2016). I attend to household decision forums, migration patterns, herd and crop management, savings groups and market transactions. Within these themes I track the rules and resources that shape entry, voice and benefit sharing, notably savings thresholds, speaking protocols, land tenure, access to credit and the time costs of care. The analysis stays with relations and positions rather than isolated attributes so that distributions of recognition, resources, and decision space become visible. I also consider formal planning in Kenya, which shapes whether Indigenous ecological knowledge informs decisions as Walker et al. (2022b) notes, while climate variability sets hard constraints even as social hierarchies determine whose practices are recognised as legitimate responses (Galwab et al., 2024). Accordingly, our aim is to explain why adaptation outcomes diverge among pastoralist women in Kajiado by showing how intersecting positions condition the conversion of cultural, social, economic, and symbolic capitals into adaptive decision space. This is shown in Indigenous Knowledge Systems, livelihood diversification and migration, and collective action through recognition, resources, and rules.

THEORETICAL FRAMEWORK

I situate the paper within climate adaptation scholarship and contribute an explicitly intersectional account of how adaptive capacity is produced through

recognition, resources, and rules. Adaptation is defined as a sustained reorganisation of practices intended to reduce future climate risk, whereas coping refers to short-term responses (Carr & Thompson, 2014; Nightingale, 2017). Resilience denotes the capacity of a system to absorb shocks without losing essential function (Liru & Heinecken, 2021). Intersectionality provides the lens for analysing how gender, age, marital status, and socioeconomic position combine to allocate the recognition and resources needed for such reorganisation (Crenshaw, 1989). In this article, adaptation is conceptualised as a relational capacity structured by intersectional hierarchies that distribute recognition, resources, and decision space in everyday practice. This conceptualisation keeps attention on relationships and positions rather than isolated individuals, and it names the core objects of analysis used throughout. Because these distributions are enacted through daily institutions and interactions, the same vocabulary is carried into the empirical analysis for coherence. I adopt a stance consistent with Carr (2020) and Nightingale (2017), anchoring explanation in position and relation and placing the study within work on everyday adaptation and power.

Selective use of Bourdieu's concepts of capital (1986) and field (1989) sharpens how recognition and authority circulate in pastoralist contexts without displacing the intersectional lens. Capital is treated as a composite resource comprising social, cultural, symbolic, and economic forms whose value depends on recognition within specific fields. Fields carry rules, thresholds, and tacit expectations, for example savings requirements or speaking protocols, that condition which actors can convert available resources into action. The term relational agency is used as shorthand for the intersectional mobilisation of these capitals within fields and is not introduced as an additional layer of theory. When recognised, Indigenous ecological knowledge functions as cultural capital that can translate into authority in household or community decisions; when unrecognised, it remains dormant. Livelihood diversification and collective action likewise yield divergent outcomes across positions because conversion depends on credit, labour time, permissions, recognition, and other economic constraints. I use a parsimonious vocabulary: an intersectional analytical lens to structure categories and comparison; and, only where needed, the language of vulnerability and resources–agency–achievements to clarify how decision space expands or contracts in practice.

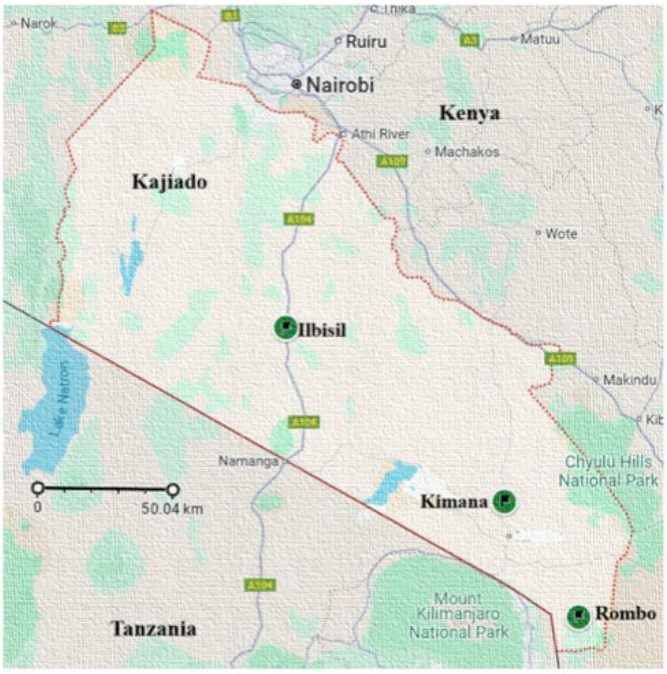
The lens is operationalised across the three domains through a single routine that travels across sites while preserving local nuance. For each practice, the analysis identifies intersecting positions and the social, cultural, symbolic, and economic capitals available to the actor, and it then assesses whether the practice reallocates recognition, resources, or decision space, which signals movement from coping toward adaptation. Next, I document the field rules that stabilise or erode the arrangement. This is because the same questions are applied across domains, comparison is possible without presuming uniform pathways and without abstracting away from everyday practice. Attention remains on relations and conversions rather than traits, so adaptive capacity is read as a product of position within hierarchies rather than individual ingenuity. Therefore, I treat climate adaptation as both a response to environmental variability and a negotiation of historically produced inequalities; in this study, the scope and direction of that negotiation are structured by intersectional position. This framework contributes two advances: it provides an intersectional explanation of how capitals convert, or fail to convert, into adaptive action in dryland pastoralism, and it offers a portable operational routine for analysis in other climate-affected contexts.

