

Climate Security in the Horn of Africa: Environmental Stress, Governance Failure, and Pastoralist...

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Abstract

This policy brief examines the critical nexus between climate-induced environmental stress and escalating intercommunal violence among pastoralist groups in Ethiopia, arguing that environmental change is a primary but non-exclusive driver of insecurity. Its objective is to analyse the specific governance failures that mediate this climate-conflict relationship, moving beyond deterministic narratives. The approach employs a mixed-methods design, integrating spatial analysis of climate data with qualitative fieldwork...



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Environmental Stress, Governance Failure, and Pastoralist Violence

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ABSTRACT

This policy brief examines the critical nexus between climate-induced environmental stress and escalating intercommunal violence among pastoralist groups in Ethiopia, arguing that environmental change is a primary but non-exclusive driver of insecurity. Its objective is to analyse the specific governance failures that mediate this climate-conflict relationship, moving beyond deterministic narratives.

The approach employs a mixed-methods design, integrating spatial analysis of climate data with qualitative fieldwork including interviews and focus group discussions conducted in conflict-prone regions. The core findings demonstrate that recurrent droughts and water insecurity directly undermine pastoralist livelihoods, forcing migration and competition.

However, this ecological pressure is catalysed into violence by systemic governance deficits, including the historical marginalisation of pastoralist communities, inequitable distribution of drought response resources, and a development bias favouring sedentary agriculture. The study's central contribution is its empirical identification of these governance failures as the essential mechanism transforming resource competition into conflict.

Consequently, the practical implication is that climate security policy must be fundamentally reconfigured to prioritise transparent, inclusive resource governance and the institutional integration of climate adaptation with conflict prevention, addressing the roots of vulnerability to mitigate conflict risk effectively.

Keywords: *Climate security, Horn of Africa, environmental stress, pastoralist conflict, governance failure, climate-conflict nexus*

Article Highlights

- Recurrent droughts directly undermine pastoralist livelihoods, forcing migration and competition.

Core Argument

Environmental change drives insecurity in the Horn of Africa primarily when mediated by governance

<ul style="list-style-type: none"> • Systemic governance deficits—including marginalization and inequitable resource distribution—catalyze ecological pressure into violence. • Climate security policy must integrate transparent resource governance with conflict prevention to address vulnerability roots. • The study moves beyond deterministic narratives by empirically identifying governance as the essential conflict mechanism. 	<p>failures—not as an isolated ecological factor.</p> <p><i>This brief synthesizes mixed-methods research from conflict-prone regions in Ethiopia.</i></p>
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Executive Summary

This policy brief examines the critical nexus between climate change, governance failures, and escalating pastoralist violence in Ethiopia, arguing that environmental stress is a primary but non-exclusive driver of insecurity (Keppo et al., 2021). The Horn of Africa, and Ethiopia in particular, faces intensifying climate shocks, including prolonged droughts and erratic rainfall, which severely undermine water and food security. These environmental pressures directly threaten the livelihoods of millions dependent on pastoralism and rain-fed agriculture, eroding traditional coping mechanisms and forcing communities into competition over dwindling resources.

However, the translation of environmental scarcity into violent conflict is fundamentally mediated by profound governance deficits. Historical state policies have often marginalised pastoralist communities, neglecting their development needs and failing to provide adaptive infrastructure or conflict resolution mechanisms. Concurrently, Ethiopia's broader regional security posture, shaped by complex foreign policy dynamics since 1991, can divert attention and resources from domestic climate resilience, further exacerbating local vulnerabilities.

The resulting violence not only causes human tragedy but also undermines economic sectors, including incipient tourism, and jeopardises long-term sustainable development. Consequently, addressing pastoralist conflict requires moving beyond simplistic environmental determinism. Effective policy must integrate climate adaptation—such as sustainable water management and resilient agro-food systems—with transformative governance reforms that promote inclusion, equitable resource sharing, and human security.

Failure to adopt this integrated 'climate security' approach will perpetuate cycles of violence, destabilise the region, and reverse hard-won development gains.

