

HARNESSING INDIGENOUS KNOWLEDGE TO COMBAT CLIMATE AND ECOLOGICAL CRISES IN SOMALIA

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SUMMARY

Somalia faces escalating climate and ecological crises that threaten food security, livelihoods, and peace. Despite contributing less than 0.1% of global emissions,¹ Somalia bears disproportionate impacts from droughts, floods, and desertification, compounded by decades of illegal fishing and toxic waste dumping by external actors, as well as charcoal production. External support remains uncertain amid shrinking aid flows and stalled climate finance. Drawing on two major recent studies by PDRC and the University of Sussex – one on climate shocks in Somalia and another on resilience within the education system – together with insights from communities, scholars and policymakers at its recent Climate, Peace and Security conference, this policy brief argues that Somalia must leverage indigenous knowledge systems, particularly Xeer, to strengthen resilience and adaptation. It outlines the scale of the challenge, the erosion of indigenous knowledge, and practical steps to embed indigenous practices into education. Recommendations include bringing elders and youth into education governance, enhancing community-led learning, and leveraging recent curriculum reforms. These measures build on existing strengths in the education system and are informed by a pathbreaking model for centring African knowledge in the education system – Somalia's mass literacy campaign in the 1970s.

1. RESEARCH APPROACH & COMMUNITY DIALOGUES

This policy brief draws on three complementary sources of evidence:

- Study 1: Research conducted by PDRC and the University of Sussex on climate impacts during the 2022 hunger crisis in Puntland. This combined a survey of 350 randomly-selected respondents (city dwellers, displaced people, nomads, farmers and traders), interviews, and consultations with officials across Nugaal, Bari, and Karkaar.²
- Study 2: Research conducted by PDRC and the University of Sussex into building resilience in education for children displaced by climate crises and conflict in Puntland. The four-year mixed-methods study tracked nine schools, 44 teachers, and 300 learners through interviews, questionnaires, focus groups, and creative activities such as drawing and drama.³
- Conference dialogues: insights from PDRC's recent conference on Climate, Peace and Security. This conference brought together climate frontline communities from Puntland, Jubbaland, Southwest, Galmudug, Hirshabelle, Somaliland, Garissa (Kenya) and Ethiopia, together with Somalis in the diaspora, academics, federal and state-level government officials. They shared lived experiences and expertise of climate-conflict dynamics and peacebuilding strategies.⁴

2. CONTEXT AND PROBLEM STATEMENT

Somalia ranks among the most climate-vulnerable countries globally.⁵ Recurring droughts, floods, desertification and locust swarms have devastated livelihoods, while decades of illegal fishing⁶ and toxic waste dumping⁷ by external actors, as well as charcoal production,⁸ have compounded ecological degradation.⁶

The 2021-2023 drought was estimated to be the worst in over four decades, bringing Somalia to the brink of famine, with 7 million people – nearly 40 percent of the population – facing acute food insecurity – the worst hunger crisis in the world at the time.⁹ This was followed by devastating flooding. During this crisis, PDRC and the University of Sussex documented how these climates were not only aggravating existing disputes but were also provoking new struggles over grazing lands and water.² By the end of 2023, over 2.4 million people had been forcibly displaced by drought and flooding,¹⁰ out of an estimated total of 3.8 million displaced people.¹¹ Climate shocks now account for more than 60% of all internal displacement.

In the year that Somalia faced the worst hunger crisis on earth, however, humanitarian aid to the country was slashed by more than 50%¹² International support remains uncertain amid shrinking aid flows and stalled climate finance negotiations for a Loss and Damage Fund. Somalia's¹³ contribution to global emissions is negligible, yet it suffers disproportionately. This reality underscores the need for Somalia to harness its own resources – its intellectual, cultural, and institutional capacities – to adapt to these climate injustices and then find new ways to thrive.

