



FIELD SERIES

2018

EXPERIENCES IN FOREST LANDSCAPE RESTORATION (FLR)

Lessons Learnt from 13 Years of Restoration in a Moist Tropical Forest: The Fandriana-Marolambo Landscape in Madagascar

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WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by: conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

PREFACE



I remember 15 years ago, in March 2003, sitting in a workshop with my colleagues and our partners in Antananarivo for the first ever workshop in Madagascar on Forest Landscape Restoration (FLR). While Madagascar was no stranger to tree planting, FLR provided new insights for all of us in the room. It was a new approach for WWF, and the various programmes that WWF was launching around the globe were all in their early days.

Who was to know then that two years later we would embark on a 13-year FLR programme in the Fandriana-Marolambo landscape in Madagascar's moist tropical forest, and that 12 years later, in 2015, our government would commit to restoring 4 million hectares of forest landscapes across the country. There was enthusiasm around the room, with public and private partners recognising the value of the FLR approach for a country like ours. The specific appeal of FLR for Madagascar is the fact that it not only focuses on restoring forest cover for ecological priorities, but also for human benefits.

Over the years, the project has evolved, built on previous phases and adapted responsively to local needs. It was a steep learning curve for all of us, we faced numerous challenges over time, but the experience we, and our partners, acquired over this period are, we believe, worthy to share more widely. For this reason, I am very pleased that we are launching this field series of reports and very proud that Madagascar's Fandriana-Marolambo landscape is the first in the series.

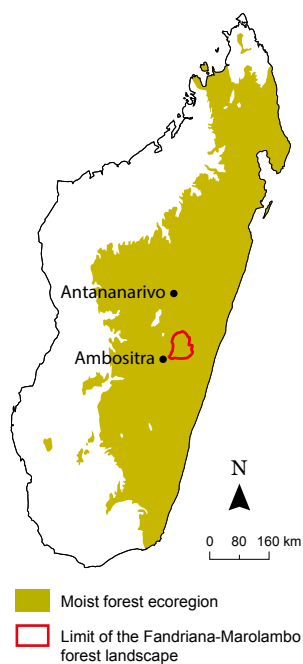
Nanie Ratsifandrihamanana
CEO of WWF Madagascar

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EXECUTIVE SUMMARY

Lessons Learnt from 13 Years of Restoration in a Moist Tropical Forest: The Fandriana-Marolambo Landscape in Madagascar



Location of the Fandriana-Marolambo landscape

In 2005, WWF initiated a Forest Landscape Restoration (FLR) programme in the Fandriana-Marolambo landscape situated in Madagascar's iconic moist forest. The landscape, harbouring fragmented forest interspersed with savannah, exotic plantations and fields, stretches over 203,080 ha and is home to 150,000 people from three ethnic groups. It is rich in biodiversity, with eight lemur species for example having been documented, but under pressure of deforestation.

Whilst the initial phase of the FLR programme had as an objective that *"the goods, services and authenticity of the moist forests of the landscape of Fandriana-Marolambo are restored so as to support the development of the populations and to secure the objectives of biodiversity conservation"*, in practice, four years was clearly insufficient for such an ambitious objective. Instead, restoration efforts have been carried out through four successive phases, funded by different donors.

The programme has built on and been integrated into national and local policies (such as the third environmental plan), and used existing governance structures (notably, community-based organisations, or COBAs). It has recognised the need to address communities' needs in parallel to seeking to restore ecological interests. Building on a solid knowledge base, interventions were varied over the programme's total duration of 13 years. A total of EUR 1,625,881 was invested in the landscape over 13 years. Fifty locally-run nurseries, growing 100 native species, contributed to FLR in the landscape. While 95,063 ha were protected in 2013 (Marolambo National Park), 51,743 ha were managed by community-based organisations and an area of 6,786 ha was placed under active or passive restoration.



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Raising awareness and mobilizing local communities for FLR

Over the course of the different phases, the project adapted to respond to evolving needs. For example, it recognised the need to support communities to access funding and markets in order to relieve pressure on forests and engage in restoration activities.

To this day, much has been done but FLR remains an ongoing process managed by local associations and people. Since 2015, WWF has progressively withdrawn from the landscape. Local associations and people have now fully taken over the FLR initiative since January 2018.

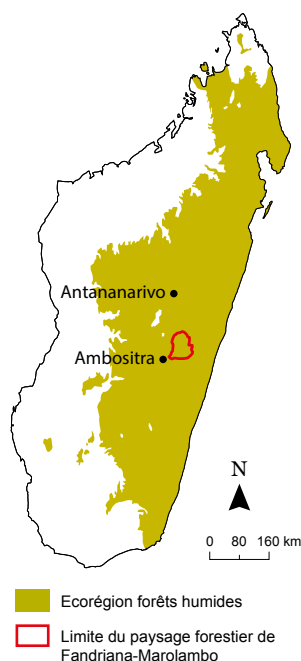
Lessons from this 13 year-long initiative will be valuable in-country as Madagascar seeks to live up to its commitments to restore 4 million ha of forest landscapes. They will also be useful in other locations as this is one of the longest standing projects designed from the start as an FLR initiative. For this reason, lessons learnt from this FLR initiative are valuable and warrant to be shared more widely.

Key lessons learnt over the course of this project are:

- 1 **Scale really matters:** It is important to reconcile site-based interventions within the landscape with objectives at the scale of the landscape. Many interventions may need to be local but they should be integrated within a landscape-scale plan.
- 2 **Monitoring is critical:** Monitoring needs to be integrated since the project initiation phase, and the necessary financial and technical means to ensure that it can continue in the long term must be secured.
- 3 **Success requires a strong social dimension:** Forest landscape restoration has both an ecological and a social dimension, and the social one is fundamental to long term success. It includes the involvement of key stakeholders, supportive governance and a well-defined exit strategy.
- 4 **Start with capacity building:** Capacity building to support FLR is necessary at different levels, from local to national. It is necessary for sustainability and includes technical aspects as well as organisational ones.
- 5 **Commit to the long term:** The long term and diverse nature of FLR is difficult to manage through short term (e.g., three years) project funding. In Fandriana-Marolambo, successive phases built on each other helping to turn the FLR initiative into a comprehensive programme that has achieved major results.
- 6 **Ground implementation in scientific knowledge:** Solid knowledge of the socio-cultural, political and ecological features of a landscape is important to better design and implement FLR interventions that are suited to local conditions. Knowledge about socioeconomics and the ecology/dynamics of native species can be challenging.
- 7 **Maintain flexibility:** Restoring forested landscapes is a long-term process and much flexibility over the course of such an endeavour is needed. Periodic reappraisal is paramount.
- 8 **Strengthen local governance structures:** strengthening local governance structures enables more stakeholders to take decisions which are necessary for the long-term success of FLR and to real engagement of landscape stakeholders.
- 9 **Restoration enhances protection:** forest protection and restoration need to be viewed as complementary tools within a wider landscape.
- 10 **Establish multi-level partnerships:** a large partnership approach helps to engage diverse actors and is needed to succeed in FLR.
- 11 **Design an exit strategy:** The lead organisation of an FLR project or programme carries a long-term responsibility (10-15 years) and needs to design a proper exit strategy.

RÉSUMÉ EXÉCUTIF

Enseignements de treize ans de restauration dans une forêt tropicale humide : le paysage de Fandriana-Marolambo à Madagascar



Localisation du paysage de Fandriana-Marolambo

En 2005, le WWF a lancé un programme de restauration du paysage forestier (RPF) de Fandriana-Marolambo situé dans la forêt humide emblématique de Madagascar. Le paysage, composé d'une forêt tropicale humide fragmentée entrecoupée de savanes, de plantations forestières et de champs, s'étend sur 203 080 ha et abrite 150 000 personnes appartenant à trois groupes ethniques. Il est riche en biodiversité, avec par exemple la présence de huit espèces de lémuriens, mais est sous pression de la déforestation.

La phase initiale du programme (4 ans) avait comme objectif que « les biens, les services et l'authenticité des forêts humides du paysage de Fandriana-Marolambo soient restaurés de manière à soutenir le développement des populations et à assurer les objectifs de conservation de la biodiversité ». En pratique, quatre années étaient clairement insuffisantes pour un objectif aussi ambitieux. Au lieu de cela, les efforts de restauration se sont poursuivis au cours de quatre phases successives, financées par différents bailleurs.

