

Farmer Managed Natural Regeneration

Farmer Managed Natural Regeneration (FMNR) is a technique of restoring degraded land and monitoring restoration of the land involving the systematic regeneration and management of trees and shrubs from tree stumps, roots and seed. Degraded arid land often features left over indigenous plants, which if maintained and promoted to grow can improve pasture and crop lands while simultaneously encouraging re-growth of seeds, roots and shrubs. Key to this practice is the existence of living stumps, tree roots and seed that, if encouraged, will regrow. The land is protected from being completely cleared or further grazed and this allows trees to grow without disturbance. Once the stumps and trees start to grow, pruning and trimming of trees is required to allow space between trees and promote healthy long tree trunks. Once the trees have matured, intercropping can take place or livestock can be re-introduced to graze.

While requiring some investment in terms of effort, FMNR has climate smart advantages such as controlling rainfall/irrigation run-off, supporting water quality improvements, providing sources of timber or fodder, supporting habitat regeneration for pollinator insect species, acting as sun shade, and reducing soil erosion.

MOST SUITABLE AGRO-ECOLOGICAL CONDITIONS

Value chain



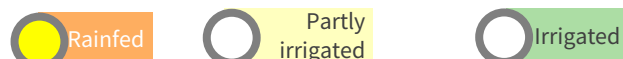
Soil texture



Climatic zone



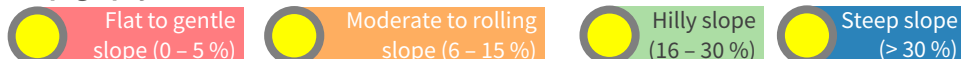
Water source



Annual average rainfall (mm)



Topography



MOST APPROPRIATE CONDITIONS AND REQUIRED INPUTS

Farming system

Does it require collective action



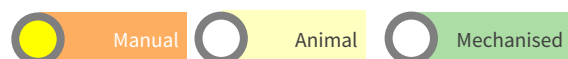
Characteristics



Farm size (ha)

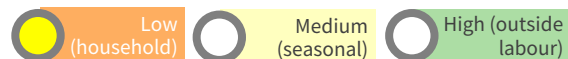


Mechanisation



Human resources

Labour intensity - level of effort

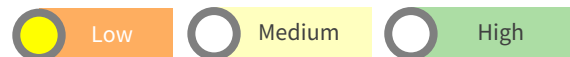


Gender/youth smart (low investment/low labour requirements)

