



THE VANISHING PASTURES: RANGELAND DEGRADATION AND THE IMPERILLED FUTURE OF SOMALILAND'S PASTORAL COMMUNITIES.



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Contents Page

1. Introduction	1
2. Historical Background: Rangeland Management	4
2.1 Issues and Impacts of Rangeland Management in Somaliland.	5
2.2 Why is rangeland management important in Somaliland?	10
3. Best Practices in Rangeland Management	13
3.1 Rangeland Management in Ethiopia:	13
3.2. Rangeland Management in Kenya.....	15
3.3. Sustainable Rangeland Management Practices in Somaliland	17
4. Strategic Options for Future Rangeland Management in Somaliland	18
a. Integrated Community-Based Rangeland Management (CBRM)	18
b. Centralized Policy Reform and Land Tenure Clarification	19
c. Pastoral Green Growth Corridor Initiative (PGGCI)	19
5. Way Forward: Advancing Rangeland Management in Somaliland	20
5.1 The Role of Government.....	20
5.2 The Role of Communities.....	21
5.3 The Role of Researchers.....	22
6. Conclusion	23
About the Author	24
Reference List	25

The Vanishing Pastures: Rangeland Degradation and the Imperilled Future of Somaliland's Pastoral Communities.

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Key Words: *Rangeland, Ecosystem, Rangeland Management, Communal Rangelands, Pastoralist, Grazing Reserves, Community-based Rangeland Management, Rangeland Degradation.*

1. Introduction

Pastoralism in Somaliland, much like in other Somali pastoralist societies, is a deeply embedded cultural and economic system, sustaining the majority of the rural population and contributing significantly to the national GDP—particularly through the export of livestock such as sheep, goats, and camels to Gulf States (Catley et al., 2013; Mahmoud, 2010). Beyond its economic value, pastoralism shapes communal identity, traditional governance structures, and indigenous ecological knowledge systems. It also plays a key ecological role: pastoralists, through their mobility, manage rangelands sustainably by adapting to seasonal variations and preventing the overexploitation of fragile ecosystems (Flintan et al., 2019).

The rangelands of Somaliland are the primary resource base for pastoral livelihoods, offering forage and water which are critical for livestock survival. These semi-arid landscapes underpin seasonal migration routes, allowing for rotational grazing that maintains ecological balance and reduces pressure on specific areas (Nori, 2007). However, these systems are under increasing threat. Colonial-era attempts to introduce formal grazing reserves had limited success, and the collapse of governance following the

Somali civil war further undermined both state-led and traditional land management practices (Farah & Lewis, 1993). The breakdown of customary mobility systems, coupled with weak enforcement of land tenure, have led to widespread rangeland degradation, particularly in regions such as Balligubadle, Sallahley, Bookh, and Banawl.

Today, the degradation of rangelands is driven by interlinked factors including overgrazing, climate variability, unregulated enclosures, charcoal production, and urban sprawl (De Jode, 2010). This has led to a contraction of grazing zones, increased land conflicts, and a decline in livestock productivity. Without coordinated and climate-resilient strategies, these trends threaten not only the livelihoods of pastoralists but also national goals of achieving food security and reducing poverty. Recent community-led efforts integrating traditional *Xeer*—a customary Somali legal system based on collective agreement and clan-based mediation—with conservation and reforestation initiatives signal a hopeful shift, but require broader institutional support (Kirkbride & Grahn, 2008).

This paper sought to investigate the state of rangelands, including the

current challenges facing the pastoralist community in Somaliland. The study employed participatory approaches, combining field observations, key informant interviews, and focus group discussions. Qualitative data collection was conducted in three ecologically diverse regions Maroodijeex, Togdheer, and Sool chosen for their reliance on pastoralism and evident signs of land degradation. Specific sites included Balli-gubadle and Sallahley in Maroodijeex; Bookh and Ban-cawl in Togdheer; and Waylo-koriye in Sool. These areas face acute pressures from drought, bush encroachment, and breakdowns in communal land use

governance.

Fieldwork was enriched through dialogues with pastoral elders, herders, local authorities, and Non-Governmental Organizations practitioners. These exchanges illuminated shifts in mobility patterns, land tenure struggles, and emerging community strategies for adapting to environmental change. Observational visits assessed grazing conditions, bush density, soil erosion, and water point availability. Supplementary desk reviews of satellite imagery, rainfall records, and rangeland studies provided historical and ecological context (FAO-SWALIM, 2018; UNEP, 2020).

FIGURE 1

Location of Study Sites.

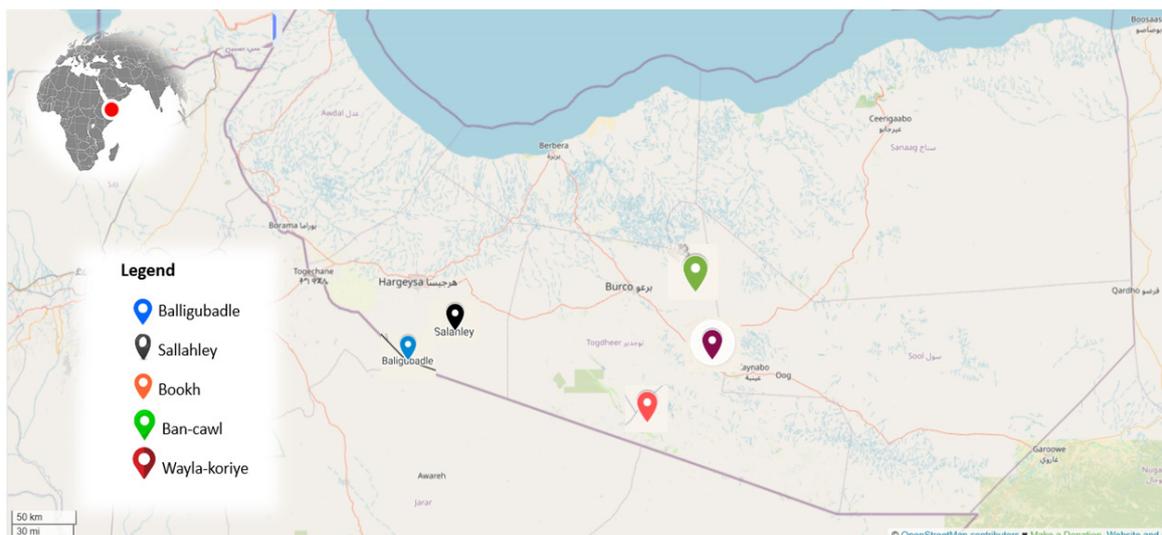


Figure 1. This map illustrates five distinct study sites selected for data collection and field observations. The visual representation highlights the geographic scope of the research, which spans across various regions of Somaliland and

border areas. These locations—*Balligubadle, Sallahley, Bookh, Ban-cawl, and Wayla-koriye* are strategically chosen to represent diverse ecological zones and pastoralist communities. The map provides a clear overview of the spatial distribution of the study areas, supporting research focused on land use, pastoralism, and rangeland ecology. Courtesy of: <https://www.openstreetmap.org>.

