

What drives natural regeneration?

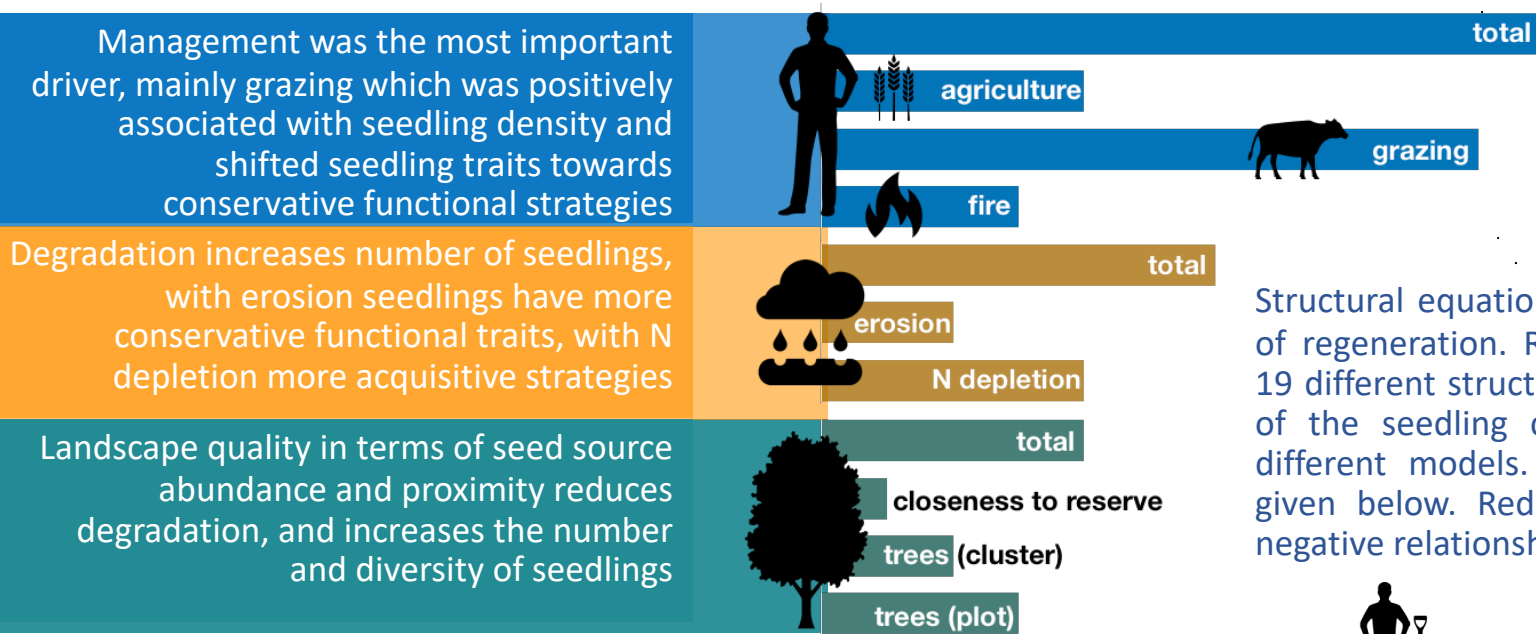
Farmer-managed natural regeneration (FMNR) as a scalable restoration technique

Madelon Lohbeck^{1,2*}, Peggy Albers¹, Laetitia Boels¹, Frans Bongers¹, Samuel Morel¹, Fergus Sinclair², Bertin Takoutsing², Tor Vågen², Leigh Winowiecki², Emilie Smith-Dumont²

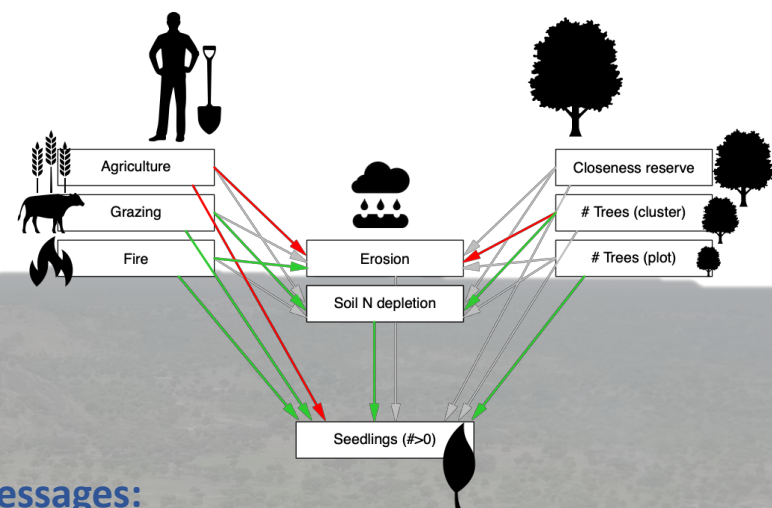
* m.lohbeck@cgiar.org 1. Wageningen University and Research (WUR) 2. World Agroforestry Centre (ICRAF)

How do human impact, land degradation and environmental factors drive natural regeneration?

A traits-based approach to understanding natural regeneration dynamics in agroforestry parklands in Burkina Faso and Ghana



Structural equation models to test the drivers of regeneration. Regeneration is indicated by 19 different structural and functional variables of the seedling community, resulting in 19 different models. Example of one model is given below. Red arrows indicate significant negative relationships, green arrows positive.

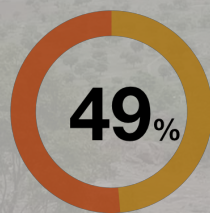


What is FMNR?

Farmer Managed Natural Regeneration is a low-cost land restoration technique based on natural regeneration and used to combat poverty and hunger amongst poor subsistence farmers by increasing food and timber production and resilience to climate extremes (fmnrhub.com)

Methods:

2 Land Degradation Surveillance Framework sites (Vågen et al 2013), 32 cluster, 325 plots, 16 functional traits (adult height, deciduousness, N₂ fixing, invasiveness, exotic, wood density, twig dry matter content, resprouting capacity, seed mass, specific leaf area, leaf area, leaf dry matter content, leaf density, chlorophyll content, chlorophyll fluorescence, leaf thickness) measured on 44 species



Of the plots had regeneration

Take home messages:

1. Land degradation does not limit regeneration but shifts the functional composition. Future research should indicate whether species that thrive on degraded land can reverse further loss of land health and whether they are useful to farmers
2. Dispersal limitation may inhibit regeneration so landscape quality in terms of tree abundance is a condition for natural regeneration to succeed
3. Management and how people use the land is central to FMNR and its success
4. The success of FMNR depends on the conditions under which natural regeneration can take place. Understanding this is crucial for scaling up FMNR as a restoration strategy

Vågen, T.-G., L. A. Winowiecki, L. Tamene Desta, and J. E. Tondoh. 2013. The Land Degradation Surveillance Framework (LDSF) field guide v3. World Agroforestry Centre, Nairobi, Kenya