FOREST LANDSCAPE RESTORATION IN UGANDA:
The Case of Farmer Managed Natural Regeneration (FMNR)

Policy Brief

KEY MESSAGES

1. *Farmer Managed Natural Regeneration (FMNR) is a rapid, low cost and easily replicated form of social forestry for restoring and improving agricultural, forested and pasture lands.*

2. *Following Uganda's commitment to restore 2.5 million hectares of deforested and degraded land as a pledge towards the Bonn Challenge, FMNR is recommended as one of the cheap and fast options for achieving forest and landscape restoration.*

3. *FMNR has demonstrated the potential to improve growth rates of indigenous trees, improving pastures and increasing biodiversity thus making it attractive to farmers and communities.*

4. *Local Governments and community institutions are key stakeholders in promotion of FMNR, once their capacities are enhanced they will put in place the necessary policy environment to ensure that local communities accrue the benefits of FMNR.*

Deforestation and forest degradation in Uganda

In the last two decades, Uganda has experienced high levels of deforestation and forest degradation. Between 1990 and 2005, 1.33 million ha of forest cover were lost. Over this 15 year period, the annual deforestation rate was 1.8%. Shockingly, forest loss in a span of only 5 years between 2005 and 2010, was 1.28 million hectares representing an annual deforestation rate of 7.15% (Figure 1). However, there is variation in the figures of area of forest lost between 2010 and 2015 as some reports indicate 487,472 ha representing an annual deforestation rate of about 4.14% or 95,694ha per year (MWE, 2016). According to MWE/IUCN (2016), 204,679 ha/year were lost while MWE (2016), indicates an annual loss of 256,151ha. This variance in data notwithstanding, the fact remains that deforestation during the said period was at its peak. The highest annual rate of deforestation occurs on private and communal lands (3%) and the lowest in National Parks and Wildlife Reserves (0.4%) (NFA, 2015). The major causes of deforestation are over-harvesting of forest products, forest clearance for agriculture, overgrazing, urbanization, industrial development, poor governance and limited funding and technical capacity. Furthermore, rapid population growth (average 3.2% annually) has continued to exert more pressure on the already strained forestry resources. The effects of this massive forest loss include, soil degradation, reduced biodiversity, insufficient wood supply for cooking and building, degradation of watersheds, loss of income, poor crop yields, food insecurity due to long droughts and flooding, habitat loss and conflicts among others.

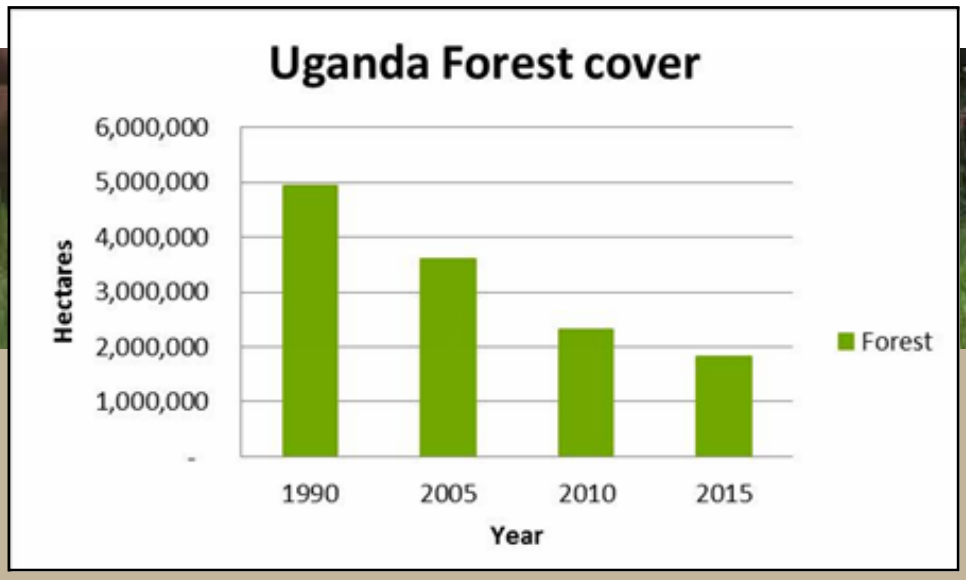

Figure 1: Forest cover changes in Uganda 1990-2015 (Ministry of Water & Environment, Uganda 2016)