Somali society possesses rich indigenous knowledge – particularly Xeer, a customary legal system, which has been used for centuries to govern ecological resources sustainably and resolve conflicts peacefully. It played a central role in holding Somali society together during its civil war and the ensuing collapse of the state,¹⁴ and was increasingly relied on during the Covid pandemic.¹⁵

However, PDRC and the University of Sussex's research into the dynamics of Somalia's climate crisis has found that young people are losing knowledge about Xeer and respect for its institutions. This has led to the breaking of rules regarding ecological conservation, and the transgression of taboos and norms regarding violence. Examples of this include violations of Birmageydo, categories of people who may not be harmed, such as women, children, elderly people, and people of wisdom.^{4,16} Together, these factors have contributed to the emergence of new conflicts. Similarly, new research by Asal Africa has shown that prolonged displacement has led to a loss of vital indigenous ecological knowledge among young people in cities and camps for internally displaced people (IDPs).¹⁷ The potential erosion of indigenous knowledge, and its connection to new conflicts, has been highlighted by climate frontline communities as a serious cause for concern.⁴

Schools are key to preserving and transmitting this indigenous knowledge.¹⁸ They are important sites for socialising young people, equipping them with tools for environmental stewardship and conflict resolution. Without this knowledge, young people not only lose connections to their intellectual and cultural heritage, but they also lose important links to the past, and therefore, to themselves. A historical understanding is fundamental to their capacity to envision and build pathways to a different world.



Somalia's climate challenges are part of a larger struggle faced by the peoples of the South, who experience heightened vulnerability to climate crises despite contributing minimally to climate change. These societies are increasingly leveraging indigenous knowledge help them build climate resilience and strive for a more sustainable future. For example, in South Africa, scientists have codified extensive ethnobotanical knowledge into high school

science textbooks.¹⁹ In Colombia, initial teacher education integrates indigenous worldviews and knowledge systems, focusing on ecological understanding.²⁰ In Bhutan, the sacredness of rivers, forests, and mountains is recognised in the legal framework and taught in schools. These contexts have established well-tested methodologies for incorporating indigenous knowledge into schools and universities in rigorous, careful, and evidence-based ways.²¹ They demonstrate the urgency and practicality of integrating indigenous knowledge in education for climate resilience.

This policy brief sets out the case for investing in the long-term flourishing of Somalia by embedding indigenous knowledge practices in the formal education system. Strengthening indigenous knowledge directly enhances climate resilience by promoting sustainable practices that help Somali society safeguard its fragile ecosystem and adapt to increasing climate variability. While it focuses on Xeer as a clearly defined example of valuable indigenous knowledge, the insights from this policy brief apply more broadly to indigenous knowledge in general.

3. XEER AS A LIVING LAW

Xeer is Somalia's customary legal system, historically used by communities to regulate access to common pool resources such as grazing lands, water points, fisheries, and forests. In this system, ecological resources are managed communally, with people acting as custodians for future generations rather than private owners seeking personal gain.

Evidence indicates it may have emerged in the 16th century in response to natural disasters, the collapse of walled cities, and large-scale migration. In the midst of this social and political upheaval, Xeer developed as a new socio-political contract that aimed to re-establish the rule of law and reconcile individual aspirations with collective duties to protect common goods. It operates through negotiated agreements among clan elders and is enforced collectively. It is restorative rather than retributive, group-based rather than individual-based, and delineated through public deliberation and consensus.

XEER AS A BODY OF INDIGENOUS KNOWLEDGE

Xeer operates through precedent, which is remembered and reworked through oral literature – particularly poetry.¹⁶ As such, its oral archive contains vital knowledge about how ecological resources have been governed in the past, the evolution of this governance over time, and how it might be adapted for contemporary realities.