METHODOLOGY

Kajiado County, located in southern Kenya along the Tanzanian border, forms part of the Serengeti-Mara Ecosystem, a vital wildlife migration corridor spanning nearly 25 million hectares and supporting the annual migration of wildebeest, zebra, and Thomson's gazelle (Osano et al., 2013). The region experiences arid to semi-arid conditions, with temperatures

ranging from 10°C to 34°C and a bimodal rainfall pattern, with long rains from March to May and short rains from October to December. Climate change has resulted in declining rainfall, rising temperatures, and more frequent droughts, leading to crop failures, livestock losses, and increasing livelihood precarity (Imana & Zenda, 2023; Osano et al., 2013) Livestock rearing, the primary livelihood for approximately 75 percent of the population, has become increasingly unstable, while crop farming faces mounting risks from unreliable rains and flash floods. The study sites of Rombo, Kimana, and Ilbisil reflect these vulnerabilities (Figure 1).

Figure 1. Location of study sites in Kajiado County, Kenya. Focus group sites are marked with green flags.



(Google Maps, 2025)

To capture diverse socio-ecological conditions and livelihood practices, three communities were purposefully selected within Kajiado County. Rombo represents a rural pastoralist community characterised by traditional nomadic livestock rearing and limited access to services. Ilbisil constitutes a rural mixed farming community combining livestock rearing with small-scale agriculture. Kimana, a peri-urban pastoralist setting, features diversified livelihoods supported by irrigation alongside traditional pastoralism. Site selection was aimed at capturing ecological, social, and economic heterogeneity relevant to pastoralist climate adaptation processes.

The study was undertaken in August 2023. Participants were selected if they were Maasai adults, native to the study sites, and had resided there for more than twenty years to ensure historical and contextual depth. Gender-disaggregated focus groups were used, reflecting the analytical focus on gender and respecting local norms around social interaction. Male respondents were moderated by a team led by a trained male assistant, while women's groups were moderated by the author with the assistance of female record-keepers. Focus groups were conducted in local schools and churches, neutral venues selected to facilitate accessibility and minimise external interference during discussions.

Participants were purposefully sampled to reflect diversity in age, education, occupation, and income. Each site hosted two focus groups per gender, comprising eight to eleven participants to ensure discourse saturation while maintaining manageability (Pinto da Costa, 2021). Socio-economic characteristics were recorded through a demographic register completed after each session (Supplementary Table 1). In total, 113 individuals participated, 56 women and 57 men. This article draws exclusively on women's focus groups, in line with the study's intra-gender analytical focus on women's adaptation practices. Discussions followed a semi-structured guide designed to elicit participants' interactions with climate change. Sessions began with an explanation of the study's purpose, confidentiality assurances, and consent procedures. Given low literacy levels in the study communities, verbal consent was obtained and audio recorded. All discussions were audio recorded with participants' permission and supplemented by written field notes to ensure comprehensive data capture.

Transcripts were produced in Kiswahili and Maa; the languages used during the sessions and translated

into English by a professional service to preserve meaning and cultural nuance. Data were analysed in MAXQDA using a hybrid thematic coding approach that combined inductive exploration with deductive framing from the study's intersectional framework. Intersectionality serves as the theoretical–analytical framework. I analysed how gender, age, marital status, and socioeconomic position combine to organise exposure to hazard, recognition within institutions, and the conversion of available capitals into decision space. This framework guided the coding scheme and comparison across the three adaptation domains and explains why similar knowledges or resources yield divergent outcomes for different women. Open coding was first used to capture recurring themes in women's accounts of climate-related challenges and responses. These were then refined into higher-order categories that aligned with both participant emphasis and the structural concerns of the analytical framework. The three adaptation domains discussed in the findings, emerged from this process as the most consistently referenced and theoretically significant across all focus groups.

