Vi Agroforestry

siani
Swedish International Agricultural Network Initiative

A POLICY BRIEF

Scaling Agroforestry as a Climate Resilience and Food Security Solution in Drylands of Kenya, Uganda, and Tanzania

EXECUTIVE SUMMARY

East Africa's drylands are grappling with climate change impacts, food insecurity, and governance failures in natural resource management (IGAD, 2020, pp. 37-39). Recurrent droughts, rapid land degradation, and worsening water scarcity have intensified competition over dwindling natural resources (World Bank, 2022, p. 15), sparking conflicts between pastoralists and farmers (UNEP, 2021, Ch. 4), human-wildlife clashes (WWF, 2023), and conservation-related displacements—all of which systematically erode human security (Ackerl et al., 2023; African Union, 2021). Three interconnected factors drive this crisis: (1) environmental degradation—including desertification (IPCC, 2019), erratic rainfall (ICRAF, 2022), and collapsing soil fertility; (2) structural inequities such as entrenched poverty (World Bank, 2023), population pressures, and gender disparities in land access (AU & UN Women, 2021); and (3) institutional weaknesses marked by inadequate governance (IGAD, 2021) and chronic underinvestment in sustainable land management (AfDB, 2022).

Without decisive intervention, these pressures will escalate, further destabilising livelihoods and regional security. Agroforestry—the deliberate integration of trees into agricultural landscapes—offers a powerful, nature-based solution. Evidence demonstrates that agroforestry can increase dryland crop yields by 30–58% (World Agroforestry Centre, 2022) while regenerating soil organic matter by 36% within five years (FAO, 2021). Beyond ecological benefits, agroforestry fosters economic resilience and mitigates resource-based conflicts. This brief outlines concrete policy measures to scale these benefits, offering decision-makers a practical roadmap for implementation.

INTRODUCTION

Agroforestry as a transformative solution in drylands

Agroforestry—the intentional integration of trees with crops and livestock on the same land—is a proven strategy for restoring degraded drylands. By combining agricultural production with ecosystem regeneration, it simultaneously rebuilds soil health, conserves water, and enhances biodiversity while supporting rural livelihoods (World Agroforestry [ICRAF] & UNEP, 2021). This approach is especially critical in East Africa, where landscapes are disproportionately arid. A vast majority of the region's land is classified as dry (Le et al., 2024), with striking national disparities: over 80% of Kenya's land area falls under fragile dryland ecosystems (Ndungu, J., & Kilelu, C. (2017). I*nnovation and Development in Dryland Agriculture: Exploring Innovation Pathways in Kenya's Arid and Semi-Arid Lands.* Wageningen University & Research), while Tanzania and Uganda each designate approximately 30% of their territories as dry (Jama & Zeila, 2005). *(See figure 1)*

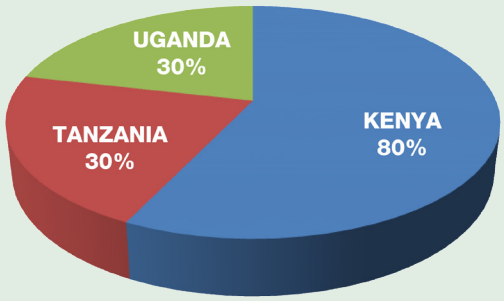

Figure 1: Percentage of national land area classified as drylands.

When implemented effectively, agroforestry systems can simultaneously enhance climate adaptation and mitigation capacities, boost sustainable agricultural productivity, reduce natural resource-based conflicts, and advance gender-inclusive development outcomes (FAO, 2016).

Key benefits of agroforestry in drylands

Climate resilience: Carbon sequestration and microclimate regulation buffer against droughts, floods, and temperature extremes. Trees improve water retention and reduce soil erosion, critical in water-scarce regions (van Noordwijk et al., 2022).

Food and nutrition security: Diversified yields (fruits, nuts, fodder) reduce reliance on monocultures, enhancing dietary diversity and income stability. Soil fertility restoration boosts crop productivity, vital for dryland farmers facing erratic rainfall (Mbow et al., 2014).