Le programme s'est construit progressivement et a été intégré dans les politiques nationales et locales (comme le troisième plan environnemental). Il a utilisé les structures de gouvernance existantes (notamment les organisations communautaires, ou COBA). Il a reconnu la nécessité de répondre aux besoins des communautés parallèlement à la recherche de la restauration à des fins écologiques. S'appuyant sur une base de connaissances solide, les interventions ont varié au cours des 13 ans du programme. Au total, 1 625 881 euros ont été investis dans le paysage durant ces 13 ans. Cinquante pépinières gérées localement, cultivant 100 espèces indigènes différentes, ont contribué à la RPF. Alors que 95 063 ha ont été officiellement protégés en 2013 (Parc national de Marolambo), la gestion de 51 743 ha a été transférée à des organisations communautaires et 6 786 ha étaient placés en restauration active ou passive.



Sensibiliser et mobiliser les populations locales pour la RPF

Au cours des différentes phases, le projet s'est adapté pour répondre à l'évolution des besoins. Par exemple, il a été reconnu la nécessité d'aider les communautés à accéder au financement et aux marchés afin de réduire la pression sur les forêts et de leur permettre de s'engager dans des activités de restauration.

À ce jour, beaucoup a été fait mais le processus de RPF continue géré par des associations et la population. À partir de 2015, le WWF s'est progressivement retiré du paysage. Depuis janvier 2018, les associations locales et la population ont pleinement pris le relais de l'initiative de RPF.

Les enseignements de cette initiative longue de 13 ans seront utiles non seulement dans le pays, car Madagascar cherche à respecter ses engagements de restaurer 4 millions d'hectares de paysages forestiers. Ils le seront également pour d'autres endroits du monde car c'est l'un des projets les plus anciens qui dès le début a été conçu comme une initiative de RPF. Pour cette raison, les enseignements de cette initiative de RPF sont d'une grande valeur et méritent d'être partagées largement.

Les principaux enseignements capitalisés au cours de ce projet sont :

- 1 **L'échelle est importante** : il est important de concilier les interventions à l'échelle de sites spécifiques dans le paysage avec les objectifs édictés à l'échelle du paysage. De nombreuses interventions peuvent être locales mais doivent être intégrées dans un plan à l'échelle du paysage.
- 2 **Le suivi est essentiel** : le suivi doit être intégré depuis la phase d'initiation du projet, et les moyens financiers et techniques nécessaires pour assurer sa pérennité doivent être garantis.
- 3 **Le succès nécessite une dimension sociale forte** : la restauration d'un paysage forestier a une dimension à la fois écologique et sociale. La dimension sociale est fondamentale pour le succès à long terme. Cela inclut la participation des principales parties prenantes, une gouvernance favorable et une stratégie de sortie bien définie.
- 4 **Commencer par le renforcement des capacités** : le renforcement des capacités pour soutenir la RPF est nécessaire à différents niveaux, du local au national. Il est nécessaire pour la durabilité et inclut des aspects techniques aussi bien qu'organisationnels.
- 5 **S'engager à long terme** : La nature même de la RPF, à long terme et diversifiée, est difficile à gérer via un financement de projet à court terme (par exemple, trois ans). À Fandriana-Marolambo, des phases successives ont été construites les unes après les autres, contribuant à les transformer en une initiative de RPF complète obtenant des résultats importants.
- 6 **Une mise en œuvre fondée sur des connaissances scientifiques** : Une connaissance solide des caractéristiques socioculturelles, politiques et écologiques du paysage est indispensable pour mieux concevoir et mettre en œuvre des interventions de RPF adaptées au contexte local. La connaissance de la socio-économie et de l'écologie/la dynamique des espèces indigènes peut être longue à réunir.
- 7 **Maintenir la flexibilité** : La restauration des paysages forestiers est un processus à long terme et une grande flexibilité est nécessaire au cours d'une telle entreprise. Une réévaluation périodique est primordiale.
- 8 **Renforcer les structures de gouvernance locale** : le renforcement des structures de gouvernance locale permet à plus de parties prenantes de prendre part aux décisions nécessaires au succès à long terme de la RPF et facilite l'engagement réel des acteurs du paysage.
- 9 **La restauration est complémentaire de la protection** : la protection et la restauration des forêts doivent être considérées comme des outils complémentaires à articuler dans un vaste paysage.
- 10 **Établir des partenariats à plusieurs niveaux** : une approche large de partenariat aide à engager les divers acteurs nécessaires à réussir la RPF.
- 11 **Concevoir une stratégie de sortie** : l'organisation principale du programme de RPF porte une responsabilité à long terme (10-15 ans) et doit concevoir une stratégie de sortie appropriée.

INTRODUCTION

Renowned for its unique biodiversity, Madagascar has been losing its forests consistently in the last 20 years. Between 1990 and 2010 the country lost about 57,000 ha of forest each year, netting a total loss of over 1 million ha in this 20-year period (FAO, 2010). Efforts to halt this alarming rate of deforestation have been complemented with attempts to restore lost forest cover.

Reforestation is not new in Madagascar. Already in 1897 nurseries were established to grow a handful of exotic species (mainly eucalyptus and pines). These species were used to restore some of the hills where forest had been removed for construction and fuelwood (Rambeloarisoa, 2007). This legacy of plantations of single exotic species remains today. Both from an ecological and social point of view their impact is dubious, in particular compared to a wider diversity of species, including native ones. With this in mind, forest landscape restoration (FLR) was introduced as a concept in Madagascar in 2003.

Forest landscape restoration aims to restore the functions – such as protecting water sources, fields, pollination and the provision of food and other materials – that trees provide to nature and to people in deforested or degraded landscapes. It was defined in 2000 by a group of experts as “*a planned process that aims to regain ecological integrity and enhance human wellbeing in deforested or degraded landscapes*” (WWF and IUCN, 2000). The process explicitly emphasises both a human and an ecological dimension recognising the need to secure both short- and long-term benefits for people, particularly in poor tropical countries.

WWF, together with IUCN, was a pioneer in FLR among global conservation organisations (see page 8). Today, 18 years since the start of WWF’s engagement in FLR, political momentum is considerable as reflected by global commitments, levels of international funding and scientific research in FLR. However, many challenges remain (Mansourian *et al.*, 2017) and learning from FLR implementation is paramount to support future efforts.

RESTORATION OF
DEGRADED FORESTS
IS A LARGE SCALE AND
GLOBAL CHALLENGE.
WWF AIMS TO
CONTRIBUTE TO
THE INTERNATIONAL
AMBITION TO
RESTORE 350 MILLION
HECTARES OF FOREST
LANDSCAPES BY 2030.

Photo 1. The main direct cause of deforestation in Madagascar is repeated slash and burn agriculture.



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FLR in WWF's Global Forest Programme

WWF's 2001-2006 "Forests for Life" programme centred around three targets: a protected areas target, a sustainable forest management one and an FLR one. The FLR target was "to undertake at least twenty FLR initiatives in the world's threatened, deforested or degraded forest regions to enhance ecological integrity and human well-being by 2005". WWF contributed specific steps along the way to this global target, including leading the implementation of 10 FLR long term initiatives.

Outside of the WWF network, much has been achieved at an international level to raise FLR's political profile and to advance technical understanding through implementation in key landscapes (Mansourian and Vallauri, 2014).

Today, WWF's Global Forest Strategy aims to contribute to the international ambition to restore "350 million hectares of forest landscapes" by 2030 (New York Declaration on Forests and Bonn Challenge on FLR). These global efforts aim to reverse the trend of forest loss and degradation by putting an emphasis on restoring the ecological functions of degraded forest landscapes.

In Madagascar, to launch the FLR approach, a first workshop was held in Antananarivo in 2003 and brought together key national level stakeholders to discuss the purpose of FLR, its value and its need in the country. The same year, a national working group on FLR was set up. It identified the landscape of Fandriana-Marolambo in the east-central part of the island as a suitable area to implement FLR. Since 2005, implementation in the landscape has been led by WWF-Madagascar till the end of 2017 when the organisation finalised an exit strategy. This is one of the longest running and more complete (from initiation to exit) FLR case studies in the WWF network. The purpose of this report is to capitalise on this unique experience.

