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# Final evaluation report of MANITATRA-2 project

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**Final version**

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## Acronyms

<b>ACP</b>	Africa, Caribbean and Pacific
<b>AE</b>	Agroecology
<b>AFD</b>	Agence Française de Développement (French Development Agency)
<b>AFRICA Rice</b>	Africa Rice Center
<b>AGRISUD</b>	Agrisud International : Association française à but non lucratif et de Bienfaisance (French Non-Profit and Charity Association)
<b>AMO</b>	Appui à la maîtrise d'ouvrage (Support to the contracting authority)
<b>APDRA</b>	Association Pisciculture et Développement Rural en Afrique (Association Pisciculture and Rural Development in Africa)
<b>Ar</b>	Ariary (Malagasy currency unit)
<b>ASC</b>	Agricultural Service Center
<b>AVSF</b>	Agronomes et Vétérinaires sans Frontières (Agronomists and Veterinarians without frontiers)
<b>BDD</b>	Base de données (Database)
<b>BEMC</b>	Bureau de l'Education de Masse et du Civisme (Office of Mass Education and Civics)
<b>BNCC</b>	Bureau National du Changement Climatique (National Climate Change Office)
<b>BVPI</b>	Bassin Versant Périmètre Irrigué (Watershed and Irrigated Perimeter Project)
<b>CA</b>	Conservation Agriculture
<b>CC</b>	Climate Change
<b>CEFFEL</b>	Conseil Expérimentation Formation en Fruits et Légumes (Consulting, Experimentation Training in Fruits and Vegetables)
<b>CEG</b>	Collège d'Enseignement Général (Public Secondary school)
<b>CIRAEP</b>	Circonscription de l'Agriculture, de l'Elevage et de la Pêche (District of Agriculture, Livestock and Fisheries)
<b>CIRAD</b>	Centre International de Recherche Agronomique pour le Développement (French International Center for Agronomic Research for Development)
<b>CISCO</b>	Circonscription Scolaire (School District)
<b>COMESA</b>	Common Market for East and Southern Africa
<b>CR</b>	Commune Rurale (Rural Commune)
<b>CROA</b>	Comité Régional d'Octroi et d'Allocation (Regional Committee of Granting and Allocation)
<b>CSA</b>	Climate Smart Agriculture

<b>CV</b>	Coefficient of variation
<b>DGE</b>	Direction Générale de l'Environnement (General Directorate for the Environment)
<b>DGM</b>	Direction Générale de la Météorologie (General Directorate of Meteorology)
<b>DRAE</b>	Direction Régionale de l'Agriculture et de l'Elevage (Regional Direction of Agriculture and Livestock)
<b>DREDD</b>	Direction Régionale de l'Environnement et du Développement Durable (Regional Department of the Environment and Sustainable Development)
<b>DREMC</b>	Direction Régionale de l'Education de Masse et du Civisme (Regional Direction of Mass Education and Civics)
<b>MINAE</b>	Ministère de l'Agriculture et de l'Elevage (Ministry of Agriculture and Livestock)
<b>FAO</b>	Food and Agricultural Organization
<b>FDA</b>	Fond de Développement Agricole (Agricultural Development Fund)
<b>FDAR</b>	Fond de Développement Agricole Régional (Regional Agricultural Development Fund)
<b>FFS</b>	Farm Field School
<b>FIFATA</b>	Fikambanana Fampivoarana ny Tantsaha (Farmers' Organisation Umbrella)
<b>FKT</b>	Fokontany (The smallest administrative unit)
<b>FO</b>	Farmers' Organization
<b>FOFIFA</b>	Foibe Fikarohana amin'ny Fambolena (National Center for Applied Research in Rural Development)
<b>GCCA +</b>	Global Climate Change Alliance +
<b>GSDM</b>	GSDM, Professionnels de l'Agroécologie (Agroecology Professionals association)
<b>Ha</b>	Hectare
<b>IA</b>	Indicateur d'activité (Activity Indicators)
<b>IEM</b>	Initiative Emergence de Madagascar (Madagascar Emergence Initiative)
<b>IR</b>	Indicateur de résultat (Result Indicators)
<b>LF</b>	Lead Farmers
<b>MAEP</b>	Ministère de l'Agriculture de l'Elevage et de la Pêche (Ministry of Agriculture, Animal Husbandry and Fisheries)
<b>MEDD</b>	Ministère de l'Environnement et du Développement Durable (Ministry of the Environment and Sustainable Development )
<b>MEN</b>	Ministère de l'Education Nationale (Ministry of National Education)
<b>NGO</b>	Non Gouvernemental Organization

<b>OEMC</b>	Office de l'Education de Masse et du Civisme (Office of Mass Education and Civics)
<b>ONU</b>	Organisation des Nations Unies (United Nations)
<b>PAPAM</b>	Projet d'Appui à la Productivité Agricole à Madagascar (Agricultural Productivity Support Project in Madagascar)
<b>PGE</b>	Politique Générale de l'Etat (General Policy of the State)
<b>PTBA</b>	Plan de Travail et Budget Annuel (Annual Work Plan and Budget)
<b>SPAD</b>	Système de Production d'Altitude (teaching and research device Sustainable Altitude Production System)
<b>RNM</b>	Radio Nationale Malagasy (Malagasy National Radio)
<b>STD</b>	Service Technique Déconcentré (Decentralized Technical Service)
<b>T</b>	Ton
<b>TVM</b>	Télévision Malagasy (National Malagasy TV)
<b>UA</b>	Union Africaine (African Union)
<b>UE</b>	Union Européenne (European Union)
<b>USD</b>	US Dollar

# Abstract

With the financial support from the European Union within the Global Climate Change Alliance plus (GCCA+) program of intra-African, Caribbean and Pacific (intra-ACP) countries, and coordinated by COMESA, the Climate-Smart Agriculture (CSA) pilot program is implemented in Madagascar by the GSDM through the MANITATRA-2 Project. This project aims to capitalize the experiences and successes of the previous GCCA pilot project (MANITATRA 1), implemented during the period 2014-2016 in the Region of Vakinankaratra and South-East Regions in Madagascar. The project, launched in July 2018, aims to support the strong expansion of Rainfed Rice by scaling up Climate-Smart Agriculture. These practices are developed to adapt to climate change and mitigate its effects.

In relation to the national and sectoral guidelines, the activities of the MANITATRA-2 project are in line with the base no 2 of Madagascar Emergence Initiative – advocating environmental emergence and sustainable development – on which the general policy of the Malagasy state was developed. The project, through the dissemination of techniques aiming climate change resilience and food security, is fully in line with the objectives and challenges of the ministry of Agriculture and Livestock, as well as national development strategies.

With regard to the regional context of intervention, the project is of great relevance with regard to the irregularity of rainfall observed in the region in recent years. The project activities combine the improvement of the productivity of agricultural activities and soil protection.

In September 30, 2021, the cumulative disbursement rate of the project is estimated at 81.10% of the budget and a commitment rate of 89.06%<sup>1</sup> on 39 months of implementation out of 42 (92.85% regarding the project execution time). The budget commitment is close to the time elapsed for implementation and is considered acceptable.

Considering the cumulative disbursement of result 1 in September 30, 2021 amounting to €258,358.89 and the 2058.70 Ha of surface area with conservation agriculture, a direct result of the activities carried out in this component of the project, the cost per hectare is estimated at 125.49 €/Ha, or 151.85 USD/Ha, if it was 317 USD/Ha at the end of the MANITATRA-1 project. This cost per hectare is close to the cost evaluated during the mid-term evaluation of the project around the third quarter of 2020 but remains much lower than the cost per hectare evaluated during the final evaluation of the MANITATRA 1 project which is taken as the reference cost for the comparison.

In relation to the expected results of the project:

- Result 1: CSA and best practices are scaled up in two ecosystems in the Vakinankaratra region, covering the areas of the highlands and the Middle West

The area cultivated in CA is estimated at 2058.70 ha at the end of the 3rd year with 4378 adopting producers, nearly 47 ares per farmer. All the disseminated systems have been adopted in varying proportions, but the mucuna-based system is very representative among the three main cropping systems (CA based on mucuna, CA based on cajanus/crotalaria/tephrosia, CA based on stylosanthes).

The mucuna-based system remains the most representative among the three main culture systems (CA with mucuna, CA with cajanus/crotalaria/tephrosia, CA with stylosanthes). Compared to the mid-term result, there is a decrease in the adoption of the Stylosanthes-based system in the Middle West; the problem of equipment to control Stylosanthes remains the main limiting factor of this practice. It should be noted that the project relies on tripartite funding (FOs – GSDM – FDA) for the acquisition of rollers<sup>2</sup> in the Middle West. Of the 5 rollers planned, 4 requests have already been granted at the level of the CROA of the FDA of the Vakinankaratra Region, but the fund is still not accessible despite the availability of beneficiary contributions during the final evaluation.

A particular focus was given for rainfed rice because it is the main practice targeted by the Project. In all of the Communes of surveys, the practice of rainfed rice has improved, particularly in the Middle West

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<sup>1</sup> Quarterly report as of September 30th, 2021

<sup>2</sup> The acquisition of roller is planned in the 3rd year of the project

compared to the mid-term situation (97% in the Highlands and 96% in the Middle West during the final evaluation, compared to 93% and 83% respectively at the mid-term evaluation). For rainfed rice in CA, at the end of the project, 77% of the beneficiaries had promoted this technique, compared to 10% for the non-beneficiaries. While in 2015, between 1 to 6% of rainfed rice plots are conducted with the CA system, at the end of the project intervention, 21% of producers practice the system in 75 to 100% of their rainfed rice. In the Highlands, the percentage of the CA system in rainfed rice cultivation varies from 2.3% to 16.9%. The baseline situation is zero because there was no rainfed rice in conservation agriculture before MANITATRA 2 in the Highlands.

Concerning reforestation, the demand in the Middle West is such that the quantity of seedlings usually produced by nurserymen is far below the real needs. The number of nurserymen operating in the area, already trained by the various actors who intervened in the BVPI and FAFIALA areas, is sufficient to satisfy the needs of the project. In the Highlands, the function of nurseryman constitutes a new employment opportunity and despite the lack of experience of some nurserymen, collaboration with the project is immediately agreed. In this way, the number of nurserymen recruited by the project exceeds the number initially planned. This is largely due to the intervention of the Project. There is a strong increase in the percentage of farmers who have planted trees from 12% in the baseline situation in the Highlands to 52% (mid-term) and 63% (final) and from 6% in the Middle West to 52% (mid-term) and 70% (final). This is largely due to the intervention of the Project.

For composting, classic compost remains the most practiced by 43% (24%) of the exploitations, including 42% of the Highlands (14% during the baseline and 32% during the mid-term evaluation) and 43 % of the Middle West (9% during the baseline and 21% during the mid-term evaluation) According to the surveys undertaken, the lack of biomass remains the main problem encountered by farmers in the production of compost with 76% of cases for the whole intervention area.

In contrast to the types of compost mentioned above, the adoption of liquid compost and 7-day compost is progressing slowly, given the difficulty encountered by producers in making them, particularly with the need for manure and green biomass and availability of specific inputs such as activator (rumen juice for 7-day compost), repellent plants for liquid compost. Vermicompost is also evolving gradually, but there is an interesting dynamic with markets created between farmers (purchase by producers for vegetable growing) and with horticulturists in the city:

- Liquid compost (from 3% during the mid-term situation to 6% during the final situation; if the value is not available during the baseline situation)
- Compost 7 days (from 3% during the mid-term situation to 5% during the final situation; if the value is not available during the baseline situation)
- Vermicompost (from 5% during the mid-term situation to 7% of the final situation; the value is not as available during the baseline situation<sup>3</sup> and it is a fertilization method introduced by the project except in the MANITATRA 1 areas where this practice has already been promoted).

The average quantity of compost produced is about 1 ton, which is not negligible given the lack of organic matter in these areas, but there is a great variability between the production of each farmer.

Regarding the adoption of fodder crops, the results of the survey gave figures of around 5% if the rate of cultivation of at least one fodder crop stood at 3.5% during the mid-term evaluation. The percentage is slightly higher in the Highlands (15% of affected farmers), as this is an important dairy farming area.

The cultivation of oats in the off-season in the rice fields is one of the most usual practices of farmers, particularly in the Highlands, with an average surface area of 14.76 ares for the beneficiaries who practice it.

- Result 2: Capacity of various stakeholders is built in climate-smart agriculture

Since the start of the project, 72 nurserymen have already collaborated with the project, 82 lead farmers have benefited training by the project team but 33 of them have either resigned or been fired: 49 remain operational. The target is exceeded.

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<sup>3</sup> Which is perhaps considered insignificant because it was MANITATRA 2 that promoted its broadcast in the area

12 schools have benefited technical support, supervision and have been provided with agricultural tools and educational kits to ensure the transfer of knowledge to target students since the beginning of the project. Agroecology and environmental education are taught by trained teachers during extracurricular activities. The lessons are delivered in a fun way and include theoretical and practical sessions. They are mainly aimed for students in a secondary school. The number of students per class varies from one school to school, but in total 8217 students and 45 teachers are trained on CSA. This awareness-raising action for parents is the of the “reverse education” approach. In fact, parents became interested in agroecology through the children and the observation of the application plot at school.

It is important to emphasize that the interest of parents and farmers around constitutes a scaling up of the dissemination of techniques and increases the number of adopters of best agricultural practices. In this sense, cases of spontaneous adoption in areas outside those of project intervention have been recorded, such as those observed in Fokontany Mandritsarakely (Rural Commune of Antsoatany) and the hamlet Ambohikely (Rural commune of Antanifotsy); also in Vinaninkarena (outside the intervention zone) where farmers and parents of students have obtained specific seeds from the CEG of Vinaninkarena. The same observations are noted at the school level, the trained teachers testify to the advantages of Agroecology and not only practiced it on their own farms, but also disseminated the best practices with their peers in their respective hamlet.

In terms of collaboration with the decentralized technical services, the project has signed collaboration agreements with the Regional Department of Meteorology, the DRAE and the DREDD. Quarterly agro-meteorological bulletins have been developed and distributed to stakeholders. These decentralized technical services contribute to the development of strategies and instruct the different orientations of the project.

- Result 3: Farmers' organizations are supported and linked with various stakeholders in agriculture for the sustainability of the project results

While the exchange visits at the national level were undoubtedly successful, the planned exchange visit COMESA and member countries was prevented by the COVID-19 pandemic.

The delay in processing files by the FDAR means that admission to financing is still uncertain given the access conditions. 141 funding requests have been made with farmers-organizations supervised by the project. These requests were submitted to the FDA Vakinankaratra. Among these requests, 18 micro-projects received the approval of the CROA (an achievement rate of 20% compared to the objective of 90) including: rainfed rice (06), rice-fish farming (03), Dairy farming (06), local breed chicken (02), market gardening (01).

The abandonment of the use of agricultural service centers handicaps the project for this result 3. Agricultural service centers have become an independent NGO, so their operability/dynamism varies from service centers to services centers. As a result of this situation, the project supported FOs to prepare requests and submitted them to the FDAR, a role that should have been entrusted to the Agricultural service centers.

At the stage of the evaluation, measuring the impact of the project may be premature, but those listed here are based on declarative facts: savings opportunities for households practicing CA and improved incomes for community service providers, promotion of agricultural productivity and food availability, new local skills that vary according to the actors, adoption of measures in favor of the restoration or sustainable management of natural resources and the effects of climate change.

The spontaneous adoption of practices by non-beneficiaries reflects the scaling up of best agroecological practices targeted by the project. The success of the beneficiaries' experiences, the effects of awareness-raising and communication actions, the need to improve soil fertility for better production are the main leverage effects for the adoption of conservation agriculture and best agroecological practices.

The application of Agroecology contributes to the improvement of soil fertility through the maintenance of humidity and particularly in the Middle West, for the control of striga. Through the application of techniques, the old plots degraded by erosion (infertile) have regenerated; which demonstrates the interest of agroecology in the development of sustainable agriculture.

