

LEARNING BRIEF: Nuyok Activity in Karamoja



Farmer Managed Natural Regeneration: Lessons from Nuyok's Approach in Karamoja

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SERIES

This learning brief is part of a series bringing together experiences and lessons learned from the Nuyok Resilience Food Security Activity (2017–2023). The briefs are designed for practitioners, including local government representatives, civil society organizations and other actors working on natural resources management, sanitation, and livelihoods-related issues.

ABSTRACT

This learning brief highlights farmer managed natural regeneration (FMNR) as a promising approach to conserving trees and increasing tree cover, providing many benefits to communities, particularly when complemented with soil water harvesting and conservation practices. In the context of the Nuyok program, the impact of FMNR practices is based on community perception and observations of change. Future FMNR efforts can benefit from further data around factors that influence the sustainability of the approach and uptake by communities.



DISCLAIMER

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PHOTOS

Nuyok Resilience Food Security Activity. All photos reproduced with permission.

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ACRONYMS

CFW	Cash-For-Work
CLDRM	Community-Led Disaster Risk Management
CRS	Catholic Relief Services
FMNR	Farmer Managed Natural Regeneration
NRM	Natural Resource Management
RFSA	Resilience Food Security Activity
UGX	Ugandan Shilling
USAID	United States Agency for International Development
USD	United States Dollar
VDMC	Village Disaster Management Committee

ACTIVITY BACKGROUND

The Nuyok Resilience Food Security Activity (RFSA) sought to build resilience to shocks, enhance livelihoods, and improve food and nutrition security for at-risk rural families in the Karamoja sub-region of Northeastern Uganda. Funded by the United States Agency for International Development (USAID) Bureau for Humanitarian Assistance, the activity operated for six years (2017–2023) under a consortium of six implementing partners led by Catholic Relief Services (CRS)—Caritas Moroto, Caritas Kotido Diocese, Cooperation for Development, The BOMA Project, and YouthBuild International. The activity reached more than 269,000 at-risk people across 524 villages in four Karamoja districts—Abim, Napak, Nakapiripirit, and Nabilatuk—targeting women, men, and youth. Using a multi-sectoral approach, Nuyok worked to strengthen governance, gender equity, community capacity to manage shocks and stresses, and traditional and diversified livelihood opportunities. Nuyok also focused on improving nutrition, health, and water, sanitation, and hygiene for pregnant and lactating women, adolescent girls, and children under five years of age.

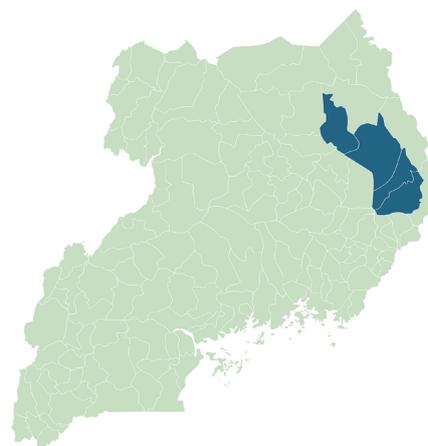


Figure 1. The Nuyok RFSA's four project areas highlighted in blue: Abim, Napak, Nakapiripirit, and Nabilatu.

ACTIVITY CONTEXT

Karamoja has the highest levels of poverty in the country, forcing extremely poor and vulnerable households to depend on natural resource products to meet critical needs such as fuel, fodder, and food. Many families, especially the poorest households, are increasingly engaged in charcoal production and firewood sales to earn cash and supply the rapidly growing urban centers. The rising demand for charcoal is driving deforestation and environmental degradation, compounding negative effects on households, particularly for women and girls required to walk longer distances to find firewood. Recent studies show that climate change has worsened the impacts of degradation, affecting both crop and livestock production.¹

Consequently, the Nuyok team decided to explore the Farmer Managed Natural Regeneration (FMNR) approach to reverse land degradation, improve and stabilize ecosystem services, and reduce time burdens for women. FMNR is a technique where native tree stumps, sprouting roots, and seedlings are protected and allowed to grow into bigger trees and shrubs, while larger trees are strategically pruned to allow for faster growth. It is a simple, low-cost land restoration approach for increasing tree and vegetation cover, which supports improved ecosystem functioning, slows or halts erosion and other forms of land degradation, and promotes improved soil health. Nuyok examined existing evidence of the approach successfully restoring degraded lands in the Sahel.² As Karamoja's ecology is similarly semi-arid, Nuyok decided to apply the approach in its own operational context to gauge its impact and capture lessons and best practices for scale-up.

