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Greening the East African Drylands: Agroforestry for Climate Resilience and Food Security

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Executive Summary

East Africa's dryland regions face escalating challenges from climate change, food insecurity, and weak natural resource governance (IGAD, 2020, pp. 37–39). Increasingly frequent droughts, accelerated land degradation, and declining water availability are intensifying competition over natural resources (World Bank, 2022, p. 15). These tensions have triggered conflicts between farmers and pastoralists (UNEP, 2021, Ch. 4), heightened human-wildlife interactions (WWF, 2023), and led to displacement linked to conservation efforts—factors that collectively threaten human security across the region (Ackerl et al., 2023; African Union, 2021).

This crisis is underpinned by three interlinked drivers.

- Environmental degradation, including desertification (IPCC, 2019), erratic rainfall patterns (ICRAF, 2022), and a decline in soil fertility;
- Socioeconomic inequities, such as widespread poverty (World Bank, 2023), population pressures, and unequal access to land, especially for women (AU & UN Women, 2021);
- Institutional and policy gaps, including weak governance systems (IGAD, 2021) and insufficient investment in sustainable land management (AfDB, 2022).

If these trends persist without targeted interventions, they will further undermine livelihoods and regional stability. Agroforestry—integrating trees into farmland—is a proven, nature-based approach with the potential to reverse these trends. Research shows that agroforestry can boost crop yields in drylands by 30–58% (World Agroforestry Centre, 2022) and enhance soil organic matter by 36% within just five years (FAO, 2021). Alongside environmental restoration, agroforestry contributes to economic stability and reduces tensions over scarce resources.

This brief presents actionable policy recommendations to harness and scale agroforestry's benefits, offering decision-makers a clear and practical roadmap for advancing resilience and food security in East Africa's drylands.

INTRODUCTION

Agroforestry as a transformative solution in drylands

Agroforestry—deliberately integrating trees with crops and livestock within the same farming system—has emerged as an effective solution for revitalizing degraded drylands. This land-use approach blends food production with ecological restoration, improving soil structure and fertility, conserving water resources, enhancing biodiversity, and bolstering the livelihoods of rural communities (World Agroforestry [ICRAF] & UNEP, 2021).

The relevance of agroforestry is particularly pronounced in East Africa, where arid and semi-arid conditions dominate much of the landscape. According to recent assessments, a significant portion of the region's terrain qualifies as dryland (Le et al., 2024), though national variations are considerable. In Kenya, more than 80% of land is classified as dryland and considered ecologically fragile (Ndungu & Kilelu, 2017), whereas Tanzania and Uganda report approximately 30% of their territories falling within dryland zones (Jama & Zeila, 2005).

When well-designed and appropriately implemented, agroforestry systems offer multiple, integrated benefits. They strengthen both climate adaptation and mitigation, improve the sustainability of agricultural production, reduce competition over natural resources, and promote gender-equitable development outcomes (FAO, 2016). Key Contributions of Agroforestry in Dryland Areas

Building Climate Resilience: Trees in agroforestry systems help regulate microclimates and sequester carbon, offering protection against droughts, flooding, and extreme temperatures. They also improve soil structure, enhance water retention, and reduce erosion—functions that are especially vital in dry, water-limited environments (van Noordwijk et al., 2022).

Enhancing Food and Nutrition Security: Agroforestry increases the diversity of food and income sources by producing fruits, nuts, fodder, and other non-timber products. This diversification reduces dependence on monoculture farming, improves dietary quality, and stabilizes household incomes. Additionally, the natural enrichment of soil fertility supports higher and more reliable crop yields, which is crucial for smallholder farmers in areas with unpredictable rainfall patterns (Mbow et al., 2024).

Agrobiodiversity Conservation

Agroforestry plays a critical role in conserving agrobiodiversity by protecting native, drought-tolerant plant species and supporting pollinators essential to ecosystem health. This is particularly important in dryland regions where monocultures and climate change are accelerating biodiversity loss (Genga et al., 2023).

