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Pastoral Women as Climate Adaptation Leaders: Indigenous Knowledge, Resilience, and Everyday Adaptation

Evidence from key informant interviews on women's agency, indigenous ecological knowledge and locally led adaptation strategies across pastoral communities in Kenya, Somalia, Tanzania, and South Africa

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ABOUT US

CGIAR aims to address gaps in knowledge about climate change and food security for peace and security policies and operations through a unique multidisciplinary approach. Our main objective is to align evidence from the realms of climate, land, and food systems science with peacebuilding efforts already underway that address conflict through evidence-based environmental, political, and socio-economic solutions.

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EXECUTIVE SUMMARY

Across the East and Horn of Africa, pastoralist women are already leading climate adaptation and not waiting to be included in it. Evidence from key informant interviews with 20 organizations working in Kenya, Somalia, Tanzania and South Africa shows that women possess and apply detailed indigenous ecological knowledge of weather patterns, water sources, livestock health, seed preservation and rangeland conditions, and are the primary architects of the everyday coping and adaptation strategies that keep pastoral households functioning through drought, flood and displacement. Yet this leadership is almost entirely informal, undocumented, and unfunded.

Global evidence indicates that only a fraction of one percent of international climate finance reaches initiatives led by Indigenous women (UN Women, (as cited in Coelho, 2025), and this study's evidence suggests pastoralist women in the Horn of Africa face a comparable funding gap. This brief argues that recognizing and resourcing women's existing adaptation leadership through direct finance, formal knowledge integration, and institutional partnership is a more effective and more just starting point for climate resilience programming than treating pastoralist women primarily as beneficiaries of externally designed interventions.



WHY THIS MATTERS

Header Photo: CGIAR Climate Security

Adaptation policy in the Horn of Africa has tended to treat pastoralist women as a vulnerable population to be protected, rather than as practitioners with decades of applied ecological expertise. Such framing bears real costs because it channels resources toward externally designed interventions rather than strengthening what communities and women specifically are already doing. Hence, this leaves women's knowledge systems undocumented and vulnerable to loss as environmental and social conditions change faster than knowledge can be transmitted between and across generations.

Our evidence points to this. Accordingly, this brief builds on evidence generated specifically for this study through key informant interviews with 20 pastoralist women-led, humanitarian, climate-resilience, policy and peacebuilding organizations across Kenya, Somalia, Tanzania, and South Africa. Across every country in this study, women were identified by respondents as the primary holders of practical climate knowledge, knowledge that is granular, hyper-local and continuously updated through daily interaction with livestock, water sources and rangeland, in contrast to the more generalized, top-down knowledge embedded in many formal early-warning and adaptation systems.

What the evidence shows

- Women are the primary custodians of indigenous ecological knowledge - weather forecasting, water and pasture management, seed preservation, and livestock health.
- Women-led adaptation strategies (savings groups, food preservation, water conservation, livelihood diversification) are widespread but operate with minimal external support.
- Adaptive capacity is not the constraint - asset ownership and formal authority are. Women adapt despite structural exclusion, not because of institutional backing.
- Recurrent shocks are testing the limits of unsupported adaptation; without investment, informal strategies risk collapsing into distress coping.
- Indigenous knowledge remains largely undocumented and excluded from formal climate information, research and education systems.
- Climate finance overwhelmingly bypasses women-led organizations, reflecting a global pattern rather than one unique to the Horn of Africa.



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SITUATING THE EVIDENCE: WHAT THE WIDER LITERATURE SHOWS

A growing body of literature confirms that women's leadership in climate adaptation is a well-documented global and regional phenomenon, not an emerging or speculative claim. The World Bank (2022) documents Indigenous women across multiple regions innovating community-level adaptation and mitigation practices, reviving indigenous seed varieties, establishing seed banks, developing water-harvesting systems and preserving food, a scenario that describes the generational transfer of traditional climate knowledge as having made Indigenous women "climate experts, innovators, and problem-solvers" (World Bank, 2022). Evidence from Baringo County, Kenya, provides some of the most granular confirmation available for the East Africa context.