Somaliland's rangeland ecology spans arid to semi-arid zones, including acacia woodlands, scrublands, and desert grasslands. Annual rainfall averages between 100 and 500 mm, primarily during the *Gu* seasons (main spring wet season, typically from April to June) and *Deyr* (short autumn rainy season, usually from October to November) seasons. These ecosystems are particularly vulnerable to mismanagement and climate stressors. Customary systems of land governance, such as *Xeer*, continue to mediate access to rangelands, but modern pressures—including enclosures, sedentarization, and poor infrastructure—have weakened their authority and effectiveness (Watson & Catley, 2020).

To situate Somaliland's experiences within broader regional dynamics, the study also incorporated comparative case analysis from Ethiopia and Kenya. In Ethiopia, hybrid governance models that integrate customary institutions—most notably the indigenous *Gadaa* system—with scientific rangeland management practice and Community-Based Rangeland Management

(CBRM), have yielded tangible improvements in rangeland health and conflict mitigation, particularly in Borana and the Somali region (Gebre Michael & Kifleyesus, 2011). On the other hand, Kenya's institutional framework anchored in the Community Land Act and the National Rangeland Management Policy provides a structured legal basis for community ownership, and control over the land and natural resources. Practices like reseedling, rotational grazing, and regulated water use in Kenya's arid and semi-arid lands (ASALs) offer important policy lessons for Somaliland's emerging policies (MoALF, 2017; Flintan, 2021).

The findings from this study are intended to inform policy recommendations for sustainable rangeland governance in Somaliland by drawing on local knowledge, ecological realities, and regional best practices.

2. Historical Background: Rangeland Management

Somaliland is a de facto independent state that unilaterally declared independence from Somalia in 1991, but is not internationally recognized as a sovereign state (Bereketeab, 2012). Somaliland is characterised by arid and semi-arid climates. Vegetation ranges from desert grassland to open woodland habitats dominated by deciduous scrubland and patches of montane forest in some of the highest ecological zones (Ahmed, 2024). Historically, pastoralism has been the primary livelihood in the Somali region, with herders employing a system of nomadic rotation in response to the arid to semiarid environment (Ahmed, 2024).

The British Administration in the Somaliland Protectorate, which governed the territory until independence on 26 June 1960, introduced formal range management in the 1950s through a system of forest and grazing reserves, including famine reserves, utilizing a deferred grazing system (Ahmed 2024; Hartley, 1967). For instance, Heemstra's documentation states that in the Tuyo Seasonal Reserve, which was established in 1950, grazing was prohibited during rainy seasons but allowed in dry seasons (Heemstra, 1950s). According to research by John A. Hunt, the

Somaliland Protectorate's conditions between 1944 and 1950 suggested the redistribution of livestock to ease pressure on overgrazed areas near water sources (John, 1951). Subsequently, in 1951, significant efforts were made to reshape pastoral grazing patterns through the development of water infrastructure. This involved the construction of 30 surface reservoirs along a 483 km stretch north of the Ethiopian border to provide water in arid regions (Lawrence, 1963).

In 1972, under Siad Barre's government, the establishment of the National Range Agency (NRA) marked the beginning of efforts by the authorities to tackle and mitigate ongoing rangeland degradation (Ahmed, 2024; Musse, 1981). These efforts included the establishment of seasonal grazing reserves and larger famine reserves to provide forage for livestock during dry periods through community-based pastoral associations. However, the 1988–1991 civil war and the collapse of central governance reversed these efforts. Rangeland laws were suspended, customary systems weakened, and uncontrolled grazing and land enclosures severely disrupted pastoral mobility, worsening degradation.

Historical and recent factors have significantly shaped rangeland management practices in Somaliland, particularly concerning grazing reserves. In recent years, Somaliland has pursued community-led rangeland management reforms. Five grazing areas (e.g., Bancawl, Casuura, Bookh, Aroori, and Tuuyo) are now under local communities, and twenty additional sites are under review (NDP III, 2023). Despite progress, severe land degradation persists, according to the Ministry of Environment and Climate Change, with nearly 30% of land classified as highly degraded (MoECC, 2017) due to vegetation loss, soil erosion, and deforestation, largely driven by overgrazing, enclosure expansion, and climate stress.

Recent research shows that Somaliland is experiencing severe land degradation driven by vegetation loss, soil erosion, and deforestation—mainly due to overgrazing, unsustainable farming, and expanding land enclosures. These human-induced activities disrupt traditional grazing patterns, concentrate livestock pressure, and accelerate environmental decline (MoECC, 2017). Though gradual, the degradation leads to reduced agricultural productivity occasioned by shrinking grazing land, disrupted water cycles, and infrastructure damage—ultimately threatening food security, economic stability, and

ecological resilience.

2.1 Issues and Impacts of Rangeland Management in Somaliland.

Rangeland ecosystems are vital to the livelihoods and survival strategies of millions globally. They cover roughly 40% of the Earth's land surface and support more than 38% of the global population (FAO, 2022). In Africa, rangelands occupy 43% of the continental landmass, forming part of the broader 70% of terrain classified as drylands (ILRI, 2021). Pastoralism is the dominant land use system across these areas, accounting for approximately 40% of land area and providing food security and income for vast rural populations (AU-IBAR, 2018).

In Somaliland, where nearly 45% of the population is pastoral or agropastoral (NDP III, 2022), the health and accessibility of rangelands are central to socio-economic stability. However, these ecosystems are threatened by interlinked environmental, institutional, and economic pressures.

One of the most visible threats is overgrazing, particularly in areas such as Balli-gubadle, Sallahley and Waylo-koriye, where increased livestock concentration—caused by sedentarization and conflict-related displacement, has strained specific grazing zones. As traditional migratory routes become blocked

or restricted, overutilization leads to land degradation and desertification, evidenced by dry soil, disappearing vegetation, and declining rangeland productivity.