The practice of CA has allowed an increase in production at the level of adopters but also observed at the level of schools where the techniques have been disseminated. On farms, the yield of rainfed rice with the conservation agriculture system is 2.81 t/ha, with a very large variation depending on the farmer (standard deviation: 188.64). Between the two intervention zones, the yield of rainfed rice in the Highlands is highest - 3.16 t/ha (Highlands) and 2.47 t/ha (Middle West) - reflecting the effectiveness of the mucuna-based system which is highly developed in this area. For the beneficiaries of the project, 73% of the surplus rainfed rice production is mainly used for self-consumption, 16% for sale and 8% to repay debts. This situation leads to a reduction in the time of food insecurity perceived by 90.5% of beneficiaries comparing the 2019-2020 period with 2020-2021 period.

Regarding the economic benefits of reforestation, apart from the use of trees for compost after 3 years and the benefit of reforestation in carbon sequestration, a farm could generate a margin varying from 631,417 Ar to 1,213,382 Ar depending on the zone after 5 years and from 1,055,124 Ar to 2,027,611 Ar after 10 years.

The final evaluation concluded that the project had the necessary conditions for better replicability and scaling up activities. However, the activities faced various problems:

- Assignment of teachers trained by the project in agroecology
- Very young ages of students to pass on knowledge to their parents
- Insufficient linking of supply and demand for cover crop seeds
- Insufficient consideration of agroecology in FDA funding

# Introduction

Several factors demonstrate Madagascar's vulnerability to climate change. Firstly, the majority of poor livelihoods are highly dependent on climate-dependent activities to ensure household nutrition, making local socio-economic development highly dependent on climatic uncertainties. Added to this, the pressure on natural resources due to the strong population increase are important. In the Highlands regions, a mountainous area whose plains and irrigated lowlands are dominated by steep topography, the increase in population pressure has conducted the saturation of irrigated area, intended for rice cultivation, and an increasingly strong agricultural hold on the upland. The upland (Tanety) cultivation, with rainfed crops, conducted with traditional tillage techniques, combined with abundant rainfall, accentuate the phenomena of erosion and thus leads to a strong loss of fertility.

In response to this, with financial support Funded by the European Union within the Global Climate Change Alliance plus (GCCA+) program of intra-African, Caribbean and Pacific (intra-ACP) countries, and coordinated by COMESA, the Climate-Smart Agriculture (CSA) pilot program is implemented in Madagascar by GSDM through the MANITATRA-2 Project. This project aims to capitalize the experiences and successes of the previous GCCA pilot project (MANITATRA 1), implemented during the period 2014-2016 in the Region of Vakinankaratra and South-East Regions in Madagascar. The project, launched in July 2018, aims to support the strong expansion of Rainfed Rice by scaling up Climate-Smart Agriculture. These practices are developed to adapt to climate change and mitigate its effects, as well as to improve food security in Madagascar and particularly in the region of Vakinankaratra.

This report is the result of the final evaluation of the interventions. Realized between the months of September 2021 and January 2022, according to the terms of reference, the expectations of the evaluation are:

- *The values of the indicators of the framework of activities and results compared to the initial values measured;*
- *Specific analyzes are provided on the consideration of the main orientations of the project, namely support for rainfed rice and consideration of the environment and climate change aspect;*
- *The gender aspects and in particular the place given or taken by women in the intervention of the project and its impact are analyzed within the framework of this mandate;*
- *An evaluative analysis of the project's implementation based on the five (5) key monitoring-evaluation criteria (relevance, effectiveness, efficiency, impact, and sustainability) is carried out;*
- *The effects and impacts of the strategies adopted on the support systems (lead farmers, farmer field schools, nurserymen, seed suppliers, links with key players, links with decentralized services) are analyzed;*
- *The progress achieved in achieving the expected outputs by highlighting the strengths and weaknesses are reviewed;*
- *The factors that positively or negatively affected the achievement of results are analyzed;*
- *The experiences and lessons learned from the Project on the conditions for carrying out the activities are informed and capitalized;*
- *The sustainability of the expected results (institutional and technical strengthening, coverage of recurrent costs, ownership of change by the beneficiaries, etc.) is assessed;*
- *The partnership strategy for achieving project results is analyzed;*
- *The lessons learned from the implementation of the project and the proposal of recommendations for other future projects are formulated;*
- *The impacts of the Project on the target farmers and the area of intervention are measured.*

For the operational level, the evaluation was carried out in 3 phases:

- Phase 1: preparation including the development of the methodological document
- Phase 2: data and information collection including the exploitation of available bibliographical resources, the sample survey of 340 beneficiaries and 232 non-beneficiaries, field visits and interviews with key informants
- Phase 3: clearing / data analysis / reporting

The present report is divided in three parts:

- Part 1 including the general framework of the study (justification, description, progress and quantified assessment of the MANITATRA 2 project, the reminder of the Terms of Reference and the methodology;
- Part 2 analyzing the evaluation criteria (relevance, efficiency, effectiveness, impacts and sustainability/reproducibility). This part analyses the evolution of the indicators of activities and results of the baseline, mid-term and final situation
- Part 3 for recommandations

# 1. GENERAL FRAMEWORK OF THE STUDY

## 1.1 MANITATRA 2 PROJECT

### 1.1.1 Objectives

With financial support from the European Union within the Global Climate Change Alliance plus (GCCA+) program of the Intra-African, Caribbean and Pacific (intra-ACP) countries, and coordinated by COMESA, the Climate Smart Agriculture (CSA) pilot program is being implemented in Madagascar by GSDM through the MANITATRA-2 Project. This project aims to enhance the previous GCCA pilot project (MANITATRA 1) experiences and successes, implemented during the 2014-2016 period in the Vakinankaratra and Southeast regions. In this Way, the scaling up under MANITATRA 2 project can be interpreted as a reinforcement of these results for initially three-year project: July 2018 to June 2021 with an extension until December 31, 2021.

*"The main objective of the project is to support the scaling up of Climate-Smart Agriculture to adapt to climate change and mitigate its effects, as well as to improve food security in Madagascar". Specifically, the project aims to scale up Agroecology for agriculture development and soil and smart forest conservation in the Middle West and Highlands of the Vakinankaratra region, Madagascar".*

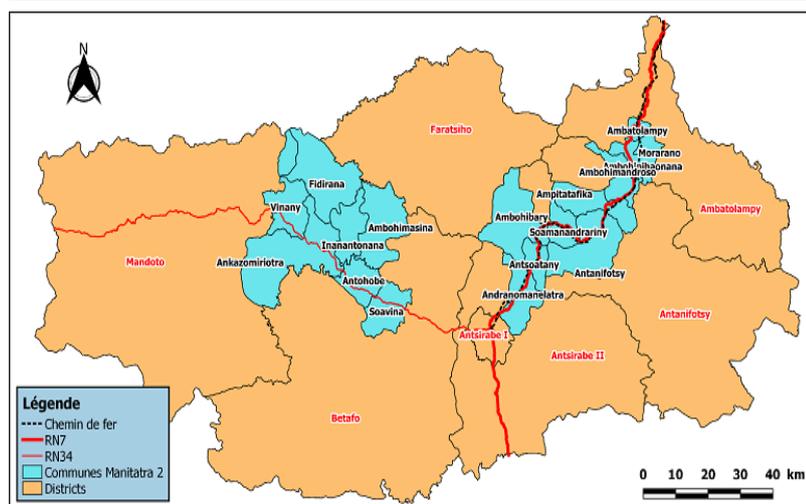
Considering the context prevailing in the intervention area, the implementation of the project is justified by the high expansion of upland rice. Thus, in practice, one of the basic objectives of MANITATRA 2 would be to support the expansion of upland rice in the area. The research results conducted on rice by SPAD, which has led to the development of high-performance varieties but facing the fertility and weeds problems as well as an increased pest and disease constraints, will be tested within the project implementation.

### 1.1.2 Intervention area



#### PROJET MANITATRA 2

#### ZONES D'INTERVENTION



Source : Projet MANITATRA 2 (FTM, BD 100)

Map 1 : MANITATRA-2 Project intervention area

### 1.1.3 Project content

The project develops various themes relating to the development of agroecology, which should contribute to achieving the following expected results:

- **Result 1:** CSA and Best practices are up scaled in two ecosystems of the Vakinankaratra region, covering the Highland and Middle West regions in Madagascar
- **Result 2:** Capacity of various stakeholders is built in climate-smart agriculture
- **Result 3:** Farmers' organizations are supported and linked with various stakeholders in agriculture for the sustainability of the project results

Communication and visibility of CSA are promoted throughout the implementation of the project on i) visibility and communication events organization, ii) publications and broadcasting and iii) documentaries conception and edition. The achievements relating to communication and visibility represent a transversal result of the project.

In summary, the project planned activities are:

- Conduct awareness raising, information and communication to facilitate experience sharing and learning between the beneficiaries to adhere to the project activities and practices.
- To improve agricultural production in a sustainable way, through the promotion of adapted techniques, especially agroecological techniques, aiming particularly the promotion of rainfed rice production, and the crop diversification.
- Strengthen the capacities of producers and other stakeholders to promote local development self-governance
- Build links between the various agricultural development actors in order to support the sustainability of the project's outcomes.
- Use a variety of support to ensure communication and visibility of the project

The intervention modalities are based on GSDM's experiences in project management. The "farmer to farmer" approach is developed through lead farmers (LF) to support local producers.

#### **1.1.4 Context of the project**

##### **1.1.4.1 Biophysical and socio-economic characteristics of the zone**

The Vakinankaratra region is part of the Malagasy Highlands, it covers an area of 19,205 km<sup>2</sup> with the volcanic massif of Ankaratra in the center, the Mandoto peneplain in the west and a succession of depressions and basins dominated by the Ibity chain in the south (DSI/MAEP, 2006).

The climate is "tropical altitude" type in the high Eastern and central parts. Frosts are frequent. Hail sometimes causes a lot of damage. In the Middle West (Mandoto), the climate is warmer.

Family farm assets are slightly lower than family assets, which corresponds to a reduced availability of family labor for agricultural activities and thus a diversity of activities in the area. The vast majority of household heads have been educated at the primary level. The head of household who has not attended school are not exceeding 10%. However, the head of household who has passed the secondary level and above are even less numerous.

Cattle breeding is also important in the two zones occupying nearly half of the farms (49% of Middle West farmers and a little more, 69% in the Highlands).

For the two ecosystems of the Vakinankaratra region, the average size of farms is respectively 215 ares (CV 89%), 150 ares (CV 88%) and 50 ares (CV 99%) for the Middle West 1, Middle West 2 and the Highlands. The Highlands zone is characterized by a small size farm. However, the Middle West Vakinankaratra zone still has a large area dominated by Tanety (upland).

The COVID-19 pandemic affected Madagascar, like any other country in the world, so the necessary health measures, including containment, were taken for the entire country. However, the dates of application of these measures vary from one region to another.

##### **1.1.4.2 Environmental context and climate change**

In the Highland, the intensification of agricultural production, with the abandonment of fallow, the systematization of tillage (manual or animal-drawn) and the overexploitation of land cultivated with

conventional techniques has generalized the erosion phenomena, with dramatic environmental consequences:

- at the level of rainfed hillside crops: loss of fertility, land degradation and fallow, erosion claws.
- at the level of lowland rice fields: silting up and damage (submersion).

In the Middle West, crops are mainly concentrated around irrigated rice field. The upland and sloping tanety are also exploited and erosion problems with consequences similar to those observed in the Highlands are observed. Moreover, bush fires are a common phenomenon in the area, with consequences of considerable forest cover loss.

Drought, like the one observed in 2019, has negative impacts on agricultural production, particularly rice. Apart from the drought, the rainy seasons are getting shorter but the rains are with high intensity.

#### 1.1.4.3 Political context

Two major electoral events took place during the two years of project implementation: the presidential election and the election of mayors in 2018. At the end of the presidential election, the new government replaced the heads by governors: the governor of the Vakinankaratra region was appointed in March 2020. The new heads of municipalities (mayors, deputy mayor, etc.) took office in the first quarter of 2020.

### 1.2 Reminder of the terms of reference of the mission

This report is the result of the final evaluation of the interventions. Realized between the months of September 2021 and January 2022, according to the terms of reference, the expectations of the evaluation are:

- *The values of the indicators of the framework of activities and results compared to the initial values measured;*
- *Specific analyzes are provided on the consideration of the main orientations of the project, namely support for rainfed rice and consideration of the environment and climate change aspect;*
- *The gender aspects and in particular the place given or taken by women in the intervention of the project and its impact are analyzed within the framework of this mandate;*
- *An evaluative analysis of the project's implementation based on the five (5) key monitoring-evaluation criteria (relevance, effectiveness, efficiency, impact, and sustainability) is carried out;*
- *The effects and impacts of the strategies adopted on the support systems (farmer leaders, farmer field schools, nurserymen, seed suppliers, links with key players, links with decentralized services) are analyzed;*
- *The progress achieved in achieving the expected outputs by highlighting the strengths and weaknesses are reviewed;*
- *The factors that positively or negatively affected the achievement of results are analyzed;*
- *The experiences and lessons learned from the Project on the conditions for carrying out the activities are informed and capitalized;*
- *The sustainability of the expected results (institutional and technical strengthening, coverage of recurrent costs, ownership of change by the beneficiaries, etc.) is assessed;*
- *The partnership strategy for achieving project results is analyzed;*
- *The lessons learned from the implementation of the project and the proposal of recommendations for other future projects are formulated;*
- *The impacts of the Project on the target farmers and the area of intervention are measured.*

### 1.3 Methodology

#### 1.3.1 Definition of activity and result indicators to be measured

The principle to be applied is to use a certain number of indicators to measure the most important factors of each objective. Apart from the activity indicators in the project document and which will be listed in the table below, the proposed result indicators are characterized by their logical link with the objective and the potential availability of data to measure the indicator.

The project objectives, including the logical framework, are the initial points for developing the questionnaires. Results are measured on the basis of the indicators provided in the project document.