Agrobiodiversity conservation: Agroforestry preserves indigenous drought-resistant species and pollinators, safeguarding ecosystems threatened by monocultures and climate change (Genga et al., 2023).

Policy pathways for scaling agroforestry impact

To realise agroforestry's full potential across East Africa's drylands, governments and development partners should prioritise these key interventions:

- **Policy integration:** Mainstream agroforestry into national climate adaptation strategies, agricultural policies, and dryland development programmes
- **Regional collaboration:** Establish an East African Agroforestry Platform to align cross-border knowledge sharing, funding, and implementation
- **Innovative financing:** Create dedicated agroforestry investment windows within climate funds and agricultural budgets
- **Capacity building:** Modernise extension services with agroforestry training and launch farmer-to-farmer learning networks
- **Education reform:** Incorporate agroforestry principles into primary and secondary schools, universities, and vocational training curricula

> ***Agroforestry—the intentional integration of woody perennials (trees, shrubs) alongside other crops and/or livestock in the same land—is a proven strategy for restoring degraded drylands."***

FROM POLICY TO PRACTICE: BRIDGING EAST AFRICA'S AGRO-FORESTRY IMPLEMENTATION GAP

While current policies acknowledge agroforestry's benefits, implementation gaps persist, limiting its transformative potential.

Kenya's National Climate Change Action Plan (NCCAP) 2018–2022 recognises agroforestry as a nature-based climate solution but suffers from fragmented implementation. The **National Forest Policy (2020)** promotes farm forestry and community-based forest management but lacks a clear agroforestry strategy.

Uganda's National Development Plan III (2020–2025) advocates for ecosystem restoration and climate-resilient agriculture, though agroforestry integration remains weak. The **National Forest Policy (2001)** supports tree planting and public-private partnerships but requires updating.

Tanzania's National Climate Change Strategy (2021) endorses agroforestry for carbon sequestration and land restoration. The **Forest Policy (1998, under review)** encourages community forestry but lacks integrated land-use approaches.

At the EAC-Level, the EAC Climate Change Policy (2011) and EAC Vision 2050 promote sustainable land use, but agroforestry implementation varies across member states. Notably, on the global level, agroforestry directly contributes to at least **nine Sustainable Development Goals (SDGs),** offering a proven model for climate resilience, food security, and ecosystem restoration (See figure 2).

Figure 2. Agroforestry can contribute to achieving at least nine out of the 17 SDGs.

A farmer in Kiabakari village in Tanzania tills his cassava farm. Cassava is a staple crop cherished by dryland farmers across Africa—thanks to its exceptional drought tolerance and ability to thrive in poor soils.

CASE STUDY: FARMER-MANAGED NATURAL REGENERATION

Farmer Managed Natural Regeneration (FMNR) is a low-cost, high-impact land restoration approach that empowers smallholder farmers to regenerate degraded landscapes (World Vision, 2018). By systematically managing regrowth from existing tree stumps, roots, and seeds, FMNR revives native vegetation without costly planting programmes. This practice combines indigenous knowledge with simple techniques to deliver multiple benefits.

In Kitui County, Kenya, FMNR has transformed barren fields into productive land, boosting crop yields by 30% while restoring water sources and biodiversity (World Vision, 2018). The model's success stems from its farmer-led implementation, which ensures community ownership and long-term adoption.

For policymakers, FMNR offers a compelling triple-win: it alleviates poverty by increasing farm productivity, enhances food security, and restores ecosystems—all while building climate resilience. Its low technical and financial barriers make it particularly suitable for scaling across East Africa's drylands.

POLICY RECOMMENDATIONS

Scaling agroforestry in East Africa's drylands requires coordinated action across five priority areas.