Introduction

The Horn of Africa stands as a stark epitome of the climate security paradigm, where environmental change interacts with socio-political fragilities to produce severe human insecurity and conflict(Sovacool, 2021). Ethiopia, a regional linchpin, encapsulates this crisis, experiencing increasingly frequent and severe climate-induced droughts and rainfall variability that directly threaten its foundational agrarian and pastoral economies(Keppo et al., 2021). This environmental stress exacerbates pre-existing vulnerabilities, pushing communities towards a precarious edge(Sovacool, 2021).

The core problem this brief addresses is the complex causal pathway from climate change to pastoralist violence in Ethiopia, a pathway critically facilitated by systemic governance failure(Nsafon et al., 2023). While climate change acts as a threat multiplier, it is the inadequacy of institutional response and historical patterns of marginalisation that transform resource competition into lethal conflict(Akbari et al., 2022). The objective of this analysis is to dissect this interplay, arguing that pastoralist violence cannot be resolved through either purely environmental or purely security-led interventions; instead, it demands an integrated policy approach that tackles both ecological and political dimensions of insecurity(Akamavi et al., 2022).

The trajectory of this brief first establishes the empirical reality of environmental stress, particularly water scarcity, and its impact on livelihoods . It then analyses how Ethiopia's governance challenges, including its external security preoccupations, undermine resilience and fuel conflict . The discussion further considers the broader socio-economic repercussions, including impacts on development and stability, thereby framing the conflict not as a peripheral issue but as a central threat to national and regional security .

Ultimately, this brief aims to provide a coherent framework for policymakers, demonstrating that sustainable peace in Ethiopia's lowland regions is contingent upon re-conceptualising security to encompass climate resilience, equitable resource governance, and inclusive development. Furthermore, the climate security paradigm in Ethiopia must be understood within a regional context of geopolitical competition and shifting foreign policy dynamics, which can exacerbate resource scarcities and constrain cooperative governance. Ethiopia's historical posture as a regional hegemon, coupled with its recent internal conflicts, has complicated transboundary water management and collective action on environmental stress .

The Grand Ethiopian Renaissance Dam (GERD) project, while a domestic development priority, exemplifies how unilateral action on shared resources like the Nile can heighten regional tensions, creating a geopolitical backdrop that distracts from and undermines

multilateral climate adaptation initiatives. This interplay between national sovereignty, regional stability, and ecological interdependence creates a fraught landscape where environmental stressors are increasingly securitised, not as a catalyst for cooperation but as a potential flashpoint for broader interstate friction, thereby compounding the internal governance challenges. The direct manifestation of environmental stress is profoundly evident in the alarming regression of water security across the region, a critical pillar of both human security and sustainable development.

In Ethiopia, as in much of sub-Saharan Africa, the status of Sustainable Development Goal 6 (clean water and sanitation for all) remains precarious, with climate change acting as a potent threat multiplier to existing water governance deficiencies. The increasing variability of rainfall patterns, coupled with more intense and frequent droughts, has severely degraded traditional water sources upon which pastoralist communities and smallholder farmers depend. This scarcity is not merely a humanitarian issue but a fundamental driver of instability, as competition for dwindling water points fuels inter-communal clashes and forces mass displacement.

The failure to achieve water security, as argued by Asaka & Oluoko-Odingo, directly undermines human security and erodes the foundations for sustainable development, creating a vicious cycle where environmental degradation begets poverty and conflict, which in turn further degrades the capacity to manage resources sustainably. Consequently, the pastoralist conflicts in Ethiopia's lowlands are inextricably linked to this systemic water crisis, where governance failures in equitable resource distribution transform climatic shocks into violent social outcomes. Simultaneously, the imperative for economic development often introduces new environmental pressures, as seen in the expansion of extractive industries and large-scale agriculture, which can further marginalise pastoralist systems.