This orality, and its constantly growing poetic archive, makes Xeer highly flexible and adaptive to changing conditions in ways that written legal systems often struggle to emulate. It is a living law, continuously negotiated and renegotiated through deliberation among elders and communities. This flexibility allows Xeer to incorporate new norms and knowledge, and address emerging challenges, such as climate variability, migration and shifting gender roles. Its adaptability also means that it can differ between communities: some might selectively incorporate and emphasise Sharia or Romano-Germanic (statutory) law, while others might adjust rules on water or grazing depending on seasonal variations in rainfall patterns or new scientific insights.

XEER AS BEST PRACTICE IN CONSERVATION SCIENCE

Xeer's norms exemplify evidence-based best practices for managing common-pool resources, reflecting principles that conservation science identifies as crucial for ecological and social sustainability.

Participatory governance: Evidence shows that policies supporting participation and empowerment increase people's intrinsic motivation to conserve shared resources.²⁴ Communities that are involved in rule-making, monitoring, and enforcement are more likely to sustain forests, water, and grazing lands. Xeer embodies these principles through public deliberation and consensus-building on resource rules.

Slow decision-making: Studies indicate that slow and deliberate cooperation improves sustainable outcomes in common-pool resource management, while quick and unilateral decision-making leads to the collapse of shared resources.²⁵ Xeer's deliberative traditions encourage measured reflection, discussion, and negotiation, ensuring that rules are carefully considered and adapted to changing environmental conditions.

Cross-scale cooperation: research shows that cooperation and social interaction across communities – even weak interaction – can prevent the collapse of shared resources, and that cooperation at one scale can reinforce cooperation at another.²⁶ Xeer embodies this principle as it is based on inter-communal dialogues, and operates at multiple social levels: clan, lineage and family. This multi-level structure ensures coordination of resource use both within and between communities. By linking these overlapping social groups, Xeer aligns grazing, water, fisheries, and forest management practices locally while supporting broader ecological stability.



Indigenous knowledge is often approached as though it is primordial and unchanging, and in conflict with modern science. However, as the case of Xeer shows, indigenous knowledge has deep roots but young branches: it preserves traditions while allowing for innovation. Its ecological principles align closely with best practice in contemporary conservation science. What makes Xeer distinctive and uniquely valuable for Somalia is not its age or permanence, but rather that it is rooted in the particularities of the country's social, literary, spiritual, and ecological life.

XEER AND CLIMATE RESILIENCE

Xeer is deeply embedded in Somali society, and has remained effective even after public institutions collapsed, and statutory law broke down.^{14,15} As a climate adaptation mechanism, it is cost-effective, implementable, and likely to be more effective than externally-driven interventions.

The causal pathways between Xeer and climate resilience are evident in the norms that guide environmental protection. Xeer promotes sustainable practices such as preventing contamination of shared water sources, refraining from unnecessary hunting, conserving forests, and resisting the privatisation of communal grazing lands. Each of these practices, upheld historically, has been crucial for preserving the environment and supporting community livelihoods.

While these practices have been upheld in the past, they are increasingly neglected today. There is therefore a direct relationship between strengthening Xeer and enhancing climate resilience. By reinforcing indigenous knowledge, Somali society can better safeguard its fragile ecosystem and adapt to increasing climate variability.

INTERNAL DEBATE AND CRITIQUE

Within Somali society, Xeer is the subject of ongoing internal debates and negotiations. Gender, generational, and clan-based inequalities are well documented – women and young people often have limited voice in decision-making, and clan structures can perpetuate exclusion.^{27,28} Yet the very mechanism of Xeer – public deliberation – provides the means for its ongoing renewal and transformation. Through open dialogue and collective negotiation, Somali communities have often tackled these concerns. Women, for instance, have successfully advocated for changes to inheritance laws that once excluded them²³ and pressed for their poetry to be remembered as part of the Xeer cannon.^{29,30} Likewise, the emergence of female clan elders³¹ and youth-led peace dialogues^{32,33} illustrates how deliberative processes enable adaptation. These developments, while nascent, underscore that Xeer's flexibility is not abstract; it is enacted through contestation and consensus-building within Somali society itself.