**THIS FLR PROJECT IS
ONE OF THE LONGEST
RUNNING IN WWF'S
PORTFOLIO: A UNIQUE
EXPERIENCE.**

PRESENTATION OF THE LANDSCAPE

THE FLR PROJECT
FOCUSES ON
45 VILLAGES
(203,080 HA),
INCLUDING A
LARGE CORE AREA
(95,063HA) OF
DENSE MOIST
EVERGREEN FOREST.

The Fandriana-Marolambo area (Figures 1 to 3) includes 14 communes (342,669 ha). The FLR project focuses on a landscape of 203,080 ha straddling 45 “Fokontany” (first level of administrative organisation) which are the most important for forest conservation, composed of a large core area of dense moist evergreen forest (95,063 ha), surrounded by a more diverse mosaic pattern that includes plantations, savannah and agricultural crops (Roelens *et al.*, 2010).

The area is mountainous with an elevation range from 800 to 1800m. Floristically, the forests present a high rate of endemism with for example the endemic Melanophyllaceae family as well as numerous epiphytes. Eight lemur species can be found here, such as the vulnerable brown mouse lemur (*Microcebus rufus*) or the endangered Betsileo sportive lemur (*Lepilemur betsileo*). Central to the landscape, the Marolambo National Park was created in 2013 and covers approximately 95,000 ha.

The landscape is home to about 150,000 people from three different ethnic groups: the Betsileo, Vakinankaratra and Betsimisaraka. A total of 14 communes can be found in the landscape, and an estimated 2,730 households live directly from the use of forest and natural resources (Roelens *et al.*, 2010). Before the project, deforestation rates were severe, reaching 2.58% in Fandriana, 1.38% in Mahanoro and 2.86% in Antanifotsy for the period 1990-2000 - above the national average (MINENVEF and USAID, 2007).

As elsewhere in Madagascar, the main direct cause of deforestation is slash and burn agriculture with limited periods of fallow in between which reduces the soil's ability to regain fertility, leading to the quest for more land, migration and more intensive burning. With a population growing at a rate of 3%, the need for further land to feed the population is inevitable. In the east of the landscape, forests are burnt for rice and sugarcane cultivation, and a small amount of coffee, banana and clove is also cultivated in the hills. In the west of the landscape, rice paddy cultivation is the mainstay, with some migration into the forest in between seasons to cultivate sugarcane. Faced with unclear and overlapping tenure, clearing forest is also a means of “acquiring” land. As a result, the forest in Fandriana-Marolambo is severely fragmented.

Photo 2. The connection between the savannah and the forest corridor.



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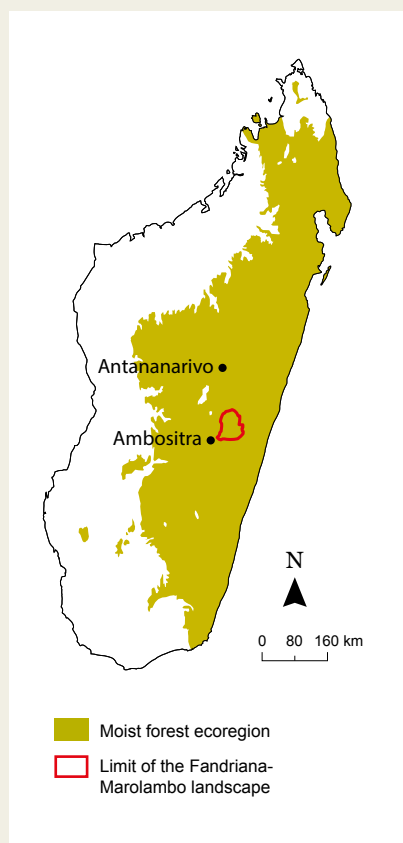


Figure 1. Location of the Fandriana Marolambo landscape

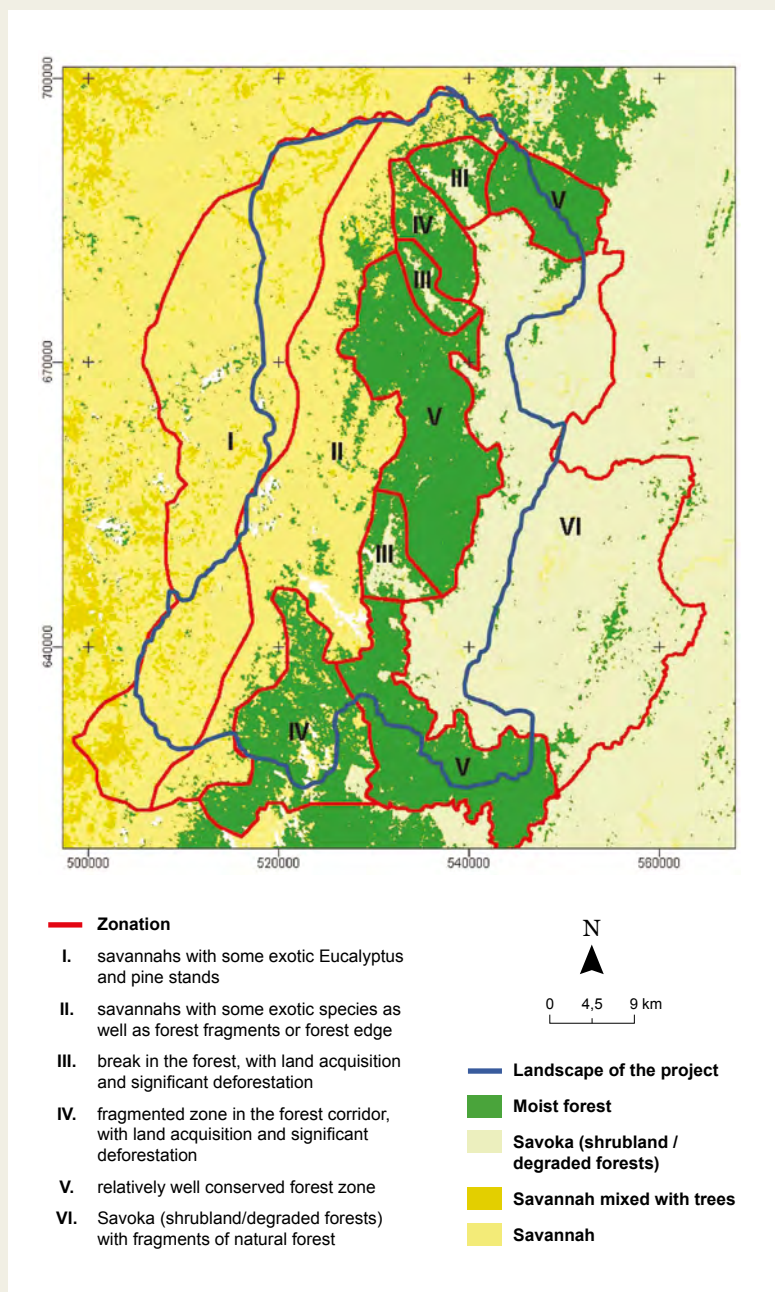


Figure 2. Type of vegetation in the large landscape (342,669 ha). The project focuses on the 45 “Fokontany” (first level of administrative organisation) which are the most important for forest conservation (203,080 ha).

↓ West



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↓ Corridor



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↓ East



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Figure 3. The landscape in a few images.

PROJECT PHASES

Recognising the urgency to act, WWF (Madagascar, US, International and France) designed an FLR project for the Fandriana-Marolambo landscape in 2003-2004. It formed part of WWF's overall Global Forest Programme's work under the FLR target contributing to the "20 FLR initiatives" and the start of what became a multi-phase 13-year programme in the landscape.

In 2004, WWF raised funding from the French Ministry of Foreign Affairs (MAE). Subsequently, over the course of 13 years an approximate EUR 1.6 million were invested in the programme, first from MAE, and the Fondation Ensemble. Subsequently, further developments and implementation connected other funding from Air France and the GoodPlanet foundation, and from WWF Switzerland and WWF Sweden (see Table 1).