For example, a 2026 study of pastoral women in Ribkwo, Tiaty Sub-County, found women to be near-universal managers of domestic water and small livestock, and documented emerging hybrid adaptation practices that the authors term "ritual-technological hybridity", whereby women combining indigenous environmental sensing (such as traditional weather and pasture indicators) with new digital and mobile-based information sharing, including informal networks of women rain-scouts (Liru, 2026). The same study found that while household-level improvisations such as rotational water fetching and dew harvesting provide immediate relief, recurrent coping erodes assets and time in ways that undermine long-term adaptive capacity, directly reinforcing this brief's core argument that unsupported adaptation has limits.

Marty et al. (2022) reached a related conclusion in their intersectional analysis of Maasai pastoralists in southern Kenya, finding that households' ability to benefit from livelihood diversification as a climate adaptation strategy is shaped by intersecting inequalities, meaning that not all women, and not all adaptation strategies, have equal chances of success without external support to address the underlying structural constraints. At the continental level, UNDP's Regional Service Centre for Africa found that women are crucial custodians of indigenous knowledge passed down through generations and are frequently the first to notice declining resource quality such as water, soil, and pasture, thus enabling them to lead the search for community-level solutions (UNDP, 2024).

UNDP's blog series on women and climate adaptation in Africa similarly documents that in Kenya, women produce up to eighty percent of the country's food, yet continue to struggle to secure financing, climate-smart technology and land titles necessary to convert their labor and knowledge into durable resilience (UNDP, 2025).

The finance gap identified in this brief is corroborated by global monitoring data. UN Women's tracking of international climate finance flows found that only an estimated 0.01 percent of global climate finance reaches initiatives led directly by Indigenous women (Coelho, 2025), Crucially, this figure helps explain why the adaptation strategies documented in this study remain informal, small-scale and self-financed despite their demonstrated effectiveness and reach. The World Resources Institute's review of locally led climate adaptation mechanisms similarly finds that intermediated funding structures, where finance must pass through multiple institutional layers before reaching community organizations remain one of the most significant barriers to scaling women-led and community-led adaptation across Africa (World Resources Institute, 2025).

Comparative evidence from outside the Horn of Africa situates these findings within a wider global pattern. Research on Indigenous women's climate leadership in Peru documents that women's leadership development is frequently constrained not by lack of capacity but by limited institutional recognition, inadequate integration of Indigenous knowledge into formal governance, and barriers to women's participation in environmental decision-making forums (Flores et al, 2024). Research from Indigenous communities in Western Canada similarly repositions Indigenous women as knowledge-keepers and agents of change rather than passive subjects of climate vulnerability, arguing that centering women's land-based knowledge and leadership, rather than treating it as supplementary to scientific or technical adaptation approaches is essential to durable climate resilience (Datta et al, 2024).

Taken together, this literature confirms this study’s findings on pastoralist women's adaptation leadership in the Horn of Africa reflect a well-established global pattern: women already hold substantial climate knowledge and already lead substantial adaptation activity, but chronic under-investment and not lack of capability is what constrains the scale and durability of that leadership.



KEY FINDINGS

Header Photo: CGIAR Climate Security

1. Women as primary holders of indigenous ecological knowledge

Across all four study countries notably Kenya, Somalia, Tanzania and South Africa, key informants consistently identified women as the principal holders and transmitters of practical ecological knowledge, including reading weather and seasonal patterns, tracking water source reliability, identifying edible and medicinal plants, managing seed varieties, and recognizing early signs of livestock illness or pasture degradation. This knowledge is typically acquired through direct, sustained daily engagement with the environment over decades, and is transmitted informally from older to younger women rather than through any formal institution.