4. WHAT IS THE CURRENT STATE OF INDIGENOUS KNOWLEDGE IN SCHOOLS?

Xeer and other forms of indigenous knowledge remain largely absent from the formal curriculum in Puntland and across Somalia. This exclusion from schools is a critical mechanism through which indigenous knowledge is eroded. However, PDRC and the University of Sussex's research into schools for displaced communities has identified existing strengths within Somali education that can serve as entry points for integrating indigenous knowledge: women's leadership in education, intergenerational learning and the strong position of the Somali language in teaching and learning.³

Moreover, there is a growing body of research on Xeer, and it is actively taught in some universities as part of conflict resolution studies.⁴ This availability of resources presents an opportunity for developing curriculum materials that can effectively incorporate indigenous knowledge into schools.

WOMEN'S LEADERSHIP IN SCHOOLS

Community-established schools in Somalia are often led by women, in contrast with INGO-founded schools, which are all led by men. This matters, because 79% of female teachers support girls' right to education compared with 47% of male teachers, suggesting that girls in community-established schools might be better supported than those in INGO-established schools.⁵ Somali women frequently take the initiative to establish and manage schools in displaced communities, exercising leadership through relational authority and community trust. These dynamics challenge external narratives that portray Somali gender relations as rigid. In reality, gender roles are fluid and evolving.

Policy insight: Somali society contains its own resources for addressing gender inequalities. Building on women's leadership in education, schools can create spaces for students and teachers to debate issues such as gender norms within Xeer. This approach strengthens both indigenous knowledge and gender equity.

WOMEN'S LEADERSHIP IN SCHOOLS

Many schools in IDP communities originated as adult literacy centres before they transitioned to serve children. This reflects a recognition that parental literacy directly influences children's literacy and that learning is inherently intergenerational. In practice, education often extends beyond the classroom: children apply their learning to assist their families, creating a family-centric model of knowledge exchange. However, there is a notable imbalance – most teachers are very young – 82% are under 30 – and the wisdom of older generations is largely absent from schools. This gap limits the intergenerational transmission of indigenous knowledge.

Policy insight: The community-led nature of these schools signals untapped potential for strengthening intergenerational learning. Initiatives that bring elders into classrooms as cultural and ecological knowledge bearers could enrich education and reinforce Xeer's principles.