Table 1. Programme phases

Dates	Phases in the landscape	Related events
2003-2004	Inception Phase - Preparing concept and searching for seed funding to start	First workshop on FLR held in Antananarivo (2003)
2005-2009	Phase I - Funding secured from WWF, French Ministry of Foreign Affairs (MAE) and Fondation Ensemble for a 4-year FLR project focusing exclusively on the Fandriana-Marolambo landscape	
2010-2012	Phase II - Funds secured from Good Planet Foundation/Air France to pursue restoration efforts with the aim to reduce deforestation and degradation in 5 sites (one of which is Fandriana-Marolambo) in the context of climate change mitigation and adaptation	Bonn Challenge on FLR (2011)
2011-2013	Phase III - Innovative financial mechanisms funded by WWF Switzerland	Establishment of Marolambo National Park in the landscape (2013)
2014-2017	Phase IV - Funds secured from the Swedish aid agency, SIDA, for empowering local communities and water for life project (2014) in two landscapes, one of which is Fandriana-Marolambo.	New York declaration on Forests (2014) Madagascar joins the Bonn Challenge and the AFR100 by committing 4 million ha to FLR by 2030 (2015)
2015-2017	Phase V - Exit strategy: WWF progressively hands over project management to local associations	

IN FANDRIANA-MAROLAMBO, SUCCESSIVE PHASES BUILT ON EACH OTHER HELPING TO TURN THE FLR INITIATIVE INTO A COMPREHENSIVE PROGRAMME THAT HAS ACHIEVED MAJOR RESULTS.

Altogether FLR work in Fandriana-Marolambo has been ongoing for 13 years in five distinct phases based on donor support (see Table 1). In 2005, the funds raised from the French Foreign Ministry (MAE) were for an initial 4-year FLR project implemented by WWF-Madagascar (EUR 756,000) with the overall objective being that *“The goods, services and authenticity of the moist forests of the landscape of Fandriana-Marolambo are restored so as to support the development of the populations and to secure the objectives of biodiversity conservation.”* Co-funding was obtained from the Fondation Ensemble in 2007. Key activities implemented were the engagement of the local populations and authorities, and ensuring that the project was inserted into development plans of all 14 landscape communes. Contracts were signed with local communities to set aside areas for passive restoration in 50 sites. Active restoration was implemented together with communities in 73 sites covering a total of 500ha. A total of 18 studies since the start of the project helped to better understand the local socio-economic and ecological circumstances in order to define more suitable and locally-relevant restoration strategies.

Subsequently, in 2009 further funding was raised from the Fondation Good Planet/Air France also for 4 years to reduce deforestation and forest degradation across five sites, one of which was Fandriana-Marolambo (EUR 259,000). The project emphasised the role of FLR in climate change mitigation and adaptation. Indeed, restoring forested landscapes helps to not only sequester carbon (mitigation) but it also helps both biodiversity and humans to adapt to changing conditions by, for example, protecting fields and human settlements from flash floods.

This phase focused on raising awareness among the local population and decision-makers about climate change, addressing deforestation and promoting FLR as a mitigation measure for climate change. Its intention was to increase knowledge about the role of forest restoration projects in reducing greenhouse gas emissions. More specifically, it aimed to dispel myths about the facility of using tree planting as an easy option rather than reducing greenhouse gas emissions. Lessons from this project were intended to contribute directly to policy-making on the delicate relationship between restoration and climate mitigation.

The next phase funded by WWF Switzerland (EUR 312,000), was designed specifically to relieve pressure on the Marolambo National Park (established in 2013), but also on other natural forest in the landscape. Research in this phase centred on improving the quality of life of local communities and sought notably, to identify financing options (e.g. microcredit schemes) to help communities expand and improve their livelihoods, as well as help them to connect to markets. Active and passive restoration continued under this phase. Recognising the importance of lifting the landscape inhabitants out of poverty so that they could be in a position to better protect and restore their unique natural environment, an emphasis was given to alternative livelihood approaches.

The establishment of the Marolambo National Park in 2013 (and preparations for it already starting since 2009) had significant repercussions on the project. On the one hand, it limited activities possible inside the zone that was set aside for the park. On the other hand, it signified that the project activities could complement and support the value of the national park by improving the ecological condition around the park and working with communities to reduce their impact on existing forest.

An evaluation during the first phase of the project, established that concrete “on the ground” results were better than expected (Ratsimbarison and Burren, 2009). In particular, good progress in terms of improved agricultural techniques and both active and passive restoration were observed. Involvement of local communities in forest management was achieved through COBAs and management contracts. One unexpected development

was that project staff had to be significantly upscaled because of the communities' lack of involvement in the development of the project and in their initial distrust of outside intervention (Mansourian *et al.*, 2016). As such, the project was led by a coordinator based out of Fandriana but also counted on several local level facilitators to work with the communities, and two extension officers ("socio-organisateurs") one for each of the western and eastern ends of the landscape.

Monitoring was highlighted as a shortcoming in the first phase of the project. In the second phase (after 2009) more detailed monitoring was undertaken at the level of households. Data that was collected by local facilitators and brought together by the WWF office in Fandriana, was fed into a database maintained by the forestry department. Information collected included for example data on tree planting activities by farmers, on the promotion of natural regeneration and on the alternative crops being harvested. Many of the indicators included in the project were at the level of activities (e.g. the number of management plans, the number of sites identified, the number of training activities undertaken etc.), with limited attention paid to measuring impact and outcomes. A first effort to capitalise on data and results was undertaken in 2010 (Roelens *et al.*, 2010).

Funding secured from the Swedish aid agency, SIDA, (EUR 298,424) contributed to empowering local communities by strengthening the institutional capacity of community-based organisations and supporting exchanges among these organisations.

Photo 3. Raising awareness by setting up nurseries managed by schools.



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IMPLEMENTATION: ACTIVITIES AND RESULTS

This section first briefly reviews the key activities in the distinct phases of the programme. Implementation can be split into two closely inter-related axes:

1. Engaging in passive and active restoration,
2. Supporting communities.

The two are not distinct, however, for our purposes it may be easier to identify these two categories of activities, notably, given the interest in identifying concrete implementation of restoration actions.

Activities

The landscape was zoned into six distinct areas, based on landscape types, social drivers and extent of forest degradation. In each zone, different FLR strategies and activities were prioritised (Figure 2, Table 2). These zones were based on a landscape approach and were defined according to the current state of the forest.

The different uses and project activities within the zones were:

General activities:

- agreeing on a joint vision for the landscape;
- clarifying land status and tenure;
- introducing the FLR concept and ensuring it was adopted within local development plans;
- building on local associations; supporting and initiating long term sustainability.

Other activities by zones:

- adapting agriculture practices, identifying alternative income-generating options for local farmers (I, II, IV, VI);
- some restoration activities such as nursery development (II, III, IV, VI);
- transferring management rights to COBAs (III, IV, VI).

Key restoration actions were divided between active restoration - through seedling and sapling collection, nursery establishment and tree planting - and passive restoration, essentially through protecting certain zones (from fire) and allowing them to regenerate. In practice, passive restoration also signified entering into contracts with landowners and groups to ensure that they would leave some parts of their land to regenerate. Community forest management contracts ("*contrats de gestion communautaire des forêts*") cover an area of 51,743 ha in Fandriana-Marolambo, within which 6,786ha were identified for active or passive restoration.

Thanks to the project, local communities have changed their negative perception of local species, which they used to think were difficult to produce and grow on degraded land and were slow growing. Now they see the value of local species and have acquired the knowledge to grow them. As a result, there is a 75% survival rate for indigenous trees. Understanding the value of forests, notably to secure water, local communities are willing to set aside fields for restoration. Different methods have been tested, including transplanting wild saplings into nurseries, transplanting saplings directly onto the sites, germination in nurseries, direct seeding and pre-germination and cuttings. Based on this experience, transplanting saplings into nurseries first was found to be the best method to scale up production, with 80% of plants being produced in this way in the landscape. Old stands of exotic species present in the landscape (e.g. Eucalyptus stands of over 30 years) have also acted as nurse trees, improving local soil conditions and facilitating the growth of native species below (Roelens et al., 2010).

Close to 100 communities were engaged in the landscape. Local communities were supported on several counts: 1. To improve their general management capacity, 2. To improve their agricultural techniques so as to expand their income base while limiting impact on forests, 3. To learn active restoration techniques and 4. To access funding. Diverse agricultural practices were promoted such as improved crop fertilisation, crop combinations and cropping systems over vegetation to reduce the impact of slash and burn practices, improved rice cultivation techniques which did not involve the use of fire, and agroforestry. Alternative income-generating activities were introduced, including production of essential oils, honey, and small animal and fish farming to reduce pressure on the forests while improving peoples' livelihoods. It was important for the communities to develop their own ideas and proposals for these income-generating activities. In this way, they could not only identify the best options for them but were also more actively engaged and wanting to succeed. At the same time, particularly in phase IV, financing options were explored such as microcredit schemes.