> "Pastoralist women are not just victims of climate change; they are keepers of indigenous ecological knowledge and crucial agents of change." — TUPO Foundation / Rural Women's Assembly

This finding is well supported in the wider literature. The World Bank (2022) documents Indigenous women's climate knowledge as the product of generational transfer that has made women climate experts, innovators, and problem-solvers in their communities, while research from Baringo County (Liru, 2026) documents specific hybrid practices which include informal women-led weather-scouting networks that combine this indigenous knowledge base with newer digital tools.

2. Everyday adaptation is already extensive, but unsupported

Women are not adapting in theory; they are adapting daily, through petty trade, milk sales, beadwork, poultry keeping, savings groups, food preservation, seed saving and water conservation. These strategies were described across the dataset as continuous, practical responses to shifting conditions as opposed to once-off interventions, but an ongoing management practice. Respondents were clear, however, that these strategies operate almost entirely without external technical or financial support, leaving women to absorb the full cost of experimentation, failure and adjustment themselves.

Marty et al. (2023) found a comparable pattern among Maasai pastoralists transitioning to diversified livelihoods in southern Kenya, noting that households' ability to succeed with diversification as an adaptation strategy depends heavily on pre-existing access to assets, information and social networks suggesting that unsupported adaptation systematically favours those already better positioned, rather than being equally accessible to all women.

3. Recurrent shocks are testing the limits of unsupported resilience

While women's adaptation strategies demonstrate real innovation and agency, respondents across the dataset cautioned that repeated, closely spaced shocks are eroding the assets, time and social capital that these strategies depend on. Coping measures that once represented adaptive resilience such as reducing meals, drawing down savings, informal borrowing are increasingly indistinguishable from emergency survival.

This mirrors the Baringo County findings directly: household-level improvisations such as rotational water fetching and dew harvesting provide only fragile, short-term relief, and recurrent coping erodes the very assets and time that longer-term adaptive capacity requires (Liru, 2026). The same study's introduction of "ritual-technological hybridity" , referring to women blending indigenous sensing practices with mobile-based information sharing illustrates both the ingenuity of women's adaptation and its continued fragility without institutional backing.

4. Indigenous knowledge remains excluded from formal systems

Despite its demonstrated value, women's ecological knowledge remains largely absent from formal early-warning systems, agricultural extension services, climate research and school curricula. Respondents described a persistent institutional tendency to treat indigenous knowledge as anecdotal or outdated, rather than validating and integrating it alongside scientific and technical climate information. Significantly, this gap is well documented at a global level. A systematic review of the peer-reviewed literature on nomadic pastoralism and climate adaptation found that while international frameworks such as the UN's Local Communities and Indigenous Peoples Platform aim to give Indigenous knowledge a more active role in shaping climate action, substantial barriers remain, rooted largely in the comparatively lower institutional power of local and Indigenous knowledge-holders relative to formal scientific and governmental actors (Tugjamba et al, 2023).

5. Locally led adaptation is effective, but structurally under-financed

Respondents described women's savings groups, informal cooperatives and community networks as consistently reliable sources of adaptive capacity, often more responsive and locally appropriate than externally designed programmes. Yet these same groups reported chronic difficulty accessing external financing, technical support or formal partnership with government or donor programmes. This finding is consistent with global climate-finance data. UN Women's monitoring indicates that only an estimated 0.01 percent of global climate finance reaches initiatives led directly by Indigenous women (UN Women, as cited in Coelho, 2025), while grassroots women's organizations in East Africa report facing significant practical barriers — such as lengthy processes to access even small microloans — that are disproportionate to the scale of finance being requested (Coelho, 2025). The World Resources Institute similarly finds that finance intermediation i.e. funds passing through multiple institutional layers before reaching community organizations remains one of the most persistent obstacles to scaling locally led adaptation across the continent (World Resources Institute, 2025), a pattern that mechanisms such as the UNDP–Adaptation Fund Climate Innovation Accelerator and the Locally Led Climate Fund are beginning to address through direct small-grant models (UNDP Climate Promise, 2025; ACT Alliance, 2025).