Policy pathways for scaling agroforestry impact

To unlock the full potential of agroforestry in enhancing resilience and livelihoods across dryland areas of East Africa, targeted policy and institutional actions are needed. Key recommendations include:

Policy Integration: Embed agroforestry into national policies and strategies, including climate adaptation plans, agricultural development frameworks, and forest and natural resource management policies.

Regional Coordination: Establish an East African Agroforestry Platform to harmonize cross-border collaboration, facilitate knowledge exchange, mobilize funding, and support coordinated implementation.

Innovative Financing Mechanisms: Develop specialized investment streams for agroforestry within national climate funds, agricultural finance programs, and donor-supported resilience initiatives.

Strengthening Capacity: Upgrade agricultural extension services by integrating agroforestry-specific training, and promote farmer-to-farmer learning networks that foster peer exchange and innovation.

Education and Training Reform: Integrate agroforestry principles into formal curricula at all levels—from primary and secondary schools to universities and technical/vocational institutions—to build long-term knowledge and skills across generations.

From Policy to Practice: Addressing the Agroforestry Implementation Gap in East Africa although national and regional policies across East Africa increasingly recognize the value of agroforestry as a nature-based solution, significant implementation gaps continue to hinder its full potential.

In Kenya, the National Climate Change Action Plan (NCCAP) 2018–2022 identifies agroforestry as a key strategy for climate adaptation and mitigation. However, progress has been limited due to fragmented and poorly coordinated implementation efforts. Similarly, the National Forest Policy (2020) promotes farm forestry and community-based forest management but lacks a dedicated agroforestry framework or strategy to guide action on the ground.

In Uganda, agroforestry is referenced in the National Development Plan III (2020–2025) under broader ecosystem restoration and climate-resilient agriculture objectives. Yet, its integration remains weak and largely unstructured. The National Forest Policy (2001) supports tree planting and public-private partnerships but does not provide a clear pathway for scaling agroforestry within mixed farming systems.

Tanzania’s National Climate Change Strategy (2021) endorses agroforestry as a tool for land restoration and carbon sequestration. While the Forest Policy (1998) promotes tree planting and community forestry, it does not embed agroforestry within a comprehensive, integrated land-use approach necessary for dryland resilience.

At the regional level, the East African Community (EAC) Climate Change Policy (2011) and the EAC Vision 2050 highlight sustainable land use and ecosystem restoration. However, agroforestry implementation remains uneven across EAC member states, with limited harmonization of strategies, practices, and investments.

On the global stage, agroforestry contributes directly to at least nine of the Sustainable Development Goals (SDGs)—including those focused on climate action, zero hunger, life on land, and poverty reduction—demonstrating its cross-cutting relevance as a scalable solution for climate resilience, food security, and ecosystem regeneration.



A farmer in Nyakach, Kisumu County with pigeon peas.

Case study: Farmer-Managed Natural Regeneration (FMNR)

FMNR is a cost-effective and impactful land restoration method that enables smallholder farmers to rehabilitate degraded landscapes using locally available resources (World Vision, 2018). The approach involves protecting and managing the natural regrowth of trees and shrubs from existing stumps, roots, and seeds—revitalizing native vegetation without the need for expensive tree planting initiatives.

Rooted in indigenous knowledge and guided by simple yet effective techniques, FMNR delivers wide-ranging benefits. In Kitui County, Kenya, FMNR has successfully restored previously barren lands, leading to a 30% increase in crop yields, the re-emergence of biodiversity, and the rejuvenation of water sources (World Vision, 2018). The farmer-led implementation fosters community ownership, scalability, and long-term sustainability.

For policymakers, FMNR represents a powerful triple-win solution: it reduces poverty through improved agricultural productivity, strengthens food security, and restores vital ecosystems—all while enhancing climate resilience. Its low-cost and low-technical entry point makes it especially well-suited for widespread adoption across East Africa’s dryland regions.