Table 2:
Key activities by phases

Dates	Key activities
2005-2009	<ul style="list-style-type: none"> • agreeing on a joint vision for the landscape; • clarifying land status and tenure; • introducing the FLR concept and ensuring it was adopted within local development plans; • undertaking a number of studies; • building on local associations; • adapting agriculture practices; • beginning some restoration activities such as nursery development.
2010-2012	<ul style="list-style-type: none"> • working closely with communities to inform them about the links between forests and climate change; • supporting communities to obtain management rights for forests; • transferring management rights to COBAs; • ongoing active and passive restoration actions.
2011-2013	<ul style="list-style-type: none"> • identifying alternative income-generating options for local farmers; • technical support; • identifying sustainable financial mechanisms; • continuation of ongoing active and passive restoration actions.
2014-2017	<ul style="list-style-type: none"> • working with local communities so that they could better engage in alternative income-generating activities and access markets; • capacity building, management, lobbying, communications and advocacy; • continuation of restoration activities; • supporting and initiating long term sustainability; • preparing hand over to local associations and communities.

Photo 4. Production of native species seedlings



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**FLR IS NOT A 'ONE TOOL
FITS ALL' APPROACH.
IT REQUIRES A
COMBINATION OF
DIVERSE TECHNIQUES
ADAPTED TO
THE LANDSCAPE
PRESSURES AND LEVEL
OF DEGRADATION.**

Results

Reducing the pressure of deforestation

The first result of the project is the reduction of ongoing deforestation. In the western part of the landscape the deforestation rates were very high before the project (e.g. 2.20% per year in the commune of Fandriana, 3.56% à Antanifotsy during the period 1990-2005). During the period 2006 to 2016, this rate has been maintained below 1% per year, partly as a result of the development of sustainable agriculture (rice) by local communities. In the eastern part of the landscape, the situation is more sensitive: the two main pressures, illegal rose wood extraction and sugar cane cultivation (for rum production) are still present (deforestation is about 1%), attributed to migrants and uncontrolled by local communities or the forest department.

Community forest management

The programme specifically helped to establish 14 community-based organisations (COBAs) (out of 35 in the landscape) which manage an area of 38,828 ha, as well as a federation of COBAs for the landscape. This federation is intended to strengthen the political clout of COBAs at the national level and with donors.

Overall, through the 35 COBAs in Fandriana-Marolambo, communities are managing a total of 51,743 ha. Increasingly, local communities are recognising the link between planting trees and water availability, erosion control, bees, food and health. Their income has been significantly diversified and includes: pig rearing, production of essential oils, fruit trees and beekeeping. As a result, food security has improved and incomes have increased.

Active restoration

All 14 communes in the landscape adapted their communal development plans to include FLR. Restoration zones were identified across the landscape and 48 village communities established specific contracts delimiting restoration zones.

Apart from direct seeding and the direct planting of wildings, the project established 50 tree nurseries run by local communities, schools or family associations. These nurseries were producing a total of 100 indigenous species and on each restoration plot an average of 25 different species were being planted. Overall 999,370 saplings were planted in the landscape.

Sustainable resource production

A total of 554 farmers were trained in different agricultural techniques and 481 projects demonstrating alternative income generating activities were supported through micro-credit schemes. Seventy partner associations for agriculture were established and their members trained in seven alternative agriculture techniques (including intensified rice production, bee hives, fruit trees, compost, etc.).

Approximately 1400 households benefitted either directly or indirectly from these alternative income generation schemes. Improved rice production systems enabled a 2-4 fold increase in production, and close to 60% of association members adopted these systems. Exotic species were also planted with a total of 472,500 plants to respond to local demand for fuelwood and construction timber in Zones I and VI (Figure 2). Also, 159,786 fruit trees were planted (including citrus, apples and the essential oil “Ravintsara”).

Other social results

Additional social benefits were secured through literacy courses, with 187 participants attending these courses for a total of 16 sessions. Twelve houses were constructed as community work areas, 10 community houses and five grain stores built. Forest restoration has also demonstrated a positive impact on nearby water sources (<http://www.wwf.mg/en/?uNewsID=309810>).

Table 3:
Key quantitative results

Key Priority Indicator	Results
Deforestation rate (per year)	Reduced to <1%
Area protected	95,063 ha
Number of hectares managed by community-based organisations	51,743 ha
Area under active or passive restoration	6,786 ha
Number of trees planted	999,370
Number of locally-run nurseries	50
Number of native species	100
Survival rate for indigenous tree species planted	75%
Number of community-based organisations	35
Number of farmers trained in different agricultural techniques	554
Number of household benefitting from alternative income-generating activities	1,400

PARTNERS AND MAIN ACTORS

Four WWF offices were involved in the initiation of the programme: WWF International, WWF France, WWF Madagascar and WWF US. The first workshop in 2003 brought around the table other NGOs (e.g. Conservation International) and government representatives (from the forest service) as well as a representative from the private sector. A national working group on FLR was established composed of the national participants present at this first workshop. WWF led the project, with a newly established project office in Fandriana and a project coordinator based in the landscape.

Stakeholders at the level of the landscape were, unsurprisingly, distinct. A total of 150,000 people live in the landscape, from three different ethnic groups. Once the project started in 2004, it became apparent that, in part because of the diversity of local inhabitants, more local facilitators were needed to engage with the different communities living in the landscape.

The project staff had to overcome distrust from the local communities who in the past had been encouraged to remove trees from their landscape in order to promote agriculture, and who were now being punished for deforesting, and instead were being encouraged to plant trees (Mansourian *et al.*, 2016). Indeed in an effort to promote settlements in the area during the 1970s and 1980s, the central government issued permits to farmers to allow them to remove forests for agriculture. Resulting forest loss led to significant outside funding for conservation in the 1990s and a subsequent reversal of government policy, punishing instead of promoting forest clearance (Aubert *et al.*, 2003). Understandably, this led to conflict and mistrust between communities and forest authorities.

For poor local communities to engage in restoration signified seeking short term benefits from restoration to respond to their livelihood needs for example through improved agriculture, or the production of fruit trees, or marketable products such as essential oils. Eucalyptus plantations were also maintained - in designated zones - to respond to the need for fuelwood by local communities. In this way, the opportunity cost of setting aside land for passive restoration or for planting species that could only provide longer term benefits, could be offset given the social and economic conditions present among those living in the landscape. The development of alternative income-generating activities was important from the start of the project but from 2010 to 2014, with funding from WWF Switzerland.

Because all natural forests officially belong to the state, representatives from the environment ministry were closely involved in all phases of the project with local extension officers actively participating. However, the distrust between the local communities and authorities meant that WWF had a fine balance to manage between these two sets of key stakeholder groups.

In phase 2 of the project (2008-2010) a working group was established at the level of the landscape made up of ministerial representatives and other bodies working on environmental conservation. The working group met at least once a year to review workplans. More recently, this group has been revived since the government committed in 2015 to restore 4 million ha.

Traditionally the role of elders and notables is fundamental among the communities in the landscape. Provincial and regional chiefs were involved in the project as it was successfully inserted in community and regional development plans.

**A LARGE PARTNERSHIP
APPROACH HELPS TO
ENGAGE THE DIVERSE
ACTORS AND IS NEEDED
TO SUCCEED IN FLR.**

The national parks authority “Madagascar National Parks” (MNP) was involved in the preparation for the establishment of the Marolambo National Park in 2013. Because of the preparations for this park, MNP was placing constraints on activities in the area to be declared a national park. WWF collaborated closely with MNP to share data and to ensure that efforts to build trust among the community were not affected by the new protected area.

Mayors at the communal level are particularly important stakeholders as they act as a bridge between the local communities they represent and project leaders. They played an important role in inserting project activities into the 14 communal development plans (PCDs).

While initially part of 70 associations, communities re-grouped under 35 legal entities that could manage forests and natural resources in a recognised manner. These local management bodies are a way of organising community members and provide a meaningful counterpart for projects. At a landscape level the federation of COBAs was established in a bid to organise the 35 COBAs into a larger body with more political clout vis-a-vis the government and the donor community.

