

# Gender-focused economic models of climate resilience in Madagascar

Producer organization: Manarivo AB Society and its four supply cooperatives



Madagascar - Climate Resilience Case Study No. 5

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## Forest and Farm Facility



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## EXECUTIVE SUMMARY

The PNFDSA of Madagascar has taken supportive steps to make women members resilient to climate change and natural disasters, by building their capacities on Climate Change (CC), climate smart agriculture, food security within integrated family farming, and the Sustainable Development Goals (SDGs) many of which concern the needs of women, such as : SDGs 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15 and 16. The PNFDDSA has carried out these capacity building activities in the 9 Regions of Madagascar where our Regional Offices have been set up.

The outcome of these capacity building activities has been seen in tangible impacts on the lives of producer women who are farmers, fishermen and traders, in the fight against climate change. Those members now know how to fight against climate change and are starting small and medium scale activities including reforestation, tree nurseries, climate-smart agriculture, conservation agriculture, agroforestry, and organic composting.

The Secretary General of PNFDDSA is also the President of the Regional Office of the Analamanga Region, and the leader of MANARIVO AB which is a company whose suppliers include four forest and farm producer organisation (FFPO) cooperatives whose members have benefitted from all these capacity building activities.

In this report, we present MANARIVO AB as a company case study of how economic models can improve climate resilience in Madagascar. MANARIVO AB has successfully improved the resilience of its forest and farm producers in the Bongolava and Analamanga Regions. It has achieved this by building their capacity to understand climate change threats, develop a series of climate change mitigation options and climate change adaptation options that can be achieved through climate smart agriculture, but also using fire breaks to fight bushfires, rainfall management techniques and an emergency plan on rainwater management to improve water availability, plus following the Malagasy state's health emergency plans.

The main threats encountered by farmers in the region include late and variable rains, dry season fires, increasing outbreaks of plant pests and diseases, occasional flooding, lack of political and tenure security and now the pandemic COVID-19.

The MANARIVO AB Company works with four Forest and Farm Producer Organisations (FFPOs) in the Bongolava Region, to ensure the sustainable management of agricultural and forest resources, which are the raw materials of the MANARIVO AB Company. It is these four member-based organisations that have been the recipients of capacity building efforts. The Bongolava Region produces less than 3,000t of groundnuts and contributes less than 5% of the national production. The four FFPOs working with the MANARIVO AB Company produce groundnuts and ensure the transformation of groundnuts into raw oils, The MANARIVO AB Company then cleans them and ensures the packaging and marketing (see Figure 1).

## 1. INTRODUCTION

Madagascar currently has an estimated population of 25,680,000. More than 13 million the total population are female. These figures are available from the provisional results of the latest official population censuses conducted in Madagascar a little over a year ago. Of the total population, 20,676,000 people reside in rural areas (80.51%).

Agriculture in Madagascar employs 80% of the rural population and is an essential component of the Malagasy economy, contributing 30% to the GDP (43% if agri-food is included). The rural population practises mostly subsistence-based agriculture (growing rice, manioc, potatoes, vegetables: potatoes, carrots, tomatoes, squash, etc..., fruits: mangoes, bananas, avocados, persimmons, peaches, apples, etc...). Rice is the main staple crop. There are however some cash crops: lychees, vanilla, spices, coffee, cloves, cocoa, red, green, and black pepper, and these provide export earnings for the economy.

Madagascan farms are almost all family-run and almost all of them practice mixed farming and livestock farming. There are extremely few specialised agricultural enterprises that can help the farmers with income generation, and consequently it is the diversification of on-farm activities forms the basis of their resilience. There is a general weakness across all factors of production (land, livestock, equipment, buildings, etc.), apart from the ready availability of family labour. Small and medium enterprises (SMEs) in the agricultural sector face these same general weaknesses.

The two most widespread activities are rice cultivation, complemented by livestock rearing (both poultry and cattle breeding). These dominant production systems shape Malagasy agriculture and the different types of SMEs.