According to the environmental expert interviewed in this study, overgrazing induces soil compaction, a condition caused by the continuous trampling of the soil by livestock, the depletion of organic matter, and the impact of raindrops on exposed soil surfaces. This process leads to the formation of a hardened hardpan layer that limits water infiltration and root penetration, significantly reducing soil fertility and productivity. This expert further noted that:

“Overgrazing often results from overstocking and overstay of livestock over long periods on the same land. It selectively removes palatable plant species, allowing non-palatable, invasive, and noxious plants to dominate. This shift in plant composition reduces biodiversity and pasture quality, further undermining the resilience of the ecosystem”.

The expert explains that overgrazing occurs when livestock remain in one place for too long, consuming the most nutritious vegetation and leaving behind less desirable plants. Over time this unwanted species dominates, leading to a decline in plant diversity and pasture quality. This weakens the

land, making it less resilient to drought and reducing its ability to sustain healthy grazing in the future.

One local elder in Qoolcaday indicated that seasonal mobility has for a long time been one of the key strategies for managing rangelands. According to the elder:

“We used to move livestock seasonally to access pastures and water, allowing areas like Banka Qoolcaday to rest and naturally regenerate during the wet season. But now, due to the expansion of private enclosures around Qoolcaday plain, our livestock remain in the Qoolcaday plain during both the rainy and dry seasons.”

This shift undermines the effectiveness of traditional rotational grazing systems, resulting in reduced livestock mobility, disrupted rangeland regeneration, and the breakdown of community-based grazing practices.

Deforestation exacerbates land degradation by removing tree cover that stabilizes the soil, maintains moisture, and supports biodiversity. The combined effects of overgrazing and deforestation create a vicious cycle of degradation, where poor soil conditions hinder vegetation growth, which in turn accelerates erosion and further soil-quality decline.

This dual-impact scenario highlights the accelerating process of rangeland

degradation, where overgrazing triggers both physical soil deterioration and a shift in plant community composition towards less desirable species. These interconnected forces compound environmental stress, reduce the productive capacity of rangelands, and ultimately threaten the sustainability of pastoral systems and the livelihoods that depend on them.

The impact of encroachment and unregulated land use is especially stark in rangeland areas around Qolcaday treeless plain (*Banka Qolcaday*), where the spread of private enclosures (*Ceshiimo*, in Somali terms) and unplanned farming have reduced communal grazing space. These enclosures not only disrupt pastoral movement but often emerge without community consensus or legal clarity, deepening tensions and ecological fragility.

During the data collection phase

of the study, one member of the Sallahley Agro-Pastoralist Association highlighted a growing concern over the proliferation of private land enclosures, which are rapidly transforming the landscape and threatening traditional pastoral systems.

"This area was once renowned for its livestock," he remarked, "but now they are in danger of disappearing because individuals have taken over the communal grazing lands. For example, I own 150 sheep and cattle, but I plan to sell most of them because I no longer have access to the grazing land they depend on".

This respondent's testimony underscores the broader trend of land privatization that undermines communal grazing systems essential to pastoral livelihoods. The loss of open access to rangelands not only forces livestock producers to reduce herd sizes but also erodes social cohesion, intensifies resource-based conflicts, and accelerates rural impoverishment.

FIGURE 2

Private enclosures in Sallahley Rangelands



Figure 2, Private enclosures in Sallahley Rangelands. This satellite image vividly illustrates the widespread emergence of private enclosures in the Sallahley rangelands of Somaliland. The visible patchwork of polygonal

shapes represents areas that have been fenced or demarcated for exclusive use, often by individuals or families. This trend marks a significant departure from the traditional, communal use of rangelands historically managed through customary governance systems and, more recently, formal institutions. The rapid proliferation of enclosures is driving land fragmentation, undermining traditional pastoral livelihoods, and contributing to growing social tensions and ecological degradation. Data Source: Composite of satellite data from [OpenStreetMap](#) and contributors (Esri, USGS, NASA, METI, Microsoft Impact Observatory).

Similar to other sites in Tuuyo and Banawl, a drought-prone region in the east, the effects of climate variability and drought have been devastating. Repeated dry seasons have exhausted local pasture, while the lack of climate-resilient infrastructure and early warning systems leaves herders unprepared. These shocks often lead to livestock losses, debt, and in some cases, permanent migration away from pastoral life.

The degradation is compounded by Somaliland's weak land tenure system. Disputes over grazing rights and ownership are common in regions like Bookh and Qolcaday, where clan claims, returnee settlements, and speculative land grabs coexist without formal adjudication or documentation. The erosion of customary governance mechanisms leaves communities vulnerable and powerless in the face of elite land acquisition.

According to the Director of Planning, Policy, and Research at the Ministry of Environment and Climate

Change, Somaliland currently lacks a comprehensive and standalone national rangeland management policy. In addition, existing land tenure and environmental regulations are fragmented, outdated, and inconsistently applied across sectors. This policy vacuum contributes to weak governance over rangeland resources, limiting the government's ability to plan and regulate land use effectively.

The coexistence of customary and formal legal systems further complicates land governance. These parallel systems often operate in conflict, particularly over the control and allocation of communal grazing lands. Regulatory enforcement remains particularly weak in curbing the spread of private land enclosures, the proliferation of charcoal production, and other unsustainable land use practices. These gaps have significantly accelerated rangeland degradation and undermined collective management traditions that once sustained ecological balance.

Poor institutional coordination among

ministries (e.g., livestock, environment, agriculture and interior) further limits effective rangeland governance. For instance, in Sallahley, efforts to protect migratory routes have stalled due to a lack of clarity over mandates and the absence of a cohesive rangeland policy. Without coordinated oversight, unsustainable practices like indiscriminate fencing and deforestation continue unchecked.

According to a statement from the Ministry of Environment and Climate Change (MoECC), the institutional fragmentation remains a critical barrier to effective rangeland governance in Somaliland. Multiple government ministries—including the Ministry of Environment and Climate Change, the Ministry of Agriculture, and the Ministry of Livestock—share overlapping mandates in natural resource management, which has resulted in significant coordination gaps and jurisdictional ambiguity.

Moreover, government institutions tasked with managing rangelands face substantial limitations in both human and financial resources. These agencies often lack the technical expertise, operational funding, and logistical infrastructure required to effectively monitor, map, and sustainably manage the country's expansive and ecologically diverse rangeland areas.

