

# Uncovering the Hidden Forest.

A Short History and Description of Farmer Managed Natural Regeneration.

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## Introduction

For many years, conventional Western forestry methods have been applied, and exotic tree species promoted in Sahelian countries in order to combat desertification. Large and small projects were commissioned to curtail the assumed southward movement of the Sahara desert, but few made any lasting impression.

Little thought was given to the appropriateness of these methods. Indigenous species were generally dismissed as 'useless' scrub. In the name of afforestation, many projects even cleared the 'useless scrub' to make way for exotics. Often exotic species were simply planted in fields containing living and sprouting stumps of indigenous vegetation, the presence of which was barely acknowledged, let alone seen as important.

This was an enormous oversight. In fact, these living stumps constitute a vast 'hidden forest', just waiting for a little encouragement to grow and provide multiple benefits at little or no cost. These live stumps may produce between ten and fifty stems each. During the process of traditional land preparation, farmers treated these stems as weeds, slashing and burning them before sowing their food crops. Under this management system, the stems rarely grow beyond 1.5 meters tall before being slashed again. The net result is a barren landscape for much of the year with few mature trees remaining. To the casual observer, the land appears to be turning to desert and most would conclude that tree planting is required to restore it.

Farmer Managed Natural Regeneration (FMNR) is the systematic regeneration of this 'hidden forest'.

Desired tree stumps are selected. For each stump, a decision is made as to how many stems will be chosen for growth. The tallest and straightest stems are selected and side branches removed to roughly half the height of the stem. The remaining stems are then culled. Returning regularly to prune any unwanted new stems and side branches attains best results.

Tentative steps to introduce FMNR commenced in 1983, in the Maradi Department of Niger Republic. Twenty-two years on, the results have been amazing with FMNR being practiced in one form or another across Niger and beyond.

### **A social, rather than a technical breakthrough has been achieved.**

The greatest barriers to reforestation were neither the absence of an exotic super tree nor ignorance of best practice nursery and tree husbandry techniques. The greatest barriers were the collective mindset which saw trees as 'weeds' needing to be cleared and inappropriate laws which put responsibility and ownership of trees in the hands of the government and not in the hands of the people.

With the aid of the Maradi Forestry Department, which unofficially relaxed laws on tree harvesting, farmers stopped seeing this tree re-growth as a weed problem. Trees had become a cash crop with multiple benefits. Once this was established, the revolution began, moving slowly but surely from farmer to farmer and eventually across the nation, often aided by various development agencies.

Guidelines on how to practice FMNR were given,  
**but one key factor to its widespread appeal and success is that farmers themselves controlled the process.**

Farmers choose the stumps they will manage, how many stems they will prune, when and how they will prune the stems, and when they will harvest the wood and what they will do with it. Because FMNR can become a grass roots movement, large areas of land can be 're-treed' rapidly and for little or no cost, resulting in increased bio-diversity and benefits to people (i), the environment, soils, crops and livestock.

At a time of unprecedented forest destruction and increased demand for agricultural land, FMNR has much to offer not only Africa but also the world. Development practitioners, Government and Non Government bodies concerned with the environment, agriculture and/or forestry and farmers themselves would do well to study the Niger experience outlined in this paper, and consider if FMNR could be applied to their particular situation.

## **Background**

Missionaries from the Society of International Ministries (SIM) began working on forestry interventions with local farmers in Maradi Department, immediately after famine relief activities in 1975. The Maradi Wind Break and Woodlot Project eventually became the Maradi Integrated Development Project (MIDP) funded predominately by the Canadian International Development Agency.

It was very evident in 1975 that if large-scale famines were to be averted in the future, something needed to be done to reverse the staggering tree loss and severe environmental degradation which had been exacerbated by drought. However, SIMs early attempts at reforestation were small scale and could not impact the environment at large. Nor did these efforts capture the hearts and minds of the community, as little was attempted beyond prescribed project activities. This was a common pattern witnessed by most government and non-government forestry projects at the time.

Travelling in any direction from the project base, one was struck by endless windswept plains, stripped of practically all woody vegetation. The fatalistic outlook of those most affected, who declared that it was God's will and there was nothing man could or should do about it, compounded the difficulty of restoration.