Deforestation and forest degradation in Madagascar continue at the same pace despite the successive reforms of forest resource management policies since the 1990s. It was thought that there was a decrease in the deforestation rate from 0.83%/year (1990 to 2000) to 0.53% (2000 -2005) but this then increased to 1.4% for the period 2005 to 2010. Over the last ten years, the country has lost around 90 000ha of forest per year and the remaining forest cover in 2013 was 8,716,000 ha (PERR-FH, 2015, MEEF 2018).

The direct causes of deforestation are widely understood to include:

- Agricultural expansion: Slash-and-burn agriculture involving rice, maize, groundnuts, and cassava coupled with the traditional agricultural practice of conversion of forests to cash crops.
- Unsustainable traditional livestock farming: Forest grazing and uncontrolled grazing fires.
- Illegal exploitation of natural resources: Illegal exploitation of wood, weak law enforcement and weak administrative resources, lack of technical expertise on wood exploitation.
- Artisanal mining: Unsustainable and illegal exploitation without a permit.

The 13 million Malagasy women farmers play a very important role in eradicating hunger and building food security. Family farming offers a unique opportunity to ensure food security, improve livelihoods, better manage natural resources, protect the environment, and for the Sustainable Development of the country, especially in rural areas. Climate smart agriculture contributes to the resilience of women farmers to climate change (i.e. SDG 13). At the Rio de Janeiro Earth Summit (Rio+20) a declaration was made that highlights the role of women in ensuring food security: "Without women there will never be Sustainable Development".

The steering group of the Indian Ocean Commission (IOC) declared during the Round Table on Food Security in Mahajanga that Madagascar will be the breadbasket of the Indian Ocean! The IOC has developed a Sub-Regional Gender Policy and Strategy for the Indian Ocean Region (PSRGOI), which will enable it to formulate more effective responses to address gender gaps in the IOC region. The latter will thus have an approach that will be carried out at two levels: on the one hand, gender mainstreaming in the projects it manages and, on the other hand, support to Member States for the implementation of the principle of gender equality at the national level. The vision of this PSRGOI is to help women in the Indian Ocean Region to fully realise their citizenship, i.e. to be free from all violence, to be in full capacity to take part in economic opportunities and to participate fully in decision-making bodies. The specific objectives of the PSRGOI are as follows:

- Take measures to protect women and girls from gender-based violence and provide appropriate listening, support, and counselling services.
- Intensify efforts to increase women's participation in decision-making and achieve the goal of parity.
- Promote people-centered sustainable development with particular attention to food security and the management and conservation of natural resources and the environment
- Promoting women's access to decision-making positions in the economic world
- Provide the necessary technical and institutional support to national stakeholders and IOC projects

According to the specific objectives of the PSRGOI, four Platforms have been created since 2007: Platform for Women, Indian Ocean Policy (PFPOI set up in 2011), Platform against Gender-Based Violence (PLVBG set up in 2013) Entreprenre Féminin de l'Océan Indien (EFOI set up in 2007) and National Platforms for Women, Sustainable Development and Food Security (PNFDDSA set up in Comoros, Seychelles and Mauritius with the Madagascar branch set up in 2013). This latter platform has a global objective to promote the role and contribution of women to sustainable development and food security.

PNFDDSA projects have been funded by the IOC, the African Development Bank, GIZ, FTA, the Ministry of Environment and Sustainable Development and most recently the FAO through the FFF programme. Revenues are managed collegially by the members of the PNFDDSA National Office according to the budgets presented in projects. The eight specific objectives (SO) of the PNFDDSA are as follows:

- SO1: Strengthen and develop women's intellectual capacities.
  - The PNFDDSA strengthens the capacities of women on sustainable development, the 17 Sustainable Development Goals, climate change, climate smart agriculture, food security, the green economy and the blue economy, business incubation, project development, business plans, NICTs, etc.,
- SO2: Mobilize women to commit themselves to the development of their country.
- SO3: Contribute to the integration of sustainable development dimensions in their daily lives.
  - Women make a strong contribution to sustainable development and will implement SDGs if they understand that contribution.
- SO4: Contribute to the improvement of the green and blue planet initiatives.
- SO5: Contributing to the fight against climate change
  - The reason why PNFDDSA is building the capacity of our members on climate smart agriculture is to achieve our Specific Objective 8: Contributing to food security.
- SO6: Contribute to building women's resilience to environmental shocks and natural disasters.
  - Climate resilience is a key concern.
- SO7: Contribute to the promotion of Madagascar's green and blue economy.
  - Our women will take up green and blue jobs to promote the green economy and the green economy.
- SO8: Contribute to food and nutritional security of the country.
  - Rural women members strengthened on food and nutritional security through climate smart agriculture.

