

Expanding greening across Africa's Great Green Wall, using farmer managed natural regeneration



Authors: Eliane Ubalijiro, Luc Gnacadja and Mitiku Haile. Editors: Nick Pasiecznik, Chris Reij, Sammy Carsan, Tony Rinaudo, Alice Muller, Irene Ojuok, Grace Koech and Mieke Bourne

This is the first document in K4GGWA briefs series aimed at practitioners, policymakers and researchers who want to see more trees in the Sahel, that will enable the region and its people to better cope with climate change, and restore the productive capacity of land to increase food security and reduce rural poverty.

Key messages

- Millions of farmers across the Sahel have already invested in increasing the number of on-farm trees on their land, by protecting and managing natural regeneration of woody species, known as farmer managed natural regeneration.
- Farmer managed natural regeneration is a low-cost community-led restoration strategy that produces a wide range of economic and environmental benefits and has a high scalability potential across Great Green Wall countries, especially in areas with high population densities.
- Achieving ambitious tree-based restoration goals requires prioritizing farmer managed natural regeneration and empowering millions of smallholders to grow locally adapted trees on farmland, community land and pastures.
- But active tree planting continues to play a vital role, particularly in areas lacking natural regeneration capacity or where farmers demand specific target species.

Regreening successes: Lessons for scaling

Many regreening successes in Africa have had a considerable impact on food security, poverty reduction, biodiversity and rebuilding resilience of rural communities to climate change. Examples can be found across the Sahel (e.g., Pasiecznik and Reij 2020). Half a million hectares of young agroforestry parkland are found on Mali's Seno Plains (Allen et al. 2020). Meanwhile, 5 million hectares of agroforestry parklands have emerged since the mid-1980s in Niger's Zinder, Maradi and Tahoua regions (Reij et al. 2009; Abasse et al. 2023). In addition, Ethiopia's Tigray region has at least 1.5 million hectares of 'exclosures', where communities exclude people and livestock from areas of degraded land from exploitation, to allow natural regeneration (Birhane et al. 2017). These successes can inform implementation of the Great Green Wall and the African Forest Landscape Restoration Initiative (AFR100), whose implementation rates are currently and historically too low to achieve their respective targets of restoring 100 million hectares by 2030.

All these examples share one common characteristic. They are based on farmers and rural communities protecting and managing trees and shrubs that regenerate naturally on their own farms, homesteads and communal lands. The general term for this practice is farmer managed natural regeneration, also known as assisted natural regeneration.

This policy brief proposes that Great Green Wall countries fully adopt farmer managed natural regeneration as the most effective, cost-efficient and sustainable means to quickly expand regreening, thereby increasing all the positive economic, social and environmental impacts across the region.

Box 1. Lessons from large-scale regreening in Niger for policy and practice

Since a major drought forced farmers into famine in the mid-1980s, hundreds of thousands of smallholders in densely populated south-central regions have increased on-farm tree densities.

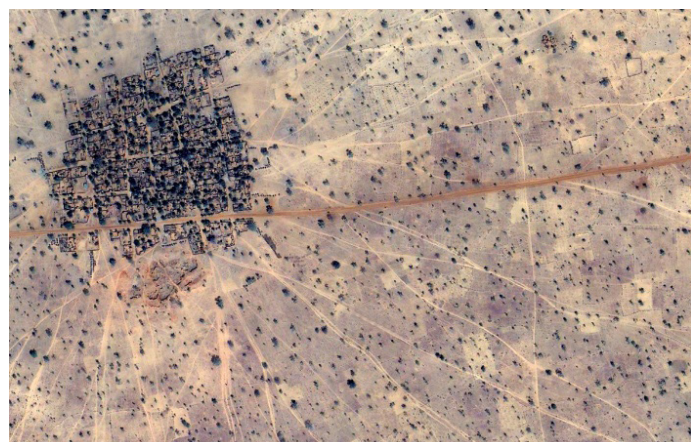
Key points

1. Farmers protected and managed natural tree growth to sustainably boost crop production without expensive external inputs, due to the ecosystem services provided by the nurtured trees.
2. Increasing on-farm tree numbers by farmers is driven by tangible incentives including enhanced crop productivity expanded fodder availability, more firewood for consumption and sale, and heightened climate resilience.
3. Farmer managed natural regeneration happens where population densities are high: a story of "more people, more trees", because farmers have less farmland to feed their families, forcing them to intensify agriculture, and the cheapest way is to add more trees to farming systems.
4. External project support was limited to knowledge transfer, with farmer-to-farmer visits, farmer training and strengthening of village institutions.
5. Many farmers adopted the practice spontaneously, and it spread because farmers perceived *de facto* ownership of their on-farm trees, which was confirmed *de jure* in July 2020 by a presidential decree.
6. Communities learned over time to develop, agree and enforce their own bylaws to protect and manage the new trees that have been regenerating in large numbers.

Implementing farmer managed natural regeneration helps meet global goals

This is one of the most effective practices to accelerate implementation of Sustainable Development Goal 15.3 on land degradation neutrality. It operationalizes SDG 15.3 by combining productivity, resilience and ecosystem restoration. Farmer managed natural regeneration is also an effective and practical bridge between the three Rio Conventions (UNCCD, UNFCCC and CBD) as it helps restore degraded landscapes, helps land users adapt to climate change and increases biodiversity. In this way, locally driven action helps to achieve global commitments.