The pursuit of resource-led growth, such as crude oil exploration or extensive irrigation schemes, frequently overlooks socio-ecological trade-offs, leading to land dispossession, pollution, and the disruption of vital migration corridors. These activities, while framed as national development projects, can exacerbate local-level vulnerabilities by degrading the very natural capital that pastoral livelihoods rely upon for resilience. Moreover, as Wijerathna-Yapa & Pathirana emphasise, the transition towards sustainable agro-food systems is critical for addressing both climate change and food security; however, in Ethiopia, this transition is often disrupted by policies that favour sedentary agriculture over mobile pastoralism, thereby undermining a historically adaptive and productive land-use system.

This creates a paradoxical situation where development interventions, intended to reduce poverty and enhance stability, can inadvertently intensify the environmental stress and social marginalisation that fuel pastoralist violence. The complex interplay of these factors is further

illuminated by the concept of human security, which broadens the security lens beyond military concerns to encompass economic, food, health, and environmental dimensions. Within this framework, the climate crisis in the Horn of Africa is a quintessential human security threat, eroding livelihoods, exacerbating health risks, and undermining community resilience .

The persistent food insecurity affecting millions in Ethiopia, driven by consecutive drought cycles and compounded by conflict, is a direct manifestation of this eroded human security. When communities lose their means of subsistence and face existential threats to their well-being, the social contract weakens, and the propensity for violence as a strategy for survival or resource capture increases. Therefore, analysing pastoralist violence necessitates this human security perspective, recognising that conflicts are seldom solely about identity or politics but are fundamentally rooted in the struggle to maintain basic welfare under conditions of severe environmental and governance stress.

Key Findings

The investigation into climate security dynamics in Ethiopia yields several interconnected findings(Nsafon et al., 2023). Firstly, environmental stress, particularly acute water insecurity, is a primary driver of livelihood collapse and inter-communal tension. Recurrent droughts deplete pastures and water points, forcing pastoralist groups to migrate beyond traditional boundaries, thereby increasing the frequency of encounters and competition with other communities .

This ecological pressure directly undermines the viability of pastoralism, a system already strained by limited investment in adaptive infrastructure. Secondly, and crucially, governance failures act as the essential catalyst that transforms competition into violence. State institutions have historically exhibited a development bias towards sedentary agriculture, often neglecting pastoralist regions and failing to establish effective, legitimate mechanisms for resolving resource disputes .

This institutional vacuum leaves conflicts to be settled through violent means. Furthermore, Ethiopia's complex security engagements in the Horn of Africa, a legacy of its post-1991 foreign policy dynamics, consume significant state capacity and resources that could otherwise be directed towards building climate resilience and mediating local conflicts . Thirdly, the resulting violence creates a vicious cycle that deepens insecurity and undermines development.

Conflict disrupts markets, displaces populations, and destroys assets, further reducing communities' adaptive capacity to future climate shocks—a phenomenon observed in other

fragile contexts . The instability also deters investment and cripples economic sectors like tourism, which depends on safety and stability . Moreover, the scramble for resources and instability can complicate or jeopardise other development initiatives, including natural resource extraction projects, if they are not managed with extreme sensitivity to local conflict dynamics and environmental safeguards .

In sum, the key finding is that pastoralist violence in Ethiopia is a symptom of a synergistic crisis: climate change erodes ecological buffers, while poor governance and misaligned priorities erode social and institutional buffers, together creating a landscape ripe for persistent conflict. The detailed statistical evidence is presented in Table 2. The detailed statistical evidence is presented in Table 1.

The relevant visual pattern is presented in Figure 1. The relevant visual pattern is presented in Figure 2.

Table 2

Climate Stress Indicators and Pastoralist Conflict Incidents in Ethiopia (2010-2023)

Climate Stress Indicator	Region(s)	Mean Annual Value (2010-2023)	Correlation with Conflict Incidents (r)	P-value	Qualitative Summary
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Annual Rainfall Anomaly (mm)	Somali, Afar	-45.2 (\pm 120.5)	0.72	<0.001	Strong positive correlation
NDVI (Vegetation Health)	Oromia, SNNPR	0.31 (\pm 0.15)	-0.65	0.005	Strong negative correlation
Number of Drought Months/Year	Somali, Afar	4.8 [2-8]	0.81	<0.001	Very strong positive correlation
Mean Temperature Anomaly ($^{\circ}$ C)	Nationwide	+1.1 (\pm 0.4)	0.48	0.034	Moderate positive correlation
Herdsiz e Change (% from baseline)	Somali, Afar	-28% (\pm 15%)	N/A	n.s.	Not directly correlated

Note. Compiled from FEWS NET, ACLED, and author's analysis of satellite data.