The PNFDDSA has a presidency, general secretariat, treasury and specific advisory groups on gender approaches, sustainable development, food security and legal support. Beneath the headquarters structure there are nine Regional Offices for Women, Sustainable Development and Food Security (ARFDDSA) that have been officially set up in the nine regions of Madagascar (Boeny, Analamanga, Menabe, Vakinankaratra, Amoron'i Mania, Sud Ouest, Ihorombe, Haute Matsiatra and Sofia), See the map in Annex n°1

This report highlights how capacity building support to MANARIVO Organic Agriculture AB has built climate resilience for women in Analamanga and Bongolava regions.

## 1.1 NAME AND VISION

The MANARIVO Organic Agriculture (AB) Company of the Analamanga and Bongolava Region has developed an economic model of climate resilience in Madagascar. The owner of MANARIVO AB is the

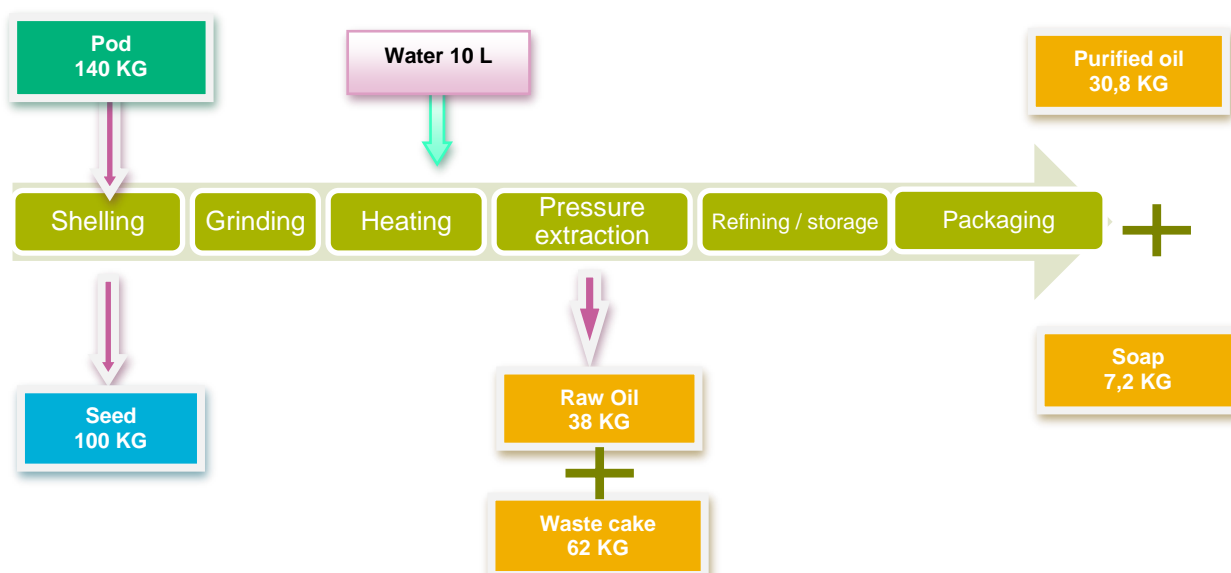


Secretary General of PNFDDSA and President of ARFDDSA Analamanga. She participated in two successive trainings in Togo and at the Hôtel Colbert in Antananarivo, Madagascar on business incubation, risk management and gendered market development approaches for forest and farm producer organisations (FFPOs), that were organised by the FFF under the overall objective of climate resilience and improved livelihoods.

MANARIVO AB is a for-profit company that aims to make sustainable development effective in Madagascar, promote Organic Agriculture, and improve the availability of quality foodstuffs and to meet the challenges of self-sufficiency.