This capacity deficit undermines the state's ability to implement long-term planning, enforce regulations, or respond adaptively to environmental degradation.

Charcoal production is another major threat, especially near Balli-gubadle and Sallahley, where demand from urban centres drives widespread cutting of acacia trees. The loss of tree cover worsens soil erosion, reduces biodiversity, and leaves the land more vulnerable to flash floods and drought.

According to an elderly resident of Ina-Guuxaa, charcoal production remains a widespread and environmentally destructive activity in the region. Observations indicate that on a daily basis, four lorries cross the Ina-Guuxaa border, each carrying approximately 130 sacks of charcoal. Given that two sacks are typically derived from a single acacia tree, each lorry represents the loss of an estimated 65 mature acacia trees. Cumulatively, this translates to 120 lorries transporting around 15,600 sacks of charcoal per month—corresponding to the felling of approximately 7,800 acacia trees within that same period.

This scale of extraction poses a critical threat to biodiversity, accelerates desertification, and undermines efforts toward sustainable land management. Without effective regulation and

the promotion of alternative energy sources, the unchecked charcoal trade risks irreversible damage to Somaliland's rangeland ecosystems.

Expanding urbanization and the rapid growth of rural villages (*Tuulo*) are also fragmenting critical rangeland corridors. This environmental decline is further compounded by infrastructure developments—most notably the Berbera Road networks—which, while economically significant, disrupt traditional migratory routes. As roads, fences, and settlements expand, they cut off access to seasonal grazing and water sources, and further concentrate livestock in fragile zones.

Moreover, there are serious knowledge and capacity gaps among both herding communities and local authorities. In places like Ban-awl, there is limited awareness or training on rotational grazing, soil restoration, or sustainable pasture management. Government extension services rarely reach these remote areas, leaving herders without resilience and adaptation support.

Lastly, while Somaliland is seeking to expand livestock exports to Gulf markets, there remains a disconnect between livestock marketing strategies and rangeland sustainability. Although the country sees potential in increasing trade, little investment has been made in improving grazing systems

or restoring degraded rangelands to meet rising demand (FEWSN, 2020). In areas like Sallahley, increased herd sizes driven by trade prospects are not matched by land restoration efforts, accelerating rangeland exhaustion.

The rangeland management in Somaliland is caught in a cycle of degradation driven by demographic pressure, weak governance, climate shocks, and market neglect. Localised impacts in areas such as Sallahley, Balli-gubadle, Bookh, Casuura, and Ban-awl reflect the national pattern. An integrated rangeland management approach—combining climate resilience, legal reform, inter-ministerial coordination, and local knowledge—is essential to safeguard pastoral livelihoods and the long-term sustainability of Somaliland's drylands.

2.2 Why is rangeland management important in Somaliland?

Rangeland management in Somaliland is not merely an environmental issue—it is a foundational pillar of the country's economic resilience, social stability, and ecological survival. With approximately 45% of Somaliland's population directly dependent on pastoralism for their livelihoods, the productivity, accessibility, and governance of rangelands directly shape the living conditions of nearly half the nation (MoPND, 2022). The

health of these rangelands determines not only household incomes but also the functioning of livestock markets, cross-border trade, and climate adaptation strategies. In this context, rangeland governance plays a transformative role in ensuring peace, development, and sustainability across all regions of Somaliland. Thus, rangeland management plays critical roles in Somaliland.

1. Livelihoods and food security:

Somaliland's pastoral economy is anchored in the health and availability of rangelands. These lands provide critical grazing and water resources for millions of animals, forming the basis of livestock trade, the largest sector in the country's economy. Livestock products are the primary export commodity, supplying key markets in the Gulf region, particularly Saudi Arabia and the UAE (MoPND, 2015). However, persistent overgrazing, recurrent droughts, and poor rangeland governance have caused widespread land degradation, reduced pasture productivity and increased the vulnerability of herds to disease and starvation.

When rangelands degrade, pastoralists face a multi-layered crisis: livestock health deteriorates, household income collapses, food insecurity rises, and forced

migration becomes inevitable. Between 2021 and 2023, Somaliland witnessed substantial livestock losses due to drought-related pasture exhaustion (FSNAU, 2023). These losses not only affected rural incomes but also exerted pressure on urban centers, where displaced families migrated in search of aid. Therefore, strategic rangeland management—through rotational grazing, reseeding, and water infrastructure—offers a powerful tool for improving rural food security and poverty resilience.

2. Conflict prevention and displacement reduction:

Rangeland scarcity and governance failures are increasingly fueling inter-clan competition and land disputes, particularly where land tenure systems are weak or contested. As private enclosures and speculative fencing expand, pastoral mobility is disrupted, sparking grievances among communities who depend on open access grazing. These tensions often escalate into violent conflict, leading to internal displacement, strained social relations, and in some cases, retaliatory cycles of insecurity.

Traditional systems of negotiated access and customary land sharing—once effective in managing seasonal use—are

now under severe pressure due to population growth, elite capture, and legal ambiguities. Without deliberate efforts to strengthen conflict-sensitive rangeland governance, Somaliland risks increased pastoral marginalization and loss of customary livelihoods. An effective rangeland management framework must therefore clarify communal rights, protect grazing corridors, regulate land enclosure, and invest in local dispute resolution structures, ensuring that both access and ownership are equitable and transparent.

3. **Climate change adaptation and resilience:**

Somaliland lies in one of the world's most climate-vulnerable regions. The country is already grappling with prolonged drought cycles, erratic rainfall patterns, and advancing desertification (IGAD, 2022). In this context, rangelands play a vital role as natural climate buffers, supporting carbon storage, water retention, and vegetation cover. When rangelands are degraded, Somaliland loses these ecological services, exacerbating drought impacts and reducing the ability of communities to recover.

By contrast, healthy rangelands—maintained through community-led restoration, grazing regulation, and early warning systems—can

significantly enhance climate resilience. Such practices improve soil stability, promote regrowth of native grasses, and help recharge groundwater. Integrating rangeland management into national climate adaptation strategies not only ensures ecological sustainability but also reduces reliance on costly humanitarian interventions during drought emergencies. In this way, rangeland investment becomes both a climate and development priority.

