

Food security

Context

In 2016, 108 million people were recorded to be severely food insecure – a significant increase from 80 million in 2015.¹ People are considered food secure if they have consistent and easy access to sufficient and nutritious food options.² Food security has become a great concern globally as research findings suggest that crop and pasture yields are likely to decline in many places.³

By 2050, eight major food crops across Africa and South Asia are predicted to decline by an average of eight percent.⁴ Unsustainable farming practices in already degraded rural environments have resulted in hunger, poor nutrition and abject poverty for smallholder farmers. Across Africa, four-fifths of chronically undernourished people were found to be smallholder farmers.⁵ In many countries such as Burkina Faso, this has also contributed to mass labour migration to urban areas, leading to dysfunctional rural communities.⁶ Trees have proven to notably improve the environmental conditions required for better crop yield. Rural populations in developing countries also heavily rely on ecological resources from forests and savannah lands for food in the form of tree products, wild animals and honey.⁷

How Farmer Managed Natural Regeneration (FMNR) improves food security

Introducing FMNR along with other low-cost sustainable agriculture practices has been proven to improve food security and resilience for smallholder farmers and their families. This integrated approach contributes to diversified food options, improved access to food and nutrition, increased crop yields and improved livestock production. Regenerating trees on cropland promotes increased crop growth during the dry season by providing shade and reducing water evaporation. Fallen leaves from many trees can also significantly improve soil fertility. Trees can further provide a buffer against climatic extremes that directly affect crop yields, such as air and soil temperature.⁸

Some tree species improve crop growth by using their roots to lift water from deep within the soil and releasing some of that water closer to the surface – a process known as the “hydraulic lift”. Increased tree cover from regeneration can often result in restored water cycling in the landscape and maximise



Maize growing under the tree is greener from leaf litter than maize not under the tree.

Benefits of an integrated approach to FMNR

- More consistent crop yields
- Diversified food options
- Improved nutrition
- Increased quantity and availability of food
- Improved access to food
- Increased availability of fodder needed for livestock production
- Improved soil fertility

1. World Food Programme 2018 “108 Million People In The World Face Severe Food Insecurity – Situation Worsening” [online]. Available at: <<https://www.wfp.org/news/news-release/108-million-people-world-face-severe-food-insecuritysituation-worsening>>
2. World Food Programme 2018 “What is food security”, WFP <<https://www.wfp.org/node/359289>>
3. Vermeulen S.J. 2014. “Climate change, food security and small-scale producers. CCAFS Info Brief.” CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark
4. ibid
5. Montpellier Panel, 2013, “Sustainable Intensification: A New Paradigm for African Agriculture”, Imperial College, London
6. Garrity, D., Akinnifesi, F., Ajayi, O., Weldesemayat, S., Mowo, J., Kalinganire, A., Larwanou, M. and Bayala, J., 2010, “Evergreen Agriculture: a robust approach to sustainable food security in Africa, Food Security” 2:197–214
7. UNDP, 2011, “Human Development Report 2011”, United Nations Development Programme, New York
8. Mbow, C., Smith, P., Skole, D., Duguma, L. and Bustamante, M., 2014. “Achieving mitigation and adaptation to climate change through sustainable agroforestry practices in Africa”, Current Opinion in Environmental Sustainability, 6, 8-14.

groundwater recharge in the seasonally dry tropics. This increase in water – along with irrigation practices – increases crop diversity and production.

These benefits are further amplified through the introduction of Climate-Smart Agricultural techniques such as introducing climate adaptive and high-yield seed varieties. Climate-Smart Agriculture is the implementation of agricultural practices that sustainably increase productivity, are climate resilient and reduce greenhouse gas emissions.⁹ Integrating Market System Development programming further increases food security by increasing the purchasing power for smallholder farmers. Market System Development programming improves farmers' linkages with other value-chain actors and their access to markets, thereby supporting farmers to increase their income via the selling of timber and non-timber food products such as fruits and seed pods. These multi-faceted benefits support farmers to improve their food security all year round, especially in the dry season.

Implementation of an integrated FMNR approach

An integrated FMNR approach has proven to significantly contribute to improving food security in many communities. In Niger, FMNR had a significant impact in increasing crop yields and in some communities, contributed to reducing the annual "hunger period" when food supplies are exhausted. The "hunger period" reduced from over six months to three months or less.¹⁰ The yields of crops growing within FMNR tree systems in Niger have been extensively evaluated at rainfalls of less than 600mm/yr. It was found that FMNR notably increased yields in these dry areas. Research conducted in Maradi District in Niger between the period of 2006 and 2009 found FMNR adopted areas produced 173kg of millet and 77kg of other crops such as sorghum, cowpeas, peanuts and hibiscus per hectare. In contrast, areas that did not adopt FMNR only produced 149kg of millet and 10kg of other crops per hectare.

A World Vision project in Chad recorded an increase in sorghum due to implementing the FMNR approach.

In Talensi, Ghana, 575 households adopted the FMNR approach and the Social Return on Investment was found to be 6:1 at the end of three years.

Some World Vision projects have witnessed FMNR reduce the impact of famine and food shortages as families are able to draw on FMNR "reserves" and sell wood in order to buy food items such as grain. In other project areas farmers who used to sell their animals

cheaply or watch them die during times of drought can now rely more on edible leaves and seed pods, reducing the need to sell their animals.

"[Community members] can get wildlife from there now that bush burning and destruction of forest has disappeared. They are even coming back to breed. This means meat ... before the land was so bare, there was nowhere for these animals. Now that there is natural regeneration of the shrubs, it is returning to how it was 100 years ago: forest."

– Edward Agumah, Ministry of Food and Agriculture, Ghana 2011



Improved millet growth in a dry year due to shade effects. Also known as the "halo effect".

"This year is very exceptional for me because I have been able to get enough sorghum. I cultivated One hectare and harvested 15 bags of sorghum. Generally, I could get three to five bags when working in this land in the past. This would have been impossible if I was not taught the new FMNR technique of land management."

– Khadidja Gangan, 35-year-old mother of six

9. Food and Agriculture Organization of the United Nations, 2010 "Climate-Smart Agriculture: Policies, Practices and Financing for Food Security, Adaptation and Mitigation"; FAO

10. Gubbels, P., 2012, "Harnessing Small-Scale Agriculture for Resilience and Improved Child Nutrition" in Ending the Everyday Emergency: Resilience and children in the Sahel, World Vision/Save the Children, London; Reij, C., Tappan, G., and Smale, M., 2009, "Re-Greening the Sahel: Farmer-led innovation in Burkina Faso and Niger" in Spielman, D. & Pandya-Lorch, R. (eds), Millions Fed – proven successes in agricultural development, pp 53-58, International Food Policy Research Institute, USA