MANARIVO AB works with four FFPOs of Bongolava under the supervision of the Support Programme for Rural Micro-Enterprise Clusters and Regional Economies (PROSPERER) of Bongolava. The members of these FFPOs are responsible for planting groundnuts and processing raw groundnut oil. MANARIVO AB buys the raw groundnut oil from the members of the 4 FFPOs, cleans it to be sold as an organic oil (see Figure 1).

Figure 1. Combined value chain activities for four FFPOs supplying MANARIVO AB in the Bongolava Region.



## 1.2 LOCATION

MANARIVO AB's area of intervention is located on the Tampoketsa plateaus, at an altitude of 1,500 m, with geographical coordinates at around 18°25'30"S and 46°51'0"E. The region is a landlocked area severely degraded by bush fires during the dry season and by the vagaries of climate change. The nature of the forest and agricultural resources is based on the establishment and exploitation of market gardening, and the practice of climate smart agricultural techniques such as agroforestry.

Figure 2. Location of MANARIVO AB and photo of typical production area



The groundnut plantation of the raw materials of the MANARIVO AB Company is in Bemahatazana and Miandrarivo of the Bongolava Region.

### 1.3 FOUNDATION AND MEMBERS

MANARIVO AB was founded in 2011. At the beginning, MANARIVO AB sourced its products from and was made up of about 60 people, including most women mainly working on agricultural plots with a total surface area of 100 hectares. In the past two years ago, MANARIVO AB has started to transform their products (rice into cereals, aromatic and medicinal plants into essential oils, spices such as pink pepper, tropical fruits, and arabica coffee).

To advance in terms of processing, the first step was to help establish partnerships with 4 newly established FFPO cooperatives of peanut producers to produce organic crude oil. The women and men farmers ensure the planting of raw materials in the 100ha fields of Tampoketsa and Bongolava. The four FFPO Cooperatives (Santatra, Vondrona, Tsikivy and KF2VS) working with the Manarivo AB Company have 80 members, including 47 women in the communes of Bemahatazana and Miandrarivo in the Bongolava Region. The cooperatives and their members all have their own land, but this is not yet titled.

The 4 FFPO cooperatives transform the peanuts into raw oil and the Company MANARIVO AB buys the oil and cleans it, to produce a high-quality organic oil. MANARIVO AB is responsible for packaging and marketing.

Figure 3. Picture of some of the oil products for sale from MANARIVO AB





Around this core value chain, MANARIVO AB is also selling a wide variety of diverse products which they cultivate or manage on their land. This will ultimately allow farmers to generate income from a diverse array of what were formerly subsistence items.

## 1.4 BUSINESS PROPOSAL

The main objectives of MANARIVO AB are to:

- Contribute to the promotion of organic agriculture in Madagascar
- Participate in sustainable development and food and nutritional security
- Strengthen integration within and between social networks,
- Develop partnerships and collaborations with other economic operators and FFPOs
- Invest in autonomous but modern production systems,
- Innovate and develop quality labelled products.

The MANARIVO Company has proposed the following activities: (i) strengthen the market gardening land and maintain biological corridors to protect natural ecosystems and wildlife in the area, (ii) multiply aromatic and medicinal plants, (iii) intensify the production of organic compost, biofertilizers and biopesticides, and (iv) diversify production, including by developing short-cycle livestock farms, which will help to produce more organic compost.

The FFPOs of Bongolava and Analamanga plant agricultural resources and offer certified organic products such as: Red and white rice, peanuts, pink bay, fruit trees: pineapple, guava, passion fruit, arabica coffee, Aloe, Pok pok or physalis...Ravintsara, Eucalyptus, Lemongrass, Geranium and so on.

MANARIVO AB transform products under the label "Tresor & Sens". Products include jams, dried fruit, fruit juices such as pineapple, guava, passion fruit, aloe, pok or physalis ..., extra refined peanut oil, cosmetic products such as vegetable soap, massage and care oils, mosquito repellents, natural hydroalcoholic cleansing gel, and essential oils of Ravintsara, Eucalyptus, Lemongrass and Geranium.

The MANARIVO Company considers organic production to be important as it allows to safeguard the environment and biodiversity, to produce items sustainably and to offer quality food products that offer health benefits. Their organic method, which is based on ecosystem diversification (combination and crop rotation), the use of natural products and innovative mulching techniques, reinforces the management of soil fertility and therefore resilience to climate change. This is an important and undeniable step towards sustainable development and food and nutritional security for the population. By choosing the right specialisation of crop processing with adequate means, the creation of value and therefore wealth is ensured.