4. **Ecological sustainability and biodiversity protection:**

Somaliland's rangelands are ecologically rich landscapes that support biodiverse habitats, including woodland ecosystems, seasonal wetlands, and dry savannahs. These environments host not only livestock but also medicinal plants, pollinators, and culturally significant wildlife. However, the growing pressure from charcoal production, deforestation, and unmanaged grazing is stripping these landscapes of their ecological value (UNEP, 2019)

Unchecked land degradation also threatens long-term food security by depleting soil fertility and reducing water retention capacity. Ecologically informed rangeland governance—emphasising afforestation, zoning of critical habitats, and reg-

ulation of destructive land use practices—can restore biodiversity and increase the long-term productivity of rangelands. Such efforts should be grounded in local knowledge and involve the pastoral communities as custodians of the land.

5. Regional trade and cross-border mobility: pastoralism in Somaliland is not confined within national borders; it is part of a transboundary livestock system extending across the Horn of Africa. Seasonal migration and shared grazing arrangements with communities in Ethiopia, Djibouti, and Puntland are essential for drought coping and herd diversification. However, these traditional mobility patterns are increasingly under threat due to fencing, land privatization, and a lack of bilateral coordination (IGAD-RPLRP, 2020). To sustain regional livestock trade and ensure pastoral resilience, rangeland management must include mechanisms for cross-border cooperation, corridor protection, and harmonization of land use policies. Strengthening

these linkages also contributes to regional peacebuilding and economic integration, positioning Somaliland as a key player in the broader Horn of Africa pastoral economy.

Rangeland management is a strategic development and governance priority for Somaliland. It lies at the intersection of livelihood security, ecological sustainability, conflict prevention, and climate resilience. The current trajectory—marked by degradation, unregulated access, and weak institutional capacity—threatens to undermine the very foundation of the pastoral economy that sustains nearly half of the population.

To reverse this trend, Somaliland needs an integrated and inclusive rangeland governance strategy that aligns customary practices with formal policy, promotes community-based restoration, and ensures equitable access for all. In doing so, Somaliland can safeguard its rangelands not only as a livelihood resource but as a national asset critical to its future stability and prosperity.

3. Best Practices in Rangeland Management

3.1 Rangeland Management in Ethiopia:

Somaliland and Ethiopia share a border within the arid and semi-arid rangeland zones of the

Horn of Africa, which support diverse ecosystems—grasslands, shrublands, and savannahs—and have histori-

cally sustained pastoralist livelihoods. The porous border between the two regions has facilitated seasonal mobility and cross-border grazing among clan-based communities.

In Ethiopia, lowland rangelands cover over 60% of the country's landmass (Government of Ethiopia, 2020), particularly in the Borana (Oromia), Afar, and Somali regions. These areas are home to pastoral and agro-pastoral communities whose livelihoods depend on livestock and access to communal rangelands. Over the past century, rangeland management in Ethiopia has evolved through a blend of traditional systems, state interventions, and donor-led development efforts.

The Borana Plateau is well known for its indigenous *Gadaa* system, a traditional hierarchical governance structure that regulates land use through seasonal mobility and customary laws (Coppock, 1994). However, the Borana rangelands have faced increasing pressure from overgrazing and the spread of sedentarization. In response, the Borana Rangeland Pilot Project (1977–1984), led by the International Livestock Centre for Africa (ILCA), introduced scientific rangeland management practices, including the establishment of grazing reserves and strategically located water points. Since the 1990s, the region has shifted toward Community-Based Rangeland

Management (CBRM), integrating local cooperatives with customary institutions. Today, grazing reserves exist in both traditional and NGO-supported forms, often as managed enclosures designed to conserve forage for use during dry periods (Bokutache, 2011)

The Afar pastoralism system is shaped by clan-based tenure systems and faces challenges such as conflicts over land rights and blocked seasonal migration routes. Access to resources is traditionally negotiated through customary leaders (*Makabantu*), who mediate migratory agreements among clans. Although dry-season grazing reserves are not formally marked, they are protected through social norms. Since the 1960s, state-led irrigation schemes like the Tendaho Sugar Project have reduced rangeland access, undermining mobility. Recent NGO-led initiatives now focus on ecological restoration using reseeding, soil bunds, and controlled grazing.

In Ethiopia's Somali Region, rangeland management is traditionally governed by *Xeer*, a clan-based system that regulates grazing, water use, and conflict resolution. Strategic grazing reserves near permanent water sources are protected through communal enforcement (Abdi, 2021). Earlier development efforts often ignored such indigenous systems, resulting in poor outcomes.

However, recent programs like Pastoralist Areas Resilience Improvement through Market Expansion (PRIME) and Resilience Building and Creation of Economic Opportunities in Ethiopia (RESET) now emphasize community-based planning, land rehabilitation, and the integration of traditional institutions into formal governance frameworks (USAID 2017).

Across Ethiopia's lowland regions, rangeland transformations reflect the combined influence of customary systems, state policies, and environmental pressures. While indigenous frameworks like the *Gadaa* and *Xeer* remain vital to pastoral resilience, sustainable rangeland management now depends on adaptive, community-driven approaches supported by inclusive governance.

3.2. Rangeland Management in Kenya

Rangelands occupy approximately 80% of Kenya's surface area and support key ecosystems and the livelihoods of millions, particularly pastoralist communities (Government of Kenya, 2013). These arid and semi-arid lands (ASALs) face increasing threats from climate change, land degradation, and unsustainable land-use practices.

Kenya and Somali communities share notable similarities in ecological conditions, pastureland characteristics,

and socioeconomic structures. Both regions are predominantly composed of ASALs, where pastoralism constitutes the principal source of livelihood and plays a central role in local economies and cultural systems.

National policies and Institutional frameworks in Kenya provide a strong foundation for rangeland management. Kenya has adopted a hybrid model that blends traditional pastoral knowledge with modern ecological principles.

Since the 1980s, Kenya has struggled with overgrazing and unregulated pasture enclosures, leading to widespread rangeland degradation. In response, from the early 2000s, the government began promoting government-managed grazing lands and reintroduced rotational grazing as a key strategy. This has since become a common practice to curb overgrazing and promote vegetation recovery. By the 2010s, restoration efforts expanded to include controlled enclosures, reseeding with drought-tolerant grasses, bush encroachment control, and water infrastructure development. These interventions, particularly scaled between 2013 and 2022, are now coordinated with grazing calendars to support sustainable land use and long-term ecological resilience.

Kenya has faced longstanding

challenges related to land disputes, particularly in pastoral and communal areas. To address these issues, the government enacted the Community Land Act in 2016, which formally recognises communal land rights. The Act empowers communities to form Community Land Management Committees (CLMCs), granting them the authority to develop and enforce land-use and grazing plans. This legal framework supports sustainable resource management while also promoting conflict resolution and local ownership of rangeland governance (MoAL&F 2017).