POLICY RECOMMENDATIONS

Scaling agroforestry across the drylands of Kenya, Uganda, and Tanzania requires coordinated, cross-sectoral policy action in five key areas:

1. Adopt Strengthen National and Regional Agroforestry Policy Frameworks

- Integrate agroforestry across national policies and planning instruments in agriculture, environment, forestry, and climate change—ensuring coherence from national to local levels.
- Prioritize dryland-specific agroforestry strategies by embedding them into national development plans, climate action plans (e.g. NDCs), and agricultural extension policies.
- Establish a formal East African Agroforestry Platform to enhance cross-border learning, coordinate investments, align policy implementation, and support joint monitoring and reporting frameworks.

2. Mobilize Public and Private Financing for Agroforestry

- Create dedicated agroforestry funding mechanisms, including budget lines in national agriculture, environment, and rural development programs.
- Design incentive schemes—such as tax breaks, climate-smart subsidies, and low-interest credit facilities—to support smallholders adopting agroforestry practices.
- Promote inclusive value chains for agroforestry products (timber, fruit, fodder, resins), with targeted investments in processing, transport, and market infrastructure in dryland regions. dedicated financing mechanisms for agroforestry, with explicit budget allocations in agriculture and conservation programmes.

3. Build Technical Capacity and Support Farmer-Led Innovation

- Expand dryland-focused agroforestry extension services, by training community-based facilitators and strengthening linkages between research, government, and farmer organizations.
- Support adaptive research that blends scientific evidence with indigenous knowledge, emphasizing farmer-led experimentation and participatory technology development.
- Institutionalize monitoring, evaluation, and learning (MEL) systems that generate real-time data to guide adaptive management and measure climate resilience and livelihood impacts.

4. Secure Land and Resource Tenure to Enable Agroforestry Investment

- Protect tenure rights of women, youth, and marginalized dryland communities, ensuring legal recognition of customary and communal land ownership.
- Establish participatory land-use planning processes to reduce conflicts, clarify land boundaries, and align agroforestry investments with sustainable rangeland and forest governance frameworks.
- Strengthen natural resource governance institutions to support equitable and transparent oversight of dryland landscapes.

5. Institutionalize Inclusive Multi-Stakeholder Engagement

- Co-design agroforestry policies with farmers, Indigenous peoples, women's groups, and youth, ensuring traditional ecological knowledge informs policy and practice.
- Create transparent national and county-level platforms that promote equitable decision-making, accountability, and inter-sectoral coordination.
- Address barriers to agroforestry markets, including poor infrastructure, information gaps, and unfair pricing—while strengthening farmer cooperatives to improve bargaining power and incomes.



Cassava-Mango farm in Hoima District, Uganda. Photo: John Recha, AICCRA

Policy Brief Development and Purpose

This policy brief was developed by the Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) in collaboration with the East Africa Drylands Agroforestry Expert Group, with support from the Swedish International Agriculture Network Initiative (SIANI). The Expert Group brings together a multidisciplinary team of professionals—including representatives from civil society, government ministries, academia, practitioner networks, and youth organizations—committed to addressing the challenges faced by rural communities in dryland regions. Their collective efforts aim to strengthen food systems through concrete recommendations on sustainable land management.

The Group works closely with local farming and agropastoralist organizations to promote mutual knowledge exchange and foster inclusive dialogue.

Through this engagement, they advocate for stronger commitments to transform food systems, enhance food security, and conserve biodiversity in East Africa's drylands using agroforestry as a key strategy.

This policy brief synthesizes expert contributions from a regional webinar held on March 14, 2025, titled "Enhancing Climate Resilience and Food Security in Drylands: Scaling Agroforestry for Sustainable Livelihoods in Kenya, Uganda, and Tanzania." It also draws from insights gathered through national dialogues—such as Tanzania's Agroforestry Symposium—and comprehensive policy analyses. These engagements helped identify critical barriers, opportunities, and evidence-based approaches to scaling agroforestry as a climate adaptation solution, providing a roadmap for regional action.

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