Ethical approval for the study was granted by the Ethics Review Board of the Universidad de Oviedo (Ref: 28_RRI_2023). Informed consent procedures were adapted to respect local linguistic and literacy contexts. Pseudonyms were assigned in all transcripts to preserve anonymity. Attention was given to creating a culturally appropriate and respectful research environment that encouraged participants to share their experiences openly and without fear of reprisal. Building on this methodological approach, the next section presents the findings of the study, structured around the three adaptation domains identified through the thematic analysis.

FINDINGS

Climate change manifests most clearly for participants as prolonged drought, hotter seasons and erratic rainfall. Women across age, occupation and status linked these shifts to shrinking pasture, longer water walks and higher food costs. Across sites respondents listed a mix of coping tactics such as digging wells for domestic and irrigation use, trading, borrowing and exchanging seeds and self-help groups. Yet, respondents stressed that success depended on who controlled assets, labour, and knowledge. Those controls vary along intersecting lines of gender, age and socio-economic position, confirming the study's focus on adaptation as relational capacity rather than individual ingenuity. The first domain, Indigenous Knowledge Systems (IKS), illustrates how ecological expertise becomes an adaptive resource or remains latent depending on the resources and recognition available to different women.

INDIGENOUS KNOWLEDGE SYSTEMS (IKS)

Indigenous Knowledge Systems are central to pastoralist women's climate response, yet who can mobilise that knowledge and with what effect depends on intersecting identities that structure access and authority (Crenshaw, 1989; Sithole, 2019; Walker et al. 2022a). I treat cultural capital as ecological expertise and read social, economic, and symbolic capital as the enabling resources and recognitions through which expertise converts into action. Conversion turns on recognition, resource reach, and rules that set decision space. Using this routine across sites, I identify intersecting positions and available capitals for each practice and then assess whether recognition, resources, or rules are reallocated from coping toward adaptation. The evidence that follows shows how identical knowledge yields divergent outcomes when positions differ.

This tension is particularly visible in Rombo, where older widows act as custodians of ecological knowledge while lacking the labour and assets needed to scale it. One elderly widow described her practices:

> "This land is hard, and we use what we know. My mother showed me how to find plants that keep the animals alive when there is no rain. We dig shallow wells and line them with stones to keep the water for longer, but it is not enough, and

without men to help, the work is very slow." (R4F, Rombo).

Here cultural capital is strong, while social capital in male labour networks and economic capital for tools are weak; symbolic capital in formal programmes is uneven. This reading accords with reports of institutional neglect and makes visible the blocking rules of gendered labour allocation and credentialing over water works that interrupt conversion beyond the household (Rao, 2019). Recognition among peers is high but institutional uptake is limited, so authority and budgets do not widen. Decision space remains narrow despite competence, which shows how position, not motivation, sets the ceiling.

Kimana's peri-urban setting layers education and connectivity onto pastoral practice, yielding selective knowledge hybridisation. Some women integrate traditional ecological indicators with modern technologies to navigate climate variability, yet this capacity is structured by intersectional advantages that privilege certain positions while marginalising others. One college-educated participant explained:

> "We still follow the signs in nature, like the birds, but now also check our phones to confirm the weather to know when to plant or move the animals. But not all women here know how to use these tools, and some cannot afford them." (R2F, Kimana).

The speaker illustrates how intersectional positioning combining gender with higher education and digital access enables knowledge pluralism where traditional and scientific systems are selectively combined. Cultural capital in reading clouds and birds merges with economic capital in handset and data and with symbolic capital from schooling, which sharpens timing for planting and movements. This evidence resonates with plural knowledge accounts and adds device access, data costs, and literacy as the rules that sort women within the same site (Agarwal, 2009; Liru & Heinecken, 2021). Recognition tilts toward device holders and resources cluster around connectivity, so room to act expands for some and contracts for others. Hybrid practice therefore displays innovation while reproducing exclusions rooted in intersectional inequalities. The result is an intra-gender divide produced by access and validation rather than by interest or effort.

In Ilbisil, where agro-pastoralist practices coexist with acute resource stress, the patriarchal control of assets limits married women, even when ecological knowledge is sound. One married woman recounted:

> "We grow kitchen gardens and dig small wells to save water for the animals. I had a large herd of goats, but my husband sold them, even though we needed them for school fees." (R6F, Ilbisil).