Other Malagasy organisations that were brought into the project include, for example, the Madagascar Savings scheme (Caisse d’Epargne de Madagascar) which was brought in to emphasise the value of microcredit as an option to support local farmers (see Table 4).

Other international NGOs such as CI and the Durrell Wildlife Conservation Trust (DWCT) are active in the landscape. Collaboration specifically on this project has been in the establishment of the protected area and of a Ramsar site at the river Nosivolo (originating in the Fandriana-Marolambo landscape).

Photo 5. Mayors at the communal level are particularly important stakeholders



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Table 4: List of partner entities

Category	Partner	Role/Activity
Environment	MNP	Establishing the Fandriana National Park. Workshop on deforestation, sharing of information on park management and awareness raising activities.
Nursery	SNGF	Provision of seeds, seedlings and saplings.
Agriculture	Fafafi Spafi	Training of community organisations, technical support and capacity building.
	Pharmacie & Cabinet Veterinary Zay Manina	Supplying inputs, support to the Maintymanitra cooperative.
	Amoron'i Mania Voasary	Supplying citrus saplings.
	NGO Sahavo	Supplying <i>arachis pintoï</i> , <i>brachirria</i> and <i>stylosanthès</i> .
	Association Kintana	Supplying ravintsara, Buying <i>Arachis</i> , <i>Kikiuyu</i> , <i>Avoine</i> , <i>Ray grass</i> . Supplying citrus saplings.
	Fifamanor	Provision of seeds of Ray Grass and potatoes .
	CTHT	Capacity building of farmers in plantation techniques and collection of pink peppercorn.
Finances	Otiv Fanantenana Fandriana	Microcredit accounts of associations.
	Caisse d'épargnes de Madagascar	
	Otiv Antanifotsy	
Capacity building	Aroma forest / Homme et Environnement	Training on use of stills for aromatherapy and on sustainable trade.
	Consulting Plus	Undertaking a study and training on microcredits.
	FRDA / CSA	Sharing of information and experiences in product chains.
	Société Aromania	Support for markets in essential oils (Ravintsara).
	Société Jaccarandas	Training and commercial partnership on pink peppercorn.
	ATDR	Support to establish and train community organisations.
	Tsirymada / Tsiry Parm	
	Articom	Producer of stills and trainer in distillation of essential oils.

GOVERNANCE

An eminent political scientist, Arun Agrawal, with his colleague Maria Lemos, defined environmental governance as “the set of regulatory processes, mechanisms and organisations through which political actors influence environmental actions and outcomes.” (Lemos and Agrawal, 2006).

In the Fandriana-Marolambo landscape, the importance of governance can be described through three key elements.

Firstly, the choice to develop the project in this landscape was widely consultative, with a first workshop (2003) bringing in different national-level stakeholders.

Secondly, the governance arrangements for the project itself shifted over successive phases from being top-down with the forest service at the centre, to being more bottom-up with the communities gradually becoming more involved in decision-making, notably through a number of local associations established in the landscape to address FLR. In part, this development has been a response to the government’s inability to engage in and maintain forests because of their remoteness. At the same time, in a poor country such as Madagascar, many rural communities are heavily dependent on forests and land for their livelihoods.

The main policy instrument supporting this delegation of power in remote forest areas, originating with the 1996 law named GELOSE (Gestion Locale Sécurisée or “secure local management”), which established the devolution of management rights of natural resources to rural communities and was complemented in 2001 by a decree on the Gestion Contractualisée des Forêts (GCF or “contractual management of forests”). Community-based organisations (communautés de base or COBAs) are established to organise communities and they act as government counterparts in the signing of co-management agreements.

In Fandriana-Marolambo, COBAs were established to engage communities in the restoration work with “*contrats de gestion communautaire des forêts*” or “Community forest management contracts” covering an area of 51,743 ha. Thanks to these contracts, communities have the necessary authority to engage in restoration. For example, in the Ezaka community in Ambatodidy, a 20ha degraded zone was delimited for active and passive restoration through a contractual arrangement. Community forest management contracts describe modalities of forest use, including restoration. A record has been kept of all the agreed contracts.

The project is well aligned with national and communal policies, including the Madagascar Action Plan (MAP), the third environment programme (PE III), the poverty reduction strategy (PRSP), the forestry policy, as well as the local communal plans. At the international level, it is aligned with the government of Madagascar’s commitment to restore 4 million ha under the Bonn Challenge and the AFR100 restoration initiative.

Thirdly, the importance of tenure and property rights has been critical. Property rights determine who has the right to use, manage, benefit from and access land and other resources. Unclear or contested rights and tenure may complicate restoration while evidence suggests that clear tenure supports restoration (Nagendra, 2007). Officially, all of Madagascar’s forests belong to the state, but in practice there are significant overlaps with customary tenure systems. The lack of tenure security in the landscape has discouraged sustainable practices, leading to more deforestation in order to claim land. Also, the choice of trees (exotic versus indigenous) used for restoration can determine the right to the land, with exotic species facilitating land appropriation, while indigenous species fall under the national forest (Mansourian *et al.*, 2016). Thanks to contracts negotiated through COBAs, forest restoration by communities also served to improve their status, empower them and give them greater recognition as the rightful guardians of the forests.

STRENGTHENING
LOCAL GOVERNANCE
STRUCTURES ENABLES
TO ENGAGE MORE
STAKEHOLDERS.



Photo 6. Local festival and collective tree planting ceremonies gather local communities

CAPACITY BUILDING

The diversity of interventions necessary in FLR require many different skills. All too often capacity building is not considered a priority, particularly by donors.

Capacity building efforts started with WWF's own staff.

The FLR approach was a new way of tackling restoration, agricultural alternatives and tree planting more generally in the country as it sought to link both ecological and social dimensions. This meant combining a number of technical skills. It is fair to say, that over the course of the project WWF staff learnt valuable and diverse skills to engage in the restoration of landscapes, from negotiating with diverse actors, to specific techniques for planting native species.

At the same time, local farmers' capacity was built in both the technical aspects of growing a diverse range of native tree species and the managerial aspects of running small businesses. A number of training activities for farmers were designed including on composting techniques, improved rice cultivation, beekeeping, fruit tree management, amongst others. A study tour enabled 80 local farmers to visit different sites around Madagascar and see different improved agricultural techniques in practice as well as nursery management. Improved cash crop production was also prioritised notably for litchi, citrus trees, kaki, peach and coffee. Some farmers were also trained in basic management, accounting, project development and management, and financial management.

Photo 7. Supporting improved rice cultivation and alternative agricultural practices contribute to FLR implementation



The national forest service and the authority in charge of national parks had limited experience with many of the indigenous tree species that were promoted through the project. In this way, the project helped to build local capacity in different restoration techniques and expand the approach taken to forestry in the region.

Several Malagasy students used the project as a study site (e.g. Felanirina Rabevazaha studied forest succession in the landscape, completing her thesis in 2008). A total of 13 surveys were carried out, including a lemur survey (Andriaholinirina, 2007), a botanical one (Anjaniala, 2007), as well as one on amphibians and reptiles (Andriamazava, 2007). These served to improve knowledge about the landscape but also were considered essential to ensure that landscape interventions were grounded in solid scientific knowledge.

COMMUNICATIONS

Through the different phases of this programme, the main message has been modified. Initially the emphasis was on promoting the return of trees to the landscape to fulfil the dual social and ecological objectives of FLR. In a second phase (2010-2012), the role of FLR in climate change mitigation was emphasised as it became crucial internationally. In the latter phases (2011-2017) of the project, the emphasis was on the capacity building dimensions and improving livelihoods of local farmers. All of these dimensions and messages are part of the comprehensive FLR approach.

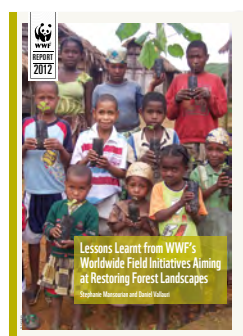
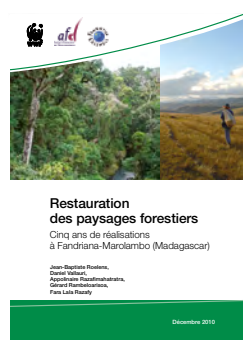


Photo 8. Publications from the project

The audience before the project officially started was national level decision-makers. The national working group on FLR set up in 2003 was created to ensure buy-in from key decision-makers and alignment with national plans. Once the project started, communications emphasis shifted to the landscape with community level decision-makers (such as mayors) and local community members being the target audiences. Internationally there was limited communications targeting donors and the growing international FLR community (see e.g. the global partnership on FLR).