INTERVENTION DESCRIPTION

To build the capacity of communities to manage shocks and stresses through resilience pathways, Nuyok employed a community led disaster risk management (CLDRM) approach to engage communities through village disaster management committees (VDMCs). CLDRM is a step-by-step participatory process in which different groups within the community—men, women, youth, people with disabilities, and others—come together to identify the most common risks directly affecting their livelihoods ranked according to community priority. At the same time, the community groups

- 1 Doso, S. (2014). [Land degradation and agriculture in the Sahel of Africa: causes, impacts and recommendations](#). *Journal of Agricultural Science and Applications* 3(3): 67-73.
- 2 Lohbeck, M., Albers, P., Boels, L.E., Frans Bongers, Morel, S., Sinclair, F., Takoutsing, B., Vågen, T., Winowiecki L. A., & Smith-Dumont, E. (2020). [Drivers of farmer-managed natural regeneration in the Sahel: Lessons for restoration](#). *Scientific Reports* 10(15038).

work together to identify appropriate solutions and develop an action plan to implement them. The identification and ranking exercises highlighted that communities prioritize their immediate needs like water and health (human and animal diseases) as most critical to their livelihoods. Different villages ranked similar risks differently depending on how that specific risk impacted their lives and livelihoods, including the frequency of impact. Overall, hazards related to the environment ranked fairly low, and yet environmental degradation and loss of tree cover both directly and indirectly contributes to other identified risks, such as droughts and water shortages. For these hazards, communities selected solutions focused on tree planting and formulation of by-laws to stop deforestation and bush burning. These solutions were then included in the village disaster management plans (VDMs). This participatory process enabled the project team to understand risks and areas of vulnerability in each village, including which hazards were most critical for communities and why.

Contour trenches are ditches constructed at the same altitude across a slope to collect water, reduce runoff, and improve infiltration. At FMNR sites, trenches were dug 0.5m deep and 0.5m wide with excavated soil piled downslope of the trench to create a bund.

Semicircular bunds (or half-moons) are trenches that collect water and dug parallel to the slope in half-circles around the downslope base of trees and shrubs.

Two strategies were deployed to promote FMNR through the VDMCs and the surrounding communities to address environmental hazards. First, as the primary structures supporting communities in disaster preparedness, VDMCs received training on FMNR and natural resource management practices and techniques including tree pruning and thinning, as well as the establishment of soil water harvesting practices such as mulching, semicircular bunds, and contour trenches. Next, Nuyok trained cadres of community resilience facilitators who cascaded FMNR training to additional communities. To support scaling of the approach, Nuyok targeted the roll out of FMNR and natural resource management (NRM) techniques at both the community and farm levels.



Semicircular bunds and contour trenches at a communal FMNR site

The project followed a sequence of steps for rolling out FMNR practices:

- 1. Site Identification, verification, and measurements:** As the first step, the VDMCs engaged the entire community to identify one priority area in their village that was deforested and degraded. After the community agreed, Nuyok NRM officers and district forest officers visited the site to measure its size and identify tree species and their respective benefits to the community. Table 1 below provides a sample of targeted tree species and their benefits. Other factors considered were the proximity of the site to the community for management ease and the willingness of the community to formulate bylaws for managing and protecting the site. Seventeen FMNR sites totaling 116 hectares were designated as learning sites for restoration practices.