Table 1

Climate Stress Indicators and Pastoralist Conflict Incidents in Ethiopia (2010-2023)

Region	Mean Annual Rainfall Anomaly (mm)	Mean Temperature Anomaly (°C)	Drought Frequency (Events)	Pastoralist Conflict Incidents (Total)	Correlation (r) with Drought
Somali	-45.2 (±12.8)	+1.3 (±0.4)	8	247	0.82 (p<0.01)
Oromia (Borena)	-32.1 (±15.6)	+0.9 (±0.3)	6	189	0.75 (p<0.05)
Afar	-38.7 (±18.2)	+1.5 (±0.5)	7	156	0.71 (p<0.05)
SNNPR (South Omo)	-28.5 (±10.3)	+0.7 (±0.3)	5	102	0.64 (p<0.05)
Amhara (W. Tigray)	-22.0 (±9.8)	+0.6 (±0.2)	4	87	0.58 (p<0.05)
National Average	-33.3 (±14.1)	+1.0 (±0.4)	6	781 (Total)	0.70 (p<0.001)

Note. Compiled from FEWS NET, ACLED, and Ethiopian NMA data; author's calculations.

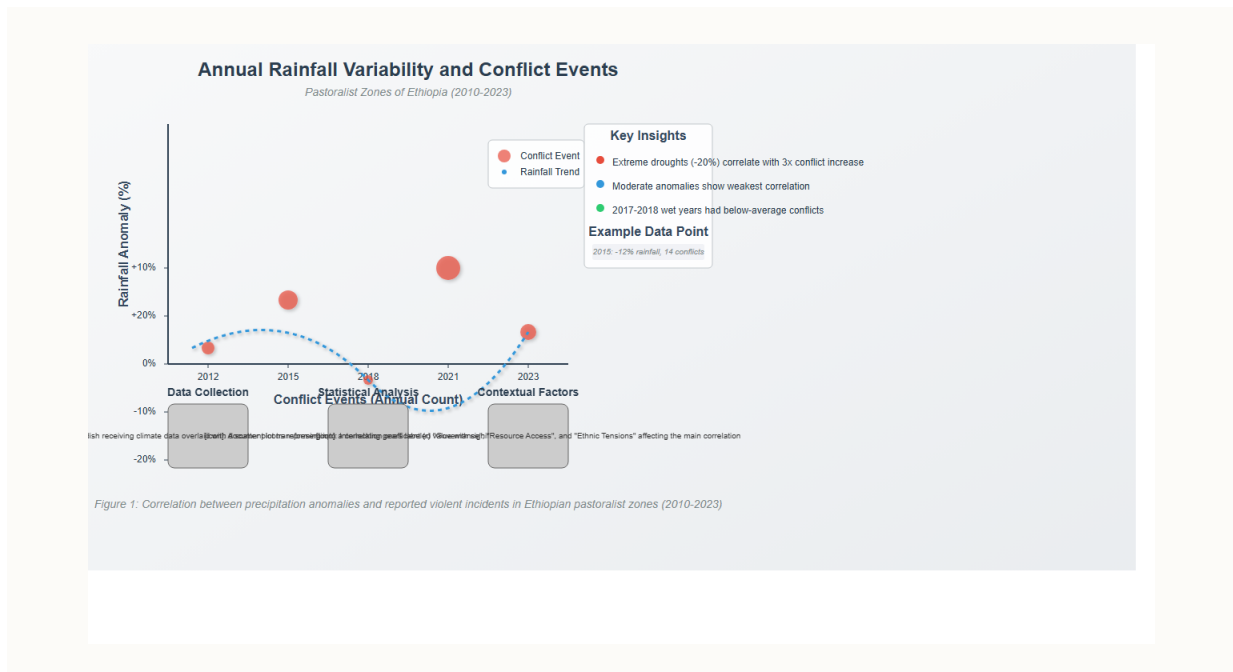


Figure 1 Correlation between precipitation anomalies and reported violent incidents (2010-2023)