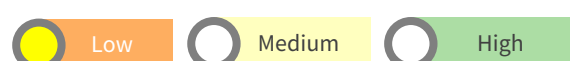


Financial resources

Initial investment



Maintenance Costs



Access to finance capital or credit required



Enabling Environment

Extension support



Access to inputs



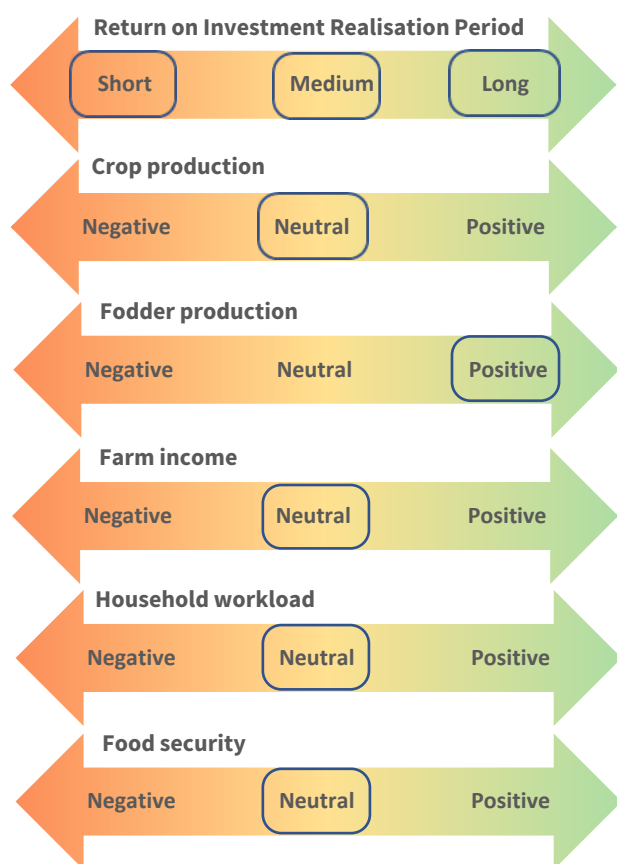
Market access



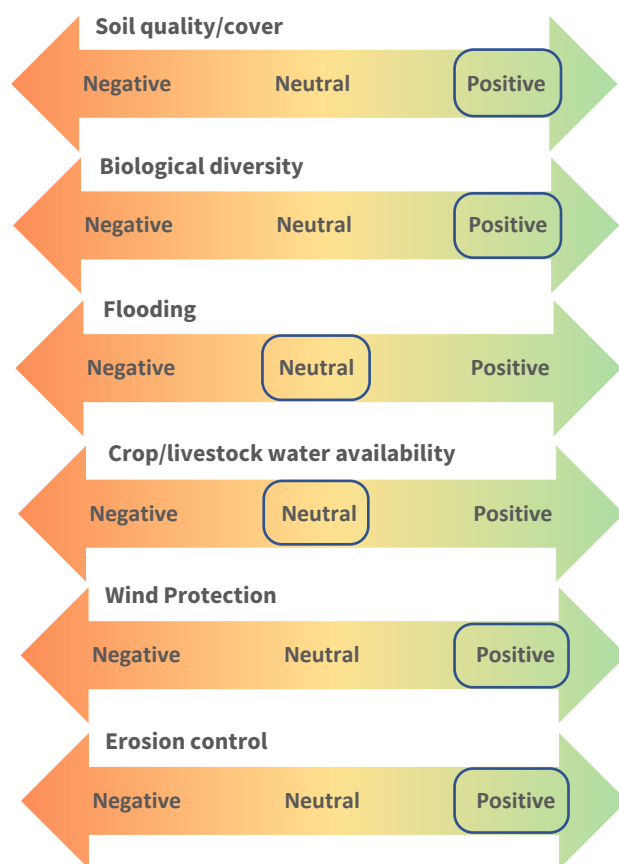
The purpose of this technical brief is to guide where this **practice, technology or strategy** could be applied. It may be applicable in other circumstances, but this brief focuses on where it is possibly **most suitable**. Content is general, and should be contextualised depending upon locality. The brief provides an overview, details of appropriate agroecological characteristics, appropriate conditions and inputs, possible outcomes and impacts, how the **practice, technology or strategy** should be applied, potential benefits and drawbacks, and provides suggestions for further reading in terms of CCARDESA materials and other sources, including those used to develop this technical brief.

POSSIBLE IMPACT/OUTCOMES

Socio-Economic Impacts Positive or Negative



Ecological Impacts Positive or Negative



These descriptors indicate whether the practice, technology or strategy has a positive, neutral, or negative impact or outcome. Those with no box are deemed not-applicable.

TECHNICAL APPLICATION

To effectively implement Farmer Managed Natural Regeneration :

- **Step 1:** Degraded land needs to be identified and living stumps, roots and seeds need to be encouraged to regrow. This may include periodic watering. Focus should be on indigenous species, and present tree species (existing stumps)
- **Step 2:** Consider leaving the field un-grazed to promote tree growth.
- **Step 3:** Select tree stumps and the tallest and straightest stems to grow into trees.
- **Step 4:** Prune and manage by removing stems and unwanted side branches.
- **Step 5:** Maintain the process by occasionally pruning side branches.
- **Step 6:** Manage the land consistently to avoid overgrazing, which can lead to further degradation.
- **Step 7:** Consider rotational grazing to allow seeds, stumps and underground shrubs to re-grow. This will reduce the cost of replanting. Shrubs and growing trees and saplings need to be protected before introducing livestock. Shrubs and growing trees and saplings need to be protected before introducing livestock.

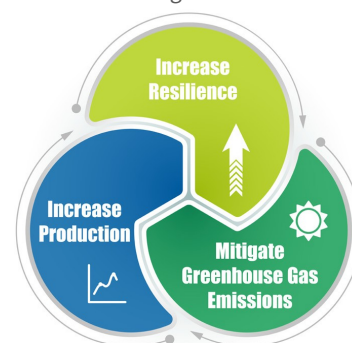
CLIMATE SMART AGRICULTURE OUTCOME(S)

Reflecting how this **practice, technology or strategy** contributes to Climate Smart Agriculture outcomes

Increase availability of biomass, which improves soil fertility and thus production. The trees/shrubs can be a source of income and reduce costs.

Reduces erosion of soil and evaporation. Increases water retention and infiltration. Diversifies income sources. Improves yield stability.

Locks more carbon in plants and in soil.



SUMMARY/KEY ISSUES

Benefits

- FMNR improves soil quality and reduces soil erosion
- Improved dry-season pasture
- Agricultural management practices such as pruning, and trimming are carried out appropriately in turn improving growth and air circulation
- Higher livestock productivity
- Provides protection from wind and shade for livestock, when introduced
- Increased availability of firewood, thatch and other non-timber forest-products/materials

Drawbacks

- The land needs to be managed consistently to avoid overgrazing

REFERENCE MATERIAL

CCARDESA Related Content

- Related CCARDESA Knowledge Products: CCARDESA, 2019. Technical Brief 12, Climate Smart Agroforestry Options for Maize, Sorghum & Rice.

Additional Information

- Food and Agriculture Organisation (FAO), 2015. [The social, environmental and economic benefits of Farmer Managed Natural Regeneration \(FMNR\)](#). Rome, Italy.
- Food and Agriculture Organisation (FAO), 2012. [Land rehabilitation on the central plateau of Burkina Faso and Building resilience to climate change through farmer-managed natural regeneration in Niger](#). Rome, Italy.
- Food and Agriculture Organisation, 2018. [Advancing the Role of Natural Regeneration in Large-Scale Forest and Landscape Restoration in the Asia-Pacific Region](#). Rome, Italy.