Like many other countries, Kenya has experienced the adverse effects of climate change. To reduce climate-related risks, the government implemented the National Climate Change Action Plan (2018–2022), which supports broader resilience efforts by promoting ecosystem-based adaptation—particularly in drought-prone arid and semi-arid lands (ASALs). This approach emphasizes sustainable land management and strengthens the capacity of vulnerable communities to cope with climate variability (Republic of Kenya, 2018)

At the county level, national frameworks are put into action through County Integrated Development Plans (CIDPs), which incorporate strategies

for climate adaptation, pasture improvement, and livestock mobility. These localized efforts are further supported by development partners (FOA & USAID, 2022), enhancing the capacity of the counties to implement sustainable rangeland and climate-resilient practices.

Historically, rangeland governance in Kenya evolved from colonial-era grazing policies—such as forest demarcation, grazing control, and livestock marketing—to modern frameworks that emphasize decentralization and participatory resource management (Annemiek P. Daniel L., 2017). The Kenya Rangelands Ecosystem Services Productivity (K-RESP) initiative exemplifies current trends in multi-stakeholder collaboration, supporting county grazing plans, mapping degradation hotspots, and facilitating community-based restoration using indigenous plant species. Overall, Kenya's experience demonstrates how coherent policy frameworks, local institutional support, and integration of traditional knowledge with scientific practices can enhance rangeland sustainability and resilience.

The comparison between Ethiopian and Kenyan rangeland management practices highlights distinct approaches shaped by their respective governance structures. Ethiopia relies heavily on

traditional governance and indigenous knowledge systems, with rangeland management practices deeply rooted in customary norms and communal decision-making. In contrast, Kenya adopts a more formalized and structured approach, guided by comprehensive national policies, legal frameworks, and modern ecological principles. This divergence underscores the importance of contextualizing rangeland management strategies to align with socio-political realities, while also suggesting potential benefits from integrating traditional knowledge with modern scientific practices for sustainable rangeland use.

3.3. Sustainable Rangeland Management Practices in Somaliland

One of the most prominent examples of successful rangeland rehabilitation in Somaliland is the Aroori Grazing Reserve, located in the Togdheer Region. Reestablished in 2016 with the support of the Somaliland Development Fund (SDF), Aroori has emerged as a flagship model for sustainable rangeland management and the most notable successes in the country's rangeland rehabilitation efforts. The initiative represents a strategic intervention to the interlinked challenges of rural poverty, restoring ecological bal-

ance, and livelihood insecurity in the region's fragile dryland ecosystems. It adopts an integrated approach encompassing community participation, local institutional strengthening, and the implementation of sustainable land management (SLM) practices. This holistic framework not only facilitates the restoration of degraded grazing lands but also strengthens communal governance mechanisms, thereby enhancing the long-term stewardship and resilience of Somaliland's rangeland resources. In the Sool Region, the Ministry of Environment and Climate Change (MoECC) has initiated a reseeded program aimed at revitalizing degraded rangelands, with a specific focus on the Waylo-Koriye area. This targeted intervention seeks to restore ecosystems that have been severely affected by overgrazing, recurrent droughts, and poor land management. By promoting the regeneration of native grass species, the program enhances forage availability, supports biodiversity, and strengthens the ecological resilience of pastoral systems. The reseeded initiative is further reinforced through community mobilization and technical training, fostering local ownership and ensuring sustainable, long-term impact on rangeland restoration and pastoral livelihoods.

4. Strategic Options for Future Rangeland Management in Somaliland

In light of the multi-dimensional pressures undermining Somaliland's rangeland ecosystems—ranging from overgrazing and the proliferation of enclosures to climate-induced stress and governance fragmentation—it is imperative to adopt integrated, forward-looking strategies. The sustainability of pastoralism, which supports approximately 45% of the national population and contributes significantly to the livestock export economy, depends on transforming current rangeland governance and restoration practices. This section proposes three strategic directions, grounded in empirical evidence and regional lessons, to guide the future of rangeland management in Somaliland.

a. Integrated Community-Based Rangeland Management (CBRM)

One strategic option is the adoption of an integrated community-based rangeland management (CBRM) framework that decentralises authority and empowers local pastoral institutions. This approach draws upon Somaliland's longstanding tradition of indigenous land governance (*Xeer*), which has historically regulated seasonal mobility and pasture sharing. However, as the expansion of private

enclosures and the breakdown of customary systems have diminished collective oversight, a revitalisation of community structures is essential.

Community-based rangeland management would involve the legal recognition of communal grazing areas, the formal establishment of local grazing committees, and the use of participatory planning to manage seasonal access and resolve disputes. Sustainable land management practices—such as rotational grazing, reseeding with native grasses, and the rehabilitation of water infrastructure—would be implemented under local stewardship. The Aroori Grazing Reserve model and recent reseeding initiatives in Waylo-Koriye demonstrate the potential effectiveness of community-led restoration, especially when combined with technical and institutional support.

This strategic direction directly responds to documented issues of overgrazing, loss of mobility, and weakened customary institutions, particularly in areas such as Banka Qoolcaday, Sallaxley, and Balli-Gubadle. It offers an ecologically sound and socially legitimate model for restoring degraded lands while preserving pastoral livelihoods.

b. Centralized Policy Reform and Land Tenure Clarification

A second strategic option involves comprehensive policy and institutional reform at the national level, with an emphasis on legal clarity, land tenure security, and inter-ministerial coordination. The absence of a unified national rangeland management policy, coupled with overlapping mandates among key ministries (e.g., Environment, Agriculture, and Livestock), has resulted in regulatory paralysis and fragmented implementation. This institutional incoherence has facilitated the unchecked spread of private land enclosures and charcoal-driven deforestation—key drivers of degradation in areas such as Sallahley, Bookh, and Ban-awl.

Developing and enforcing a national rangeland policy would provide a coherent legal and administrative framework for land use planning, environmental protection, and climate adaptation. Furthermore, the formal recognition of communal land tenure—supported by legislation and cadastral mapping—would reduce conflict, incentivize sustainable practices, and protect critical grazing corridors. Regulatory enforcement must also target unsustainable practices such as unlicensed enclosures and acacia deforestation for charcoal production.