## 1.5 MARKET CONTEXT

The main market for groundnut seeds are 3 main destinations in the country: (i) the local market for human consumption as peanuts, (ii) export, and (iii) processing into crude oil with different types of processing units.

The main agricultural product at this stage is the groundnuts of the 4 FFPOs are all transformed into crude oil and are all sold to the MANARIVO AB Company on the local market, to shops specialising in essential oils and to supermarkets.

Challenges include the fact that local / national markets and supermarkets are dominated by imported products, demand for organic products is low, there are few regulations on labelling etc., and there is high competition from many small informal farmers.

The distances between the 2 Communes of the Bongolava Region and the capital of the Analamanga Region where the shops are located are as follows

- Distance to Bemahatazana: 169 km
- Distance to Miandrarivo: 203.3 km
- Distance to Score Acoor Digue: 11 km

Below in Figure 4 are some pictures of some of the products of the Manarivo AB Company, named "Tresor & Sens" in the supermarkets of the 3 SCORE department shops of the Capital of Madagascar. It should be noted that only the organic refined peanut oils come from the 04 FFPOs in the Bongolava region, but the other products such as essential oils, Arabica coffee, Rice, vegetables and fruits etc... are from personal and family plantations.

Figure 4. Main products of MANARIVO AB



Arabica Coffee



Peanut oil



Essential Oils of Ravintsara, Eucalyptus, Citriodora, Ylang and Geranium



All the supermarkets of the 'Score de Madagascar' have the 'Tresor & Sens' products of the MANARIVO AB Company.

## 2. THE NATURE OF THE THREAT OF CLIMATE CHANGE

### 2.1 PERCEIVED CLIMATE CHANGE THREATS

Within Madagascar, temperatures have been rising steadily from 1910 to the present. Sea levels are rising, which is particularly problematic on the West Coast. Additionally, cyclones come to the east of Madagascar every year, with flooding in the centre but there are also increasing droughts in the south of the island with fires. Of course, COVID-19 is an additional threat that has recently emerged.

The threats specifically mentioned as being encountered by the FFPOs of the Bongolava Region, the four working with the MANARIVO AB Company are:

- Climate Change: Delayed rainfall patterns and higher variability of rainfall,
- Rural political insecurity: Land of the Dahalo in the Bongolava Region is declared a red zone,
- Bush fire practices – and occasional incidence of arson / pyromania
- Land insecurity with the existence of land concentrated in state farms.

As noted in that list, the climate related changes in rainfall patterns, including a lack of rainfall in this region of Madagascar threatens agriculture and has a great impact on the planting work of partner FFPO cooperatives. For these reasons, the PNFDDSA has strengthened the capacities of our members through trainings across the nine in the 09 regions of regions of Madagascar on the themes below:

- Sustainable Development and Sustainable Development Objectives concerning the needs of Women such as: SDO1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15 and 16
- Climate hazards and fighting against climate change through both mitigation and adaptation – with introduction to payment mechanisms such as the Clean Development Mechanism (CDM)
- Climate smart agriculture and conservation agriculture
- How to increase food and nutritional security
- Agroforestry

The FAO through the FFF has done a good job of building the capacity of PNFDDSA members including the owner of MANARIVO AB and the latter has done a good job of training the members of the Bongolava Region FFPOs.

## 2.2 IMPACT ON FOREST AND AGRICULTURAL RESOURCES

These climate change threats have impacts on natural and agricultural resources, and this table shows the measures taken by FFPOs and Manarivo AB:

Threats encountered	Impacts	Measures taken
Rain delay	Delayed crop calendar, low yields, attack of insects and diseases such as 'rosettes'	Use of adapted seeds, use of organic manure, use of well water
Rainfall variability	The decline leads to the appearance of the pest "sakivy" and the excess leads to the disease called "boka", The decline in groundnut production is a permanent threat to producers.	Adaptation of the growing season according to the weather information received, implementation of new technologies such as climate smart agriculture, agroforestry, permaculture, biological corridors
Fires: During the dry season: June, July, August, September.	Burnt forest and agricultural resources, soil degradation, Sometimes the plantations have gone up in flames, so zero production.	Installation of fire breaks
Plant pests and diseases	Decrease in production	Multiplication and planting of endemic varieties, practice of biological pest control through the production of organic compost, the production of plant fermented extracts for preventive and curative actions, formation of associations and development of crop rotation
Rural insecurity	The scarcity of oxen will lead to the scarcity of production factors that depend on animal traction for the activity of ploughing the land	Strengthening advocacy between indigenous people and the relevant authorities. Strengthening rural security through a contract with Public Security Services
Security of tenure	Most of the cultivated land in the commune of Bemahatazana is part of the state domain.	Training on how to acquire a legal certificate and a land title so that farmers can cultivate without land ownership.
Flooding	Flooded plantation: case of Sofia Region in January 2020. "very low production".	Proper management of rainwater by following the emergency plan on rainwater management.
Pandemic Containment COVID19	Lack of monitoring of plantations on the ground: Land full of weeds.	Properly comply with the state's health emergency plans

## 2.3 IMPACT ON BUSINESS AND FINANCE

Climate-related threats have had a strong impact on the forest and agricultural resources of FFPOs. In the case of MANARIVO AB, the drought and the COVID-19 pandemic have seriously threatened FFPOs' revenues.

The impacts of these threats on the production of crude oil show a loss over the three periods even though the processing production of organic refined oil shows a positive result. This leads us to the conclusion that the sale of unrefined oil is not profitable for processors and that there is even more need to consolidate the processing capacity of partnerships such as MANARIVO AB.

Crude oil			
	April-June	July-August	September-February
Cost price	440,000	472,000	632,000
Sales price	236,842	284,211	360,000
Waste cake	110,000	132,000	187,000
Price difference	(93,158)	(55,789)	(85,000)
Refined oil			
Cost price	296,327	341,327	413,327
Sales price	394,211	416,211	471,211
Price difference	97,884	74,884	57,884

For the capacity of financial investment for the future, the FFPOs of the Bongolava Region are supported by the Bongolava Regional PROSPERER in partnership with the Rural Micro Enterprises (MER) and market operators. They are committed to contributing considerably to the development of the Peanut Oil sector at the level of the District of Tsiroanomandidy with the aim of meeting the needs of the markets on a sustainable basis. What they are realising is that operational measures with an impact on the development of the Region must be oriented towards the increase of the local added value. PROSPERER Bongolava will therefore support these FFPOs by increasing their production this year. PROSPERER has already included these activities in its multiannual action plan 2020 - 2025.

## 2.4 IMPACT ON VULNERABLE GROUPS

The OPFAs working with the MANARIVO AB Society have 80 members, 47 of whom are women and not counting young people.

FFPO Cooperatives	Office holders	Of which women	Members	Of which women	Locality	Commune
VONDRONA	7	1	24	13	Andriambe	Bemahatazana
TSIKIVY	6	1	16	12	Anaviavy	Bemahatazana
SANTATRA	3	2	8	6	Bemahatazana	Bemahatazana
K2FVS	7	1	32	16	Soamanana	Miandrarivo
Total	23	5	80	47		

Lack of rain and drought are well felt by the members of the FFPOs. They are aware of the timing of the drought and the excess rainfall and they practice sowing before the critical moments, to prevent low production.

## 3. THE BUSINESS AND FINANCIAL MODEL RESPONSE TO IMPROVE CLIMATE RESILIENCE

### 3.1 AGRO-ECOLOGICAL DIVERSIFICATION

All the farmer members of the four FFPOs have practised new techniques and processes for diversifying the use of natural resources. This has included the development of a variety of different crops to reduce reliance on any one product.

A major innovation has been the production of organic fertilizers (made from plant residues) to increase soil fertilization together without chemicals. The production of organic fertilizers is done at any given time, but without specific dates – and the use of organic fertilizers and organic manures is believed to be the main measure against drought.

An additional innovation has been the use of different and improved seeds that are more adapted to climate change (especially drought). Additionally, farmers keep back 50% of the production of these new varieties to build up seedstock for the next planting seasons. The MANARIVO AB Company in the Analamanga Region and the FFPOs in the Bongolava Region now have seed orchards to produce seeds for the next planting season.