Table 1. Native trees prioritized for FMNR and their benefits

Local Name	Botanical Name	Benefit
Opedo	Harrisomia abyssinica	Medicinal/fodder
Ekwakwala	Strychnos innocua	Fodder for wild animals
Olam	Tamilina spp	Fodder for birds

Local Name	Botanical Name	Benefit
Kworo	Ficus sycomorous	Medicinal—its bark treats diarrhea/dysentery
Cumu	Diospyros mespilifomis	Medicinal remedy for toothache
Acuga	Carissa edulis	Medicinal remedy for diarrhea
Orwecho	Vitex doniana	Medicinal remedy for eye cataracts
Obwolo	Soursop (Annona muricata)	Medicinal remedy for backache
Alemu/Ngalam	Ximenia americana	Fruits
Cwaa/Epeduru	Tamarind (Tamarindus indica)	Fruits
Yao	Vitalleria paradoxa	Shea nut oil
Ekorete	Balanites aegyptiaca	Fruits, grains, and vegetables
Ekodiokodioi	Acacia Senegal	Fodder

- 2. Site assessment and analysis:** Nuyok NRM officers and engineers conducted a site assessment, documenting the topography, determining the slope for each site, counting the number of trees, and estimating the number of contour trenches and half-moons to be constructed. Based on this information, the team calculated the number of participants required to accomplish the initial work on the site over 15 days.
- 3. Registration of cash-for-work (CFW) participants:** As FMNR and complementary soil conservation techniques can be labor intensive, the Nuyok team decided to employ cash-for-work to mitigate the time and labor burden for establishing each restoration project site, targeting a total of 1,782 participants.
- 4. Formation of management committees:** Nuyok then supported the formation of project management committees at each site, composed of government disaster risk reduction officers, Nuyok NRM officers and engineers, as well as crew leaders selected by the community and trained by Nuyok. These committees supervised FMNR activities at the sites, with each crew leader assigned to supervise 20 participants. By employing a CLDRM process from the start, Nuyok’s approach sought to instill community ownership of the entire process, operationalized through the local committees overseeing the management and monitoring of their own FMNR sites. VDMC members were also supported by relevant district and sub-county officials who attended community meetings to sensitize members on the benefits of FMNR and tree planting in the community.
- 5. Implementation:** At the FMNR sites, the rollout of each practice was supported by specific technical guidelines, which the project management committees and participants used to construct fire lines, thin and prune trees, and construct semicircular bunds and contour trenches. To support participants’ time and labor and encourage uptake, each participant was paid an average of 90,000 in Ugandan shillings (UGX) (\$24 in U.S. dollars (USD)) through CFW. In total, communities restored and pruned 48,861 trees using FMNR techniques. The sites were fenced to allow trees to grow, and communities were responsible for ensuring no trees were cut. In addition, 6,260 meters of contour trenches and 50,000 semicircular bunds were constructed to retain water and promote soil water retention for plant growth.
- 6. Site monitoring and handover:** VDMCs and community and government leaders collaborated to formulate bylaws for conserving the trees at each site and preventing people from cutting them. Elders have the overall responsibility of monitoring the site and enforcing the bylaws. The district and sub-county officials participated in monthly and quarterly visits organized by Nuyok to inspect FMNR sites. During these visits, the officials advised the community on how best to manage the sites, troubleshoot issues, and share tips on community ownership and sustainability. In this way, Nuyok aimed to establish site maintenance as a partnership between community leaders and local government.



Loboloin FMNR site in April 2020 and March 2023, Loregae sub-county, Nakapiripirit District

Nuyok also targeted FMNR practices at the individual farm level, starting by training the 20 members of each VDMC on FMNR. The VDMC members were then tasked with selecting at least five tree species on their individual farms for conservation. They pruned and constructed half-moons beside each prioritized tree. As a result, 9,895 VDMC members replicated the approach on their farms—leading to the conservation of over 50,000 trees across 10,000 farms in the four Nuyok districts.

IMPACT AND RESULTS

Based on a qualitative assessment conducted in March 2023, most respondents have observed positive changes on conserved sites in the form of increased vegetation, tree growth, and water harvested on contours, with some describing the sites as bushy and dense. All assessment respondents reported noticeable tree growth and an increase in habitat for birds, dik dik (antelope), reptiles, rabbits, and other animals. Communities reported that this increase in biodiversity has increased access to food resources from both trees (wild fruits and leaves) and wildlife, as well as fodder for livestock that browse leaves and acacia pods during the dry season. Respondents reported that trees also provide fuel, fencing, and building materials for communities, using the branches gathered through pruning and tree maintenance. District Forest Officers and sub-county officials in the four districts also reported increased biodiversity at the FMNR sites compared to non-protected areas.