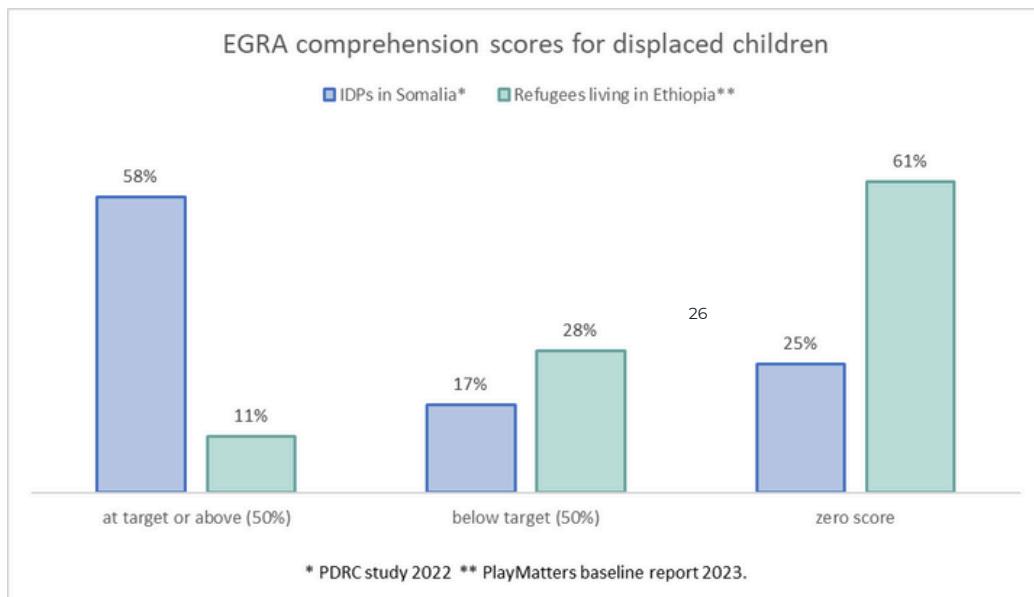
SOMALI LANGUAGE AS A LIVING RESOURCE



Somalia is one of the few African countries where children are taught in an African language rather than a colonial one, and where an African language is used for scientific research, state communications, and literature. This policy choice, which stretches back to the post-independence period, has yielded significantly higher literacy scores compared to schools in other displacement contexts (see figure below comparing the literacy scores for IDPs in Somalia with refugees in Ethiopia).³⁵ It is a major achievement, as children cannot learn effectively in a language they do not understand. Beyond literacy, language itself is a repository of cultural, ecological, and spiritual knowledge. Xeer exemplifies this connection: its principles are embedded in oral literature and poetry.

³⁴

Policy insight: Recent efforts to incorporate oral literature into the curriculum create opportunities to harness the knowledge embedded in Somali language. Teaching poetry, for example, can serve as a gateway to teaching Xeer, ensuring that indigenous knowledge remains vibrant and relevant.



5. CASE STUDY: SOMALIA'S MASS LITERACY CAMPAIGN IN THE 1970S – A MODEL FOR CENTRING AFRICAN KNOWLEDGE IN THE EDUCATION SYSTEM



In the world, our language was taking no part; but the sunrise appeared uncovering our language from darkness; the fence was cleared, so the livestock could graze. Give me your pen, the words I wrote from you. It is not a foreign language; the tongue does not slip. Like milk, it can be swallowed smoothly.

Song on Radio Mogadishu, heralding written Somali.³⁶

The integration of indigenous knowledge into schooling is not new in Somalia. In the 1970s, the country pioneered a pathbreaking model of mass literacy in the Somali language, which simultaneously not only brought literacy to the vast majority of the country, but helped university students and teachers to deepen their knowledge of indigenous knowledge – in the form of oral literature – and contribute to its national preservation^{37,38}

BACKGROUND

In 1972, Somalia adopted the Latin script for Somali and declared it the official language of administration and education, ending decades of linguistic fragmentation. This decision launched one of Africa's most ambitious mass literacy campaigns, aimed at cultural emancipation and national development.³⁸



Key Features

- **Somalisation policy:** Somali became the medium of instruction; curricula and textbooks were rewritten to reflect Somali heritage.
- **Mass literacy drive:** Urban and rural campaigns mobilised 15,000 teachers and 15,225 students as instructors. Over 1.2 million learners participated; adult literacy rose from 5% to an estimated 60–80%.
- **Volunteer-led:** thousands of teachers and students volunteered to play a role in this mass literacy campaign.
- **Women's leadership:** Somali women played a significant role in organising and teaching during the campaigns.

- **Community-centred approach:** Classes adapted to the lives of rural people. Literacy was linked to health, agriculture, veterinary care, and rural development.
- **Nomadic schools:** Somalia pioneered the development of nomadic schools that followed seasonal migration. Teachers lived alongside nomadic communities, travelling with them, engaging in teaching while also learning from them.
- **National mobilisation:** Under the slogan Bar ama Baro (“If you know, teach; if you don’t, learn”), literacy became a civic duty. Ministries, armed forces, and civil servants participated
- **Two-way flow of knowledge:** Urban students helped rural communities learn how to read and write in Somali. But students in turn learnt important cultural and ecological knowledge from rural communities, and collected and wrote down Somali oral literature, thereby preserving and enriching Somali heritage.
- **Recognition:** Somalia received UNESCO’s Nadezhda K. Krupskaya International Literacy Prize in 1975 for this achievement.