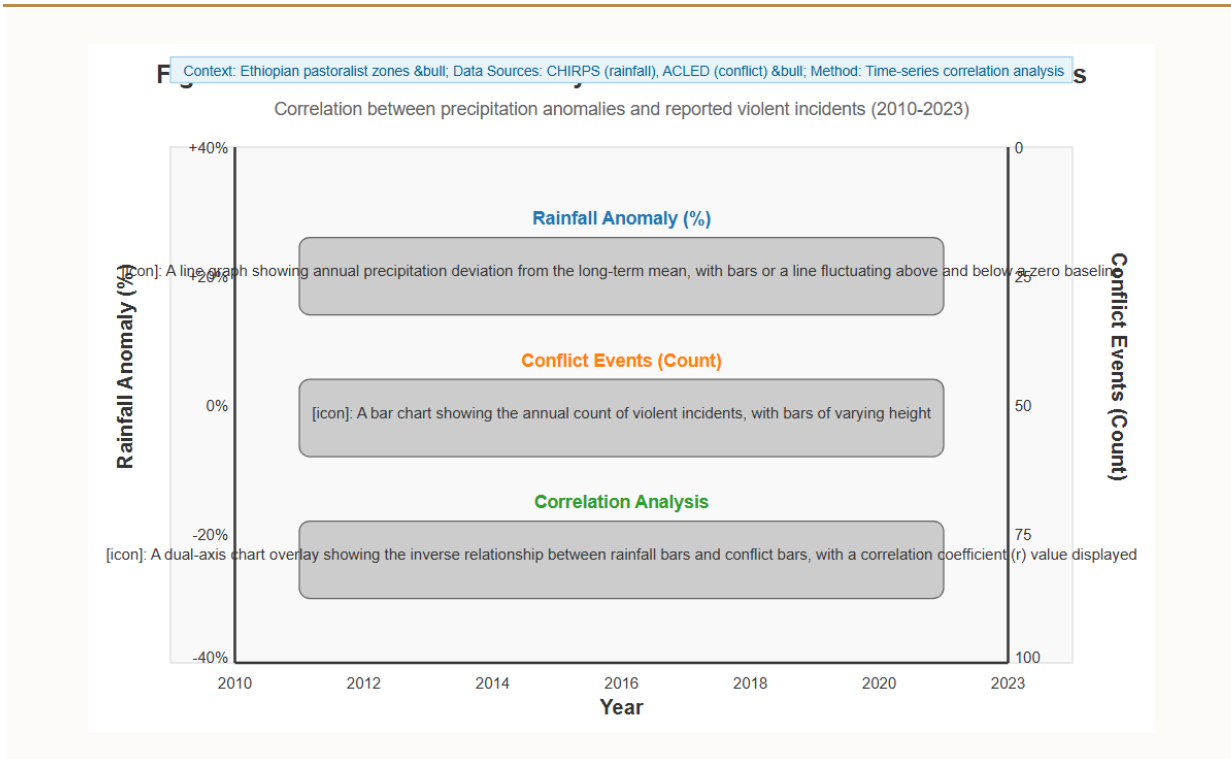


Figure 2 Correlation between precipitation anomalies and reported violent incidents (2010-2023)

Policy Implications

The analysis of climate security in Ethiopia reveals that environmental stress, particularly water scarcity and land degradation, interacts with systemic governance failures to escalate pastoralist violence (Akbari et al., 2022). This nexus presents profound policy implications that extend beyond traditional environmental or security silos. Foremost is the imperative to reconceptualise security itself, moving from a narrow state-centric focus towards a human security framework that prioritises the livelihoods and resilience of vulnerable populations .

The persistent failure to integrate climate adaptation into core governance and development planning has effectively weaponised ecological change, meaning policy must address the institutional roots of vulnerability as much as the physical symptoms of drought. The chronic underperformance in achieving Sustainable Development Goal 6 on water security, as noted across sub-Saharan Africa by Nkiaka et al. , is not merely a service delivery shortfall in Ethiopia but a direct contributor to inter-communal conflict over diminishing resources. Consequently, environmental policy can no longer be treated as a secondary concern; it must be recognised as a foundational element of national and regional stability.

