2013

TECHNICAL BRIEF

World Agroforestry Centre

Farmer-managed natural regeneration

How to regenerate pasture and farmland on a low budget

OVERVIEW

This brief is intended for project-level practitioners – extension agents, farmer trainers, leaders of farmers' groups, pastoralist associations and others – who wish to increase the productivity of (semi-arid) pasture and farmlands using trees. The methods presented have been used on a very large scale in some West African countries – especially in southern Niger. They have also been implemented in central Tanzania (Shinyanga Region) and northern Ethiopia (Tigray – exclosures), by land owners and community groups with a strong desire to return their land to a more productive state.

FAQs ABOUT FMNR

What is farmer-managed natural regeneration?

Farmer-managed natural regeneration (FMNR) is a quick, affordable and easy-to-replicate way of restoring and improving agricultural, forested and pasture lands. FMNR promotes the systematic regrowth of existing trees or from naturally occurring tree seeds. It can be used wherever there are living tree stumps with the ability to coppice (re-sprout) or seeds in the soil that will germinate.

Photo 1: Mzee Mabula, on his private *ngitili*. Water conservation, poles, bee hives, fodder, firewood, shade and improved pasture are just some of the benefits he enjoys. *Credit: Bob Wagner*

What are the main advantages of this approach?

- FMNR starts with what many farmers/ herders already have: land with trees that have known value and uses. It respects and builds on **local knowledge**.
- It is not expensive to implement, although some form of protection of trees is very important. Local (enforceable) by-laws are more practical and affordable than fencing.
- Coupled with progressive policy environments and secure property tenure regimes, FMNR has great potential for spreading from farmer to farmer over large areas. This goes far beyond the usual concerns of project sustainability, because once established, the process attracts wider attention and spreads using local resources and initiative.

Where did the method originate?

It began in West Africa, following the severe drought of the mid 1970s. A few innovative farmers working with a development agent (Tony Rinaudo) developed specific techniques for regenerating trees from existing stumps – combined with low-cost soil and water conservation techniques. These simple methods are now practised on over hundreds of thousands of hectares in Niger. In eastern Africa, in Tanzania's Shinyanga region during the late 1980s and 1990s, a long-term government supported programme to reverse land degradation by reviving traditional dry-season pasture and woodlot protection gained momentum and spread to more than 800 villages.

This technical brief is an output of an ICRAF-supported, DFID-funded [KnowFor Programme] write-shop.
To access the digital version see [http://www.worldagroforestry.org/knowfor]

Photo 2: Improved dry-season pasture is TOP PRIORITY, and a major resilience booster for agro-pastoral societies like that of the Wasukuma in northern Tanzania. *Credit: Bob Wagner*

Table A: Key impacts and other ecosystem benefits from *Ngitili* (2004 US$ equivalent)

Economic value of restored *ngitili*	US$ 14.00 per person, per month
National average rural consumption	US$ 8.50 per person, per month
Average annual gross value of 16 major natural resource products harvested from *ngitili* (Bukombe district only)	US$ 1,190 per year per household US$ 700,000 per year per village US$ 89.6 million per year across the district
Species of trees, shrubs and climbers found in restored *ngitili*	152 in total
Typical reduction in time spent in collecting natural resources	Collection time reduced by: • Fuelwood: 2-6 hours per day • Poles: 1-5 hours per harvest • Thatch: 1-6 hours per harvest • Water: 1-2 hours per day • Fodder: 3-6 hours per harvest
Percentage of households in seven districts across Shinyanga using *ngitili* products for various purposes	To diversify diet: 22% To provide animal fodder and forage: 21% To collect medicinal products: 14% To collect firewood: 61% To pay for children's education: 36%

Source: Extracted from Monela et al. 2004:3-4, 53, 61, 67-69

When should the method be used? By whom?

Where community members recognize that trees are disappearing, their environment is deteriorating, and they have expressed a clear need for support, FMNR is more likely to be accepted and spread. As the name implies, the main target group must be those people (community groups) who have a vested interest (i.e. *tenure*) and will benefit directly from improved agro-ecological conditions that they create over many years.

Community leaders who are already involved in conserving and managing trees are ideal initial partners, as they are respected and well-known. Their success (or failure) will influence many others to follow suit (or not).

Local government officers (Forest Department, Ministry of Agriculture or Environment) should always be involved right from the beginning on the basis of their key roles in information sharing, training and implementing progressive policy reforms.

Do not leave out school headmasters/groups, churches, mosques and other CBOs who can also spread the initiative among their constituent members.

Remember: Women, the youth and marginalized groups often suffer first in situations of severe food and water shortage. They carry the largest burden of searching for fuel wood, cooking food, gathering wild fruits, so they benefit significantly, as will their families. Well-designed FMNR projects include the most vulnerable, and ensure information and training on FMNR and its impacts are available to all.

What are the most common constraints?