IMPACT AND LESSONS

The campaign transformed education, expanded access, and embedded Somali identity in schooling – an unprecedented example of aligning education with indigenous knowledge and national development. It demonstrates the power of political will, cultural relevance, and community participation in driving systemic change.

6. INTEGRATING XEER INTO SCHOOLING

Contemporary integration of indigenous knowledge – including Xeer – into⁵ the schooling system should build on the existing strengths within Somali education and learn from its past achievements in mass literacy in the Somali language. Based on this, recommendations include bringing elders and youth into education governance, enhancing community-led learning, and leveraging recent curriculum reforms. These recommendations are rooted in, and seek to strengthen, the deliberative democratic traditions that are deeply woven into the fabric of Somali society.

RECOMMENDATION 1: BRING ELDERS AND YOUTH INTO EDUCATION GOVERNANCE

As Somalia's mass literacy campaign demonstrates, the knowledge and agency of both elders and youth is critical for achieving educational transformation in Somalia. On this basis, we suggest a grassroots model that cascades up into state and federal government:

- In each state, local communities nominate six elders and youth (divided equally between women and men) for their community education hub based on traits that they deem important – such as wisdom, ecological knowledge, and social commitment.
- Each community education hub elects representatives to a distinct and then state level education forum (divided equally between women and men, elders, and youth)
- Each state education forum elects representatives for a federal education forum (divided equally between women and men, elders, and youth)

Elder and youth representatives in state and federal education forums would have a mandate to deliberate on and work together with education experts on curriculum and teacher training policy and interventions.



Teacher training (pre-service and in-service) on how to incorporate Xeer into the curriculum and how to bring elders into school communities is especially important, for without this, the curriculum cannot be implemented.

State and federal education forums should ideally be coordinated by their respective Ministry of Education, but with input from advisors in the Ministries of Environment and Climate Change, Agriculture and Irrigation, and Fisheries and Blue Economy. This will enable the whole-of-society approach that frontline communities have called for.

Following the model of the Somali mass literacy campaign, elders and youth would be recruited on a voluntary basis. Many elders are already involved in the management of schools on a voluntary basis and would likely be eager to help preserve and share their valuable knowledge.

To guard against policy capture – and with awareness of inter-clan and gender inequality – we recommend ensuring equal representation of all clans and lineages, as well as parity between women and men. Representatives should also rotate out of their roles after a set period, such as three or four years.

RECOMMENDATION 2: UNLOCK THE DYNAMISM OF COMMUNITY-LED LEARNING

Elders hold a vast reservoir of critically endangered ecological knowledge. Bringing them into schools can revive this knowledge and foster intergenerational learning, while addressing the imbalance created by an overwhelmingly young teaching workforce. This exchange should be two-way: elders share their wisdom, and young people introduce new ideas and perspectives. As the research into IDP schools by PDRC and the University of Sussex shows, this reciprocal flow is the hallmark of community-led education.

Practical entry points

- Social Studies: Elders narrate life stories to illuminate the history of Xeer and shifting ecosystems.
- Literacy: Students and elders create poetry together, blending oral and written traditions.
- Science: Elders teach the identification, use, and care of plants and animals, explaining their roles in sustaining ecosystems.

Harnessing these practices will not only preserve indigenous knowledge but also enrich learning experiences, strengthen cultural identity, and build resilience.



RECOMMENDATION 3: BUILD ON EXISTING CURRICULUM REFORMS

Somalia's remarkable achievements in African language literacy were undermined by state collapse in 1991. Many schools reverted to English or Arabic due to shortages of Somali textbooks and resources. Recent reforms – including the 2018 curriculum overhaul and the 2023 unified national curriculum – have reaffirmed Somali as the primary language of instruction in primary education, with English and Arabic taught as additional languages. Oral literature has also been introduced into the curriculum, creating a strong foundation for further innovation.