This centralized policy direction aligns with the broader need for state-led coordination and investment, particularly in areas where institutional fragmentation has constrained progress. Lessons from Kenya's Community Land Act and National Rangeland Policy illustrate how legal empowerment and policy coherence can significantly enhance ecological resilience and local governance.

c. Pastoral Green Growth Corridor Initiative (PGGCI)

A third strategic direction proposes the establishment of a Pastoral Green Growth Corridor Initiative (PGGCI) that integrates rangeland restoration with economic infrastructure and trade development. As Somaliland positions itself as a livestock export hub—particularly through the Berbera Corridor—there is a risk that economic ambitions will outpace ecological recovery, leading to further land exhaustion.

The PGGCI approach would safeguard and formalize seasonal migratory routes while aligning rangeland management with livestock market development. This includes protecting transhumance corridors from fragmentation due to road construction and urban expansion, investing in fodder banks and veterinary infrastructure, and incentivizing climate-smart grazing

systems through public-private partnerships. The initiative would also promote transboundary cooperation with Ethiopia and Djibouti on shared rangeland access and drought contingency planning.

This option addresses the mismatch between growing herd sizes and limited rangeland capacity, particularly in regions affected by sedentarization and infrastructural encroachment. It introduces a paradigm of environmentally sensitive development, positioning rangelands not as marginal lands, but as critical economic and ecological assets.

In conclusion, each of these strategic options reflects a distinct but complementary approach to addressing Somaliland's rangeland crisis. Community-based rangeland management emphasizes local empowerment and restoration; centralized reform ensures legal clarity and institutional coordination; and the green growth corridor integrates environmental and economic priorities. Together, these options provide a roadmap for reversing degradation, supporting pastoral resilience, and achieving sustainable rangeland governance in Somaliland.

5. Way Forward: Advancing Rangeland Management in Somaliland

The degradation of Somaliland's rangelands—manifested through overgrazing, expansion of enclosures, climate shocks, and weak institutional governance—poses an existential threat to the country's pastoral economy and ecological resilience. This concluding section outlines a path forward to restore degraded rangelands and safeguard the future of pastoral livelihoods in Somaliland. The following pathways present a coherent roadmap grounded in evidence, centred on three pillars: government reform, community engagement, and research-driven innovation.

5.1 The Role of Government

Sustainable rangeland management in Somaliland begins with strong government leadership in policy, coordination, investment, and planning. Policy reform and enforcement are foundational. A National Rangeland Management Policy is urgently needed to provide legal recognition of communal grazing lands and seasonal mobility routes. This would harmonize customary grazing systems with statutory land tenure and environmental protection laws. Practices like unsanctioned

private enclosures (*Cashiimo*), indiscriminate fencing, and charcoal-driven deforestation—especially in fragile areas such as Balli-Gubadle and Sallahley—must be explicitly prohibited. Such a policy should also align formal laws with traditional norms like *Xeer*, ensuring that legal pluralism supports pastoral systems instead of undermining them.

Beyond laws, the government must address fragmented responsibilities through institutional coordination. Establishing an Inter-Ministerial Rangeland Governance Taskforce that includes the Ministries of Environment, Livestock, Agriculture, and Interior would streamline mandates and facilitate cohesive decision-making. At the local level, regional and district authorities need clear mandates, sufficient resources, and legal empowerment to manage rangeland use and mediate conflicts. Shared planning tools and data systems across ministries are necessary to integrate rangeland governance into broader development and climate adaptation agendas.

Achieving sustainability also requires public investment in pastoral infrastructure and resilience mechanisms. This includes constructing and maintaining water sources such as earth dams, solar-powered boreholes,

and *hafir* dams — small, excavated water reservoirs designed to collect and store rainwater for use during dry seasons — to support livestock during dry spells. Early warning systems that combine satellite data with indigenous forecasting can improve preparedness for drought. Public support must also include mobile veterinary services, drought recovery funds, and community-managed fodder banks.

Finally, government-led, pastoralist-friendly development planning must ensure that roads, settlements, and commercial farms do not disrupt traditional grazing corridors. National land use frameworks should identify and protect these corridors and create designated pastoral development zones to accommodate herd mobility and seasonal grazing cycles. Integrating pastoralist needs into national plans will secure livelihoods while reducing land-use conflict.

5.2 The Role of Communities

Communities are central actors in the sustainable use and protection of rangelands, particularly through self-governance, awareness-building, and local monitoring. Community-based rangeland management offers an effective approach, where local grazing committees are formalized with authority to enforce traditional rules, coordinate seasonal grazing

calendars, and resolve disputes. Successful examples, such as the Aroori and Waylo-Koriye restoration initiatives, demonstrate the power of community-driven land use arrangements in reversing degradation and strengthening social cohesion.

Local efforts must also focus on awareness and education to inspire behavioral shifts that align with ecological needs. Leveraging local media, religious leaders, and community elders can raise understanding of the causes and consequences of land degradation, climate risks, and the value of rotational grazing. Equally important is the facilitation of intergenerational learning through peer-to-peer networks that connect experienced herders with youth to promote indigenous ecological knowledge.

As competition over scarce resources increases, conflict resolution mechanisms rooted in customary practices must be revitalized and supported. Clan-based dialogues should be facilitated to address disputes related to migratory routes, blocked grazing access, and illegal enclosures. Customary institutions—such as elders' councils and clan arbitration systems—must be strengthened with legal recognition and support to ensure their continued relevance and authority in a changing socio-political context.

Community participation should extend to participatory monitoring of rangeland conditions. Training herders in basic ecological assessment—such as grass cover observation, soil quality analysis, and erosion tracking—will equip them to serve as frontline stewards of the land. Establishing collaborative platforms that link community monitors with government agencies will create a two-way feedback loop for timely intervention and planning.

5.3 The Role of Researchers

Researchers play a vital role in informing rangeland governance through evidence, innovation, and capacity building. Evidence-based insights are critical to guide decision-makers, especially when drawn from both participatory methods and technological tools like remote sensing. Mapping traditional grazing corridors, seasonal water sources, and ecologically stressed zones, allows for more precise interventions. Conducting baseline assessments of rangeland health and identifying degradation hotspots provides a scientific foundation for long-term restoration planning.

To influence actual policies, research must be geared toward policy-relevant outputs that address the real concerns of planners and pastoral communities. Socio-economic studies that compare the costs of inaction with the benefits

of restoration—especially in highly degraded zones like Ban-Awl and Bookh—are essential for prioritizing interventions. Research must also critically examine existing land tenure systems and practices to uncover their implications for both environmental sustainability and social equity.