Forest Landscape Restoration

Forest landscape restoration (FLR) is a long-term process of regaining ecological functionality and enhancing human well-being across deforested and degraded landscapes. It is carried out to build a forest-based landscape that can improve biodiversity conservation, ecological functioning and livelihoods. It includes tree-

based restoration in croplands and rangelands although the greatest potential is in mixtures of land-uses. It is guided by principles such as considering and restoring entire landscapes, allowing for multiple benefits, considering a wide range of appropriate technical strategies for restoring trees on a landscape, actively involving local stakeholders in decision making, adapting restoration strategies to fit local social, economic and ecological contexts, addressing ongoing loss and conversion of primary and secondary natural forest and applying adaptive management. FLR can be implemented through new tree plantings, **managed natural regeneration**, agroforestry, or improved land management to accommodate a mixture of land uses, including agriculture, protected wildlife reserves, managed plantations and riverside plantings (MWE/IUCN 2016).

Uganda made a commitment to restore 2.5 million hectares of deforested and degraded land, as a pledge towards the Bonn Challenge - a global effort intended to restore 150 million hectares of the World's deforested and degraded land by 2020 and 350 million hectares by 2030. In order to mitigate the current sharp decline in forest cover, Uganda has **prioritized forest restoration** as envisaged in existing targets provided in vision 2040, National Development Plan II, and the National Forestry Plan (2011/12-2021/22). The primary target is to restore forest cover from the current 9% to a national target of 24% of Uganda's land cover. Restoring 2.5 million hectares would contribute about 89% of the aspired 24% considering the current forest cover status (MWE/ IUCN, 2016).

For purposes of carrying out restoration and other associated interventions, the Ministry of Water and Environment (MWE) and IUCN have classified the country into seven landscape zones based on climate, altitude and farming systems. The most preferred and feasible restoration interventions across the landscapes are: afforestation (for sites that have not been under forest for the last ten years), reforestation, agroforestry and natural regeneration-including Farmer Managed Natural Regeneration (FMNR). The Uganda forest landscape restoration opportunities assessment report, 2016 recommends FMNR as one of the intervention options for restoring forests in the South West rangelands, Eastern Kyoga flood plains, Western Mid Altitude farmlands and Karamoja zones. This policy brief therefore, focuses on FMNR as one of the cheap and fast options for achieving FLR in Uganda as well as contributing to improved livelihoods.

Origin of Farmer Managed Natural Regeneration (FMNR)

For many years, conventional forestry methods were applied to combat land degradation and desertification and mainly exotic tree species promoted in many countries. Indigenous species were considered as "useless scrub" and cleared to establish forests of exotic species. These exotic species were planted in fields containing living and sprouting stumps of indigenous vegetation, the presence of which was barely acknowledged, let alone seen as important. Apparently these living stumps constitute a vast "underground forest," just waiting for a little nudge to grow and provide multiple benefits as they produce several stems each (Rinaudo, 2010). Farmer Managed Natural Regeneration (FMNR) is simply the practice of unlocking the potential of these re-sprouting tree stumps and soil seed banks.

FMNR has been described as a rapid, low cost and easily replicated approach to restoring and improving agricultural, forested and pasture lands. It is based on encouraging the

systematic re-growth of existing trees or self-sown seeds. It can be used wherever there are living tree stumps with the ability to coppice (re-sprout) or seeds in the soil that can germinate.

The simplicity of the FMNR approach makes it suitable for men and women, as well as youths. However, FMNR needs to be integrated with other short-term income generating activities to make it more attractive.

Piloting FMNR in Uganda

FMNR was introduced to Uganda in 2010, in Offaka and Anyiribu sub counties in Arua district by World Vision Uganda (WVU) as a pilot project. Later on WVU extended FMNR implementation to Kibaale, Nakasongola, Kotido and Abim districts in partnership with the World Agroforestry Centre (ICRAF) and the district local governments with a goal of improving food security and climate resilience in smallholder farming systems. World Vision has also been able to scale up FMNR model to over 20 districts through its Area Development Programs. In a bid to share and integrate experiences, skills and knowledge, capacity building, lobbying and advocacy in scaling up of the practice, a national FMNR Network has been formed. The network is a coalition of multi stakeholder organizations, which include but not limited to Vi Agroforestry, Uganda Farmers Federation, ICRAF-Uganda (World Agroforestry Centre), The Hunger Project, Tree Talk Plus, World Vision and NARO, aimed at scaling up the FMNR model as a means of improving food, nutrition and income security in Uganda, among other things. The World Agroforestry Centre (ICRAF) undertook participatory research that has guided adaption of the FMNR concept to the Ugandan context. The results reveal that FMNR has a potential to contribute greatly to FLR in Uganda.