In the past, planting of tree seedlings was the cornerstone of greening efforts. This often followed much site preparation, and total costs could be USD 500 per hectare. Where farmer managed natural regeneration has achieved scale in the Sahel, external investment costs for staff, travel and training are USD 20–60 per hectare (e.g., EUR 52 in Ghana, data from the Regreening Africa project). Furthermore, many projects mention the number of trees planted, but not the number that survived after a few years, while peer reviewed publications estimate survival rates at 10%–40%. Zhu et al. (2025) examined 36 reforestation parcels in Senegal and found that only two parcels showed significant greening since planting. The practice also has the capacity to spread beyond ‘projects’, and the ‘cost’ to farmers is only labour, estimated at below USD 20 per hectare



Regreening around a village in southern Zinder, over 12 years: black dots are on-farm trees.

Photos by DigitalGlobe, 7 March 2002 and 13 January 2014.

(Reij and Garrity 2016). Annual recurrent costs are also low, and one IFAD project costed 90,000 hectares of farmer-managed natural regeneration in Maradi, Niger over three years at around USD 14 per hectare.

Farmer managed natural regeneration must be seen as the default and foundational practice wherever potential exists, and tree planting and natural regeneration should be seen as complementary practices, with planting allowing farmers to select specific high-value species, such as fruit trees.

Where is the low hanging fruit?

Given the characteristics of areas where farmer managed natural regeneration succeeded, regions with the following traits are most likely to adopt the practice.

- High population densities and low on-farm tree densities.
- A sense of crisis because of land degradation and lowering crop yields.
- Sandy soils where root systems can develop, make the practice easier, but all soil types are suitable.
- Mean annual rainfall of 400–1,000 millimetres.

But there are cases where it will not work or will not easily be adopted...

Farmer managed natural regeneration has huge potential, but will not work well under any of four conditions: (i) completely barren land with no vegetation, rootstocks or seedbanks; (ii) areas with insecure land-tenure rights that discourage investment in land restoration; (iii) areas with strong community resistance or limited interest; and (iv) villages without agreed bylaws that would ensure accountability and sustainability.

Farmer managed natural regeneration must be seen as policy and institutional choice

A greater focus on farmer managed natural regeneration requires a shift in the role of governments to create enabling policies and legal frameworks that induce large numbers of land users to invest their resources in the protection and management of on-farm trees. This also requires a recognition that farmers and pastoralists are driving greening, rather than being simple beneficiaries of externally driven interventions.

Developing and implementing a strategy to expand greening

The challenge is to sustainably regreen many millions of hectares, at low cost and rapidly.

- Develop and implement strategies that promote adoption to achieve ambitious restoration targets.
- Engage education and research institutions to incorporate farmer managed natural regeneration in curricula and research agendas.
- Limit tree planting to fruit species, enrichment planting and where natural regeneration is not possible.
- Develop communication strategies to mobilize millions of smallholders to invest in regenerating trees on their own farms and on communal lands.



Upper left and right: Landscape changes due to adoption of farmer managed natural regeneration, Humbo, Ethiopia.

Photos by World Vision

Lower right: Young agroforestry parkland on Mali's Seno Plain between Koro and Bankass, after the millet harvest.

Photo by Chris Reij/Independent dryland restoration specialist



Box 2. Next steps to expanding the uptake of farmer managed natural regeneration in the Sahel



Identify regreening successes in each country and use them as sources of inspiration and learning.



Communicate successes to expand national awareness of regreening successes.



Strengthen village institutions to protect and manage the millions of new trees.



Build ambitious programmes to strengthen tree management skills for trainers and farmers.



Incorporate modules on farmer managed natural regeneration into agroforestry courses.



Develop reward systems for acknowledged regreening champions.



Co-produce research to fill gaps in knowledge.



Support and build agroforestry value chains that help farmers sell products from their new trees (fruit or fodder; wood or charcoal, medicine or fibre) and additional agricultural harvests.



Develop effective legal and policy frameworks for regreening, lacking in most Great Green Wall countries, where land users are still perceived as part of the problem rather than part of the solution.

Adapted from Reij and Winterbottom (2015).

A shortcut to progress

Farmers listen to farmers. Community radio programmes can help farmers share their experiences with peers. Farmers can tell the difficulties and how they have overcome them, perceived impacts, and how they organized themselves to manage the new tree capital. This can be developed in Great Green Wall countries to catalyse a process of regreening.

Funding requirements

Long-term support is needed to strengthen the skills of farmers and build village institutions, and develop adapted policies, legislation and agroforestry value chains. The funding required for promoting farmer managed natural regeneration in Great Green Wall countries is less than what is required for massive tree planting. Farmer managed natural regeneration is a low-cost practice, which does not need nurseries or the planting of seedlings. An estimated investment of USD 300 to 500 million over the next five years will help build a solid basis for catalysing processes of natural regeneration across the Great Green Wall.

Actionable policy takeaways

- Reorient restoration finance towards regreening led by farmers and communities.
- Reform legal frameworks so that they secure smallholder rights over naturally regenerated trees.
- Invest in farmer-to-farmer learning, use of mass media and local knowledge systems to inform urban and rural populations and practitioners of regreening successes.



Regreening in Tigray, northern Ethiopia.

Photo by Landscape Alliance



Two community members pruning a young tree, Senegal.

Photo by Regreening Africa project

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