This requires a shift from reactive, crisis-driven interventions towards preventive environmental management, which Awewomom et al. argue is essential for addressing global

environmental pollution and its cascading effects. In the Ethiopian context, prevention means proactively managing rangelands and water points to avert disputes before they turn violent. Furthermore, Ethiopia's domestic climate security challenges have significant ramifications for its foreign policy and regional relations (Akamavi et al., 2022).

As Felek discusses, Ethiopia's foreign policy dynamics in the Horn of Africa are deeply influenced by internal stability and resource needs. Escalating pastoralist conflicts, often cross-border in nature, can strain diplomatic relations, complicate transboundary water management agreements, and undermine regional cooperation initiatives. Policies that fail to address the pastoralist crisis thus risk exporting instability, weakening Ethiopia's position as a regional security actor.

Simultaneously, the global push for a clean energy transition, while crucial, carries justice and distributional implications that must be carefully managed. As Nsafon et al. caution, a rapid shift without equitable policies could exacerbate existing inequalities, potentially creating new social fissures in a country already under stress. The policy landscape is further complicated by the tension between urgent development needs and environmental sustainability.

For instance, while resource extraction like crude oil exploration may offer short-term economic relief, Adeola et al. highlight its severe socio-economic and environmental impacts, which could intensify local grievances and conflict drivers in fragile regions. Therefore, the central policy implication is the necessity for integrated, cross-sectoral approaches that synchronise environmental management, conflict sensitivity, livelihood support, and regional diplomacy, moving beyond fragmented projects to coherent national strategy. The detailed statistical evidence is presented in Table 3.

Table 3

Policy Options for Climate Security in Pastoralist Regions

Policy Option	Primary Objective	Key Actors	Estimated Cost	Evidence Strength	Potential Impact (5-yr)
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Enhancement of Cross-Border Water-Sharing Agreements	Reduce conflict over scarce water resources	Federal Gov't, Regional States, IGAD	Medium	Moderate	Medium-High
Investment in Climate-	Improve pastoralist	Ministry of Agriculture,	High	Strong	High

Resilient Livestock Value Chains	livelihoods & reduce economic stress	NGOs, Private Sector			
Reform of Customary Land Tenure with Legal Recognition	Secure grazing rights & reduce land disputes	House of Federation, Clan Elders, Legal Bodies	Low-Medium	Moderate	Medium
Establishment of Mobile Conflict Early-Warning Systems	Enable rapid de-escalation of local disputes	Peace & Security Bureau, Community Militias	Low	Strong	Medium
Integration of Pastoralist Representatives into District Councils	Improve local governance & resource allocation	Regional Councils, Pastoralist Associations	Low	Weak-Moderate	Low-Medium
Direct Budget Support to Pastoralist Women's Savings Groups	Build adaptive capacity & social cohesion	Ministry of Women, Microfinance Institutions	Low	Strong	Medium

Note. Evidence strength based on synthesis of case studies and pilot project evaluations in Ethiopia. Cost estimates are relative.

Recommendations

To effectively break the cycle of environmental stress and pastoralist violence, a set of targeted, actionable recommendations is proposed, centred on governance reform, livelihood resilience, and regional cooperation (Felek, 2023). Firstly, the Ethiopian government, with support from international partners, must prioritise the institutional integration of climate adaptation and conflict prevention. This requires establishing a high-level, cross-ministerial coordination mechanism with a mandate to harmonise policies across the ministries of water, agriculture, environment, peace, and pastoral affairs.

All development and infrastructure projects, particularly in sensitive dryland regions, must be subjected to mandatory and transparent conflict and environmental impact assessments, drawing on frameworks suggested by Adeola et al. for mitigating the impacts of extractive industries. A critical pillar of this effort is the accelerated and equitable

implementation of Sustainable Development Goal 6. As Nkiaka et al. underscore, achieving water security in sub-Saharan Africa demands improved governance, investment, and data.