*Pruning transplanted tree seedlings on deforested land. The sheer scale of deforestation almost guaranteed that conventional methods of reforestation were doomed to fail. Even with enormous budgets and manpower, most large projects were proving unsustainable and they failed to realise significant acceptance from the communities meant to benefit from tree planting. Typical farm land (pre FMNR) was cleared of all vegetation. In fact, a good farmer was considered a 'clean' farmer who axed, burnt and swept his fields clean!*



*Left: Bush nursery with barren landscape in background symbolises the futility of combating desertification by this means alone.*

Women bore the brunt of the crisis, having to walk many kilometres in search of wood. As supplies diminished, they turned to poorer quality fuels such as millet stalks and dung. Occasionally one came upon fences made in the past – large logs planted side by side along a compound perimeter, however, many homes had no fence at all, and where fences existed, they were predominantly falling down.



*Sand dune engulfing a compound fence during the 1984 drought. By this time, few compounds had fences made with logs. Even the small stakes used to hold up millet stalks or grass mats had become extremely difficult to obtain.*

Due to the lack of wood, grain silos and huts were often in need of urgent repairs. As scarcity of wood increased, poorer and poorer quality materials were used, and structures needed repairs and replacement more frequently. At funerals in some districts, the bereaved turned to using bricks as a cover for the corpse, instead of wood. Ironically, rural people who once supplied towns and cities with wood began travelling 50 Kilometres or more to buy it. As trees disappeared from fields, emerging crop seedlings took the full force of winds which reached up to 70 kilometres per hour. Seedlings often desiccated after being sand blasted or they were simply buried by sand. Consequently, farmers increasingly found themselves replanting their precious seeds six to eight times in a season. This in turn contributed to diminishing crop yields and hunger.



*Abraded and partially buried millet plants. Due to strong winds, farmers plant much more seed than is needed to ensure the survival of some. This clump of seedlings will be thinned back to just three plants.*

Reforestation projects in Niger were typically based on ideas developed in temperate climates and in societies and cultures entirely different from those in West Africa. Large, costly tree nurseries were established to produce exotic species, particularly Eucalyptus (*E. camaldulensis*), Neem (*Azadirachta indica*) and Prosopis juliflora. Unfortunately, some projects appropriated land from communities without adequate consultation. Plantations were either fenced at great expense, or protected by paid, armed guards. This expensive, top-down approach often alienated rural communities and could never be replicated by them.

In belated efforts to achieve popular ownership and participation in tree planting, community and individually run nurseries were introduced. However, few formally trained project personnel could comprehend the sheer difficulty of raising, planting out and caring for trees in this hostile environment. It was expected that farmers would be happy to draw water by hand for three months. During the dry season when seedlings are raised temperatures can exceed 40 °C. Well depths range between 20 and 60 meters in many villages. Nurseries became small green

oases in a sea of brown which usually attracted termites, frogs, birds and lizards capable of doing great damage to seedlings. Water is so scarce in some villages that usage for tree nurseries is not practical. Once seedlings are planted out, a plethora of hazards including drought, termites, trampling or browsing by livestock, locusts, sand blasting, competition from crops, and even deliberate destruction by humans await them.

Project staff often ignored or were quite unaware of the considerable resentment harboured by communities. Government forestry agents enforcing tree laws often fined or at times, even imprisoned offenders. The law required farmers to obtain a permit to clear trees on their own land. This system was open to abuse, and was very impractical for farmers living in remote regions. Sometimes thieves would cut and steal trees and the innocent landowner would be fined. Not surprisingly, farmers determined that the less trees in their farms the better.

Beliefs play a big role in determining actions. Farmers saw trees as weeds which depressed crop yields. Little wonder they saw trees as little more than nuisance weeds which should be removed.

Quite needlessly, Maradi Department had its own dust bowl experience. The consultants of one large project, aimed to 'modernise' agriculture through promotion of modern inputs and animal drawn implements, complete with the total removal of trees - roots and all! The severe damage inflicted by this ill-advised project is still evident on large tracts of land today. One of the subtle consequences was the reinforcement of the old adage "a good farmer is a clean (i.e. treeless) farmer". The saying took a more sinister turn, as clearing land came to be equated with modern farming.



*Woman battling wind and dust as she returns home from the well. The almost complete removal of trees resulted in increased wind velocity at ground level and increased severity of dust storms.*

Even if people made the connection between the destruction of the environment and the decline in food supplies, few were in a position to change their behaviour. Tradition expected them to clear the land. 'Modernization' drives reinforced tradition, making people feel foolish if they did not completely clear their land. On top of all this, severe poverty and hunger forced people to cut the few trees remaining in order to survive. In some cases the roots were even removed.