The trees at the sites have grown both in height and diameter. In 2020, the Nuyok team randomly sampled and measured the size of trees in planned FMNR sites to establish a baseline. The average tree trunk diameter at baseline was 3cm. In 2023, 133 trees were randomly sampled from 15 FMNR locations and found the average diameter increased to 4.5cm. Many respondents in the district and sub-counties reported that increased tree cover has changed the microclimate of farms, acting as windbreaks and providing shade for homesteads.

The assessment found that complementary soil and water conservation practices increased the impact of FMNR. The respondents reported that the semicircular bunds and contour trenches constructed on FMNR sites fostered regeneration, controlled soil erosion, and harvested water during rainfall events. All the respondents interviewed agreed that water harvesting structures have not only been a source of water for the trees but serve as important water sources for livestock and wildlife as well.

“Protected trees in gardens provide the crops with a cooler environment, improve soil fertility, and offer windbreaks and shade.”

—FMNR Assessment Respondent

CHALLENGES

Conservation practices, labor, and time: While complementary conservation practices such as fire lines, semicircular bunds, and contour trenches are necessary for restoring landscapes, they require some initial time investment to master the techniques (for instance, marking and digging along contour lines) and communities find them labor intensive. Contour bunds were particularly technical, as they require correct measurements using a properly constructed and calibrated A-frame tool to mark the slope. The construction of semicircular bunds, contour trenches, and fire lines was reported by many respondents to be tedious and physically challenging in dry season conditions and in rocky sites where the soil was dry and difficult to work. In addition, these earthworks often require additional tools such as pickaxes and hoes which are not always readily available or affordable in at-risk communities. The result of site assessments should be used to help plan for and mitigate these challenges in locations where soil characteristics make digging more challenging. Work should be timed to coincide with the early rains when soils are softer and easier to work.

Governance and communal land tenure: The limitations and complexities around governance of communal lands and land tenure in Karamoja makes it difficult to manage forest resources. In most rural areas, the land is communal and belongs to the state. The rural community has access to the land and can work on it, but ultimate control lies with the government. As such, managing land under communal ownership is difficult because no single person has the authority to control the land and its resources. Conflicting interests between crop farmers and pastoralists mean that effects such as bush fires (sometimes initiated by herders as part of rangeland management) and livestock feeding can disrupt FMNR site management efforts.

In addition, the creation of new settlements and subsequent clearing of communal areas for agricultural use contributes to new deforestation. For example, individual landowners in Abim changed the designated FMNR learning site from a protected regeneration zone to active cultivation, cutting down many of the trees in the process. In addition, two households created settlements inside the Lobolwala FMNR site in Abim and the Ugandan army settled the FMNR site in Nakaramwae. A few of the sites that were communally owned were difficult to manage because high-ranking members of the clans are allowed to use the land however they would like. That said, in other districts (for example, Nabilatuk, Napak and Nakapiripirit), the by-laws established by the community were effectively enforced by the elders monitoring the sites. Future programs should strengthen broad consensus around by-laws.

Cash-for-work and sustainability: During the FMNR assessment, only a few respondents said they adopted FMNR to address drought. Many participants reported that they practiced this technique to receive money through CFW. Although ongoing CFW incentive is unsustainable in the long-term, it was seen as an essential factor to build initial interest and uptake, with the aim that longer term benefits will incentivize ongoing FMNR practices and site maintenance. Evidence around the possible influence of these longer term incentives on future site management is not available, but would be a useful line of inquiry in future programs.



Story of Change: FMNR in Nakapiripirit is saving time and restoring ecosystem services

Anyakun Samson is 37 years old and a member of his VDMC in Nakurobuin Village, Lolachat sub-county, Nabilatuk District. Samson is one of the FMNR champions in his community and has advocated for the approach since the start of the initiative. He started by selecting key tree species on his farm to protect based on the benefits they provide him and his family. For example, *Balanite aegyptiaca* (local name “ekorete”) and *Acacia Senegal* (local name “ekodiokodoi”) both provide a variety of benefits including fodder for livestock and medicinal uses. He was so impressed with the results of the FMNR approach that he has since scaled up his efforts to protect and regrow 25 indigenous tree species on his land.