### 1.3.1.1 Activity indicators

The project document gives the activity indicators. These indicators were readjusted in year 2 and year 3, and the following table details the indicators measured during the final evaluation:

**Table 1 : Activity indicators measured according to the project document**

Activity indicators	Reference	Unit	Project target not cumulative (except areas on Conservation Agriculture)		
			Year 1	Year 2	Year 3
<b>RESULT 1: CSA and best practices are up scaled in two ecosystems of the VAKINANKARATRA region, covering the Highland and Middle West regions in Madagascar</b>					
1.1. Conduct awareness raising, advocacy, exchanges visits and field days to facilitate experiences sharing and learning between beneficiaries					
Inception workshop and other advocacy (IFPs, journalists...)	IA 1.1.1	Participants		15	
Number of participants in exchanges visits inside communes	IA 1.1.2	Person	2 400	6000	
Number of participants exchanges visits between commune	IA 1.1.3	Person	200	500	
1.2. Upscale Conservation Agriculture to support the growing of upland rice and other crops					
Acreage of full Conservation Agriculture	IA 1.2.1	Ha of CA	500	2000	2 000
Number of farmers provided seeds of cover crops	IA 1.2.2	Farmer	1 500	3000	500
Number group farmer (FO) provided Stylosanthes rollers	IA 1.2.3	unit	0	0	5
1.3. Upscale agroforestry and forestation (equipment and seed support to nurseryman and adopting farmers)					
Number of tree nurseryman supported	IA 1.3.1	unit	20	50	
Number of trees plantlets for reforestation (Acacia, eucalyptus...)	IA 1.3.2	Plantlet	500 000	1 000 000	
Number of fruit plantlets of farmers adopting	IA 1.3.3	Plantlet	10 000	10 000	30 000
Number of farmers provided seeds of hedgerows (Cajanus, Tephrosia...)	IA 1.3.4	Farmer	2 000	1 500	3 000
1.4. Promote other best practices (bio-pesticides and repellent plants, technology of composting, improved organic fertilizers, forages, species for food safety as orange flesh sweet potatoes..., regenerative income activity as vegetables					
Number of farmers provided seeds of mucuna, crotalaria, others plants used as bio-pesticides/repellent plants (based on the experiences of BVPI, GSDM, CEFFEL)	IA 1.4.1	Farmer	1 500	500	3 000
Quantity of provided worms for composting	IA 1.4.2	Kg	0	10	0
Number of dairy farmers benefiting improved cowsheds for quality manure, for better of dairy cows and for composting	IA 1.4.3	Farmer	0	150	150
Number farmers provided seeds of forage and food safety plants (orange flesh potatoes) based on experiences of FIFAMANOR	IA 1.4.4	Farmer	500	800	700
Number of farmers provided equipment and fry for fish raising in the paddy field or in ponds	IA 1.4.5	Farmer	0	75	75
1.5. Collect data on CSA in some strategic area at National level in a view to update data on upscaling of CSA and best practices in the country					
Number of Contract with a firm to conduct National survey in some strategic agroecological areas	IA 1.5.1	Unit			1
Number of contracts with CIRAD expertise to integrate data in MANAMORA database	IA 1.5.2	Unit			1
Number of DRAE trained in the use of the data base MANAMORA	IA 1.5.3	Unit			5
1.6. Purchase principal mean for upscaling activity					
Number of means made available to the field team	IA 1.6.1	Unit	8 motorcycle 50 bicycles		
<b>RESULT 2 : Capacity of various stakeholders is built in Climate smart Agriculture (Conservation Agriculture and Agroforestry)</b>					
2.1. Train nurserymen in the technology of tree nurseries and in the choice of the appropriate tree species					
Number of Nursery men/women trained	IA 2.1.1	Person	20	23	7
2.2. Train lead farmers and farmers in CSA (CA, agroforestry and forestation, other best practices)					

Activity indicators	Reference	Unit	Project target not cumulative (except areas on Conservation Agriculture)		
			Year 1	Year 2	Year 3
Number of farmers trained (by gender)	IA 2.2.1		4 000	4 600	4 000
<b>2.3. Train secondary school students in CSA (CA, Agroforestry and forestation, other best practices)</b>					
Number of diagnosis to select beneficiary schools	IA 2.3.1	Unit	1		
Number of Event (Commitment charte event, Tools delivery)	IA 2.3.2	Unit	1	1	
Number of secondary school beneficiary for CA and CSA training and support	IA 2.3.3	Secondary school	12	12	12
Number of session organized for training for Ministry Branch (OEMC / DREMC / BEMC)	IA 2.3.4	Unit	1		
Number of session organized for training for teachers	IA 2.3.5	Unit	3		
Number of film for communication produced	IA 2.3.6	Unit		1	1
Number of cartoon strips produced for school children	IA 2.3.7	Unit		1	
Number of competition organized of best school	IA 2.3.8	Unit		1	
<b>2.4. Organise training sessions targeting development actors such as farmers organisations, NGO and services providers</b>					
Number of participants from development actor trained (FO, NGO, local services providers)	IA 2.4.1	Person	20	20	20
Number of participants to exchange visit in the training sites of GSDM	IA 2.4.2	Person	800	800	800
<b>2.5. Involve regional Directorate of Meteorology in Climate smart Agriculture (Conservation Agriculture and Agroforestry)</b>					
Number of training workshop session for local stakeholders	IA 2.5.1	Workshop Session	1	3	3
Number of regional information bulletins (meteorology) provided	IA 2.5.2	Unit	200	300	300
<b>2.6. Involve the Ministry of Agriculture and livestock (MPAE) and Ministry of Environment and Forestry (MEEF) or regional directorates</b>					
Number of collaboration and exchange sessions in the field for the MAEP and the MEDD	IA 2.6.1	Session	1	1	1
Nombre de session de collaboration et d'échange sur le terrain pour les DRAEP et le DREDD	IA 2.6.2	Unit	1	1	1
<b>RESULT 3 : Farmers Organizations are supported and linked to various stakeholders in the Agriculture to support sustainability of the project results</b>					
<b>3.1. Support FOs to participate in the development of National Action Plan for Climate Change as well as other Climate Change Framework</b>					
Number of participants informed on Climate Change framework	IA 3.1.1	Person	30	30	30
<b>3.2. Participate to sharing experiences at the regional level (COMESA and other regions) integrating political actors and development actors</b>					
Number of exchange visits in COMESA and other regions	IA 3.2.1	Person		5	
<b>3.3. Support FOs to maintain continuous exchange with FDA and FDAR (state promoted development mechanisms in national level) in order to make a link between farmers and agricultural services</b>					
Number FOs benefiting finance from FDAR	IA 3.3.1	FO	30	30	30
<b>3.4. Ensure that the FOs obtain permanent utilization of the Agricultural Service Provider to make a link between the farmers and the agricultural services</b>					
<b>3.5. Support FOs on their collaborative contracting with various partners such as APDRA, FIFAMANOR, CEFFEL, AVSF, AGRISUD and PAPAM in various interventions</b>					
Number of FOs trained on rice/fish system by APDRA	IA 3.5.1	FO	10	10	
Number of FOs trained on dairy cattle and forages by contracting with FIFAMANOR	IA 3.5.2	FO	20	20	
Number of FOs trained on Best practices, bio-pesticides and fruit trees by contracting with CEFFEL	IA 3.5.6	FO	10	10	
<b>Communication and visibility of CSA are promoted throughout the implementation of the project on i) visibility and communication events organization, ii) publications and broadcasting and iii) documentaries conception and edition.</b>					
<b>4.1. Visibility and communication events organization</b>					
Number of regional field days	IA 4.1.1	Day	0	1	

Activity indicators	Reference	Unit	Project target not cumulative (except areas on Conservation Agriculture)		
			Year 1	Year 2	Year 3
Number of participants (Authorities, donors, local stakeholders, lead farmers, researchers, development actors, unions farmer and journalist)	IA 4.1.2	Person	0	150	
Number of streamer	IA 4.1.3	Unit	2	2	
Number of roll up	IA 4.1.4	Unit	2	2	
Number of car hiring days	IA 4.1.5	Day	20	12	
4.2. Publications and broadcasting					
Number of TV broadcasting	IA 4.2.1	Broadcasting	2	1	
Number of Radio broadcasting	IA 4.2.2	Broadcasting	10	12	
Man-day of reporters (20 reporters x 5events)	IA 4.2.3	Man-day	40	20	
Number of newspapers' publication	IA 4.2.4	Publication	8	8	
Number of publication type (online & social media)	IA 4.2.5	Publication	2	2	
Number of TV events broadcasting	IA 4.2.6	Event	2	2	
Number of Radio events broadcasting	IA 4.2.7	Event	2	2	
4.3. Documentaries conception and edition.					
Number of document and tools pack edited	IA 4.3.1	Pack	0	1	
Number of films	IA 4.3.2	Film	5	5	
Number of capitalization leaflets	IA 4.3.3	Leaflet	0	1	

Source: MANITATRA 2 project document

**NB:** Communication and advocacy activities are actions carried out permanently by the project and thus contribute to the achievement of the project objective. In this sense, they will be the subject of a specific interview with the participants in the agroecological days organized in March 2020 (CASEF, PAPAM, FDAR, FIFAMANOR, etc.).

### 1.3.1.2 Results indicators

In accordance with the terms of reference, these indicators essentially repeat those identified during the baseline study while noting that they would be the subject of an analysis of their relevance. It should be noted that in table 2, for the percentages of adoption (percentage of farmers adopting CA, percentage of farmers growing cover crops, percentage of farmers growing rainfed rice, etc.), we take into account the project interventions area. As the Project does not work in the whole of the commune, we will take into account the fokontany affected by the interventions. The percentages of exploitations to be highlighted are the percentages of EAs in the fokontany concerned.

**Table 2 : Performance indicators measured with their reference values**

Result indicators	Reference	Unit	VALUES OF THE REFERENCE SITUATION		
			Highlands (2018)	Middle West (2015)	Middle West (2017)
<b>Result 1: Scaling up CSA and good agricultural practice in the MO and HT of Vakinankaratra</b>					
<b>Result 1.1 Conservation Agriculture has been integrated into the farmers' production system and has improved the production of rice and other crops</b>					
Percentage of farmers adopting CA	IR 111	%	0%	2%	n/a
Percentage of farmers growing cover crops	IR 112	%	0%	2%	n/a
Percentage of farmers growing rainfed rice	IR 113	%	42%	72%	55%
Area cultivated in rainfed rice	IR 114	Ha	0.1	0.32	0.28
Percentage of rainfed rice area conducted in CA system	IR 115	%	0%	Between 1 to 6%	n/a
Average yield of rainfed rice in conventional system	IR 116	Ton/Ha	1.57	1.7	1.49
Average rainfed rice yield in AC system	IR 117	Ton/Ha	0	3.8	n/a
<b>Result 1.2 Wooded and agroforestry areas have increased</b>					

Result indicators	Reference	Unit	VALUES OF THE REFERENCE SITUATION		
			Highlands (2018)	Middle West (2015)	Middle West (2017)
Percentage of farmers having tree planted area	IR 121	%	12%	n/a	6%
Percentage of farmers practicing fruit plantations	IR 122	%	11%	n/a	4%
Average of tree-planted area per farmer	IR 123	Ha	0.042	0.12	0.021
Average of fruit plantation area per farmer	IR 124	Ha	0.003	0.013	0.014
<b>Result 1.3 Good practices have been developed</b>					
Percentage of farmers practicing hedgerow (on cajanus, tephrosia)	IR 131	%	n/a	0.60%	n/a
Percentage of farmers using biopesticides or repellent plants	IR 132	%	n/a	n/a	n/a
Percentage of AEs owning at least one cattle/zebus	IR 133	%	69%	43%	49%
Percentage (by number) of farmers producing milk	IR 134	%	16%	n/a	2%
Average of annual milk production per dairy farm	IR 135	Liter	816	n/a	56
Percentage of farmers producing lombricompost	IR 136	%	n/a	n/a	n/a
Quantity of lombricompost produced	IR 137	Kgs	n/a	n/a	n/a
Percentage of farmers producing Conventional Compost	IR 138	%	14%	n/a	9%
Average quantity of conventional compost produced	IR 139	Kgs	334	n/a	124
Percentage of farmers building improved cowshed	IR 140	%	n/a	n/a	n/a
Percentage of farmers producing organic manure	IR 141	%	96%	n/a	93%
Quantity of improved manure produced	IR 142	Kgs	4757	n/a	1719
Percentage of farmers adopting forage crop	IR 143	%	2%	0%	0%
Average forage area	IR 144	Ha	0.11	0	0
Percentage of farmers adopting the orange-fleshed sweet potatoes	IR 145	%	n/a	n/a	n/a
Average area cultivated in orange-fleshed sweet potatoes	IR 146	Ha	n/a	n/a	n/a
Percentage of farmers introducing fish into their rice field	IR 147	%	17%	13%	12%
Percentage of farmers producing fry	IR 148	%	n/a	n/a	n/a
Average area in rice-fish farming	IR 149	Ha	0.11		
Average fish production per farmer	IR 150	Kgs	8.4		
Average fry production (number)	IR 151	Alevin	2487		
<b>Result 2: Capacity building of various stakeholders on the CSA</b>					
<b>Result 2.1 The capacity of nurserymen strengthened</b>					
Percentage of trained nurserymen achieving their set objectives	IR 211	%	0%	0%	0%
Distribution of nurserymen according to the quality of plants produced (Good, fair, poor <sup>4</sup> )	IR 212	%	0%	0%	0%
<b>Result 2.2 CSA good practices have been mastered by farmers</b>					
Percentage of lead farmers who successfully completed their training activities	IR 221	%	0%	0%	0%
Percentage of trained farmers practicing CSA on their farms	IR 222	%	0%	0%	0%
<b>Result 2.3 CSA good practices have been integrated into the school environment</b>					
Number of secondary schools that continued to conduct CSA demonstration plots	IR 231	Number	12	12	12
Number of students accompanied	IR 232	Number	2000	2000	2000
<b>Result 3: Support for FOs and connection with the various stakeholders in the Agriculture sector in order to support the sustainability of the Project results</b>					
Percentage of FO trained producing fish/suppling fry	IR 311	%	0%	0%	0%

<sup>4</sup> The criteria for categorizing plants produced (good, fair, poor) will be defined jointly with the project technicians during the preparatory meeting in Antsirabe.

Result indicators	Reference	Unit	VALUES OF THE REFERENCE SITUATION		
			Highlands (2018)	Middle West (2015)	Middle West (2017)
Dairy production gap for supported breeders	IR 312	%	0%	0%	0%
Percentage of FO members growing forage crops on their farm	IR 313	%	0%	0%	0%
Percentage of FO members adopting good practices on their farms	IR 314	%	0%	0%	0%

*Source: Reference situation of the MANITATRA 2 project, April 2020*

### 1.3.2 Synthetic presentation of the evaluation phases

For the operational level, the evaluation was carried out in 3 phases:

- Phase 1: preparation including the development of the methodological document
- Phase 2: data and information collection including the exploitation of available bibliographical resources, the sample survey of 340 beneficiaries and 232 non-beneficiaries, field visits and interviews with key informants
- Phase 3: clearing / data analysis / reporting

**Table 3 : Summary presentation of the phases of the evaluation**

Phase	Specific Objectives	Activity	Result
<b>PREPARATION</b>	<ul style="list-style-type: none"> <li>- Ensure the mandate execution under the best possible conditions, among others: <ul style="list-style-type: none"> <li>o the existence of the mandate mutual understanding by the consultant and GSDM;</li> <li>o the existence of a detailed methodology jointly validated by the Consultant and GSDM;</li> </ul> </li> <li>- Obtain the package of project documents allowing to have information;</li> <li>- Elaborate and validate the methodology document</li> <li>- Designing the data collection matrix on the tablet</li> </ul>	<ul style="list-style-type: none"> <li>1.1 Meeting with GSDM staff:</li> <li>1.2 Internal meeting of the Consultant's team</li> <li>1.3. Documentary review and use of the project baseline study results carried out internally by GSDM team.</li> <li>1.4. Designing the methodology document (planning the evaluation and developing informations/data collection tools)</li> <li>1.5. Preparing data collection: digitizing the questionnaire</li> <li>1.6. Constitution of surveyors' team</li> </ul>	<ul style="list-style-type: none"> <li>- The mandate objectives and deliverables clarified</li> <li>- The tools for the mandate realization constituted (documents and questionnaire)</li> <li>- The inception report written and validated</li> <li>- The questionnaire is digitized</li> </ul>
<b>DATA COLLECTION</b>	<ul style="list-style-type: none"> <li>- Collecting quantitative and qualitative information that will allow: <ul style="list-style-type: none"> <li>o to assess the indicators evolution in relation to the baseline situation;</li> <li>o to assess the relevance, effectiveness, efficiency, impacts and sustainability of the project;</li> <li>o to make proposals for the continuation of activities.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>2.1. Surveyor training</li> <li>2.2. Processing data collection</li> </ul>	<p>All the data enabling analysis and evaluation of the MANITATRA II project collected (indicators situation at the end of the project, ownership of the beneficiaries, identification of actions that have had successful experiences with the beneficiaries, stakeholders' perception of the project, etc.).</p>
<b>ANALYSIS/ REPORTING</b>	<ul style="list-style-type: none"> <li>- Analyze information collected in the field</li> <li>- Assess the relevance, effectiveness, efficiency, impact and sustainability of the MANITATRA 2 project.</li> <li>- Validate the mid-term evaluation final report.</li> </ul>	<ul style="list-style-type: none"> <li>3.1. Data cleaning</li> <li>3.2. Processing of information/data and drafting of the interim report</li> <li>3.3. Evaluation results presentation</li> <li>3.4. Final report submission to GSDM</li> </ul>	<ul style="list-style-type: none"> <li>- Preliminary results of the surveys shared</li> <li>- The final evaluation report submitted to GSDM</li> </ul>

### 1.3.3 Sampling

The survey was conducted with 572 farmers. This survey sample therefore represents 8219 exploitations from the 11 fokontany concerned by the Project according to the statistics collected by the INSTAT (national institute of statistics) in 2018 at the level of communes and *fokontany* which remain the official statistics of population number.

The mid-term survey was carried out from September to October 2020, almost twelve months before this final survey, for better comparability of the results and for better continuity of the two surveys, this final survey concerned the same targets as those of the mid-term. Thus, the survey sample is 572 including 340 beneficiaries and 232 non-beneficiaries. However, as the number of non-adopters is higher, extrapolation coefficients translating into the weight of each sample per fokontany have been calculated in order to be able to bring out the averages in the calculations below.