We recommend gradually integrating Xeer into the curriculum, starting at primary level, and building on these reforms as an area of strength in the Somali education system.

Practical entry points

- **Somali language:** Engage with poetic traditions and proverbs that encode Xeer; encourage students to develop their own oral and written poetry; study poetry by both women and men and debate whose voices are represented in Xeer.
- **Social studies:** Stage mock trials and mediations in Xeer. Examine ecosystem governance as a commons under Xeer. Hold interschool debates on gender, age, and clan dimensions of Xeer, and its harmonisation with Sharia and statutory law.
- **Science:** Teach ecosystems as interconnected systems, including humans. Link lessons to areas governed by Xeer – fisheries, frankincense, forests, water systems, grazing, and agriculture.
- **Learning outside:** Organise debates under trees to reflect indigenous practices of public deliberation; explore ecosystems through field trips for embodied learning.

OPERATIONAL STEPS FOR CURRICULUM INTEGRATION

Pilot phase with community involvement: Establish community education hubs in select districts where local communities nominate six elders and youth (equally divided by gender) to work with education experts on curriculum policy and teacher training. This grassroots model will ensure that local knowledge and agency drive the curriculum integration.

Timeline:

- **Months 1-2 (January-February):** Conduct needs assessments in collaboration with community education hubs. Work with elder and youth representatives to gather input on prioritising curriculum changes and teacher education for integrating Xeer effectively.
- **Months 3-5 (March-May):** Develop and refine school curriculum and teacher education materials that incorporate Xeer, informed by community feedback.
- **Months 6-7 (June-July):** Elders and youth work together with teachers to help them learn new curriculum content and instructional strategies.
- **Months 7-12 (August-December):** Launch the pilot program in schools linked to community education hubs, with ongoing mentorship from elder and youth representatives. Implement regular meetings to discuss challenges and collect feedback.

Scaling up through new forums: After evaluating the pilot, refine the curriculum based on collaborative input. Scaling up will involve establishing state-level education forums, with elder and youth representatives elected from community hubs to ensure diverse perspectives.

- **Months 13-18:** Expand the program to additional schools, utilising insights from both the pilot phase and state education forums. Provide continuous support and training for teachers on how to integrate Xeer and engage with community elders in educational settings.
- **Months 19-24:** Assess the expanded program's impact on student learning and community engagement. Gather feedback from education forums and make necessary adjustments for a comprehensive rollout across the state and federal levels.

This approach embraces the deliberative democratic ethos of Somali society, harnessing the dynamism and expertise of local communities and government planners to drive a system-wide adoption of indigenous knowledge for climate resilience.

IMPLEMENTATION CONSIDERATIONS

The Somali diaspora is an integral part of the wider Somali community and remains one of its greatest sources of strength. Thoughtful attention should therefore be given to the diaspora's role in this initiative. In some ways, contemporary diaspora life can be understood as a twenty-first-century expression of Somali nomadism: their connection to Somali society is not broken, but carried through far-reaching networks that span the globe. Their contributions touch nearly every aspect of Somali life, including education, culture, infrastructure, trade, finance, and humanitarian solidarity.⁵ This contemporary form of mobility shapes relationships between clans, influences dynamics between generations, and affects the evolving interplay between oral literature and written texts.^{39,40}

Building on this, consideration should be given to the dynamism of Somali society – reflected not only in multiple forms of mobility – within and beyond Somalia – but also in the adaptable, flexible nature of Xeer. In this context, it is important to consider how the interplay between oral literature and its written forms is approached in schools, so that codification does not inadvertently fix or restrict aspects of Xeer, thereby diminishing some of its core strengths.

More broadly, integrating Xeer into formal education should reflect its inherent plurality and democratic, deliberative qualities, so that young people engage with it as a living, evolving system rather than a single, fixed set of rules.

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