In addition to the agronomic innovations, each FFPO have invested in well prepared, weeded land, ready for the next crop and each major production area is now surrounded by fire breaks alongside some measures for erosion control on steeper land. They make firebreaks around their plantations during the months of May and June.

In the field, the MANARIVO AB Company, in the Analamanga Region, has been encouraging the planting of indigenous trees, robust trees that also produce fruit during the rainy seasons (December, January and February), in order to be able to transform various products into dried fruit, jam and fruit juice, to improve nutrition and to contribute to Zero Hunger (SDG 2). The presence of fruit trees has reduced the incidence of arsonists to stop burning the fields. Planting fruit trees is the effective strategy against bush fires.

FFPOs are used to diversifying their activities: rice, maize, groundnuts, semi-extensive cattle breeding for harnessed cultivation and organic manure, and to train producers to make compost for the 2020 season.

### 3.2 ECONOMIC DIVERSIFICATION

In Madagascar there are banking savings systems that FFPOs use to build up capital reserves such as:

- CECAM - Caisses d'Epargne et des Crédits Agricoles Mutuelle,
- OTIV -Ombona Tahiry Ifampisamborana Vola,
- ACCS - Association de Crédit à Caution Solidaire,
- ACEP - Alliance de Crédit et d'Epargne pour la Production,
- ADéFi - Action pour le Développement et le Financement des micro-entreprises,
- ADMMEC - Association pour le Développement du Mouvement Mutualiste d' Epargne et de Crédit,
- AECA: Association d'Epargne et de Crédit Autogérée.

Despite these financial options, the 4 OPFAs working with the MANARIVO AB Company save their funds mainly in cattle. But they are supported by PROSPERER Bongolava, CECAM and VOLAMHASOA.

They hope in the future to invest to increase their resilience to climate change, by implementing 3 main areas of development of the groundnut sector with PROSPERER Bongolava:

- Area 1: Increase production by increasing the number of producers, extending the surface area and above all increasing yields by using improved seeds and organic fertilisers.



- Area 2: Improvement of the quality of oil production by introducing new technology (modernisation) and
- Area 3: Improving the financial capacity of producers.

Within the framework of the FFF project, PNFDDSA will strengthen the capacities of all our member FFPOs on the following themes: "Financial education", "Development of the community savings and credit facility", "Access to microfinance", "Risk management", "Business planning", so that they can expand the possibilities and opportunities for service delivery.

The members of the MANARIVO AB Company of the Analamanga Region will also benefit from specific trainings on the above themes in October 2020 by the PNFDDSA and financed by the Malagasy Fund for Professional Training if the Analamanga Region will be de-confined.

### 3.3 SOCIAL DIVERSIFICATION

Since its inception, MANARIVO AB has continuously built relationships with various partners and national or global organisations with major interests in its activities. These include in particular:

- The National Women's Platform for Sustainable Development and Food Security (PNFDDSA)
- The Scaling Up Nutrition (SUN) Movement - in particular: The Private Sector Platform and the Researchers' Platform,
- The National Alliance for Food Fortification (NAFA) in Madagascar,
- The Malagasy Union of Organic Agriculture (SYMABIO),
- The Syndicat des Industries de Madagascar (SIM),
- The Chamber of Commerce and Industry of Antananarivo (CCIA) in Madagascar,
- Facebook: Treasure & Sense Page,
- Instagram: Tresor & Sens,

The Trésor & Sens e-commerce showcase website is currently under construction.

### 3.4 OTHER RESILIENCE MEASURES

MANARIVO AB has made a great effort in national reforestation by reforesting the areas around the plantation zones and setting up organic market gardening and practicing a system of cultivation under plant cover.

#### 3.4.1 PARTNERSHIPS

The partnerships have enabled MANARIVO AB to better direct the speculations to be undertaken according to the needs and context.