**Table 4 : Sampling, population represented and extrapolation coefficient (sample weight) in each surveyed *Fokontany***

Zone	Communes	Population 2021	Estimated number of households 2021	Fokontany	Population FKT 2021	Estimated number of FKT households 2021	Average number of persons	Number of adopters	Number of non-adopters	2021 samples			Sample weight of adopters	Sample weight of non-adopters
										Adopters	Non-adopters	Total		
Middle West	Fidirana	38,546	8,004	Antampondravola	3,376	699	4,832	215	484	30	20	50	7.17	24.18
				Ambohibolakely	3,335	638	5,231	371	267	30	20	50	12.37	13.33
	Ankazomiriotra	37,801	8,506	Ankazomiriotra II	4,585	1191	3,848	294	897	31	20	51	9.48	44.87
				Ankazomiriotra I	6,063	31562	3,881	592	970	31	21	52	19.10	46.19
	Soavina	16,934	3,732	Soavina	4,742	1088	4,359	158	930	36	24	60	4.39	38.74
				antanety	2,505	540	4,642	173	367	22	16	38	7.86	22.91
Highlands	Antsoatany	13,758	3,344	Antsoatany	3,093	751	4,119	199	552	30	20	50	6.63	27.60
	Antanifotsy	59,345	13,521	Andriantsilahy	1,163	291	3,996	164	127	30	21	51	5.47	6.05
	Ampitatafika	35,921	7,661	Ampitatafika	1,780	433	4,113	158	275	36	19	55	4.39	14.46
				Ambonivary	2,130	758	2,812	80	678	31	31	62	2.58	21.86
	Soamanandrany	21,085	4,380	Ambilona	1,158	269	4,300	48	221	33	20	53	1.45	11.06
<b>TOTAL</b>						<b>8,219</b>				<b>340</b>	<b>232</b>	<b>572</b>		

The extrapolation is thus done in the fokontany concerned by the Project, and therefore in the intervention areas of the Project only. As the project does not intervene in the whole of the commune, the extrapolation cannot be done outside the intervention areas and outside the Commune.

## 2. PROJECT PERFORMANCE ANALYSIS

### 2.1 Relevance

#### 2.1.1 Political and strategic anchoring of the project

The main objective of the project is to support the scaling up of Climate-Smart Agriculture to adapt to climate change and mitigate their effects, as well as to improve food security in Madagascar". The FAO in 2010 defines CSA as "agriculture that sustainably increases productivity, enhances resilience (adaptation), reduces/removes GHGs (mitigation) where possible, and enhances achievement of national food security and development goals".

In general, the activities developed address the main current concerns regarding climate change and their potential impact, both nationally and internationally. In fact, in 2014, the Intergovernmental Panel on Climate Change (IPCC) reveals that climate change is already underway: global average temperature has risen compared to the average of the 20th century, the number of summer days has increased, and the disruption of the major ecological balances is being observed. In medium and long term, climate change will result in various negative socio-economic and ecological phenomena. The impacts of climate change will affect the entire planet.

To limit the effects of climate change, the signatory countries of the United Nations Framework Convention on Climate Change (UNFCCC) have set themselves the objective in the Paris Agreement to "contain the rise in the average temperature of the planet".

In addition, world leaders have committed to 17 global goals, also known as "Sustainable Development Goals (SDGs)". The SDGs are seen as a global call to action to eradicate poverty, protect the planet and ensure that all people live in peace and prosperity.



Schema 1 : 17 sustainable development goals

With its objectives and expected results, the MANITATRA-2 project is part of:

- Objective 2: "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture"

- Objective 13: "Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy"

Mitigate climate change effects is also a fundamental priority for the European Union. It has set itself the goal of becoming climate neutral and reducing its greenhouse gas emissions, while encouraging other nations and regions to follow its example. In 2019, European

Union proposed to allocate at least 25% of 2021-2027 budget to climate action.

The Global Climate Change Alliance Plus (GCCA+) is a European Union initiative that helps the most vulnerable countries meet the challenge of climate change. Since its inception, the GCCA has focused on building climate resilience in least developed countries (LDCs). The GCCA+ priorities and lines of action reflect the EU's commitment to achieving the goals of the 2030 Agenda for Sustainable Development.

These priorities are defined by climate change adaptation, mainstreaming climate change and reducing poverty, reducing disaster risk, increasing resilience to shocks and harsh climatic conditions, reducing emissions from deforestation and adaptation and mitigation strategies.

The areas of intervention of the GCCA are based on agriculture, poverty reduction, natural resources, forests, energy, food security, land management, coastal regions, water sanitation, water, infrastructure, health, education/resources, waste, technical development, fishing grounds, and tourism<sup>5</sup>.

The General Policy of the Malagasy State was developed from the document Madagascar Emergence Initiative (MEI). Among the challenges outlined in this document, base No. 2 meets international concerns by advocating environmental emergence and sustainable development. The commitments included in the MEI, known as “*Velirano*”, reflect the priorities and the expected results that will have to be implemented. Food self-sufficiency through a substantial increase in rice production and the sustainable management and conservation of natural resources through massive reforestation are among these priorities.

Rice is the Malagasy staple food and in practice, food self-sufficiency can be interpreted as self-sufficiency in rice. However, rice production remains handicapped by several factors in the project intervention area: the decline in soil fertility favoring the development of *Striga asiatica*, erosion and the impact of climate change marked by short but intense rainy seasons are observed in the middle west. With the high population growth, the lowlands are insufficient to ensure the production of irrigated rice for the population of the highland areas, so they are forced to put more pressure on the *tanety* (uplands and hillsides) for rice production.

Madagascar is among the first field on which Conservation Agriculture techniques were experimented in tropical farming in the 1990s. The experimental projects evolved, from 2001, into a national project with the objectives of starting the dissemination of CA on a large scale and continuing the development of the techniques in the different agroecological zones of Madagascar. Since 2003, the dissemination of CA techniques has been carried out by various projects, including the BVLac project and the BVPI South East Highland project. The MANITATRA 1 project was implemented to relay these projects. MANITATRA 1 has had some success to be up scaled.

### **2.1.2 Consideration of the principles of agroecology**

In 2000s, the transdisciplinary nature of agroecological science, which combines natural sciences and social sciences, has become increasingly important. Agroecology has been described as an “integrated discipline bringing together elements of agronomy, ecology, sociology and economics”<sup>6</sup>. Agroecological science has expanded to the entire agrifood system<sup>7</sup> and on diverse topics, such as alternative and local food networks, producer-consumer relations, social agricultural networks, food markets and institutional food supply.

In this sense, the HLPE, in its fourteenth report<sup>8</sup> published on July 17, 2019, set out 13 principles of agroecology articulated around three key objectives such as (i) improving the efficiency of the use of resources (ii) strengthening resilience, and (iii) ensuring equity / social responsibility.

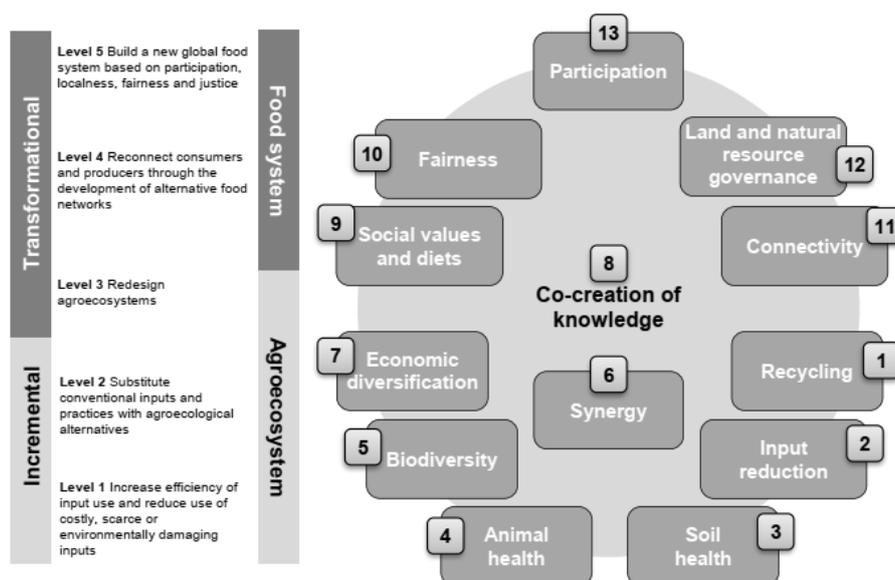
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<sup>5</sup> [to strengthen](#) the climate resilience of the most vulnerable countries, GCCA+, January 2020

<sup>6</sup> Dalgaard et al., 2003

<sup>7</sup> Francis et al., 2003; Doré et al., 2006; Gliessmann, 2007; Wezel and David, 2012; Côte et al., eds, 2019

<sup>8</sup> HLPE Report, 14, Agroecological and other innovative approaches, July 17, 2019



Schema 2 : The 13 principles of agroecology according to the HLPE

The MANITATRA 2 project, by the nature and types of activities developed, mainly considers the principles measured on the scale of crop plots and at farm level, among others: recycling, reduction of inputs, soil health, biodiversity, synergies and economic diversification. The project therefore sought to improve the efficiency of resource use and strengthen resilience by scaling up best agroecological practices such as: the production of organic manure (classic compost, vermicompost, 7 days, liquid compost), the development of conservation agriculture, reforestation, hedging, life hedges, biological control of pests and crop enemies.

However, aspects related to ensuring fairness and social responsibility are not sufficiently taken into account in its execution. In fact, this is not foreseen in the project conception the linking supply to demand by promoting equitable distribution networks by integrating food systems into local economies. Admittedly, support for local nurseries, farmers who have become suppliers of vermicompost, lead farmers tending towards the development of local services are among the interventions and effects of the project, but the impact at the level of the local economy is not sufficiently considered.

The following table analyzes the project activities consideration for each of the principles of agroecology while noting that the level of consideration presented in this table is based on an assessment by the evaluator:

Table 5 : Analysis of the project actions in relation to the 13 principles of agroecology

Principle	Activities developed by the project
<b>Improve resource utilization efficiency</b>	
<b>1. Recycling.</b> Preferentially use local renewable resources and close as far as possible resource cycles of nutrients and biomass	STRONGLY considered by the activities aimed at the production of organic manure and biomass (classic compost, 7-day compost, liquid compost, vermicompost, conservation agriculture, reforestation)
<b>2. Input reduction.</b> Reduce or eliminate dependence on purchased inputs.	STRONGLY considered by the development of biological control ( <i>ady gay</i> ) against diseases and crop enemies as well as the production of organic manure
<b>Building Resilience</b>	
<b>3. Soil health.</b> Secure and enhance soil health and functioning for improved plant growth, particularly by managing organic matter and by enhancing soil biological activity	HIGHLY considered by the activities aimed at the production of organic manure, crop rotation, conservation agriculture

Principle	Activities developed by the project
<p><b>4. Animal health.</b> Ensure animal health and welfare</p>	<p>INSUFFICIENTLY considered. Even if the project intervenes in the improvement of cowshed, the activities are essentially oriented towards the production of organic manure but not with the objective of sufficiently ensuring well-being and animal health.</p>
<p><b>5. Biodiversity.</b> Maintain and enhance diversity of species, functional diversity and genetic resources and maintain biodiversity in the agroecosystem over time and space at field, farm and landscape scales.</p>	<p>HIGHLY considered by scaling up practices relating to crop rotation, live hedges, maximum use of the possibilities of local species either as biomass or as biocidal plants, reforestation and the development of fruit trees</p>
<p><b>6. Synergies.</b> Enhance positive ecological interaction, synergy, integration, and complementarity amongst the elements of agroecosystems (plants, animals, trees, soil, water).</p>	<p>HIGHLY considered. Scaling up best practices such as crop rotation, the production of organic manure essentially via the improvement of cowshed, the biological control of crop enemies promotes integration and complementarity among the elements of agroecosystems, the promotion of rice-fish farming as part of Agroecology with its positive impact on rice yield</p>
<p><b>7. Economic diversification.</b> Diversify on-farm incomes by ensuring small-scale farmers have greater financial independence and value addition opportunities while enabling them to respond to demand from consumers</p>	<p>HIGHLY considered. The project ensured the income of farmers by promoting other income-generating activities such as rice-fish farming, dairy production, fruit and vegetable growing</p>
<b>Ensuring equity/social responsibility</b>	
<p><b>8. Co-creation of knowledge.</b> Enhance co-creation and horizontal sharing of knowledge including local and scientific innovation, especially through farmer-to-farmer exchange.</p>	<p>HIGHLY considered. Lead Farmers, FFS, visits-exchanges reinforce co-creation and horizontal knowledge sharing</p>
<p><b>9. Social values diets.</b> Build food systems based on the culture, identity, tradition, social and gender equity of local communities that provide healthy, diversified, seasonally and culturally appropriate diets.</p>	<p>INSUFFICIENTLY considered. The project did not sufficiently address this principle apart from the few initiatives such as the development of orange-fleshed sweet potato with women</p>
<p><b>10. Fairness.</b> Support dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights.</p>	<p>NOT CONSIDERED</p>
<p><b>11. Connectivity.</b> Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies.</p>	<p>INSUFFICIENTLY considered. The actions carried out by the project do not sufficiently develop the local economy. In fact, linking producers with the market is not among the planned activities despite its preponderant role in the effectiveness and long-term adoption of practices; and, the collaboration with local nurseries in the supply of young tree seedlings constitutes an initiative going in the direction of the principle but not sufficiently substantial to integrate this principle</p>
<p><b>12. Land and natural resource governance.</b> Recognize and support the needs and interests of family farmers, smallholders and peasant food producers as sustainable managers and guardians of natural and genetic resources.</p>	<p>NOT CONSIDERED</p>

Principle	Activities developed by the project
<p><b>13. Participation.</b> Encourage social organization and greater participation in decision-making by food producers and consumers to support decentralized governance and local adaptive management of agricultural and food systems.</p>	<p>NOT CONSIDERED</p>

## 2.2 Results and effectiveness

Based on the surveys conducted, this table that showing the evolution of the results indicators (baseline, mid-term and final situation of the Project) was established.