Main uses of trees and shrubs managed in FMNR sites.

Studies conducted in FMNR sites in Uganda reveal that fruits, timber, firewood, herbal medicine, shade, charcoal, windbreaks, income and fodder are the main uses that the farmers derive from the trees and shrubs they managed on their farm lands and homesteads (Figure 2). About 40% of the households were reported to rely on fruit trees such as jack fruit, mangoes, Balanites and shea butter to support the household during hunger months.

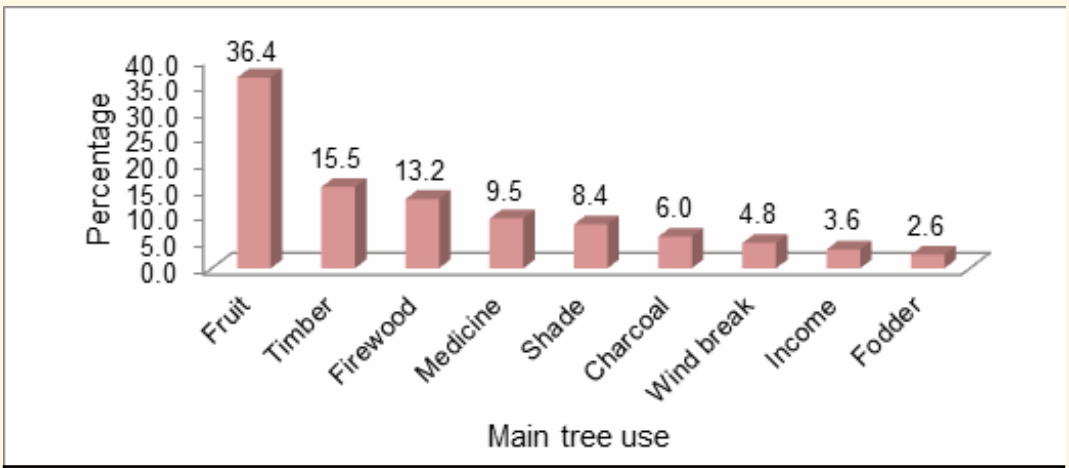

Figure 2. Main uses of trees and shrubs in FMNR study sites in Uganda

Success Factors for FMNR in Uganda

Results from studies conducted reveal the following as enabling factors that can catalyze a widespread adoption of FMNR in Uganda:

- Integration of FMNR with other short-term economic activities such as livestock, bee keeping and improved fruit trees
- Enabling policies, laws and institutions, that address specific local contexts
- Cohesive communities willing to learn from FMNR champions and from each other.
- Increased awareness on the link between FMNR, environmental resilience and improved rural livelihoods
- A shared vision of collective action and landscape-level restoration and natural resource management
- Clear and coherent knowledge management mechanisms including farmer training

Envisioning the community on FMNR in Kotido, Uganda

Why FMNR?

FMNR is an empowering form of social forestry which gives individuals and communities both responsibility for care and nurturing of naturally occurring woody vegetation and the rewards from sustainable harvesting of wood and non-timber forest products. In many cases (but not all), FMNR replaces the need to establish trees through costly, time consuming and often ineffective raising of tree seedlings in nurseries and planting out operations. It is a favorable approach to build the livelihood capital of small-holder farmers and support the management of natural resources. When farmers begin protecting and managing trees, they become more willing to enact and enforce bye-laws that safeguard trees from bush fires, unrestricted grazing and theft.

Furthermore, given the challenges of inadequate funding for tree growing, food insecurity, climate change, land degradation and rural poverty, landscape restoration through FMNR is one of the cheap and faster ways of restoring landscapes especially in the dry land areas of Uganda. FMNR is a feasible approach in most farmlands and rangelands. These areas constitute the main sources of firewood and charcoal, meeting the needs of over 90% of the Ugandan population. FMNR will therefore help to promote the regeneration of indigenous woodland species most suitable for charcoal and firewood such as Combretum, Terminalia, Grewia, Acacia, Teclea, Phoenix and Albizia species, because of their high calorific value.