This testimony highlights how intersecting identities of gender, marital status, and economic dependency create fragile adaptive agency under conditions of patriarchal resource control. Although the speaker mobilises cultural capital in water saving and some economic capital in small infrastructure, a rule that centralises livestock sale authority in men severs knowledge from assets at the crucial moment. This pattern corroborates previous analyses of negotiated rather than autonomous agency and makes the property rule that neutralises women's contribution explicit (Anbacha & Kjosavik, 2019; Kabeer, 1999). Recognition for care and water work does not translate into authority over herd portfolios. Resources are present but insecure, so decision space contracts exactly at conversion. Without rule change, this remains coping rather than adaptation. The disconnect between women's knowledge and their ability to act upon it reflects how structural inequalities reproduce vulnerability even when other capitals are present and actively deployed.

Furthermore, biodiversity stewardship created another test of conversion. Biodiversity conservation practices emerged across all sites as another vital domain through which IKS is preserved and transmitted. Yet, intersectional positioning determined whether this cultural capital earned broader recognition and institutional support. In Rombo, one elderly woman explained:

> "We grow the aloe and keep hardy trees because they heal the cows and protect the land. Younger women do not think much of these things, but when the drought comes, they remember what we taught them." (R7F, Rombo).

These reflections show intergenerational tension in knowledge transmission that is produced through intersectional positioning and the conversion of capitals. Older women's practices carry high functional value as cultural capital, yet symbolic recognition from younger cohorts is episodic, rising with drought salience and ebbing in ordinary seasons. This rhythm is consistent with hazard dynamics in Kenya's drylands. In Bourdieu's terms, conversion depends on the field rules that allocate time and labour, not memory alone. These cases therefore corroborate work showing that IKS requires institutional and social validation to travel into action (Rao, 2019; Sithole, 2019). Where recognition and small inputs are present, stewardship endures; where they are not, knowledge remains locally valued but dormant.

Among younger women in Kimana, traditional conservation knowledge persists yet rarely scales without resources. A youthful irrigation farmer reflected: "We are told to plant new trees to help with the soil. We already know which ones grow well here. If we had more resources, we could grow more to protect the land." (R5F, Kimana). The speaker demonstrates how intersectional positioning combining gender, youth, and economic resources constrains the conversion of cultural capital into broader adaptive action despite clear knowledge and motivation. Traditional ecological knowledge continues to inform adaptive practices but remains constrained by infrastructural and financial barriers that reflect intersectional disadvantages in accessing economic capital and institutional support. This finding reinforces other positions that knowledge alone cannot offset the material deficits that hinder application when intersectional positioning denies access to the social and economic resources necessary for implementation (Sithole, 2019). The respondent's position therefore is: on recognition, she receives encouragement without budget; on resources, costs block expansion; on decision space, actions remain modest and easily reversed.

Thus, this section shows that IKS operates as an intersectionally structured field in which cultural capital converts into adaptive capacity only when recognition, resources, and rules widen women's decision space. Through an intersectional lens, positions determine whose readings of pasture, water, and seasonality are treated as authoritative. Selective hybridity in peri-urban sites reshapes symbolic capital; elder stewardship reveals hazard contingent recognition; and patriarchal labour and asset rules halt conversion despite competence. In Bourdieu's terms, conversion hinges on how social, economic, and symbolic capitals can be mobilised inside local rules. This refines everyday adaptation work by locating power in routine practice rather than traits. Where rules reallocate labour, inputs, and voice to the knowledge holder, IKS moves from coping to adaptation; otherwise, expertise remains local and reversible.

LIVELIHOOD DIVERSIFICATION AND MIGRATION

Diversification is widely promoted as an adaptive pathway (Ng'ang'a & Crane, 2020), yet feasibility and payoff vary sharply with intersecting identities that govern access to land, credit, education, and labour (Rao, 2019). I read economic capital as assets, cash, and credit and social capital as work ties and migration networks, and I follow how these resources convert under rules for ownership, wages, and mobility. Diversification signals adaptation when labour is reorganised, income becomes predictable, and authority widens; it reads as coping when effort increases without security or control. These results sit with studies that document diversification under climate pressure and specify intra-gender thresholds and conversion points in local markets (Rao et al., 2020; Tugjamba et al., 2023). Symbolic capital also matters because reputation shapes hiring and group credit. The lens remains on position and rules rather than assumed dispositions.