- A landscape entirely devoid of pre-existing trees and stumps takes longer and is more costly (in terms of labour and inputs) to regenerate.
- Similarly, a low level of local knowledge and awareness of how quickly trees (once protected) will reach useful size and begin producing valuable products is a barrier. A similar limitation is where there are weak or no 'pro-tree' policies among local governance bodies and officials, that do not recognize land-user rights to the benefits trees provide.
- Zero awareness at the upper levels of government forestry or environmental policy-setting makes it harder to gain acceptance and support at district/woreda/county level for FMNR initiatives. Even so, this has not prevented efforts in countries like Ethiopia, Tanzania, Ghana or Niger from taking off over time. In fact, the success of those initiatives is pushing the policy makers to change the laws in favour of FMNR principles and practice.

Photo 3: Combining FMNR with agroforestry training and locally-run nurseries is a powerful technique. Here, a farmer offers a variety of trees to sell or swap (for bricks in his case) and plant on well-protected *ngitili*. Their survival rate is much higher because of the local by-laws which protect *ngitili* from hungry goats. *Credit: Bob Wagner*

POTENTIAL IMPACT

An essential aspect of successful FMNR is how it can reduce vulnerability and improve resilience among the less wealthy members of a community. The main beneficiaries of this approach are those who depend more on tree resources: farmers, herders, and particularly women and children who harvest wood and non-timber forest products. There are reports available (see information resources at the end of the brief) that have documented the economic value of FMNR.

In one study from Niger, an average annual value of US$ 1.40 was given for the products obtained from each regenerated tree (Reij C, Tappan G, Smale M. 2009. Agroenvironmental transformation in the Sahel. IFPRI Discussion Paper 00914, IFPRI). Multiplying this (conservative) figure by the estimated number of *new* trees per hectare yielded "*an additional value of at least US$ 56 per hectare per year*", in 2008.

NUTS AND BOLTS [OR SPROUTS AND SEEDLINGS]

Now we come to the practical part – the 'technology' aspects, of FMNR. Keep in mind that the social context is extremely IMPORTANT, much more than the technical aspects – because the long-term management, thus ownership and benefits, will be by land-users and their families (women, men, children – everyone!).

FMNR involves both raising awareness and changing behaviour, together with the physical practice of restoring and managing trees on degraded land.

The practice of FMNR is very simple. The basic key concepts are:

1. Tree stumps that are re-sprouting are selected based on the land owner's needs and resources. Trees to be managed through FMNR are then pruned, leaving a small number, possibly even only one or two strong sprouts. This helps them grow more quickly by reducing competition for resources.
2. Sample sites should be selected, marked by posts, and (where practical – e.g. if a university student or researcher is assisting) GPS coordinates recorded and photographed. This provides valuable baseline information for future monitoring and evaluation. It is the best way to create a convincing record for the owners as well as the donors!
3. If there are few or no stumps remaining, trees that naturally sprout from seed within the ground are protected from animals and people until they are large enough to be pruned and managed.
4. Participants regularly check on the trees to prune new suckers (sprouting branches) to stop these from drawing away resources from the main branches.
5. Eventually (after a few years), trees may be harvested for fuel wood, timber, charcoal or poles once they grow large enough, or kept as a source of trimmings that are used for animal feed, fertilizer or fencing, depending on the owner's preferences.

Note: It is also possible to maintain trees from project (local NGO/CBO/government) tree nurseries by using FMNR techniques, in situations where no naturally occurring tree resources are available. However, it is much cheaper and easier to implement FMNR with *existing* resources.

Remember: *Long-term resident land-users already have a LOT of local knowledge about how best to use trees and will be very innovative once they see the trees coming back on their land.*

As a supplement to this brief, try to also use other audio-visual tools (available via the Internet) to make the training aspect more interactive and dynamic. Some of these are listed under other resources at the end of the brief.

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Managed exclosure

Exclosure aims at protecting some areas from agriculture and grazing activities to protect the landscape from deforestation and overgrazing to rehabilitate degraded areas. Community/ local institutions play an important role in aligining priority areas for exclosure.

Table B. Getting good partnerships going

Partner	Priority for partnering *(Essential, Desirable)*	Partner roles
Local government	***Essential***	• Create supportive policy environment. • Endorse and encourage FMNR activities. • Communicate progress to national government.
Local departments of agriculture and forestry, and environment	***Essential***	• Adopt/promote FMNR in existing agricultural or forestry activities • Monitoring and follow-up, encourage FMNR practitioners. • Authoritative intermediary during disputes and breaking of by-laws. • Assist in establishing certified markets.
Other organizations– especially those working in natural resource management, agriculture, micro-enterprise development	***Desirable***	• Promote FMNR in adjacent areas. • Support joint FMNR initiatives. • Partnership will ensure they do not undermine FMNR promotion.

Source: Adapted from Field guide to FMNR, WVI, 2012

For details see project site: http://www.worldagroforestry.org/knowfor

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INFORMATION RESOURCES

The Development of Farmer Managed Natural Regeneration. LEISA magazine.
http://www.leisa.info/index.php?url=show-blob-tml.tpl&p[o_id]=113390&p[a_id]=211&p[a_seq]=1

Regreening the Sahel. Farmer-led regreening in Burkina Faso and Niger
http://www.ifpri.org/sites/default/files/publications/oc64ch07.pdf

Farmer-Managed Natural Regeneration - World Vision Institute
www.worldvision-institut.de/_downloads/allgemein/FMNR_PM.pdf

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