Research institutions should also lead in supporting innovation in pastoral production systems. This includes piloting and evaluating new models such as rotational grazing, drought-tolerant forage crops, community fodder production, and reseeded techniques. Climate-smart restoration practices, such as bush thinning, seed broadcasting, and soil bund

construction, should be tested in real-world community settings to determine their feasibility and impact.

Lastly, researchers must contribute to capacity building by training key stakeholders—including extension workers, grazing committee members, and district authorities—on sustainable rangeland ecology and climate-adaptive practices. Collaborating with universities and technical colleges in Somaliland to develop curricula on rangeland management will ensure that the next generation of professionals is equipped with the skills needed to manage complex pastoral ecosystems under increasing environmental pressure.

6. Conclusion

The degradation of Somaliland's rangelands marks a profound crisis at the nexus of ecology, economy, and governance. As this paper has illustrated, the sustainability of pastoralism—an essential livelihood for nearly half of Somaliland's population—hinges on the health of its rangelands. Once governed by customary systems that ensured rotational grazing and ecological balance, these landscapes are now under siege from overgrazing, unregulated land enclosures, climate-induced stress, and

institutional fragmentation. The cumulative effects are stark: reduced pasture productivity, loss of biodiversity, food insecurity, increased inter-communal tensions, and the erosion of traditional mobility patterns. This not only threatens pastoralists' resilience but also undermines national development goals tied to livestock exports, poverty reduction, and climate adaptation.

Despite these challenges, the case for integrated, community-based, and policy-supported rangeland management is compelling. The

comparative experiences of Ethiopia and Kenya underscore the value of harmonizing indigenous knowledge with statutory frameworks and the potential of community land governance and ecological restoration in reversing land degradation. For Somaliland, adopting a dual approach—community empowerment on one hand and centralized policy reform on the other—offers a viable path forward. Reviving traditional grazing calendars, formalizing land tenure, and investing in rangeland infrastructure are crucial steps toward restoring degraded lands.

Moreover, this study calls for strengthened collaboration among the

government, pastoral communities, and research institutions. Policymakers must ensure legal clarity and institutional coordination, while communities require support to revitalize local governance structures and ecological stewardship. Concurrently, researchers play a vital role in generating context-specific, actionable evidence to inform sustainable interventions.

Ultimately, rangeland management is not a sectoral issue but a national imperative. The future of Somaliland's pastoral economy—and by extension, its environmental and social stability—depends on timely, inclusive, and scientifically informed action to reclaim and safeguard its vanishing pastures.

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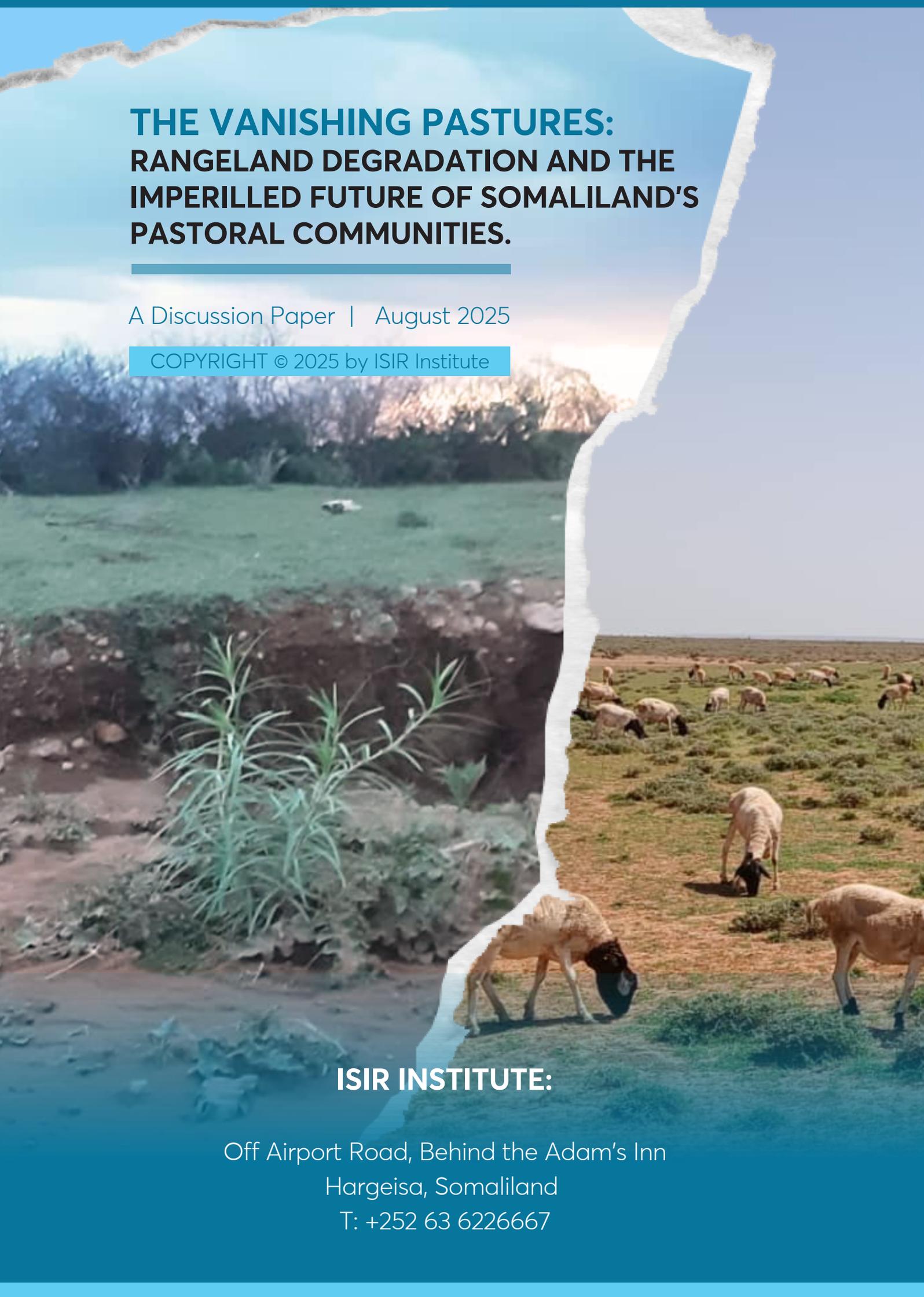
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