In Kimana, opportunities can be substantial bearing the mixed economy, yet those pre-conditions are steep. Women with land ownership and formal education combine pastoralist practices with innovations such as solar-powered irrigation systems, leveraging both economic capital (land tenure) and cultural capital (education) within fields that recognise these credentials. However, collateral rules and equipment costs limit who gets in. A younger, land-poor woman with limited education described a narrow set of options:

> "I do not have land or cows like older women. I must work on other people's farms, but the work is hard, and the pay is little. Sometimes I sell vegetables in town, but it is never enough." (R6F, Kimana).

The respondent's position shows how intersecting youth, landlessness and limited education create a deficit of economic and cultural capital, constraining agency to wage labour within exploitative field conditions. This reality exemplifies how intersectional positions condition what forms of capital women can access and convert into adaptive action (Crenshaw, 1989). This reading supports analyses of constrained agency and specifies the rules that block conversion into stability as piece rate norms, market fees, and spoilage risks that keep earnings volatile as the rules that block conversion into stability (Kabeer, 1999). In this case recognition remains transactional, resources are thin, and decision space is short and reactive.

Additionally, tourism extends the job menu yet introduces volatility and stigma in Kimana. One participant stated:

> "When there is no work, some women turn to other ways to survive. It is shameful to talk about, (sex-work) but what can you do when your children are hungry?" (R8F, Kimana).

This account reveals how adaptation practices are entangled with social stigma and economic desperation when formal fields exclude women based on their intersectional positioning. Income from such work is intermittent and risky; social capital can erode under stigma, and symbolic capital declines in community eyes. In the absence of protective labour policy, employers externalise risk, and women marked as risky workers lose access to safer jobs or loans, which matches accounts of precarious transitions and adds the social consequences that narrow future options (Liru & Heinecken, 2021; Sithole, 2019). Consequently, recognition turns negative, resources lose reliability, and decision space compresses to immediate survival.

In Ilbisil, diversification efforts centred on beadwork, poultry farming, and small-scale horticulture, representing attempts to mobilise cultural capital (craft skills) and modest economic resources within highly constrained fields. These practices provided supplementary income but remained vulnerable to environmental variability and market volatility. One middle-aged participant shared: "I weave beads and grow vegetables near my home. Even when rains are scarce, I save water for my plants. These activities help me buy food and pay school fees." (R4F, Ilbisil). Yet, a second participant added the time cost: "We spend hours fetching water and must look for extra work, like washing clothes for others, to survive." (RF2, Ilbisil). These positions mobilise cultural capital in craft and water saving and modest economic capital in tools and inputs, but queue rules, service fees, and long walks drain resources needed to move into higher-return niches. Recognition for diligence does not open credit lines; decision space remains narrow, which refines material-constraint accounts by naming everyday levers (Kabeer, 1999) and fits evidence that, without institutional support, diversification rarely restructures livelihoods (Rao et al., 2020).

Moreover, constraint also reproduces across generations. A mother in Ilbisil reflected: "My daughter has little education and no land, so she will follow what other women are doing." (R9F, Ilbisil). Without collateral for credit or certificates for training, young women enter crowded micro-enterprises with low margins. This trajectory matches classic accounts of transmitted advantage and identifies the chokepoints

that channel daughters into the same saturated niches (Bourdieu, 1986; Furusa & Furusa, 2014). Recognition is confined to family roles, resources are inherited as scarcity, and decision space funnels into limited options. Adaptation here is sustained effort under constraint rather than movement toward autonomy.

Furthermore, migration emerged as a widespread strategy, especially among younger women in domestic work, yet it often redistributes rather than reduces risk. Intersectional positioning is revealed as shaping both the decision to migrate and its consequences for those left behind. An older caregiver in Rombo explained:

> "My daughter and her husband went to the city to work, leaving her children with me...it has been months since they sent money, I had to leave Manyumbani group because I am constantly needed at home." (R7F, Rombo).

These remarks reveal how migration reconfigures household labour in ways that intensify unpaid care responsibilities for older multi-generational "de facto" mothers. For the respondent, remittances are irregular, attendance rules penalise missed meetings, and unpaid care expands for those who stay. Therefore, social capital in savings groups declines and symbolic capital as a reliable member is lost. These dynamics align with evidence on fragile remittance regimes and make visible how safety nets weaken when rules cannot be met (Camfield et al., 2020; Rao et al., 2020). When men move away, women's authority at home may widen, yet legitimacy remains retractable, which fits reports of conditional openings in household power (Grillos, 2018; Rao, 2019). Migration thus shifts risk within already precarious households rather than producing adaptation.