It has been estimated that over a twelve-year period some 60 million trees were planted in Niger, with less than 50 % surviving. Despite the millions of dollars spent on the forestry sector results have been disappointing. In addition to widespread ineffectiveness, some projects left communities hardened and less likely to attempt reforestation activities themselves.

Niger is just one country on a vast continent. Some 34% of land in Africa is threatened by desertification, and each year 2.3 million hectares of open woodlands are harvested or cleared

for new farmland. In reality, the damage is greater than this when one includes farmland tree degradation, over harvesting of branches for fuel and fodder and continuous browsing, stripping and trampling by livestock.(ii) In some African countries, deforestation rates exceed planting rates by 30:1. Therefore, because destruction is occurring on such a large arena in Niger, as in the whole of Africa, conventional methods of reforestation are not and possibly never will reverse the trend of tree loss and desertification.

When attempting to solve a difficult problem it is critical to know what the root cause of the problem is.

It is also important to analyse the assumptions held about it.

**Foresters generally assumed that:**

- droughts and population driven demand for firewood were causing deforestation
- trees had died or were completely removed by people
- indigenous species grew slowly and were of no economic importance.

**In fact:**

- while drought and firewood demand contributed to deforestation, destructive farming methods, cultural norms and inappropriate tree laws were the main causes
- While above ground parts of trees were removed, for the most part, the stumps remained and were alive, with the ability to regenerate
- Indigenous species can grow rapidly, and while most do not provide mill-able timber, they meet a wide range of basic needs and constitute a significant economic resource.

Simply planting thousands of trees did not make an impact on the deteriorating environment. Millions of dollars could have been saved if the real problems were understood and if common assumptions were tested. Incredibly, some projects actually cleared indigenous trees, considered to be 'useless', before planting exotics. They were allegedly 'useless', because they did not grow straight or tall, were assumed to be slow growing, were often knotted and forked and could not be milled. It was not until a 'Useless Bush' study was conducted that it was realised just how useful these plants were. They provided usable timber, firewood, fodder, fibres, medicines, fruits, edible leaves and nuts, fodder and dyes as well as many environmental services.

I realised that even if the project ran for a decade with a large budget, using conventional methods, it would have minimal impact. The realisation of the futility of the current approach weighed heavily on myself. In 1983, while on route to a village, I stopped the car and looked out over the barren landscape and said a silent prayer asking for wisdom and a breakthrough. Then, for the first time I "saw" what had been there all along – a sea, not of insignificant desert shrubs, but a sea of felled trees, the stumps of which were re-sprouting. In other words, an hidden forest just waiting to be discovered.

Each year multiple shoots sprouted, however, they were not given the opportunity to grow to their full height because of the standard slash and burn practice. Consequently, low-lying shrubs was all that was visible. As a result, forestry agents did not recognise that these shrubs were actually felled trees with the capacity to regenerate. The fact that the true nature of this vegetation was not realised led to the coining of the term 'the hidden forest'.

Discovering the hidden forest totally changed our approach to reforestation. There was no longer a need to run an expensive nursery. The extreme difficulties of tree establishment could simply be by-passed. The battle lines for reforestation could now be redrawn. Reforestation was no longer about technical concerns such as species choice and planting techniques. The new battle was more about social issues - how to change the belief system of communities who upheld tree felling as necessary. It was also a battle over the legal system whose workings, ironically resulted in the destruction of the trees it meant to protect.



*FMNR is based on the existence of re-sprouting tree stumps.*



*Even here in this seemingly treeless field, the hidden forest is present.*

All that needed to be done now was to convince farmers to allow a number of the tree stumps in their fields to regenerate. Over time, farmer's hearts and minds were won, and they adopted "Farmer Managed Natural Regeneration" as normal practice. Fears that trees in fields would compete with crops were overcome as farmers experimented with FMNR and fine-tuned it to meet their individual needs. FMNR also took on a life of its own as farmers themselves began to spread the new technique. Allowing the hidden forest to grow through FMNR proved to be a highly successful way of rapidly reforesting large areas of land at minimum cost.

- i. Benefits include increased firewood and building material and income generation potential.
- ii. Weber, R. & Stoney, C., 1986, Reforestation In Arid Lands. Volunteers in Technical Assistance. USA.