**Table 6 : Evolution of the project results indicators**

Result indicators	Ref.	Unity	Highland			Middle West				Together (Mid-term)	Together (Final)
			2018	Midterm	Final	2015	2017	Midterm	Final		
<b>Result 1: Scaling up CSA and good agricultural practice in the MO and HT of Vakinankaratra</b>											
<b>Result 1.1 Conservation Agriculture has been integrated into the farmers' production system and has improved the production of rice and other crops</b>											
Percentage of farmers adopting CA	IR 110	%	0%	13%	27%	2%	n/a	9%	42%	10%	37%
Area cultivated in Conservation Agriculture (average of adopters)		Ha	n/a	0.24	0.36	n/a	n/a	0.52	0.65	0.42	0.51
Area cultivated in Conservation Agriculture (adopters + non-adopters)		Ha	n/a	0.031	0.047	n/a	n/a	0.045	0.056	0.041	0.052
Percentage of farmers growing cover crops: CA based Mucuna	IR 110	%	0%	12%	22%	n/a	n/a	5%	19%	7%	20%
Percentage of farmers growing cover crops: CA based Cajanus, Crotalaria, tephrosia	IR 111	%	0%	10%	22%	n/a	n/a	4%	32%	6%	28%
Percentage of farmers growing cover crops: CA based Stylosanthes	IR 112	%	0%	0%	0%	n/a	n/a	5%	15%	4%	11%
Percentage of farmers growing rainfed rice	IR 113	%	42%	93%	97%	72%	55%	83%	96%	86%	96%
Area cultivated in rainfed rice	IR 114	Ha	0.1	n/a	0.17	0.32	0.28	n/a	0.49	n/a	0.34
Area cultivated with rainfed rice in CA (average of the project's farmers beneficiary)		Ha	0	0.135	0.08	n/a	n/a	0.356	0.31	0.27	0.25
Area cultivated with rainfed rice in CA (average of farmers in the Project's area)		Ha	0	0.06	0.07	n/a	n/a	0.089	0.29	0.08	0.18
Percentage of rainfed rice area in CA system	IR 115	%	0%	n/a	Between 2.3 to 16.9%	Between 1 to 6%	n/a	n/a	Between 1.1% to 24.3%	n/a	Between 1.6% to 21%
Average yield of rainfed rice in conventional cultivation	IR 116	Ton/Ha	1.57	n/a	n/a	1.7	1.49	n/a	n/a	n/a	n/a
Average rainfed rice yield in AC system	IR 117	Ton/Ha	0	n/a	3.16	3.8	n/a	n/a	2.47	n/a	2.81
<b>Result 1.2 Tree-planted areas and agroforestry area have increased</b>											
Percentage of farmers having tree-planted area	IR 121	%	12%	52%	63%	n/a	6%	52%	52%	52%	68%
Percentage of farmers practicing fruit plantations	IR 122	%	11%	35%	42%	n/a	4%	32%	32%	33%	50%
Average of tree-planted area per farmer	IR 123	Ha	0.042	n/a	n/a	0.12	0.021	n/a	n/a	n/a	n/a
Average number of tree-planted (overall average)		Seedlings	n/a	176	147	n/a	n/a	61	61	94	151
Average number of tree-planted (by adopters)		Seedlings	n/a	345	248	n/a	n/a	132	132	196	248
Average of fruit plantation area per farmer (number of plant but only beneficiary)	IR 124	Ha	0.003		n/a	0.013	0.014	n/a	n/a	n/a	n/a
Average of fruit plantation area per farmer (Average number of those who planted fruit trees (adopters) among the project beneficiaries)		Seedlings	n/a	42	n/a	n/a	n/a	33	33	36	n/a

Result indicators	Ref.	Unity	Highland			Middle West				Together (Mid-term)	Together (Final)
			2018	Midterm	Final	2015	2017	Midterm	Final		
Average number of fruit planted (General average of all farmers beneficiaries (adopters and non-adopters))		Seedlings	n/a	18	n/a	n/a	n/a	13	13	14	n/a
<b>Result 1.3 Best agricultural practices have been developed</b>											
Percentage of farmers practicing hedgerow (on Cajanus, tephrosia)	IR 131	%	n/a	12%	23%	0.60%	n/a	10%	23%	10%	23%
Percentage of farmers using bio-pesticides or repellent plants	IR 132	%	n/a	15%	18%	n/a	n/a	29%	33%	25%	28%
Percentage of farmers owning at least one cattle	IR 133	%	69%	50%	60%	43%	49%	46%	47%	48%	51%
Percentage (by number) of farmers producing milk (beneficiary)	IR 134	%	16%	25%	n/a	n/a	2%	19%	n/a	21%	n/a
Average of annual milk production per dairy farm (because the case of beneficiaries is not really comparable)	IR 135	liter	816	1389		n/a	56	889		1046	
Percentage of farmers producing vermicompost	IR 136	%	n/a	4%	7%	n/a	n/a	6%	7%	5%	7%
Quantity of vermicompost produced (beneficiaries)	IR 137	Kg	n/a	448		n/a	n/a	498		487	
Percentage of farmers producing classic compost	IR 138	%	14%	32%	42%	n/a	9%	21%	43%	24%	43%
Average amount of classic compost produced	IR 139	Kg	334	302	1666	n/a	124	176	2137	212	2245
Average quantity of classic compost produced (quantity of those who practice)	IR 139	Kg	n/a	932		n/a	n/a	839		874	
Percentage of farmers producing 7 days compost		%	n/a	3%	9%	n/a	n/a	4%	3%	4%	5%
Average produced quantity of 7 days compost (beneficiaries)		Kg	n/a	737		n/a	n/a	722		725	
Average produced quantity of 7 days compost (all concerned area)		n/a	n/a	20		n/a	n/a	31		28	
Percentage of farmers producing liquid compost		n/a	n/a	1%	8%	n/a	n/a	4%	5%	3%	6%
Average produced quantity (beneficiaries)		n/a	n/a	52		n/a	n/a	599		555	
Average produced quantity of liquid compost (all concerned area)		n/a	n/a	0		n/a	n/a	24		18	
Percentage of farmers building improved cowshed	IR 140	%	n/a	4%	3%	n/a	n/a	7%	10%	6%	8%
Percentage of farmers producing organic manure	IR 141	%	96%		52%	n/a	93%	93%	47%	93%	49%
Quantity of improved manure produced	IR 142	Kgs	4757	931		n/a	1719	1102		1037	
Percentage of farmers adopting forage crop	IR 143	%	2%	8%	15%	0%	0%	2%	0%	3%	5%
Average area of forage (adopters)	IR 144	Ha	0.11	0.1	2.96	0	0	0.2	33.03	0.1	14.76
Average area of forage (All concerned area)	IR 144	Ha	0.11	0.0	0.73	0	0	0.0	2.1	0.0	1.68
Percentage of farmers adopting the orange-fleshed sweet potatoes	IR 145	%	n/a	11%	14%	n/a	n/a	7%	15%	8%	15%
Average area cultivated in orange-fleshed sweet potatoes (average of adopters + non adopters)	IR 146	Ha	n/a	0.14	0.31	n/a	n/a	0.41	0.89	0.33	0.72
Average area cultivated in orange-fleshed sweet potatoes (adopters)	IR 146	Ha	n/a	0.65	0.87	n/a	n/a	2.49	2.98	1.86	1.93
Percentage of farmers introducing fish farming (pond and rice field)	IR 147	%	17%	n/a	n/a	13%	12%	n/a	n/a	n/a	
Percentage of farmers introducing fish into their rice field (rice-fish)		%	n/a	2%		n/a	n/a	6%		5%	

Result indicators	Ref.	Unity	Highland			Middle West				Together (Mid-term)	Together (Final)
			2018	Midterm	Final	2015	2017	Midterm	Final		
Percentage of farmers producing fry	IR 148	%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Surface moyenne de rizière en empoissonnée (adoptants)	IR 149	Ha	n/a	0.03	0.65	n/a	n/a	0.1	0.90	0.1	0.83
Average area of rice field with fish (general average, adopters+non-adopters)	IR 149	Ha	n/a	0.0004	0.00065	n/a	n/a	0.00066	0.13	0.00048	0.14
Average number of fry introduced into the rice field (adopters)	IR 149	fry	n/a	89		n/a	n/a	419		389	
Average number of fry introduced into the rice field (general average, adopters+non-adopters)	IR 149	Ha	n/a	1.42		n/a	n/a	26		19	
Average fish production per farmer	IR 150	Kgs						8.4			
Average fry production per fryer	IR 151	fry						2487			
<b>Result 2: Capacity of various stakeholders is built in climate-smart agriculture</b>											
<b>Result 2.1 The capacity of nurserymen strengthened</b>											
Percentage of trained nurserymen achieving the set objectives	IR 211	%	0%		n/a	0%	0%		n/a		n/a
<b>Result 2.2 CSA best practices have been mastered by farmers</b>											
Percentage of lead farmers who successfully completed their training activities	IR 221	%	0%		n/a	0%	0%		n/a		n/a
Percentage of trained farmers practicing CSA on their farms	IR 222	%	0%		n/a	0%	0%		n/a		n/a
<b>Result 2.3 CSA best practices have been integrated into secondary school program</b>											
Number of schools that have continued to conduct CSA demonstration plots	IR 231	Number	12		6	12	12		6		12
Number of students supported	IR 232	Number	2000			2000	2000		n/a		8217
<b>Result 3: Farmers Organizations are supported and linked to various stakeholders in the Agriculture to support sustainability of the project results</b>											
Percentage of FO trained producing fish/suppling fry	IR 311	%	0%		n/a	0%	0%		n/a		n/a
Dairy production gap for supported breeders	IR 312	%	0%		n/a	0%	0%		n/a		n/a
Percentage of FO members growing forage crops on their farm	IR 313	%	0%		n/a	0%	0%		n/a		n/a
Percentage of FO members adopting good practices on their farms	IR 314	%	0%		n/a	0%	0%		n/a		n/a

*Source : Baseline of the MANITATRA 2 project, April 2020 / Mid-term evaluation of the MANITATRA 2 project, January 2021 / Survey conducted by the group of Consultants, September 2021*

**2.2.1 Result 1: CSA and best practices are up scaled in two ecosystems of the VAKINANKARATRA region, covering the Highland and Middle West regions in Madagascar**

**Awareness sessions**

The project inception workshop was held in Antsirabe in November 2018. The information and communication sessions are the basis of the field staff interventions, technicians and LF, especially at the beginning of each campaign. The 7 days per month of Lead farmers (LFs) intervention during this period are very tight, given that the LFs are also busy with their farms. It should be noted, however, that the objectives set in terms of information and communication were exceeded over the two years of implementation, despite the existence of the COVID-19 pandemic in the 2<sup>nd</sup> year and part of the 3<sup>rd</sup> year.

**Table 7 : Indicators of awareness-raising activities, advocacy and exchange visits**

AI	Planned activities	Indicator	Goal	Realization				
				year 1	year 2	year 3	cumulation	%
1.1.1	Inception workshop	Number of workshops	1	1	0	0	1	100%
		Number of participants	120	110	0	0	110	92%
1.1.2	Exchange visits	Number of participants in intra-communal exchange visits	8,000	1,781	4,104	5,230	11,115	139%
		Number of participants in exchange visits between communes	500	518	437	881	1,836	367%
	Raising awareness, information and communication on project activities	Number of participants	7,000	2,242	3,900	1,713	7,855	112%
1.1.3	Car rental and other expenses during outreach	Number of car rental days	100	52		30	82	82%

*Source: Quarterly Report on MANITATRA 2 Project as of September 2021*

With the information and communication actions, exchange visits were organized in the FFS by lead-farmer or in the application plots of secondary schools or even at the plots of the producers adopting the CA systems. The delay in field staff implementation limited the results in the first year. In addition, mobilizing producers for exchange visits to the FFS is quite difficult given social factors such as doubt about the capacity of the technicians (lead farmers are sometimes not listened to much in the absence of the technician during the first two years of implementation but which has evolved positively in favor of these lead-farmers towards the third year). An improvement in exchange visits within the municipalities was however observed during the 2nd year but this was greatly limited from March 20, 2020 (the date of limitation of gathering linked to the health situation). Intermunicipal visits resumed towards the end of the 1st quarter of 2021 during which producers from the Middle West visited the achievements in the Highlands areas. These visits-exchanges allowed producers to see the results of agroecology and, consequently, boosted the adoption of the practices. These exchange visits allow farmers in the project area to assess the performance of agroecological practices. Usually, these visits are organized at the level of the FFS and/or the farmers' plots supervised by the project. Contrary to the demonstration plots, the farmers were able to observe throughout the year the practices carried out at the level of these FFS.

Apart from exchange visits within the municipalities, exchange visits outside communes always interest producers to inquire about new experiences. In addition, the support of the participants by the project influenced the result on the intermunicipal exchange visits. The final objective for this activity has already been largely exceeded.

Following information and communication actions, as well as exchange visits, a strong demand for cover crop seeds, particularly mucuna, marked the project towards the end of its implementation. According to interviews with the project team in Antsirabe, nearly 15 tons of mucuna seeds are available in the intervention areas, but more needs to be linked between these offers and the demands of producers.

## Conservation agriculture

The annual objective of the project is broken down by zone (technician) and by lead farmer (PL). In the 1st year, CA represents a technical innovation for agricultural production system in the highlands. Some highland areas have not succeeded in setting up CA at producer level but only at FFS level. The cover plants from the old plots set up during MANITATRA 1 have largely contributed to the result of the Middle West, despite the delay in MANITATRA 2 project implementation.

**Table 8 : Status of activity indicators for scaling up conservation agriculture**

	Planned activities	Indicator	Target	Realization				
				year 1	year 2	year 3	cumulation	%
1.2.1	Provide cover crop seeds (mucuna, cowpea, Stylosanthes, etc.)	Quantity of Mucuna seeds supplied (kg)	18 112	11,712		5,950	17,662	98%
		Quantity of Stylosanthes seeds supplied (kg)	2,097	1,347		492	1,839	88%
		Quantity of cowpea seeds provided (kg)	1,400	1,050		0	1,050	75%
		Quantity of oat seed supplied (kg)	1,800	600		1,200	1,800	100%
		Quantity of Vigna seeds supplied (kg)	150	150		0	150	100%
		Quantity of Cajanus seeds supplied (kg)	9,875	6,375		2,900	9,275	94%
		Number of farmers provided seeds of cover crops	5,000	1,824	3,119	1,491	6,434	129%
		Number of AC adopters		13,500				
	Total CA area (ha of CA)	2,000	425.19	1,095.17	2,058.70	2,058.70	103%	
1.2.2	Support for Stylosanthes rollers	Number group farmer provided Stylosanthes rollers	5	0	0	0	0	0%

Source: Quarterly Report on MANITATRA 2 Project as of September 2021

For the CA practice, it should be noted that this is an average at the scale of the fokontany concerned by the Project (all the Communes are not affected). At the communes' level, this percentage of farmers concerned is lower. For the Middle West, the percentage of concerned farmers in the Project areas is 42% if the intervention baseline and mid-term situations are respectively 2% and 9%. For the Highlands, the final adoption is 27% if it was at 13% at the mid-term in October 2020.

These high percentages are due to the enthusiasm of the farmers after the observation of the first two years and the exchange visits organized. However, this will not yet guarantee the sustainability of the system because many of them have been supplied with seeds by the Project and it is still necessary to wait a few years to be able to properly measure the sustainability and true adoption of CA. In any case, this high percentage already makes it possible to show in some way the interest and effectiveness of field schools, "farmer-to-farmer" dissemination systems and exchange visits. In Mandritsarakely (Antsoatany), about thirty farmers adopting CA without project's intervention but resulting from the knowledge and experiences acquired by the leader at the of the Antsoatany on CA.

**Table 9 : Evolution of the percentage of farms adopting CA**

Adoption/practice	Highland			Middle West			All project area		
	Baseline	Mid-term	Final	Baseline	Mid-term	Final	Baseline	Mid-term	Final
<b>Conservation Agriculture (CA)</b>	0%	13%	<b>27%</b>	2%	9%	<b>42%</b>	n/a	10%	<b>37%</b>
<i>CA based on Mucuna</i>	n/a	12%	<b>22%</b>	ns	5%	<b>19%</b>	n/a	7%	<b>20%</b>
<i>CA based on Cajanus, rattlesnake, tephrosia</i>	n/a	10%	<b>22%</b>	ns	4%	<b>32%</b>	n/a	6%	<b>28%</b>
<i>CA based on Stylosanthes</i>	n/a	0%	<b>0%</b>	ns	5%	<b>15%</b>	n/a	4%	<b>11%</b>

Source : Baseline of the MANITATRA 2 project, April 2020 / Mid-term evaluation of the MANITATRA 2 project, January 2021 / Survey of the group of Consultants, September 2021

At the end of its 3rd year, the total area cultivated in CA is estimated at 2058.70 ha with 4378 adopting producers<sup>9</sup> i.e. nearly 47 ares per producer with a dominance of the Mucuna-based system as shown in the table below:

**Table 10 : CA systems area distribution**

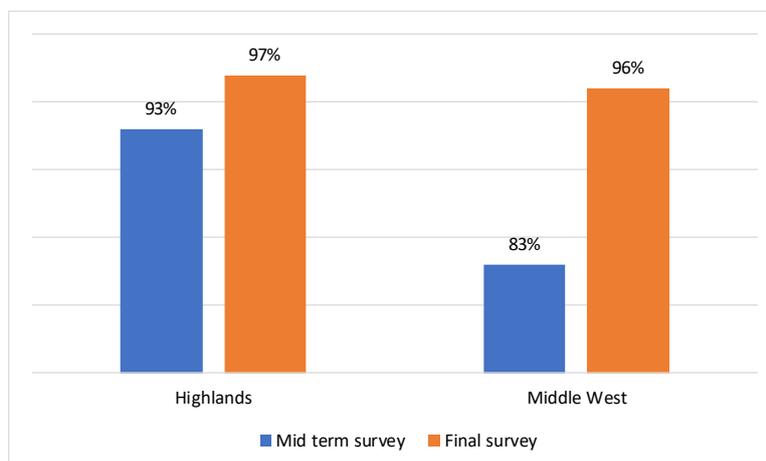
System	Area (Ha)		%	
	Mid-term	Final	Mid-term	Final
CA based on Mucuna	413.40	648.64	27.2%	31.51%
CA based on shrub legumes	399.31	576.23	26.3%	27.99%
CA based on Stylosanthes	376.28	456.75	24.7%	22.19%
CA based on Food legumes	327.09	370.18	21.5%	17.98%
CA based on Oats	4.88	6.91	3.00%	0.34%
<b>Total</b>	<b>1,520.96</b>	<b>2,058.70</b>	<b>100.00%</b>	<b>100.00%</b>

*Source : Analysis of the MANITATRA 2 project database*

The mucuna-based system remains the most representative. Compared to the mid-term result, there is a decrease in the adoption of the Stylosanthes-based system in the Middle West; the problem of material to control Stylosanthes remains the main limiting factor of this practice. It should be noted that the project relies on tripartite funding (FOs – GSDM – FDA) for the acquisition of rollers<sup>10</sup> in the Middle West. Of the 5 rollers planned, 4 requests have already been granted at the level of the CROA of the FDA of the Vakinankaratra Region, but the fund is still not accessible despite the availability of beneficiary contributions during the final evaluation.