These findings thus illustrate that diversification and migration present a spectrum of possibilities bounded by intersectional location and by rules that govern conversion. Women who align land, education, and credit translate economic and social capital into modest security; those missing one or more elements face precarious work closer to coping than adaptation. Migration offers episodic relief while shifting care burdens and sharpening conflicts over authority for those who remain. These patterns are consistent with wider accounts of diversification under climate stress and add tangible thresholds that sort participants inside local markets and groups (Rao et al., 2020; Tugjamba et al., 2023). Relational agency appears as a function of status and design rather than personality. Recognition influences access to jobs and loans, resources define feasible steps, and rules widen or close decision space. Policy that loosens collateral conditions, stabilises wages, and invests in water and childcare would change the conversion calculus for those most constrained.

Collective Action and Social Networks

Collective action and social networks have long cushioned climate shocks in pastoralist communities (Speranza et al., 2017, p. 212). Yet benefits for women hinge on intersectional positioning within local social fields. In Kajiado, social capital moves through intra and inter household exchange, while savings groups offer formal channels to pool funds and share knowledge. Whether these arrangements reduce or reproduce vulnerability depends on who speaks, who pays dues, and whose reputations carry authority. These findings align with accounts of social resilience and add the concrete rules and thresholds that sort members inside women's collectives (Adger, 2003; Rao, 2019). Reading outcomes through recognition, resources, and decision space clarifies why similar group labels yield divergent trajectories. This orientation keeps attention on position and rule design and reveals how unpaid care burdens intersect with class to reshape reciprocity.

This tension emerges clearly in Rombo and Ilbisil where reciprocity shifts from buffer to obligation as older carers manage out-migration and childcare, narrowing room for adaptation. An elderly widow in Rombo explained: "When my son left to work in the city, I care for his children and my niece's as well. We share food and labour with neighbours, but

sometimes I feel like I give more than I receive." (R6F, Rombo). An older woman in Ilbisil reiterated: "My daughter in the city sends our neighbour with gifts sometimes…we cannot eat alone; we must share with the younger women who help me with childcare, or they would be upset" (R9F, Ilbisil). These discussions show how intensified care and household fragmentation drain social capital without replenishment. While elder status yields symbolic capital as esteem rather than transfers; rules of respectability and reciprocity oblige giving before recovery, so economic capital leaks outward and decision space contracts. This reading treats vulnerability as socially produced and relational corroborating (Adger, 2003, 2006), in showing how intersecting age, gender, and marital status organise recognition. This finding explains, in conversion terms, why capitals present in these exchanges fail to become adaptive capacity.

Class shifts compound the erosion of reciprocity in Kimana. Economic stratification further reshapes access to collective support, with wealth differences interacting with gender to create new exclusions within historically reciprocal networks. A financially strained participant explained:

> "I work for them on their farms for a little money. However, when I seek help, they say they need to save for their future. I turn to friends like me, but we're all struggling." (R1F, Kimana).

This account captures how concentrated economic and symbolic capital allow better off households to exit mutual aid and convert help into wages with no reciprocal obligation. Social capital becomes segmented, linking poorer women mainly to equally constrained peers. This observation updates capitals theory (Bourdieu, 1986), by showing how private insurance practices shift collective risk downward while preserving status at the top. Recognition privileges households framed as prudent savers, resources move toward employers, and decision space for low-income women contracts inside relationships that once buffered shocks. In our criteria this is coping, not adaptation, because capitals circulate as obligation, decision space contracts, and no durable authority or income security is created.

Nevertheless, savings groups offer alternative platforms to rebuild buffering. Women's increasing participation in formalised collective institutions such as Ilbisil's "Tuinuane" and Rombo's "Manyumbani" savings groups enables pooled funds and social learning. One participant described:

> "Through our savings group, I borrowed money for farming…we also learn from each other; some women share knowledge of traditional crops. Other women bring ideas from their children who went to school". (R8F, Ilbisil).

This account shows that when fees are manageable and meetings inclusive, economic capital grows, cultural capital circulates through peer teaching, and social capital deepens through routine interaction. These gains align with work on social learning and are sharpened here by intergenerational exchange as a channel that converts knowledge into planning and investment (Adger, 2003; Rao, 2019). Benefits, however, hinge on thresholds and penalties that not all can meet. Recognition expands for reliable contributors, resources become more predictable, and decision space widens for those who can comply. Voice also matters. Speaking protocols, literacy requirements for record keeping, fixed meeting times, and fines for lateness or absence can quietly filter participation. Where rules are flexible and roles rotate, quieter members contribute knowledge and access loans; where rules are rigid, decision-making concentrates and some women attend without influence. These design choices convert the same group form into different outcomes by reallocating recognition and resources through rules. These choices also explain why some groups appear inclusive in name yet remain closed in practice, despite similar labels and objectives. Consequently, without deliberate attention to intersectional inequalities, group-based practices risk reproducing rather than dismantling existing social hierarchies, reinforcing differentiated vulnerability even within collective spaces designed

for mutual support.