THE CORE POLICY ARGUMENT

Header Photo: ILRI/IBLI project

The evidence in this brief supports a reframing of pastoralist women's relationship to climate adaptation. Rather than positioning women as recipients of adaptation assistance, the evidence shows women already functioning as adaptation leaders and they apply detailed ecological knowledge, sustaining functioning livelihoods through recurrent shocks, and innovating new hybrid practices that blend indigenous and modern information sources.

The binding constraint on scaling this leadership is not capacity, knowledge or motivation. It is the near-total absence of direct finance, formal recognition and institutional partnership. Programming that continues to design adaptation interventions around pastoralist women, rather than resourcing and building on what women are already doing and already know, will continue to under-perform relative to what locally led, women-driven adaptation has already demonstrated it can achieve.

POLICY RECOMMENDATIONS

The recommendations below are derived directly from the key informant interview findings presented in this brief and are further supported by the regional and global literature reviewed above. They translate this brief's core argument i.e. that women's adaptation leadership is already extensive but structurally under-financed.

1. Direct Climate Finance

- Fund women-led adaptation directly, at scale - create dedicated, flexible, multi-year funding windows for women's savings groups, cooperatives and community-based organizations, reducing reliance on intermediated funding structures that dilute resources before they reach the community level.

- Adopt direct small-grant delivery models - scale mechanisms already designed to bypass multi-layer intermediation, such as the UNDP–Adaptation Fund Climate Innovation Accelerator and the Locally Led Climate Fund, which channel finance to community organizations directly rather than through successive institutional layers.

- Track and close the climate-finance gap - establish standing monitoring indicators for the share of climate finance reaching women-led and women-designed adaptation initiatives specifically, given that an estimated 0.01 percent of global climate finance currently reaches Indigenous women-led initiatives directly.

2. Livestock-Centered Livelihood Diversification

- Prioritize diversification that strengthens pastoralism rather than replaces it - support herd splitting, species diversification and livestock value-chain development (milk processing, hides, off-take) as the first line of diversification for women-led households, since evidence shows non-pastoral diversification succeeds primarily where market access, credit and infrastructure are already adequate such that without these preconditions, diversification tends to be distress-driven rather than strategic.

- Scale index-based livestock insurance (IBLI) - expand forecast-triggered insurance instruments that pay out on pre-agreed climate indices before livestock losses occur, protecting the herd asset itself and reducing pressure on women to sell down breeding stock during drought.

3. Indigenous Knowledge Integration

- Document and validate indigenous ecological knowledge - support participatory, women-led documentation of local weather indicators, water and pasture knowledge, seed varieties and livestock health practices, with appropriate intellectual and cultural protections for knowledge holders.

- Integrate indigenous knowledge into formal early-warning systems directly - co-design early-warning triggers with women knowledge-holders using models such as IGAD's Forecasts to Local Action (FOLA) approach, which builds anticipatory-action triggers together with pastoralist communities, including documented sessions with women in Karamoja rather than broadcasting forecasts top-down.

- Support hybrid knowledge innovation - invest in the kind of practical, women-led innovation already emerging organically such as mobile-based information-sharing networks that complement indigenous environmental sensing rather than importing externally designed digital tools devoid of community input.

4. Institutional Partnership, Not Parallel Structures

- Strengthen and not replace existing women's networks - channel technical and financial support through savings groups, cooperatives and informal solidarity networks that already have community trust and local reach, rather than creating parallel structures.
- Build an intergenerational knowledge-transmission strategy - invest in structured mechanisms for transmitting indigenous ecological knowledge to younger women, given evidence that reliance on informal generational transfer alone is vulnerable to disruption as environmental and social conditions change.

ABOUT THIS SERIES

This brief is the second in a five-part CGIAR – OPPD - SAWONET policy brief series drawing on key informant interviews with pastoralist women-led, humanitarian, climate-resilience and peacebuilding organizations across Kenya, Somalia, Tanzania and South Africa. It builds on the flagship brief's overarching findings (Brief 1) and precedes companion briefs on rangeland governance and peacebuilding, pastoral mobility through a GESI lens, and the alignment of education systems with pastoral mobility.