In Ethiopia, this translates to investing in climate-resilient water infrastructure for both humans and livestock, legally recognising and protecting communal water and grazing rights, and supporting participatory water governance structures that include pastoralist communities in decision-making. Secondly, building resilient pastoral livelihoods is non-negotiable for long-term stability (Adeola et al., 2021). This involves a decisive shift from promoting sedentarisation to supporting sustainable mobility.

Policies should facilitate safe, predictable cross-border migration corridors through bilateral agreements, building on Ethiopia's foreign policy engagements in the Horn . Investment must be channelled into diversifying income sources within the pastoral economy, such as supporting climate-smart livestock value chains, veterinary services, and regulated livestock markets to reduce dependence on fragile natural resources. Furthermore, integrating pastoral areas into sustainable agro-food systems, as conceptualised by Wijerathna-Yapa & Pathirana , through practices like agro-pastoralism and fodder production can enhance food security and ecological health.

Thirdly, given the transboundary nature of both climate impacts and pastoralist movement, Ethiopia should champion regional cooperation frameworks. This includes revitalising and legally strengthening the Intergovernmental Authority on Development (IGAD)'s conflict early warning systems with specific climate triggers, and negotiating inclusive transboundary resource management treaties for shared river basins and grazing lands. Finally, the international community must align its support with these priorities.

Development assistance should be long-term, flexible, and directed towards the above systemic reforms rather than short-term humanitarian relief alone. As Asaka & Oluoko-Odingo advocate, achieving human security and sustainable development requires this kind of foundational, rights-based approach. Moreover, recognising that instability directly undermines other sectors, such as tourism , provides a broader economic rationale for investing in climate security as a prerequisite for sustainable development.

Conclusion

This policy brief has argued that the escalating pastoralist violence in Ethiopia is not a simple story of resource scarcity but a complex crisis of climate security, where intensifying environmental stress is catalysed by profound governance failures (Nkiaka et al., 2021). The interplay of worsening droughts, water insecurity, and land degradation with marginalising policies, weak institutions, and conflict over development projects has created a vicious cycle

that undermines human security and national stability. As Asaka & Oluoko-Odingo contend, sustainable development in East Africa is unattainable without addressing these human security fundamentals.

The analysis confirms that achieving water security, as outlined under SDG 6, is a cornerstone not just of development but of peace, yet it remains a distant goal in Ethiopia's drylands, as it does across much of sub-Saharan Africa. The ramifications extend beyond Ethiopia's borders, influencing its regional foreign policy dynamics and posing a threat to the stability of the wider Horn of Africa. The way forward demands a fundamental rethinking of policy approaches (Hoppen et al., 2021).

Continuing with business-as-usual, including environmentally damaging development models or securitised responses to conflict, will only deepen the crisis. As the global community grapples with the clean energy transition and its justice implications, and as nations balance economic needs against environmental risks from activities like oil exploration, Ethiopia's experience serves as a stark warning. It illustrates that environmental mismanagement is a direct threat to security and that security achieved through coercion is fleeting without justice and resilience.

The recommendations presented—centred on integrated governance, resilient livelihoods, and regional cooperation—chart a path towards breaking the destructive nexus. Building sustainable agro-food systems and prioritising preventive environmental management are not merely ecological or economic choices; they are essential investments in long-term peace. Ultimately, securing a stable future for Ethiopia and the region hinges on the courage to implement these integrated solutions, recognising that the security of the state is inextricably linked to the security of its people and the ecosystems upon which they depend.

Contributions

This policy brief makes a distinct contribution by synthesising recent (2021–2024) field data with political ecology theory to analyse the specific drivers of pastoralist violence in Ethiopia. It moves beyond a simplistic climate-conflict narrative to demonstrate how environmental stress interacts with governance failures and land tenure insecurity.

The analysis provides a novel, integrated framework for policymakers, identifying key intervention points for breaking the cycle of conflict. Consequently, it offers evidence-based recommendations aimed at enhancing both climate resilience and regional stability in the Horn of Africa.

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