Promising developments in the adoption of conservation agriculture have a positive impact on the CA adoption in rainfed rice while recalling that the MANITATRA 2 project was implemented to support the rainfed rice practice with the CA. In fact, this practice is currently in significant expansion. Current farming practices degrade the soil very quickly and with the climate change effects, the decline in yield is inevitable.

In all of the survey areas, rainfed rice practice has improved, particularly in the Middle West compared to the mid-term situation, as shown in the following graph:



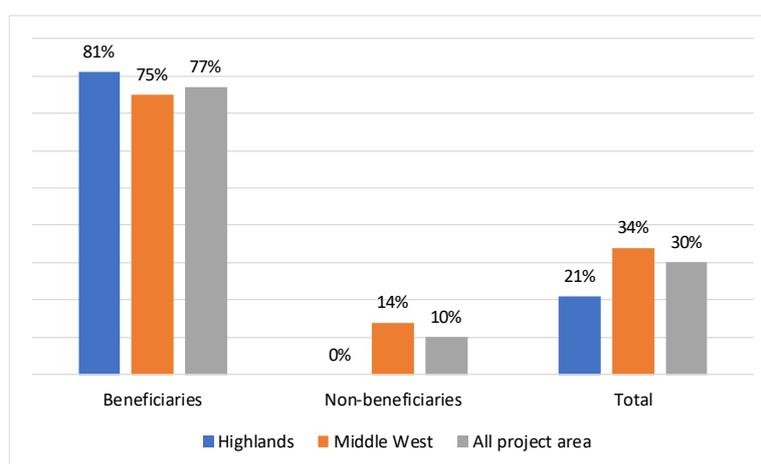
**Graph 1 : Evolution of rainfed rice practice in the survey areas**

This table shows a fairly high rate of the practice of rainfed rice that it should be noted that this reflects the situation in the Communes of intervention of the project which initially targets rainfed rice production areas.

For rainfed rice in CA, at the end of the project, 77% of the beneficiaries had promoted this technique if it was only 10% for the non-beneficiaries.

<sup>9</sup> Semi-Annual report, January to June 2021, GSDM

<sup>10</sup> The acquisition of roller is planned in the 3rd year of the project



**Graph 2 : Practice of CA on rainfed rice**

CA system is beginning to be practiced by producers in rainfed rice cultivation. If in 2015, between 1 to 6% of rainfed rice cultivation plots are conducted with the CA system, at the end of the project intervention, 21% of producers practice the system in 75 to 100% of their cultivation plots of rice on *tanety* (rainfed rice). In the Highlands, the percentage of the CA system in rainfed rice cultivation varies from 2.3% to 16.9%. The baseline situation is zero because there was no rainfed rice in conservation agriculture before MANITATRA 2 in the Highlands

**Table 11 : CA percentage in rainfed rice cultivation**

	0%	0 to 25%	25% to 50%	50% to 75%	75% to 100%
Highland	68.4%	2.3%	9.4%	2.9%	16.9%
Middle West	60.0%	1.1%	11.5%	3.2%	24.3%
All project area	63.7%	1.6%	10.6%	3.1%	21.0%
Ampitatafika	6.3%	0.4%	0.3%	0.5%	1.7%
Ankazomiriotra	9.6%	0.2%	1.0%	-	4.6%
Antanifotsy	1.2%	0.0%	0.1%	-	0.5%
Antsoatany	15.7%	-	0.8%	0.8%	4.9%
fidirana	16.4%	0.4%	4.6%	0.5%	5.5%
Soamanandrarinny	6.9%	0.6%	2.9%	-	0.3%
Soavina	7.6%	-	0.8%	1.3%	3.6%

*Source : Consultant group survey, September 2021*

Among the beneficiaries of the project, we can see in the following table an average surface area of 18 ares of rainfed rice with CA, including 7 ares in the Highlands and 29 ares in the Middle West.

**Table 12 : Average surface area of rainfed rice in CA (in are) among the adopters**

Overall average of project beneficiaries	Zoned					
	Highland		Middle West		Total	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Average area (are)	7	21	29	106	18	79

*Source : Consultant group survey, September 2021*

### **Reforestation - Agroforestry**

Concerning reforestation, the demand in the Middle West is such that the quantity of plants usually produced by nurserymen is well below the real needs. The number of nurserymen operating in the area already trained by the various actors (BVPI and FAFIALA) are sufficient to produce the project seedlings' needs. In the highlands, the function of nurseryman constitutes a new job opportunity and despite the

lack of experience of some nurserymen, the collaboration with the project is immediately granted. In this way, the number of nurserymen recruited by the project finally exceeds the number initially planned.

In general, the seedlings produced in the nurseries exceed the needs of the project both in the Highlands and in the Middle West. The project requires the production of well-specified species, adapted to each area, but sometimes the nurserymen set up other species to meet the farmers' demand. In fact, for their daily needs (firewood and construction), farmers demand species that are suitable for them. The free access seedlings, the proximity of nurseries to farms, the unlimited quantity of seedlings to be received, the good relationship with the nurseryman, the planting success rate, the pressing needs for construction and firewood contributed to the good performance of the reforestation activity.

Reforestation is carried out on particular plots but most often on the edge of crop plots and some producers for whom the land problem arises (producers renting land or those for whom the family inheritance is not yet shared between the descendants...) do not reforest.

Agroforestry was mainly oriented towards fruit growing. The subsidy granted by the project for the purchase of seedlings somewhat motivated the producers without, however, leading to any rush. In fact, the plants are delivered by the suppliers to the central place of communes following a "firm order" and a very punctual local availability of the plants. However, the purchasing power of the producers, the non-availability of money at the time of delivery, does not allow them a substantial investment. In addition, the training of technicians and farmers in fruit growing has been limited and failures have been recorded on some sites. Nevertheless, an expression of interest, particularly in the highlands, is recorded that the objectives set for this activity have been achieved.

The project has graciously provided plant seeds for hedgerow (Tephrosia, cajanus, crotalaria, etc.). These plants produce an important biomass useful for composting and constitute a windbreak and an anti-erosion system. Sometimes, producers also incorporate them into livestock feed or use certain species as firewood. The recommended plants thus have multiple functions benefiting the daily needs of producers. Often the project's intervention sites are seen by the installation of hedgerow around the perimeter and on the contour lines of plots.

**Table 13 : Status of activity indicators for the scaling up agroforestry and reforestation**

	Planned activities	Indicator	Target	Realization				
				year 1	year 2	year 3	Cumulative achievement	%
1.3.1	Support nurseries (potting bags, other materials)	Number of nurserymen supported	50	27	58	47	72	144%
1.3.2	Support adopting farmers in tree plantlets for reforestation (Acacia, Eucalyptus...)	Number of trees plantlets for reforestation	1.5 million	557 351	1,095,051	728 468	2,380,870	159%
		Number of reforestation adopters	n.a.	2,853	3,136		5,989	-
1.3.3	Support adopting farmers in fruit tree plantlets	Number of seedlings acquired by adopters in fruit growing)	50,000	6,527	6,929	2,978	16,434	33%
		Number of fruit tree adopters	n.a.	544	305		849	-
1.3.4	Provide seeds of hedgerow (Cajanus, Tephrosia)	Quantity of Tephrosia seeds supplied (kg)	3,169	2,169		1,000	3,169	100%
		Quantity of Cajanus cajan seeds supplied (kg)	3,550	2,350		2,900	5,250	148%
		Quantity of rattlesnake seeds supplied (kg)	168	168		0	168	100%
		Number of producers supplied with seeds for hedgerow	6,500	1,297	2,452	1,132	4,881	75%
		Length of hedgerows (in ml)	1,000,000	239,877	699 873	369 289	1,309,039	131%

*Source: Quarterly Report on MANITATRA 2 Project as of September 2021*

The following table gives the percentage of farmers in the Project intervention areas that have practiced reforestation, planting fruit trees and hedgerows. Compared to the mid-term situation, the project interventions have allowed an increase in the practice at the level of the beneficiaries.<sup>11</sup>

<sup>11</sup> The average in the whole area was unfortunately not available

**Table 14 : Percentage of Farmers having practiced reforestation, fruit tree growing and hedgerow**

Area	Highland		Middle West		All project area	
	Midterm	Final	Midterm	Final	Midterm	Final
Reforestation	52%	63%	52%	70%	52%	68%
Fruit tree planting	35%	42%	32%	53%	33%	50%
Hedgerow	12%	23%	10%	23%	10%	23%

*Source : Mid-term evaluation of the MANITATRA 2 project, January 2021 / Consultant group survey, September 2021*

A high percentage of farmers practicing reforestation is noted. Even if the indicators cited on this aspect are different from the baseline indicators (as specified above, the reference indicators give the percentage with reforested areas and here tree plantations), we can see a strong increase in area due to the intervention of the Project.

The following table gives the details of the practice at the level of the Communes during the final evaluation:

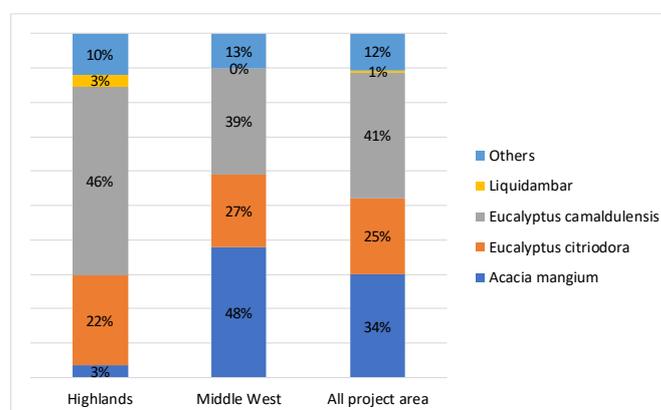
**Table 15 : Percentage of farmers practicing reforestation, fruit trees and hedgerows per Commune**

Commune	Reforestation	Fruit tree planting	Hedgerow
Highlands	63%	42%	23%
Ampitatafika	62%	35%	18%
Antanifotsy	50%	59%	52%
Antsoatany	71%	45%	25%
Middle West	70%	53%	23%
Soamanandrarinny	61%	49%	12%
Ankazomiriotra	62%	48%	24%
fidirana	78%	44%	27%
Soavina	75%	70%	18%
All project area	68%	50%	23%

*Source : Consultant group survey, September 2021*

This table shows a fairly high percentage of reforestation in Fidirana and Antsoatany with percentages reaching more than 50% in the other communes (a little less in Ankazomiriotra). Hedgerows are practiced by a relatively high number in Antanifotsy due to the generalization of this practice by the beneficiaries. The statistics from the final evaluation corroborate the results and trends observed during the mid-term evaluation in October 2020.

The following figures give the distribution of reforested plants according to the declarations of the farmers.



**Graph 3 : Distribution of reforested species per area (reforested plants in %)**

The analysis of the average number of trees reforested by farmers, as shown in the table below, shows that, overall, each farmer has reforested on average nearly 152 tree seedlings with a preference for Acacia,

while noting that reforestation really started in the second year. This average is much higher for the beneficiaries (248 seedlings per farmer).

**Table 16 : Average number of trees reforested per farmer in the project areas**

Average number of plantlets (general average)	Area					
	Highland		Middle West		Total	
	Mean	Coefficient of variation	Medium	Coefficient of variation	Medium	Coefficient of variation
Total	147.25	263%	153.92	243%	151.89	249%
Acacia	4	1686%	104	272%	73	330%
Citriodora	67	423%	16	302%	31	521%
Camaldulensis	71	263%	35	350%	46	318%
Liquidambar	5	1094%	0	#DIV/0!	1	1988%

Source: Consultant group survey, September 2021

**Table 17 : Average number of trees reforested per beneficiary**

Average number of plantlets (average of adopters)	Area					
	Highland		Middle West		Total	
	Mean	Coefficient of variation	Medium	Coefficient of variation	Medium	Coefficient of variation
Total	248.32	193%	247.88	182%	248.01	185%

Source: Consultant group survey, September 2021

The survival percentages of the plants vary according to the areas and species. Generally, the survival percentages are higher in the Highlands and more homogeneous (with a lower coefficient of variation except for Liquidambar which is a little higher). They are weaker in the Middle West with higher variability. These findings are normal given the size of the plots (easier maintenance in the Highlands in small areas than in the Middle West in large areas). Sunburns in case of drought are more important in the Middle West.

Overall, the survival rates are generally acceptable at more than 70% at the end of the project except for *Eucalyptus camaldulensis* in the Middle West (below 70%). Note that these figures include those recently installed up to 3 years of installation. The years were not specified during the investigations.

**Table 18 : Percentage of survival of reforested plants at the end of the project**

Survival percentage	Highlands			Middle West			All project area		
	Mean	CV	Median	Mean	CV	Median	Mean	CV	Median
Acacia	77.0%	24%	75.0%	66.6%	34%	70.0%	67.4%	33%	70.0%
Eucalyptus camaldulensis	80.0%	21%	80.0%	54.2%	42%	67.0%	64.4%	37%	68.3%
Eucalyptus citriodora	76.9%	21%	80.0%	54.0%	47%	70.0%	65.0%	37%	70.0%
Liquidambar	74.9%	36%	80.0%	-	-	-	74.9%	36%	80.0%

Source: Consultant group survey, September 2021

Concerning hedgerow, the practice is encountered in 23% of farmers in the survey areas. The hedgerow with the cajanus is the most practiced among the three main cultivated plants, namely: cajanus, tephrosia, crotalaria.

**Table 19 : Practice of the hedgerow in the survey areas**

Hedge	Highland	Middle West	All project area
Total	23%	23%	23%
Cajanus	14%	19%	17%
Tephrosia	19%	10%	13%
Crotalaria	4%	4%	4%

Source: Consultant group survey, September 2021

### **Variability of the results obtained on other best agricultural practices**

Compared to the mid-term situation of the project, for the third and final year of implementation, some indicators have been added and figured in the project activity reports for the 3rd year with a view to

measuring the progress of the activities implemented. These indicators mainly relate to the quantity of fodder plant seeds supplied.

The following table details the progress of the implementation of activities within the framework of the promotion of good agricultural practices in relation to the objectives initially set.