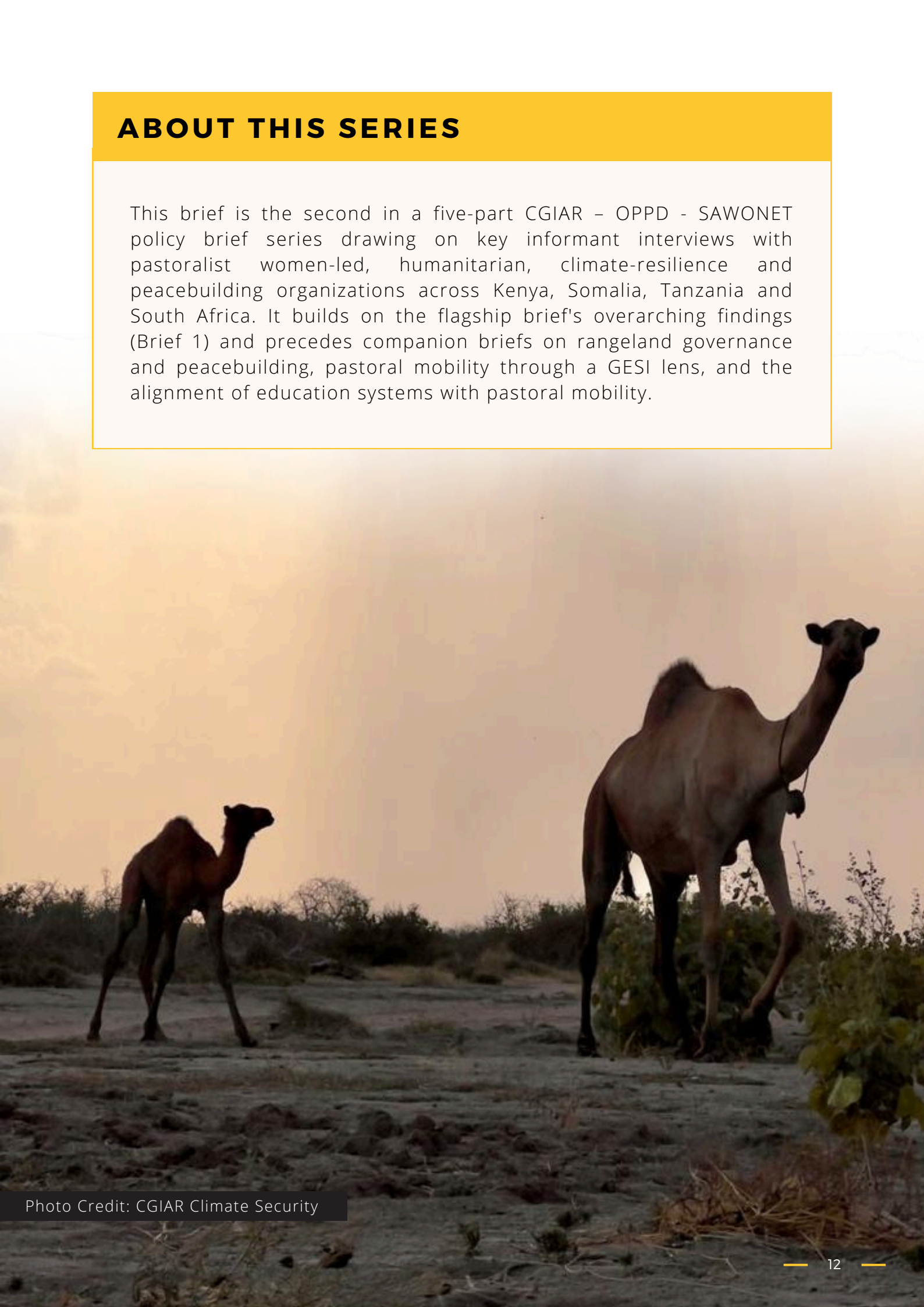


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