“The FMNR approach has made the fuel wood readily available especially when pruning is done. The [pruned] tree branches are used as fuel wood and this has reduced the time for my woman looking for fuelwood in the distant locations like Natirae,” says Samson. “FMNR approach is not cumbersome as it requires simple tools which are readily available for making half-moons and pruning. I couldn’t believe the approach can work well since I thought the indigenous tree species which are shrubs can’t grow fast.”

As an FMNR champion in the village, Samson has trained other community members on the adoption of FMNR in their individual farms through practices like pruning techniques, mulching, and creating half-moons and fire breaks.

LESSONS AND RECOMMENDATIONS

Incentivizing uptake of FMNR: Communities are more likely to adopt practices that are simple, quick, and have immediate results and benefits. It is easier to encourage uptake of FMNR by focusing on tree species with well-known benefits to communities and farmers rather than introducing new, unproven species. For example, trees like *Ximenia americana* are known by the community and valued for their fruit, and their flowers support increased honey production. Nuyok found that integrating beekeeping on FMNR sites sometimes incentivized people to protect trees. It is also important to encourage farmers to conserve trees that offer multiple benefits, for example, *Balanites aegyptiaca*, which is used for both livestock fodder and medicinal purposes. Communities also appreciated new sources of firewood and construction materials from pruned branches as well as the availability of water for livestock collected in the half-moons and contour trenches.

Manage time and labor burdens: Nuyok found that complementary interventions to FMNR, such as constructing soil and water conservation structures and establishing fire lines significantly improved tree growth and site regeneration; in fact, in the Karamoja context, it is unlikely that FMNR techniques alone would foster regeneration without these practices. The use of complementary conservation practices also played a key role in making the designated regeneration sites clearly identifiable for community members, providing visible markers in the landscape—signaling that the locations are protected. However, the consistent adoption of these complementary practices is dependent on communities’ and farmers’ time and labor availability, as well as technical support and tools to support the work. One way the intervention sought to mitigate burdens for participants was through CFW; however, this is not sustainable post-intervention.

For longer-term mitigation of these effects, programs should start with easily implementable soil and water conservation practices to increase adoption by local communities. Participants reported the practices most widely adopted by communities were pruning and half-moon bunds because they are technically simple, inexpensive, and constructible with available tools. This is crucial in at-risk communities that cannot spare money to purchase tools. It is also important to employ simple instructions and examples when training communities, identifying key community members who easily grasp concepts and can champion the process. Prior to planting, project teams should also undertake a soil assessment to

ensure realistic requirements for preparation and labor needs at each site. For example, sites with hardpan soils require more preparation time.

Plan for and mitigate governance issues through broad participation: An inclusive community participatory approach ensured communities and local leaders understood the requirements and benefits of using FMNR and the roles each stakeholder played in the project. The leaders and communities set up bylaws to protect FMNR sites and areas within traditional structures that were managed by village elders. However, it was difficult to enforce these bylaws in areas where land was owned individually (for instance, in Abim), where the owners changed the land use to farming and settlements, and where conflicting interests between farmers and pastoralists hindered FMNR practices due to livestock disruptions and bush fires. Future programs should strengthen broad consensus around bylaws. Establishing fire lines and fencing around regeneration sites also helps the visibility of protected areas. Some project areas may find it more realistic to pursue FMNR approaches on individual farms (at least to start) rather than targeting communal lands.

CONCLUSION

This learning brief highlights the most promising aspects of the FMNR approach, including increasing tree cover, improving soil health and water retention, and conserving tree species that provide multiple benefits to communities, particularly when complemented with soil water harvesting and conservation practices. Future FMNR interventions can draw important lessons from Nuyok's experience, which demonstrates that the ease of participant uptake as well as planning for land management and governance are key to the approach's long-term success. Future FMNR efforts can benefit from further data on factors that influence the sustainability of the approach and uptake by communities.



Tree protected using FMNR techniques