1. Strengthen Policy and Institutional Frameworks for Agroforestry

- Adopt integrated national policies that harmonise agroforestry across sectors (agriculture, environment, climate) and align sub-national plans.
- Prioritise dryland-specific strategies by mainstreaming agroforestry into relevant programmes and creating targeted East African policies through inclusive stakeholder processes.
- Enhance regional coordination via a permanent East African Agroforestry Platform for cross-sectoral alignment, knowledge sharing, and multi-stakeholder engagement.

2. Increase Funding and Financial Incentives

- Establish dedicated financing mechanisms for agroforestry, with explicit budget allocations in agriculture and conservation programmes.
- Direct funding to dryland communities, ensuring transparency, gender equity, and accountability in disbursement.
- Provide economic incentives (tax breaks, subsidies, credit access) and develop value chains for agroforestry products (timber, fruits, fodder).

3. Invest in Capacity Building and Farmer Support

- Scale up extension services and training networks linking researchers, governments, NGOs, and farmers, with a focus on dryland-appropriate practices.
- Strengthen research and innovation by integrating local knowledge, promoting farmer-led trials, and prioritising climate-resilient species/water management.
- Implement robust monitoring systems (MEL) to track progress and adapt strategies based on data.

4. Secure Land Tenure and Governance

- Guarantee land rights for women and marginalised groups to enable long-term agroforestry investments.
- Resolve land-use conflicts through participatory land management and transparent governance of dryland resources.

5. Foster Inclusive Multi-Stakeholder Partnerships

- Co-develop policies with farmers, Indigenous groups, NGOs, and governments, integrating traditional knowledge.
- Create transparent platforms for collaboration, ensuring equitable access to information and decision-making.
- Address market barriers to improve livelihoods and incentivise adoption.
- Prioritise policies that strengthen market access for agroforestry products—ensuring smallholder farmers earn fair value and drive green economic growth.

AUTHORS:

Recha, J., Nyika, J., Kimaro, A., Mwanja, C., Mwaimu, O., Butali, C., Bakengesa, S., Nderitu, M., Githendu, E., Maeri, D., Miseda, H. (2025). Scaling agroforestry as a climate resilience and food security solution in drylands of Kenya, Uganda, and Tanzania (Policy Brief). ViAgroforestry. With contributions from SIANI East Africa Drylands Agroforestry Expert Group and Advisory Committee.

REFERENCES

1. Ackerl, T., Weldemariam, L., Nyasimi, M., & Ayanlade, A. (2023). Climate change risk, resilience, and adaptation among rural farmers in East Africa. *Regional Sustainability, 4*(2), 185–193. https://doi.org/10.1016/j.regsus.2023.05.004

2. African Union & UN Women. (2021). Progress on gender equality and women's empowerment in Africa. https://au.int/en/documents/20211207/progress-report-gender-equality-and-womens-empowerment-africa

3. Agroforestry Network. (2020). Agroforestry, biodiversity and ecosystem services. https://agroforestrynetwork.org/wp-content/uploads/2020/05/Agroforestry-biodiversity-and-ecosystem-services.pdf

4. Food and Agriculture Organisation (FAO). (2016). Agroforestry for climate resilience and food security in drylands. http://www.fao.org/3/i6478e/i6478e.pdf

5. FAO. (2021). Soil organic matter regeneration through agroforestry. http://www.fao.org/3/cb4475en/cb4475en.pdf

6. FAO. (2023). Agroforestry for sustainable agriculture and food systems. https://www.fao.org/documents/card/en/c/cc7901en

7. Genga, I., Okia, C., & Mukisa, S. (2023). Reviving traditional seed systems in Uganda and Kenya. *Agroecology and Sustainable Food Systems, 47*(1), 72–90. https://doi.org/10.1080/21683565.2022.2123124

8. Githae, E., & Mutiga, I. (2021). Ecological restoration of pastoral landscapes in East Africa. Journal of Dryland Agriculture, 7(3), 34–41. https://doi.org/10.5897/JODA2020.0061

9. Government of Kenya. (2020). Kenya Climate-Smart Agriculture Strategy (2017–2026). https://www.adaptation-undp.org/resources/kenya-climate-smart-agriculture-strategy