This hierarchical exclusionary drift is also evident in Kimana, where affluent women shape group rules and resource distribution in ways that exclude poorer members. One participant observed:

> "The wealthier women decide how much to save and lend. The communal projects benefit their businesses, but we struggle to keep up. They know we cannot meet the savings requirements." (RF9, Kimana).

This statement reveals how intersectional positioning shapes influence within collective spaces, with economic advantages interacting with social connections to maintain control over group governance and benefit distribution. Although savings groups ostensibly promote equality among women, internal hierarchies based on intersectional positioning restrict meaningful participation for those whose economic status, age, or education level disadvantages them within group dynamics. Here, economic capital translates into agenda control, symbolic capital consolidates through leadership, and social capital channels loans toward favoured ventures. Cultural capital in financial literacy then reinforces influence and gatekeeping. This outcome echoes cautions against uncritical praise of collectives and adds the mechanism of threshold setting that mirrors elite capacities in these groups (Djoudi et al., 2016). Recognition concentrates at the top, resources follow elite priorities, and decision space for poorer women shrinks inside institutions designed for support.

Overall, collective mechanisms remain indispensable, yet their adaptive power is neither automatic nor evenly shared. The results support the view that social relations underwrite adaptation and contribute precise rules that govern inclusion, including dues, fines, loan caps, attendance, and speaking protocols (Adger, 2006; Rao, 2019). Caregivers carry uneven exchanges as reciprocity thins; employers monetise help without mutual obligation; and savings groups widen options where thresholds are inclusive and narrow them when fees mirror wealth. Relational agency appears as a function of status and rule design rather than a generic group effect. Recognition determines who leads and who is heard, resources decide who invests and when, and rules either widen or confine decision space. Practical reforms that cap fees, rotate leadership, credit unpaid care, and relax penalties would improve conversion for those most constrained.

Across the three domains, adaptation appears as relational capacity shaped by intersectional position. Women mobilise IKS, diversify livelihoods and navigate migration, and engage collective arrangements, yet conversion into durable change hinges on recognition, resources and rules that set decision space. Reading economic, social, cultural and symbolic capitals as intersectionally distributed resources explains why similar efforts diverge, with some moving beyond coping while others stall. The implication is structural: equitable adaptation requires reforms to asset rights, credit, labour and institutional validation, not praise for adaptation that leaves hierarchical constraints intact.

DISCUSSION

This article contributes to climate adaptation scholarship by showing that adaptive capacity is relational and hierarchically distributed through recognition, resources, and decision space that vary with intersectional position. I asked why ostensibly similar pastoralist women experience adaptation so differently, and answer by keeping Crenshaw's lens at the centre (Crenshaw, 1989). Capitals operate here as intersectionally distributed resources: cultural capital as ecological expertise, social capital as labour and networks, economic capital as assets and credit, and symbolic capital as legitimacy in forums. What matters is conversion, which depends on recognition, resource reach, and the rules that set decision space. This moves beyond descriptive accounts toward a mechanism for why similar efforts diverge across women. In doing so, the analysis qualifies technocratic framings that treat adaptation as primarily technical or behaviourist (Carr, 2020; Nightingale,

2017). This study also refines relational approaches by specifying how conversion succeeds or fails in everyday practices (Adger, 2006; Bourdieu, 1989).

The findings on Indigenous Knowledge Systems confirm their centrality to day-to-day climate response while clarifying the conditions under which they count. Elders' plant and pasture expertise stabilise herds, yet conversion falters where male-controlled labour and assets are required, which supports prior observations of institutional neglect and makes the blocking rule visible (Rao, 2019; Sithole, 2019). Epistemic governance still privileges certified or market-aligned practice, consistent with reports of fluctuating legitimacy for traditional stewardship, and our data show how extension and procurement priorities shape uptake (Caine, 2021; Fernández-Giménez et al., 2022). In Kimana, hybrid practice that blends ecological signs with phone-based forecasts improves timing for those with devices and data resonating with plural-knowledge accounts while identifying device access and literacy as the thresholds as appropriation thresholds that sort women intra-locally (Agarwal, 2009; Liru & Heinecken, 2021). Across sites, cultural capital travels into durable change only where social, economic, and symbolic capitals cohere and where rules recognise women as decision makers. Where recognition is episodic or costs are prohibitive, expertise remains localised and easily reversed.