- Against drought and heavy rains in short periods of time that can cause water erosion
  - adaptation of the growing season according to the weather information received,
  - implementation of new technologies such as climate smart agriculture with improved mulching, agroforestry, permaculture and so on.
- Against bush fires and rural insecurity
  - Establishment of biological market gardening areas and corridors of natural vegetation,
  - Installation of fire breaks
  - Multiplication and planting of endemic varieties,
  - Strengthening advocacy with indigenous people and the relevant authorities.
- Against plant diseases and pests
  - Practice of biological control through the production of organic compost, the production of plant purines and fermented extracts for preventive and curative actions,
  - Practice of plant associations and crop rotation.
- For resilience
  - Choice of varieties with high nutritional value: groundnut, legumes, moringa, amaranth, fruit, and vegetables.
  - Development of promising sectors such as the production of organic extra peanut oil, essential oils of aromatic and medicinal plants, local Arabica Bourbon coffee, etc...



- Establishment of an autonomous farm by integrating small farms, beekeeping, fish farming, etc...
- Development of processing units, biological investment zones, even agricultural technopoles.
- Rapid grasp of information, opportunities and technological watch which are transmitted quickly through social networks.

### 3.4.2 CLIENTS

The products of the MANARIVO Company named 'Trésor & Sens' are already distributed in large shops and supermarkets. These include SCORE Akoor Digue, Talata Maty and Ankorondrano, and in the 12 other sales outlets in Antananarivo.

### 3.4.3 COMMERCIAL STRATEGY

What differentiates 'Tresor & Sens' products are that they are all organic, environmentally friendly and the techniques used are resistant to climate change.

MANARIVO AB is constantly raising awareness of the use of organic certified products, ensuring the nutritional and health needs of mankind, to advertise the benefits of the products and a product label that attracts customers, to do a communication hype on organic products and to popularise communication tools on Tresor & Sens products which are all certified organic.

MANARIVO AB has also produced essential oils and a hand cleaning anti COVID-19 hydrogel, with essential oil fragrance such as Ravintsara, Citriodora etc.

## 4. CONCLUSIONS

### 4.1 MAIN CONCLUSIONS

In our experience, the main factors underlying the viability and success of this climate resilience model are the following:

- Capacity building of FFPOs on a wide range of topics such as: climate change and climate smart agriculture, business incubation, risk management, financial accounting, business planning, development of community savings and credit mechanism and access to micro finance.
- The use of improved, drought-adapted seeds – and the production of those seeds in seed orchards over time
- The production and use of organic fertilizers, and organic mulching techniques to improve soil fertility and water retention
- The installation of fire breaks
- The installation of anti-erosion terracing and hedging to prevent soil loss during extreme weather events
- The development of an economically diverse production, communication, and marketing strategy

### 4.2 INVESTMENT CHALLENGES

The Executive of MANARIVO AB has declared that she has created this company through hard work and the use of her own funds. In fact, the Executive, Mrs. Voahangy RAMAROMISA, has Doctoral level training, likes to diversify her activities according to the context and the opportunities that arise. She likes a challenge, wants to help local farmers, and aspires to a worldwide recognition of Madagascar's wealth and quality products. She enjoys doing innovative research and sharing her knowledge and values with her rural peers and those who are convinced by her approach and ambitions. This type of development is based on strengthening the resilience of autonomous FFPOs and the establishment of organic agricultural investment zones, with small industrial processing units.

The additional investments which the executive of MANARIVO envisages for the future include:

- Creating AB investment areas with perennial and sustainable infrastructure, according to the landscape approach,
- Increase the surface area used and the FFPO members engaged,
- Increase partnerships and collaboration with FFPOs,
- Developing the potential of small farms, including tropical beekeeping and fish farming,
- Setting up small modern processing units, complying with international standards, such as: oil mill, honey mill, roasting and grinding plant, hulling plant, cold pasteurised fresh fruit juice production unit, dryer, ...
- Setting up standardised storage and packaging units,
- Setting up a food analysis laboratory.

### 4.3 BENEFITS AND THEIR DISTRIBUTION

Manarivo AB, through its productive partnership with four FFPOs has increase the income of its farmer workers by 10 to 12% per year.

By practising together the new AIC techniques and by joining together to sell everything as a group, to save as a group and to invest as a group, the profits will be distributed between the groups and there will be no weak members but the members are at the same level and on an equal footing. They save in Cattle to get rich in the plantations and use organic fertilizers.