Whereas exotic species have the advantage of being fast growing and therefore provide returns in terms of firewood, poles, timber, income and other environmental benefits in a short time, local conditions in some areas such as drylands make them unsuitable. This is due to the harsh climatic and soil conditions coupled with high prevalence of wildfires

and pests (especially termites). FMNR is a cheap, simple and socially, financially and environmentally viable option for restoration of degraded farmlands. Results of the study carried out by MWE and IUCN to determine the profitability of selected landscape restoration options for Uganda indicated that FMNR is the most profitable option.

FMNR encourages the maintenance of farmer preferred indigenous species to restore degraded forests and agricultural lands. Indigenous species provide more ecological benefits and are suited to the local ecological conditions and natural hazards such as fires and pests. The regenerated trees and shrubs help restore degraded lands and provide multiple benefits ranging from increased crop yields, recharging ground water, providing fodder, firewood and storing carbon. FMNR can be suitable in any agricultural, livelihoods or development intervention where increased tree cover is deemed to contribute to improved livelihoods. It can largely be farmer led and farmer managed since it requires minimal technical guidance. It is therefore self-sustaining and replicable with a high multiplier effect within the ability of communities. In terms of increased land productivity, the farmers in Nakasongola and Kibaale districts testified that they had experienced improvement in the yields from 55kg of beans/acre before FMNR to 330kg of beans/acre after FMNR. The yield of coffee improved from 750 kg/acre to 1,250 kg/acre after FMNR intervention.

Common tree species managed by farmers in their FMNR sites

The most common tree species found in FMNR sites include *Combretum molle, Combretum collinum, Balanites egyptica, Markhamia lutea, Albizia zygia, Annona senegalensis, Artocapus heterophylus, Erythrina abbysinica, Eucalyptus grandis, Mangifera indica, Terminalia macroptera, Grewia mollis, Measopsis eminii, Albizia coriaria and Vitellaria paradoxa.*

Bee-keeping integrated into FMNR sites in Nakasongola District

In the cattle corridor of Uganda, FMNR has been demonstrated as a simple yet powerful tool for improving grazing lands. Farmers have been able to increase the carrying capacity of their pasturelands using FMNR. Farmers reported that bare patches in grazing lands measuring 4 -7m in radius were re-colonized with pastures within a period of 3 years of practicing FMNR. In sites where bee keeping was integrated with FMNR, farmers reported doubling of honey yields in addition to improvement in honey quality. Most farmers now

easily access poles for building and firewood from indigenous trees for sale and home use from within their farmlands. Preliminary results over 3 years pilot period showed increased growth rates for trees and shrubs in sites compared to those in control sites. This has demonstrated the potential to improve growth rates of indigenous trees thus encouraging farmers to retain and manage them on their farms.

Benefits of FMNR

- Income from sale of forest or tree products
- Food security as it boosts food productivity through enhanced soil fertility and moisture conservation
- Ecosystem resilience
- Reduction of conflict
- Climate change adaptation and mitigation (including carbon sequestration).
- Restoring degraded land including erosion control
- Enhancing ground water recharge
- Contributing to reforestation.
- Improving local governance structure
- Enhancing positive community-local government engagement.
- Conserving diversity of plant and animal communities

Challenges

- **Unclear land and tree tenure.** The issue of absentee landlords in both Nakasongola and Kibaale districts, for example, is a disincentive to the promotion of FMNR as the farmers fear that their efforts in maintaining the trees could be in vain.
- **Unregulated harvesting of forest products** especially firewood and charcoal. The system for licensing charcoal trade in local governments through tendering does not have control on off take levels
- Poor enforcement of forest related laws and regulations
- There is no clear policy on FMNR.
- **Uncontrolled wildfires** especially during the dry season
- Uncontrolled livestock movement especially during the early stages of FMNR.
- Poor conversion methods for forest products especially charcoal production
- Low market prices for forest products

- Local Governments should formulate and enforce ordinances and by-laws to regulate tree use and management.
- Local Governments should streamline FMNR into the existing agriculture and forestry programs and incorporate it into the district development plans.
- Ministry of Water and Environment should streamline the licensing procedure for forest products harvesting especially charcoal and timber to ensure sustainability.
- There is need for a conducive policy environment to secure the land and tree tenure of the farmers practicing FMNR.
- There is need to strengthen Uganda's FMNR Network to make it more effective. The Network should be represented at both local and national levels.
- Local Governments should support the establishment and recognition of community based institutions to oversee and coordinate implementation of FMNR activities.