**Table 20 : Status of activity indicators for other best agricultural practices' promotion**

	Planned activities	Indicator	Target	Realization				
				year 1	year 2	year 3	Cumulative achievement	%
1.4.1	Provide seeds of plants used as biopesticides and repellent plants	Number of producers supported with seeds of mucuna, rattlesnake, other plants used as biopesticides and repellent plants	5,500	1,607	2,233	1,326	5,166	94%
1.4.2	Provide worms for composting	Quantity of worm supplied for composting (kg)	10	10	-	0	10	100%
		Number of adopters	250	46	261	401	708	283%
	7 days compost	Number of adopters	200	60	52	9	121	61%
	45 days compost	Number of adopters	200	62	115	68	245	123%
	Classic compost	Number of adopters	600	202	438	217	857	143%
	liquid compost	Number of adopters	250	65	153	75	293	117%
1.4.3	Participate in the improvement of cowshed for quality manure and composting	Number of dairy farmers benefiting from improved cowshed for quality manure, improved dairy cow conditions and composting	300	1	152	5	158	53%
1.4.4	Provide seeds of forage (grasses and legumes and off-season forage...) and food safety plants (orange flesh potatoes)	Quantity of oat seed supplied (kg)	1,620	1,470		0	1,470	91%
		Quantity of ryegrass seed supplied (kg)	635	485		150	635	100%
		Quantity of Chloris seeds supplied (kg)	150	0		0	0	0%
		Quantity of Brachiaria seeds supplied (kg)	125,000	0		30,000	30,000	24%
		Quantity of Pennisetum seeds supplied (kg)	6,250	0		36,250	36,250	580%
		Quantity of fodder radish seeds supplied (kg)	160	10		150	160	100%
		Quantity of pannar seed supplied (kg)	75	0		0	0	0%
		Quantity of orange-fleshed sweet potato vine supplied (Cutting)	16,300	8,300		7,000	15,300	94%
		Number of farmers supplied with fodder seeds (grasses and legumes and off-season fodder, etc.) and orange-fleshed potato vines for food security	2,000	285	578	700	1,563	78%
1.4.5	Provide fry and other equipment for farmers for fish raising in the paddy field or in ponds (base on the experiences of APDRA and CIRAD)	Number of producers provided with equipment and fingerlings for rice-fish farming or fish farming in ponds	150	0	316	683	999	666%

Source: Quarterly Report on MANITATRA 2 Projctas of september 2021

#### ■ Composting

For the management of organic matter, the table below gives the percentage of farmers affected in the areas surveyed and which globally reflects the Project areas.

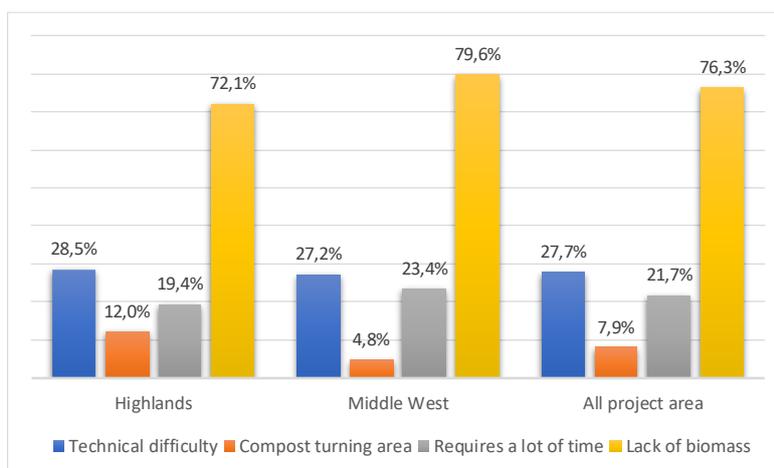
**Table 21 : Percentage of farmers adopting different types of compost**

	Area		
	Highland	Middle West	All project area
Classic compost	42%	43%	43%
Liquid compost	8%	5%	6%
7 days Compost	9%	3%	5%
Vermicompost	7%	7%	7%
Organic manure	52%	47%	49%

Source: Consultant group survey, September 2021

In all project area, classic compost remains the most practiced by 42% of farmers, although it was at 24% during the mid-term evaluation. In a matter of 12 months, the project was able to increase the percentage of adoption of this practice by 18 points. This trend is due to the fact that cattle breeding is quite important in both areas such as the ripple effects of other members of the community to practice it by seeing the successful experiences of project beneficiaries. The production of organic manure is a common practice on farms. Even farms that do not have cattle try to produce compost from available biomass and purchased or collected manure. This movement confirms farmers' perception of the unavoidable need for organic fertilizers to ensure reasonable production. In addition, chemical fertilizers are expensive, so producers are forced to proceed on composting. This inclination is only limited by insufficient biomass and manure.

According to the surveys, such as the situation during the mid-term evaluation, the lack of biomass remains the main problem encountered by farmers in the manufacture of compost with 76% of cases, the technical difficulty concerns only 28% of cases, as shown in the following graph:



**Graph 4 : Main problems encountered in composting process**

Contrary to the types of compost mentioned above, the adoption of liquid and 7-day compost is progressing rather slowly given the difficulty encountered by producers in making them, particularly with the need for manure and green biomass and availability of specific inputs such as activator (rumen juice for 7-days compost), repellent plants for liquid compost.

Vermicompost was successful in the implementation of the project. For the Middle West, this fertilizer is already anchored in the production habits of some farmers who already practiced it. The earthworm provided by the project and the results observed on agricultural production through its use have encouraged adoption in the highlands. Currently, several producers are convinced of the performance of vermicompost.

Interesting data also emerge on the quantity declared by farmers who practice the different types of compost.

**Table 22 : Quantity of compost produced in Kg for those who produce**

Type of compost	Highland		Middle West		All project area	
	Mean	CV	Mean	CV	Mean	CV
Compost 7 days	227	489%	108	714%	139	627%
Vermicompost	68	322%	97	604%	89	576%
liquid compost	7	340%	22	724%	18	765%
Classic compost	1,027	157%	1,364	158%	1,274	159%

*Source: Consultant group survey, September 2021*

There is an average quantity produced of about 1 ton of compost, which is not negligible given the lack of organic matter in these areas, but with great variability between the production of each farmer. The average yields per farmer for the other types of compost are also significant, showing the importance of these types of composting when it is practiced.

- Improved cowshed and forage crops

The result on the improved manure from the improvement of the cowshed can also be confused with the result observed with classic compost and 45-day-old compost. However, the indicator for improved cowshed refers to the number of cowsheds. Slow progress of this indicator is seen. Currently, 158 stables out of the 300 planned by the project have been built and a request from 91 cattle producers is being studied by the project.

**Table 23 : Percentage of farms practicing cattle breeding and improved barn**

Practice/Adoption (% household)	Cattle farming	Improved barn	Fodder crops
Highland	60%	3%	15%
Middle West	47%	10%	0.4%
All project area	51%	8%	5%

*Source: Consultant group survey, September 2021*

Concerning the adoption of fodder crops, the results of the survey gave figures close to 5% if the rate of cultivation of at least one fodder crop was 3.5% during the mid-term evaluation. The percentage is slightly higher in the Highlands (15% of farmers) due to the importance of dairy farming area.

The cultivation of oats in the off-season in the rice fields is one of the most usual practices of breeders, particularly in the Highlands with an average surface area of 14.76 ares for the beneficiaries who practice it.

The average surface area under fodder crops taken as a whole in the Middle West zone is higher for the whole zone with an average of 38 ares given the larger average surface area of *tanety* in the zone. This very small average area for the entire area (0.74 are) reflects the lack and narrowness of plots for fodder crops.

**Table 24 : Average area (are) in fodder crops**

Fodder crops	Highland	Middle West	All project area
oats	0.46	0.04	0.17
Brachiaria	0.17	1.44	1.05
Ray grass	0.10	0.06	0.07
Stylosanthes	0.01	0.54	0.38
banagrass	0.00	0.00	0.00
Penissetum	0.00	0.01	0.01
<b>Total</b>	<b>0.74</b>	<b>2.10</b>	<b>1.68</b>
<b>Average area for adopter (are)</b>	<b>2.96</b>	<b>38.03</b>	<b>14.76</b>

*Source: Consultant group survey, September 2021*

- Orange-fleshed sweet potato

In any case, the situation is such that the sweet potato vines supplied were insufficient. The sufficient availability of both lianas and fodder seeds for the campaign currently starting up is not as obvious. In fact, the previous beneficiaries are supposed to share part of the seeds and/or vines produced on their plots, but the methods of distribution are not fixed.

Bora, Mendrika, Donga, Irène are the most popular orange-fleshed sweet potato varieties.

Regarding orange-fleshed sweet potato practices in the project areas, the percentage of farmers is changing positively if we compare the mid-term situation of the project and the final situation.

**Table 25 : Percentage of farmers concerned by orange-fleshed sweet potatoes practice**

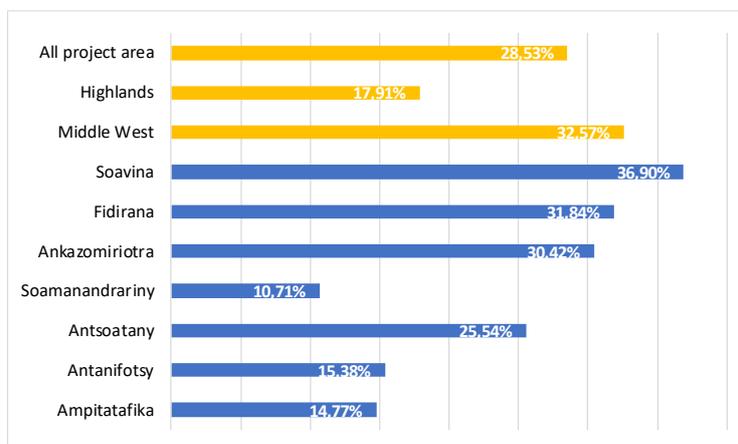
Period	Highlands	Middle West	All project area
Mid-term	11.3%	7.3%	8.4%
Final	13.7%	15.4%	14.8%

*Source : Mid-term evaluation of the MANITATRA 2 project, January 2021 / Consultant group survey, September 2021*

- Biopesticides

For information, tansy, wormwood, comfrey are used by farmers as repellent plants.

The percentage of adoption of the practice remains almost the same as during the mid-term evaluation in 2020 with a dominance of the practice in the Middle West (32.57%) compared to the Highlands (17, 91%).



Graph 5 : Biopesticide adoption

### CSA data collection

CSA data collection depends on the predisposition of the project partners. In fact, if the project has already made the preparations for the collection of data and the insertion of these data in the existing database, the agreement with the partners planned for the implementation has not yet been ratified.

Table 26 : Situation of activity indicators in relation to CSA data collection

	Planned activities	Indicator	Target	Realization				
				year 1	year 2	year 3	Cumulative achievement	%
1.5.1	Contract with a firm to conduct a national survey in some strategic agroecological areas	Expertise contract for a national survey	1	0	0	1	1	100%
1.5.2	Integrate the data into MANAMORA database - and improve the database by contracting with CIRAD	Contract with CIRAD to integrate the data into the MANAMORA database	1	0	0	0	0	0%
1.5.3	Train the regional directorates of MINAE (DRAE) in the use of the MANAMORA database	Number of DRAEP agents trained in the use of the MANAMORA database	5	0	0	0	0	0%
1.5.4	Transfer the database to the DRAE (Regional Directorate of the Ministry)	Database transferred	1	0	0	0	0	0%

Source: Quarterly Report on MANITATRA 2 Project, september 2021

### 2.2.2 Status of Outcome 2: Stakeholder capacities are strengthened in the area of climate-smart agriculture (conservation agriculture and agroforestry).

#### Nearly completed training for key stakeholders at the territory level

These stakeholders are made up of nurserymen, leading farmers and participating schools. Since the start of the project, 72 nurserymen have already worked with the project and been trained by the DREDD under the agreement between the project and this regional department.

**Table 27 : Situation of activity indicators in relation to the nurserymen training**

	Planned activities	Indicator	Target	Realization				
				year 1	year 2	year 3	Cumulative achievement	%
2.1.1	Train nurserymen	Number of nurserymen trained	50	27	57	47	72	144%

*Source: Quarterly Report on MANITATRA 2 Project, september 2021*

The project staff also provides continuous training for the lead-farmers. 82 LF have benefited training since the start of project, but 33 LF have either resigned or been fired: 49 remain operational. The target is exceeded.

**Table 28 : Situation of activity indicators in relation to lead-farmers' training**

	Planned activities	Indicator	Target	Realization				
				year 1	year 2	year 3	Cumulative achievement	%
2.2.1	Train lead farmers (by project technicians and other actors)	Number of lead-farmers	50	50	54	51	82	164%
2.2.2	Support cost of farmers training by Lead farmers (Farmer to farmer approach, based on man-day spent on training of their peer farmers)	Number of LF of man-days	12,600	1,279	4,205	4,872	10,356	82%
	Training of adopters	Number of participants	5,000		3802	1689	5,491	110%

*Source: Quarterly Report on MANITATRA 2 Project, september 2021*



**Photo 1 : CEG Ambohimandroso, one of the schools selected to benefit from the support of the**

commitment tripartite charter between the GSDM, the OEMC and each involved school.

In order to involve the MEN in the process, the OEMC agents were trained in agroecology and took part in an exchange visit to the CEFFEL site. The OEMC agents provided training for the first person in charge of each involved school, accompanied by 3 teachers: 3 training sessions were organized over the three years of the project's implementation. At the request of some schools (Ankazomiriotra and Betafo), a special session was conducted during the second year in particular because of the initially trained teachers' assignment or for capacity building. An assignment of the two teachers at Antsoatany is also observed during the third year. The objective in terms of teacher training has been achieved and even exceeded.

The training tarpaulin and the fun booklet were provided to schools as educational tools. School supplies such as pen and notebook were also delivered. The various training materials have been delivered to the schools. They include seeds and fertilizers, fruit tree plantlets, wheelbarrow, spade, fork, shovel, sprayer, jug, bag, A frame (for contour line), reforestation seedlings. The seeds for secondary schools are supported by the project<sup>12</sup> up to 90%. The 12 schools supervised have benefited from these kits.



Picture 1 : Example of fun training materials used

The target students are mainly in the 6th and 5th grade. The number of students per class varies from one school to another, but in total 8217 students and 45 teachers<sup>13</sup> are trained on CSA. Sometimes, some schools train other classes according to the demand of the students or according to the schools' situation assessment. The annual number of students trained may include students who have received training over 2 successive years if they were in 6th grade during the first training. Overall, the achievement in terms of trained students greatly exceeds the defined objective.

Table 29 : Situation of activity indicators in relation to the students' training on the CSA

	Planned activities	Indicator	Target	Realization				
				year 1	year 2	year 3	Cumulative achievement	%
2.3.1	Make diagnosis to select beneficiary schools	Number of diagnoses to select beneficiary schools	1	1	-	-	1	100%
		Number of schools selected	12	12	-	-	12	100%
2.3.2	Organize events (commitment charter, tools delivery)	Number of events	2	2	-	-	2	100%
2.3.3	Organize training for ministry branch (OEMC / DREMC / BEMC)	Number of training sessions organized for the Directorate of the Ministry	1	1	-	-	1	100%
2.3.4	Organize training for teachers (3 training sessions in Vakinankaratra)	Number of training sessions organized for teachers	3	4	-	-	4	133%
2.3.5	Training tools (tarpaulin, booklet, teaching guide, language-photo) - 6 new schools	Number of training tool packs	1	2	-	-	2	200%
2.3.6	Produce and edit communication tools (tarpaulin, Roll up)	Number of communication tools pack	2	1	-	-	1	50%
2.3.7	Produce film for communication	Number of films for product communication	1	-	1	-	1	100%
2.3.8	Produce comics for students	Number of comic strips produced for students	1	-	-	-	1	100%
2.3.9	Provide kits and inputs for demonstration plots (materials and tools, teaching tools, inputs) for 6 new schools	Number of demonstration plots	12	12	12	12	12	100%
2.3.10	Support students in the implementation	Number of students trained	6,000	1,965	3,047	3,205	8,217	137%

<sup>12</sup> Support for the application plot preparation, support for the technical supervision of students, capacity building of teachers through practical sessions are the guidelines of the project's commitments in the agroecology dissemination at the school level.