Written materials used included fact sheets, reports and studies. A significant amount of communications was done verbally with local communities, including in some cases using songs to promote restoration! (Roelens *et al.*, 2010). More importantly, local facilitators played a critical role in verbal communication with community groups and associations, based in the landscape. They were selected from the local communities themselves and were central to facilitating communications between the project team and local authorities, traditional authorities and all community members.

For communications purposes three core groups were defined, with different methods suited for each:

1. all communities across the landscape with awareness-raising including cultural and sports events held with local artists and sports groups;
2. more targeted awareness-raising at the level of inhabitants in the target villages;
3. sensitisation of decision-makers and champions.

Radio shows and events were organised in the main towns together with the forestry administration and the local authorities. Fact sheets, posters and banners, as well as t-shirts and caps, and a documentary were produced.

An annual walk was held across the forested corridor. Called the “Diabe”, this march was organised to raise awareness among villagers and the authorities about their important natural heritage. During the march, the emphasis was placed on halting deforestation, forest fires and illegal logging of precious trees.

Photo 9. Songs as a medium to raise awareness



Slogans chanted during the Diabe

- “Arovy ny ala fa lova hoan’ny Taranaka”. Protect the forest because it is our legacy to future generations
- “Tanana mamokatra sy mandroso, Lavitry ny doro ala sy ny doro tanety”. Village undertaking sustainable production, village far from forest fires
- “Doro Ala, Loza hoan’ny Taranaka, Ala voaaro, Lova hoan’ny Taranaka”. Burnt forest, danger for future generations. Protected forests, heritage for future generations.

SUSTAINABILITY AND EXIT STRATEGY

The programme has relied on external donor funding throughout its different phases (see Table 2) which, in the long term, is not a financially viable model. Having said that, several factors may be said to contribute to the programme's sustainability. Firstly, engagement with local authorities and streamlining of project activities within local development plans have been important achievements which should help to ensure long term continuity of the project objectives. Furthermore, the project has

helped to create and supported local associations such as the NGOs Loharano and Fanilo Spam and four unions/networks of COBAs (Mitafa, Soamirindra, Vahivahy and Tamba-zotra) which will continue beyond the project. More generally, emphasis has been given to strengthening civil society so that it can operate more effectively into the future beyond the project. Another form of sustainability is the skills acquired, for example, on the management of a diverse range of tree and plant species, which remain among the local population, the next generation of professionals and the national forest service well beyond the programme's lifetime.

The last phase of the programme has actively prioritised sustainability for local communities through four different dimensions: 1. Business start-up financial support, 2. Technical support to set up community organisations (micro-credit schemes, business plans, governance etc.), 3. Technical training in specific agricultural and planting practices, 4. Support for improving market access (see Figure 4).

Donor dependence is a problem in Madagascar as in many other countries. WWF has been active in the Fandriana-Marolambo landscape for a significant period of time and as it pulls out, it will inevitably leave a void.

Figure 4.
Elements of sustainability
at community level

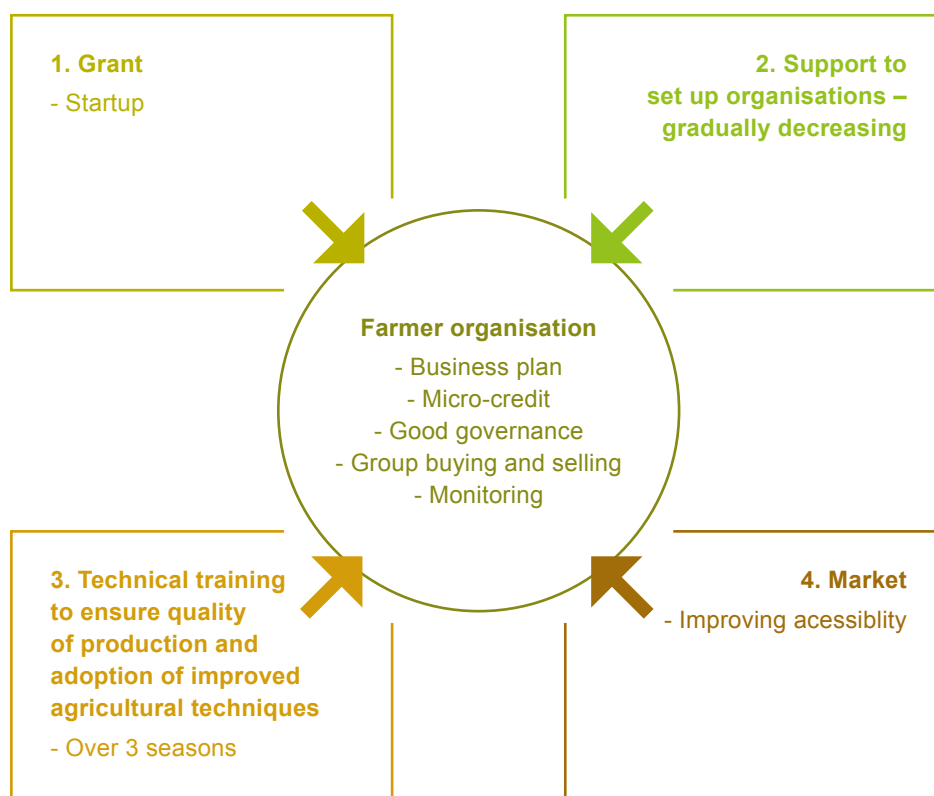


Table 5.
Funding for the Fandriana-
Marolambo FLR initiative
during 13 years

Dates	Funded projects	Donor	Amount (EUR)
2005-2009	Restoring the forested landscape of Fandriana Marolambo	French Ministry of Foreign Affairs/AFD/FFEM, Fondation Ensemble, WWF-International and WWF-France	756,000
2010-2012	Holistic project on forest conservation	Air France, Good Planet	259,003
2011-2013	Project to create innovative and sustainable financial mechanisms and develop revenue-generating activities around the Marolambo National Park	WWF Switzerland	312,454
2014-2017	Project to strengthen civil society's capacity to manage natural resources sustainably	SIDA	298,424
Total			1,625,881

**THE HOPE IS THAT
HAVING SUPPORTED
LOCAL STAKEHOLDERS,
AND ONCE THEY SEE
RESULTS, THEY WILL
BE MOTIVATED TO
PURSUE RESTORATION
INDEPENDENTLY.**

Nevertheless, a progressive WWF exit strategy started two years before the organisation's final exit in December 2017. It consisted in two major strands: 1. Building local capacity of associations and community-based organisations, 2. Promoting income-generating activities in the landscape such as essential oils. WWF took the time prior to leaving the landscape to identify and strengthen suitable local partners. At the national level, WWF has been seeking to further strengthen community-based organisations through the promotion of a national network of COBA federations. Through this network, lesson learning and exchanges can take place, and the federations can become more powerful political actors in negotiations with the government and donors.

Finally, the hope is that having built and supported local associations and institutions, and once they see results of the FLR programme in the field, they will be motivated to pursue restoration independently. However, the risk remains that this may not be the case. The population in the region is growing and pressures on land and natural resources continue. A ray of hope exists though: while in 2009, following the political crisis, many of Madagascar's forests were illegally plundered, inhabitants in the Fandriana-Marolambo landscape did not resort to illegal logging, having seen the value of halting deforestation, restoring their landscape and engaging in alternative income-generating activities. This positive sign is an indication of the solid foundations established by the programme and will hopefully serve to maintain and expand the actions initiated over 13 years of FLR intervention in Fandriana-Marolambo.

OVERARCHING LESSONS LEARNT

Over the years, several lessons for FLR practitioners have been documented from the Fandriana-Marolambo landscape in Madagascar (see e.g. Roelens *et al.*, 2010; Mansourian and Vallauri, 2012). Today, they are important for the country itself, but reflecting on the more significant lessons learnt is also crucial for FLR success in other degraded landscapes worldwide. It is the purpose of this chapter. It focuses on lessons that are of value to other projects worldwide. The following lessons stand out:

1 Scale really matters

It is important to reconcile site-based interventions within the landscape with objectives at the scale of the entire landscape. Many interventions may need to be local but they should integrate within a landscape-scale plan.