Whereas there are other land restoration options, Farmer Managed Natural Regeneration (FMNR) is one of the low-cost but effective options, especially in environments where tree survival can be a challenge. However, FMNR needs to be promoted alongside complimentary income generating activities such as bee keeping and rearing of small ruminants so as to provide short-term gains as farmers wait for medium and long-term benefits from trees.

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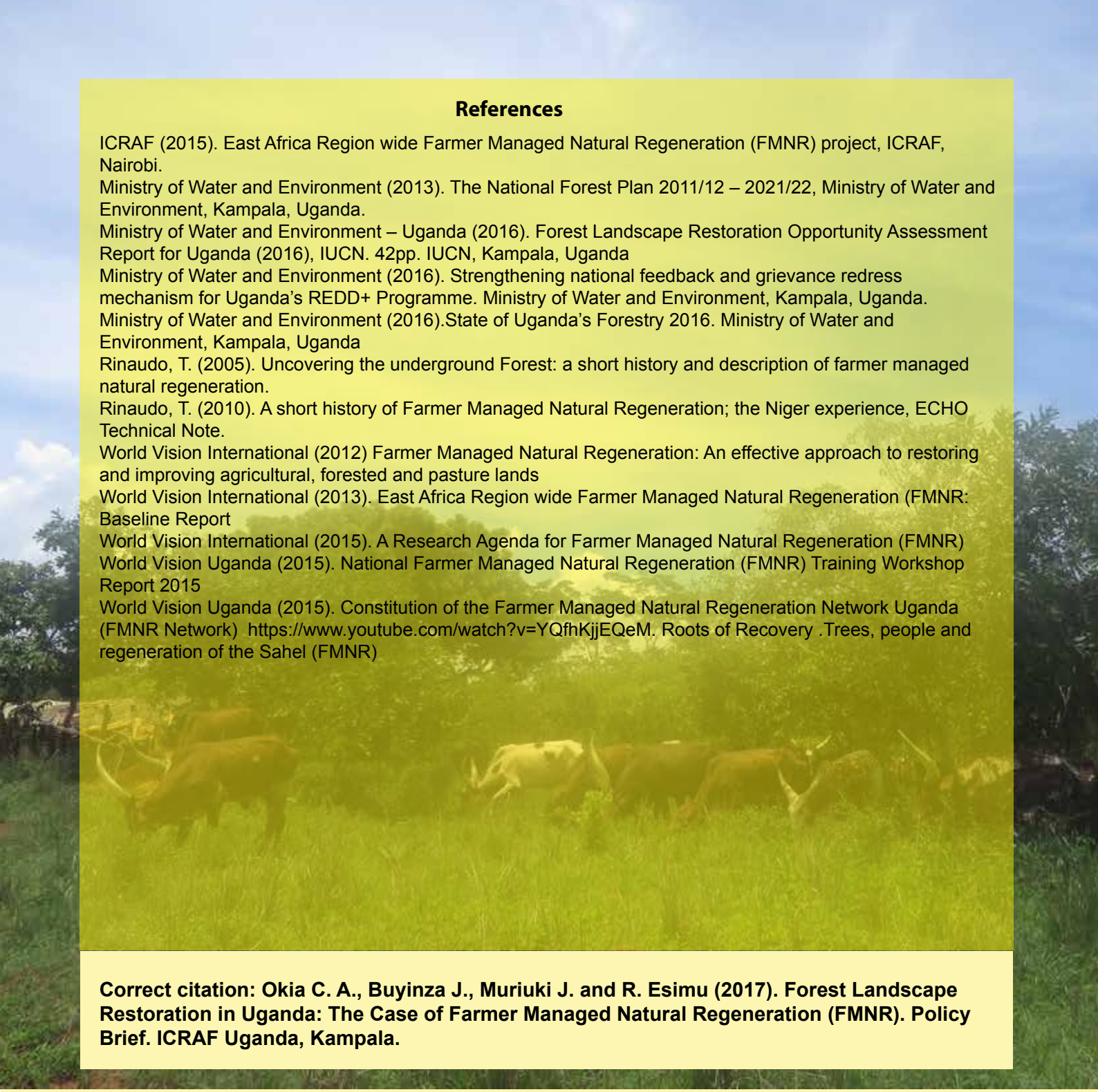

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