Diversification appears as necessary yet uneven, with outcomes bounded by land, credit, time, and reputational status. This pattern accords with research that documents the turn to multiple incomes under climate pressure and adds the chokepoints that prevent movement beyond coping, including collateral design and wage norms alongside the time burden of water and care (Kabeer, 1999; Rao et al., 2020; Tugjamba et al., 2023). Seasonal tourism widens earning possibilities, but volatility and stigma can erode social capital and narrow future options, aligning with accounts of precarious transitions while showing the social costs borne by women marked as risky workers (Liru & Heinecken, 2021; Sithole, 2019). Micro-ventures in Ilbisil stabilise consumption yet remain vulnerable to input prices and rainfall, mirroring evidence that low-return diversification rarely restructures livelihoods without infrastructure and pooled marketing (Rao et al., 2020). Moreover, male out-migration sometimes widens household authority for women, yet legitimacy remains retractable, a conditional opening noted elsewhere in East African pastoralism (Anbacha & Kjosavik, 2019; Grillos, 2018). The implication is institutional: ease the rules that confine conversion by reforming collateral, stabilising wage setting, investing in water and childcare, and credentialling informal skills.

Collective action remains vital but not automatically equalising. Intra- and inter-household exchange still move food and labour, yet reciprocity thins as migration and costs rise, which fits relational vulnerability arguments and adds the mechanism of care-driven depletion among older carers (Adger, 2003, 2006). Savings groups can rebuild buffers where thresholds are inclusive (Rao, 2019). Our evidence supports work on social learning by showing how intergenerational exchanges convert cultural capital into planning and investment choices. At the same time, contribution levels, fines, loan caps, literacy requirements, and meeting schedules can mirror wealth and status, producing elite rule-setting inside women's institutions as warned by studies that resist romanticising collectives (Djoudi et al., 2016; Iyer, 2021). These patterns indicate that social capital is not a uniform asset, but a position-specific resource governed by rules and reputations. Where design caps fees, rotates leadership, and credits unpaid care, decision space widens; where thresholds harden, collective forms reproduce the inequalities they are meant to ease.

Viewed across the three domains, our contribution is to articulate adaptation as conversion from resources held to authority exercised, via recognition and rules, within intersectional positions. This mechanism explains why similar efforts diverge within the category "women" and identifies levers that shift coping toward adaptation. Policies should recognise elder women's ecological expertise, reform collateral to

include non-land assets, invest in water and childcare, and mandate inclusive rules in savings groups. These measures target the structures that organise recognition, resource reach, and decision space and make conversion feasible for those currently blocked. With such structures present, adaptation becomes a practicable reorganisation rather than a demand for endurance. While limited to three sites and focus group evidence, the study points to future work using longitudinal mixed methods to test the durability of temporary authority gains and comparative asset surveys to quantify how capital bundles shape outcomes across life stages and counties.

CONCLUSION

Climate adaptation in Kajiado is best read as a negotiated process in which intersecting identities determine whose resources convert into durable capacity. Our central problem was to account for stark within-group differences in how pastoralist women encounter and manage climate risk. Our analysis explains within-group divergence by showing that outcomes hinge on conversion rather than effort. Across Indigenous Knowledge Systems, diversification and migration, and collective action, the decisive levers are recognition, resources, and the rules that set decision space. Cultural, social, economic, and symbolic capitals are unevenly distributed and, more importantly, unevenly convertible. Elder women's ecological expertise is indispensable yet frequently unrecognised; diversification helps only where land, credit, or schooling exist; collective forms buffer risk when thresholds are inclusive and reproduce hierarchy when they are not. Vulnerability is produced at the point where identity meets everyday rule-making.

The study covers three sites and relies on focus groups, a methodological approach with inherent limitations in generalisability. Nonetheless, future longitudinal mixed-methods and comparative asset surveys should test the durability and pathway effects of the following proposed moves. Based on the study's findings, we propose a set of politically feasible, practical moves that adjust the micro-rules of conversion. First, to promote the integration of Indigenous Knowledge Systems, we recommend hiring elder women as paraprofessional extension partners and embedding their readings in early warning systems. Second, to support livelihood diversification, we recommend bundling credit and land access reforms with investments in water points and childcare. Finally, to strengthen collective action, we recommend requiring savings groups to use sliding contributions and rotating leadership. Without these changes, celebrating resilience risks restating inequality as fortitude. With the changes, adaptation becomes a practicable reorganization rather than a demand for endurance.

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