The Fandriana-Marolambo FLR programme took place in a large landscape (203,080 ha), with a desired comprehensive approach to improve ecological integrity across the landscape, and therefore, also target its 150,000 inhabitants. The geographical scale made sense ecologically. Yet in practice, inevitably, restoration actions were localised, and small in scale. Whether these small efforts aggregate to a larger “restored landscape” is difficult to assess (see next lesson). The complexity of inhabited landscapes, with different communities, different concerns and different pressures, signifies that no single solution can be applied across the whole landscape and the project ended up designing a wide range of interventions to tackle different threats and priorities across the landscape, all of which were significant pieces of the FLR solution.

2 Monitoring is critical

Monitoring needs to be integrated since the project initiation phase, and the necessary financial and technical means to ensure that it can continue in the long term must be secured.

Recent efforts have been made to develop monitoring frameworks for FLR (e.g. Viani *et al.*, 2017; Dudley *et al.*, 2018; Evans *et al.*, 2018). However, it is notoriously difficult to find the right measures that will enable us to know whether both “ecological integrity” and “human wellbeing” have been improved. The Fandriana-Marolambo landscape is no exception. Monitoring has been limited to punctual site-based actions, rather than landscape-scale impact. This is in part because of the difficulty of measuring larger scale impact, but also because of donor pressures to measure and highlight “successes”, however small and short term. It is only when we are able to assess this larger impact that we will be able to say whether FLR is making a difference.

3 Success requires a strong social dimension

Forest landscape restoration has both an ecological and a social dimension, and the social one is fundamental to long term success. It includes the involvement of key stakeholders, supportive governance and a well-defined exit strategy.

Through practice, it became evident that to achieve ecological objectives, the social, political and economic dimensions are equally important. However, this requires specific competences that are not always available in conservation NGOs or the forestry community.

4 Start with capacity building

Capacity building to support FLR is necessary at different levels: from local to national. It is necessary for sustainability and includes technical aspects as well as organisational ones.

At times training provided did not have any apparent direct link with FLR (e.g. developing a basic business plan), but as in so many landscapes, these fundamental steps were necessary building blocks to the more comprehensive FLR objectives. Without such fundamental skills, it was difficult to engage with communities and to consider the long term viability of restoration actions.

5 Commit to the long term

The long term and diverse nature of FLR is difficult to manage through short term (e.g. three years) project funding. In Fandriana-Marolambo, successive phases built on each other helping to turn the FLR initiative into a comprehensive programme that has achieved major results.

Although the first project proposal was initially for four years, it was obvious to WWF that the engagement in the landscape had to be longer if significant restoration results were to be achieved. It will have taken 13 years to achieve visible results and to make sufficient progress for WWF to feel it appropriate to phase out through a specific exit strategy. Although the landscape cannot be considered to be “restored” even after 13 years, many ingredients are in place for the longer term success of this endeavour. However, it remains a common misinterpretation among donors, and many other stakeholders, that forest restoration (FLR or otherwise) can be achieved in 4-5 years (a typical donor cycle). The long term nature of both social and ecological dimensions must be recognised and the organisation leading the project should plan accordingly.

6 Ground implementation in scientific knowledge

Solid knowledge of the socio-cultural, political and ecological features of a landscape is important to better design and implement FLR interventions that are suited to local conditions. Knowledge about socioeconomics and the ecology/dynamics of native species can be challenging.

Although not initially included in the project plan, WWF recognised the need to increase understanding about the Fandriana-Marolambo landscape in order to take sound and well-grounded decisions related to restoration. As a result, several scientific studies and surveys (social and ecological) were conducted in order to obtain a better understanding of the ecological and socio-economic make-up of the landscape. From very simple elements (e.g. native tree species propagation techniques) to more complex issues (e.g. drivers of governance failures in the landscape), these proved invaluable to support the interventions and identify future needs.

7 Maintain flexibility

Restoring forested landscapes is a long term process and much flexibility over the course of such an endeavour is needed. Periodic reappraisal is paramount.

The Fandriana-Marolambo restoration work is iterative, building on different phases. Each phase has had to adjust depending on the reality on the ground, the context of the period, donors etc., and new and unexpected challenges, such as political upheaval. Clear end goals, capacity to adapt to opportunities and constant reappraisal of the situation through a well-designed monitoring system are essential to success.

8 Strengthen local governance structures

Strengthening local governance structures is necessary to the long term success of FLR and to real engagement of landscape stakeholders.

It is important to work with landscape communities and to determine together with them, appropriate governance structures (based on traditional ones) for communities to feel ownership of the process and to be in a position to take it forward beyond donor funding.

9 Restoration enhances protection

Combating threats, protected area and restoration need to be viewed as complementary tools within a wider landscape.

Within a landscape, some zones may be prioritised for protection and others for restoration. Frequently restoration can add value to areas protected, as seen in Fandriana-Marolambo where restoration was prioritised near the Marolambo National Park. Although restoration should be seen as enhancing the value of protected areas by creating opportunities for buffer zones, stepping stones and connectivity, this positive relationship is not always apparent. Actions taken in the name of protection, such as the exclusion of local communities, may not favour restoration activities. The creation of the Marolambo National Park led to the re-definition of a number of activities in the landscape because of new rules related to the establishment of the park.

10 Establish multi-level partnerships

A partnership approach helps to engage diverse actors in FLR.

In Fandriana-Marolambo, several partners were brought into the project, including the private sector, national government, local associations etc. A partnership approach helped to engage diverse groups at different stages in the process. Engaging in partnerships is an effective means of securing the commitment of these diverse groups, and encourages sustainability.

11 Design an exit strategy

The lead organisation of an FLR project or programme carries a long-term responsibility (10-15 years) and needs to design a proper exit strategy.

Restoration is a long-term endeavour. Yet at some point, external partners may need to phase out. Rather than ending their support abruptly, a well-planned exit strategy helps to reduce the vulnerability of local stakeholders, to maintain results achieved and to ensure future activities may build on the programme. In Fandriana-Marolambo, WWF felt that after 13 years of active presence in the landscape, it had built sufficient capacity that it could hand over responsibility for ongoing restoration efforts to local groups, while maintaining its support at the national level to federations of COBAs and to the government's efforts to restore 4 million ha across the nation.

CONCLUSION AND FUTURE PROSPECTS

In 2015, the government of Madagascar joined the Bonn Challenge and the AFR 100 initiative and committed to restore 4 million ha of forest landscapes. Started in the field at a time when FLR was just emerging (2005), the Fandriana-Marolambo project and expertise acquired during the last 13 years, provide important lessons to accelerate the achievement of this target. WWF is a member of the newly re-established national FLR working group.

The programme has faced many challenges, notably short-term funding and the need to continuously raise more funds. At the level of communities, it has had to overcome distrust and spend significant efforts and resources to successfully engage them in the initiative. While the development of the protected area inside the landscape is a positive thing, it also created challenges as it added a different interest in the landscape (that of the MNP) and brought a number of constraints with respect to use of parts of the landscape.

Poverty levels and the isolation of many communities in the landscape led to the need to identify alternative income-generating activities and access to funding and markets. All of these activities, while not directly related to restoration, were essential to the success of FLR *sensu lato*. Many and diverse forest restoration-specific actions have been necessary: to reduce direct threats (fire, deforestation), to accompany natural regeneration, and to increase knowledge of native species (how to reproduce, plant and grow them, when to plant them, which combinations of species to use, etc.).

Local associations were established and strengthened over the course of the project. WWF's withdrawal in December 2017 leaves these associations to manage the future of the restoration initiative on their own. While this is a logical progression, it remains to be seen whether the exit strategy defined will not negatively affect the results achieved. Hopefully the local associations will be able to sustain the efforts begun all those years ago and the landscape will continue on its path to restoration and sustainability.

Much expertise was acquired by WWF and its partners during these 13 years. Many of these skills will remain in the landscape among the communities and local leaders and decision-makers. It is our sincere hope that they will be applied to the next phases in Fandriana-Marolambo and to future restoration initiatives in other parts of Madagascar and worldwide.

Photo 10. Local people's buy-in is critical to the sustainability of such a complex and long-term process like forest landscape restoration



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