10. Intergovernmental Authority on Development (IGAD). (2020). Drought Resilience and Livelihoods Programme report. https://igad.int

11. Jama, B., & Zeila, A. (2005). Dryland agroecological classification in East Africa. *Arid Land Research and Management, 19*(3), 245–260. https://doi.org/10.1080/15324980590951477

12. Le, T., van Dijk, M., & Bayala, J. (2024). Dryland extent and vulnerability in East Africa. *Land Degradation & Development, 35*(1), 112–125. https://doi.org/10.1002/ldr.4567

13. Mbow, C., van Noordwijk, M., Prabhu, R., & Simons, A. J. (2014). Agroforestry solutions for food security in Africa. *Current Opinion in Environmental Sustainability,* 6, 61–67. https://doi.org/10.1016/j.cosust.2013.10.014

14. Mbow, C., van Noordwijk, M., Prabhu, R., & Simons, A. J. (2019). Agroforestry's contribution to SDGs in Africa. *Current Opinion in Environmental Sustainability, 38*, 130–136. https://doi.org/10.1016/j.cosust.2019.05.003

15. Ndungu, J., & Kilelu, C. (2017). *Innovation and Development in Dryland Agriculture: Exploring Innovation Pathways in Kenya's Arid and Semi-Arid Lands.* Wageningen University & Research)

16. Nyongesa, L., Chemutai, B., & Otieno, D. (2022). Indigenous knowledge in dryland agrobiodiversity management. *African Journal of Environmental Science and Technology, 16*(4), 111–120. https://doi.org/10.5897/AJEST2022.3105

17. Regional Learning and Advocacy Programme (REGLAP). (2012). Key statistics on East African drylands. https://www.reglap.org

18. State Department for Arid and Semi-Arid Lands (SDASAL). (2020). National Drylands Development Policy Framework. http://www.asals.go.ke

19. van Noordwijk, M., Coe, R., & Sinclair, F. (2022). Agroforestry and ecosystem services. Springer. https://doi.org/10.1007/978-3-030-91600-6

20. World Agroforestry Centre (ICRAF). (2022). Agroforestry for dryland productivity. https://www.worldagroforestry.org/output/agroforestry-dryland-productivity

21. World Agroforestry (ICRAF) & UNEP. (2021). Restoring drylands through agroforestry. https://www.worldagroforestry.org/publication/restoring-drylands

22. World Vision. (2018). Farmer Managed Natural Regeneration: Lessons from Kitui. https://www.wvi.org/publications/report/kenya/fmnr-lessons-kitui

An example of agroforestry technology at work. Photo: CIFOR-ICRAF

Policy Brief Development and Purpose

This policy brief was developed by the **East Africa Drylands Agroforestry Expert Group** with support from the **Swedish International Agriculture Network Initiative (SIANI).** The Group works with a diverse team of experts – from civil society, ministries, academia, practitioners, and youth organisations – to highlight the challenges of rural communities to improve food systems in drylands and give concrete suggestions on sustainable land management. The Group engages directly with local farming and agropastoralist organisations to exchange knowledge and promote stronger commitments and dialogues to transform food systems, improve food security and enhance biodiversity conservation in East African drylands through agroforestry.
This policy brief draws on expert insights from a regional webinar held on March 14, 2025 on "Enhancing Climate Resilience and Food Security in Drylands: Scaling Agroforestry for Sustainable Livelihoods in Kenya, Uganda, and Tanzania", national dialogues such as Tanzania's Agroforestry Symposium, and systematic policy reviews. These engagements identified key barriers, opportunities, and evidence-based strategies for scaling agroforestry as a climate adaptation solution—guiding ongoing regional action.

For more about the Expert Group's work visit:

https://www.google.com/url?q=https://www.siani.se/expert-groups/dryland-agroforestry-in-east-africa/&sa=D&source=docs&ust=1748243563153095&usg=AOvVaw3EXyDFEqgjybnF5OlY8otm and via https://www.viagroforestry.org/projects/dryland-expert-group/