<sup>13</sup> Agroecology in schools, a sustainable alternative for the dissemination of agroecology, GSDM, December 2020

	Planned activities	Indicator	Target	Realization				
				year 1	year 2	year 3	Cumulative achievement	%
2.3.11	Organize competition for the best school (demonstration plot and student knowledge)	Number of competitions for the best school organized	1	0	-	-	0	0%
2.3.12	Exchange visits between schools	Number of exchange visits between schools	3	3	15	12	30	1000%
		Number of participants in exchange visits between schools	300	77	429	331	837	279%
2.3.13	Organize an annual workshop (capitalization, exchange of experiences)	Number of annual workshops	3	0	2	1	3	100%
2.3.14	Car rental for training, follow-up and other actions for the school	Number of car rental days	60	37		26	63	105%

Source: *Quarterly Report on MANITATRA 2 Project* of september 2021

Already from the first year, a significant number of exchange visits between schools are organized by the project. While exchange visits particularly involved school officials and teachers during the first year, students and parents were involved in year 2. Awareness-raising among parents is carried out specifically during these visits and at the regular meetings of parents at each school. Attendance sheets are not drawn up at these meetings<sup>14</sup>; but according to the document “*Agroecology in schools, a sustainable alternative for the agroecology dissemination, GSDM, December 2020*”, a total of 249 parents of students have been sensitized by the MANITATRA-2 project<sup>15</sup>.

It is important to emphasize that the interest of parents and farmers in the surrounding area constitutes a scaling up of the dissemination of techniques and increases the number of people adopting best agricultural practices. In this sense, cases of spontaneous adoption in areas outside of the project’s intervention have been recorded, such as those observed in Fokontany Mandritsarakely (Rural Commune Antsoatany) and the hamlet Ambohikely (Rural Commune Antanifotsy); also, in Vinaninkarena (outside the intervention zone) where farmers and parents have obtained specific seeds from the secondary school of Vinaninkarena. The same is observed at the school level, the trained teachers testify to the advantages of Agroecology and not only practice at the level of their own farms, but also disseminate best practices with their peers in their respective *fokontany*.

Visits to school application sites, project adoption plots and the Ivory site are conducted regularly and interest participants. Visits to application sites are thus the main persuasive tool of the project. Only COVID-19 prevention measures limited the use of this tool. In particular, visitors to the Ivory site are composed of decision-makers, researchers, technicians, students, teachers, parents, journalists and photographers.

The competition for the best school among the 12 schools supported by the project did not take place due to the context of the COVID-19 pandemic.

Communication tools (tarpaulin and roll up) for schools were produced during the agroecological day, accompanied by the production of a film with the national television (TVM) collaboration.

Three workshops (capitalization, exchange of experiences) were organized in years 2 and 3.

<sup>14</sup> This made it difficult to identify these parents of pupils, but according to our interviews with the local project managers, the parents of interested pupils contacted the technicians and/or the peasant leaders and were counted as direct beneficiaries. necessary supports in the same way as the others.

<sup>15</sup> The GSDM implements the agroecology dissemination at school level with 3 projects (PAPAM, MANITATRA-2 and ProSol). For these 3 projects, a total of 95 teachers, 11,233 students and 478 parents are trained on agroecology (Source: *L’agroécologie en milieu scolaire, une alternative durable de diffusion de l’agroécologie, GSDM, December 2020*).

## **Training of producers and development actors**

According to the farmer-by-farmer approach, lead farmers conducted training sessions on the FFS or on within the fokontany under their responsibility.

LF intervention time is set at 7 days per month, and each LF uses this cycle at his convenience, so the number of trained producers can vary depending on the LF frequency intervention. If during the mid-term evaluation, it was noted that some farmers sometimes encountered difficulties in working with the LF (tendency to favor relatives, LFs not listened to much), the final evaluation notes that awareness of LF among beneficiaries is beginning to take on more and more prominence. They are starting to have a reputation with other surrounding producers.

Apart the reduction of farm work fees, the project's support for the supply of cover crop seeds and the various visit-exchanges had positive impacts on producers' involvement. These cover crop seeds are beginning to be researched by other producers not supported by the project.

However, various factors prevent some of them from participating in the CA development.

### *Availability of inputs*

Some seeds of rice varieties (FOFIFA 186 and FOFIFA 182) are not yet commercially available. In fact, the supply and demand for seeds cannot be matched. A multiplication strategy has not yet been developed, but the project is trying to implement a multi-local collection in order to improve supply.

The cover crop seeds supplied are always insufficient or delivered late to be able to expect a seed harvest at the end of each production cycle.

### *Difficulty of implementation*

Some of the farm work requires specific materials or gestures that are sometimes considered out of reach by the farmers. Among others, row cultivation (requiring a marked cord), stylosanthes management, the cajanus plantation, harvesting the associated cajanus rice are all examples cited.

### *Economic and social problem*

The CA implementation requires sufficient land availability: techniques (rotation, fallow, ...) require certain sacrifices that could impact the basic needs of small farms. In fact, small farms need to exploit all available space for food production. To this end, the production of pure cover crops is not an option.

The cover crops are often consumed by livestock (zebus, chickens, etc.) or are taken by cattle farmers, and social conflicts could result if the plots are not guarded or fenced, which is often an out of reach investment.

The use of fertilizer, especially manure or compost, is systematic in the technique's implementation. The acquisition or availability of this basic input remains uncertain for most producers.

**Table 30 : Status of activity indicators in relation to training targeting development actors such as farmers' organizations, NGOs and service providers**

	Planned activities	Indicator	Target	Achievement				
				year 1	year 2	year 3	Cumulative achievement	%
2.4.1	Organize training sessions targeting development actors such as farmer organizations, NGOs and service providers	Number of participants trained from development actors	60	0	0	20	20	33%
2.4.2	Organize an exchange visit to GSDM training sites	Number of participants in exchange visits to GSDM training sites	2400	1,306	658	1273	3237	135%
2.4.3	Organize an exchange visit to GSDM training sites	Car rental during training sessions (6 days per session)	18	0	0	6	6	33%

*Source: Quarterly Report on MANITATRA 2 Project, september 2021*

### **Implementation of the collaboration with the decentralized technical services**

The project has signed collaboration agreements with the Regional Meteorology Department, the DRAE and the DREDD.

With the Regional Department of Meteorology, the collaboration consists of raising awareness on climate change, promoting agro-meteorological databases and carrying out training on the use of meteorological data for use in the agricultural sector. In this regard, three workshops on the promotion of agro-meteorological databases were organized for FO, communal development officers, CIRAEP chiefs, local partners and project technicians. Quarterly agro-meteorological bulletins were developed and distributed to workshop participants as well as to individuals and organizations involved in rural development. However, the activities provided for in the agreement were suspended following the replacement of the first regional officer. The realization of the training workshops and sensitization seems hypothetical in view of the reorganization of the service, but the other activities could continue normally.

**Table 31 : Status of activity indicators concerning the involvement of the regional meteorology department**

	Planned activities	Indicator	Target	Achievement				
				year 1	year 2	year 3	Cumulative achievement	%
2.5.1	Organize Information/sensitization of local stakeholders	Number of sensitization workshops on climate change by the regional office of meteorology	3	0	40	1	41	1367%
2.5.2	Organize training workshop for local stakeholders	Number of training workshop sessions	3	0	2	7	9	300%
		Number of participants trained on climate change and informations bulletins	75	0	-	75	75	100%
2.5.3	Provide regional meteorological information bulletins (quarterly)	Number of informations bulletins provided	800	0	343	410	753	94%
2.5.4	Provide a per diem for the meteorological officer	Number of man-days of intervention by meteorological agents	12	0	16	32	48	400%

*Source: Quarterly Report on MANITATRA 2 Projectas of september 2021*

The regional offices of MINAE and MEDD in the Vakinankaratra region are members of the project steering committee, along with their representatives from the central ministries. These services thus contribute to the development of strategies and inform the various orientations of the project. In addition, these services have participated in the training of local stakeholders and monitor achievements in the field. The partnership with these two regional directorates was not a problem.

**Table 32 : Status of activity indicators concerning the involvement of MINAE and MEDD regional branch**

	Planned activities	Indicator	Target	Achievement				
				year 1	year 2	year 3	Cumulative achievement	%
2.6.1	Organize field collaboration and exchange by MINAE + MEDD	Number of MINAE/MEDD missions	3	0	0	0	0	0%
2.6.2	Organize field collaboration and exchange by regional directorates (DRAE + DREDD)	Number of collaboration agreements signed	2	1	1	0	2	100%

**Table 33 : Status of activity indicators regarding the CSA integration in public policies**

	Planned activities	Indicator	Target	Achievement				
				year 1	year 2	year 3	Cumulative achievement	%
2.7.1	CSA Integration into public policies	Number of CSA workshops in which GSDM participated	3	0	2	1	3	100%
2.7.2	Participate in workshops or meeting on climate change to advocate for CSA (free of charge)	Number of climate change workshops attended by GSDM	3	0	1	2	3	100%

*Source: Quarterly Report on MANITATRA 2 Project as of September 2021*

### 2.2.3 Result 3: Farmers' organizations are supported and linked to various stakeholders in agriculture for the sustainability of the project's results.

#### Raising awareness on climate change: started from the third year

Scheduled from April 2020, the COVID-19 pandemic forced the project to suspend the realization of this activity for an effective start from the third year.

**Table 34 : Situation of activity indicators on experience sharing with FO**

	Planned activities	Indicator	Target	Achievement				
				year 1	year 2	year 3	Cumulative achievement	%
3.1.1	Organize awareness raising on climate change targeting development actors such as farmer organizations, NGOs, local service providers	Number of awareness sessions carried out on climate change	3	0	0	1	1	33%
		Number of participants informed about the climate change framework	90	0	0	20	20	22%
3.1.2	Car rental during training sessions (2 days per session)	Number of car rental days	6	0	0	6	6	100%

*Source: Quarterly Report on MANITATRA 2 Project, september 2021*

#### Suspension of the COMESA exchange visit

While the exchange visits at the national level have been an undeniable success, the planned visit for an exchange with COMESA and member countries was prevented by the COVID-19 pandemic. In fact, the abolition of international flights or the closure of territories does not allow the free movement of people.

**Table 35 : Situation of activity indicators concerning the sharing of experiences at the regional level**

	Planned activities	Indicator	Target	Achievement				
				year 1	year 2	year 3	Cumulative achievement	%
3.2.1	Organize exchange visits targeting policy makers, development actors (technicians) and farmers from COMESA and other regions	Number of exchange visits to COMESA and other regions	1	0	0	0	0	0%
		Number of participants in exchange visits	5	0	0	0	0	0%

*Source: Quarterly Report on MANITATRA 2 Project, september 2021*

#### Limited FDAR consideration

FDA was being restructured from 2018 to 2020 and it has only been operational since March 2020. In the meantime, the project has supported producers in preparing and submitting demands to the FDAR for funding. 141 funding requests were submitted with FOs supervised by the project. And, among these requests, 18 micro-projects have received the approval of the CROA<sup>16</sup>, and are currently being implemented: rainfed rice (06), rice-fish farming (03), dairy farming (06), chicken (*poulet gasy*) (02), market gardening (01).

Admission to funding is still uncertain given the conditions of access, while noting that the FDA has a regional funding orientation committee that is independent of the project.

**Table 36 : Status of indicators of permanent link activities with the FDAR**

	Planned activities	Indicator	Target	Achievement				
				year 1	year 2	year 3	Cumulative achievement	%
3.3.1	Ensure a permanent exchange with the FDA in order to make the link with the government's development orientations	Number of FDA concerned	1	1	0	0	1	100%
3.3.2	Ensure a permanent exchange with the FDAR in order to make the link with the development orientations of the government	Number of FDAR concerned	1	1	0	1	1	100%
		Number of POs benefiting from funding from FDAR	90	0	0	18	18	20%

*Source: Quarterly Report on MANITATRA 2 Project, september 2021*

<sup>16</sup> Regional funding orientation of FDAR

### **Discontinuing of the use of Agricultural Service Centers (ASC)**

The project managers have periodically established contacts with the ASC in the 5 districts of the region, but it should be noted that the ASC has become an independent NGO, so their operationality/dynamism varies from one ASC to another. Following this situation, the project provided the support function for the contracting authority of farmers' organizations, i.e the preparation and transmission of demands to the FDAR, a role that should have been entrusted to the ASC. In fact, the technicians of the project were initially mobilized to collect producers' demands and then to contact the administrative authorities with the aim of accelerating the formalization of the applicant "farmers' organizations". The service requested (and paid for) by the FDAR with the CSA, consists only for technical support, the socio-organizational activity should be supported by the project.

**Table 37 : Situation of activity indicators in relation to the number of consultations carried out with the CSAs during the 2nd year of the project**

	Planned activities	Indicator	Goal	Realization				
				year 1	year 2	year 3	cumulation	%
3.4.1	Ensure Permanent utilization of ASC or Agricultural Service Center (state promoted development mechanism in District level) to make a link between farmers and agricultural service	Number of CSA concerned	6	5		0	5	83%

*Source: Quarterly Report on MANITATRA 2 Project, september 2021*

### **Seemingly confused approach to service provider intervention**

The project gave up the employment of two service providers, AVSF and AGRISUD, in order to avoid duplication with other service providers and in an effort to contain costs. However, the collaboration with the other providers (APDRA/ATDRM, FIFAMANOR, CEFFEL) is mainly marked by their interventions with individual actors.

In fact (i) ATDRM trained the project technicians and set up demonstration sites with some LFs as well as took care of the supply of fry to rice-fish farmers (ii) FIFAMANOR carried out the diagnosis of dairy farming, provided training on cow feeding to the project team and set up 2 fodder production demonstration sites (iii) CEFFEL is responsible for training technicians on best practices (on vegetable crops), composting associated with biopesticides and repellent plants, and arboriculture. Then, it is in charge of capacity building of the project team and the lead farmers, with possibly FOs, on meeting facilitation.

The farmers' organizations that represent the main targets of the activities planned in this Result 3 are practically ignored according to this scheme of interventions. In fact, no FO works with the project since on the one hand, the different interventions target individual farms and on the other hand, few FOs are operational in the field. It should also be noted that membership in an association is one of the reasons why some farmers resist on working with the project.

**Table 38 : Situation of activity indicators in relation to the support of FOs in their collaboration with different partners**

	Planned activities	Indicator	Target	Achievement				
				year 1	year 2	year 3	Cumulative achievement	%
3.5.1	Built capacity of FOs on rice-fish farming by contracting with APRA	Support from APDRA (2 years of support to technicians and lead farmers)	2	0	1	1	2	100%
3.5.2	Built capacity of FOs on dairy cows and fodder by signing contracts with FIFAMANOR	Support from FIFAMANOR (2 years of support to technicians and lead farmers)	2	0	1	1	2	100%
3.5.5	Built capacity of FOs on good practices, biopesticides and fruit trees by contracting with CEFFEL	Support from CEFFEL (2 years of support for leading technicians and farmers)	2	0	1	0	1	50%

*Source: Quarterly Report on MANITATRA 2 Project, september 2021*

Thus, achieving the objective depends on the farmers' predisposition to join FOs, which is far from being acquired.

**2.2.4 Progress on “Communication and visibility of CSA are promoted throughout the implementation of the project on i) visibility and communication events organization, ii) publications and broadcasting and iii) documentaries conception and edition”**

**A significant communication**

The design and edition of various communication tools are carried out according to events. In practice, three major events have been the subject of particular communication: the inception workshop, the field days and the convention's signing with the MEN. For these 3 events, tools such as streamer and roll up have been designed and installed. Journalists were invited for media coverage, especially for the publication of articles in the print media (Midi Madagascar, Gazetiko, Journal of Agroecology No. 5-6 and 7. The project took care of online publication (Canal News) or on social networks (Facebook).

Apart from major events, the project participates every month in the FIVOHY program of national radio (RNM), a program devoted to agroecology facing climate change. In addition, 5 films have been made in collaboration with TVM on the theme of field days on the techniques of manufacturing lombricompost, CA as a sustainable way to maintain soil fertility, reforestation for the future generation and the *ady gasy*. These films were broadcast as part of the TVM program E-see magazine.

In addition (i) interregional visit and exchange of students' parents and teachers in a secondary school in Boeny (ii) publications of the film “*agroecological days in the South-East of Madagascar*” and the 3D animation on the GSDM YouTube address mark the end of the 3<sup>rd</sup> year.

**Table 39 : Status of activity indicators on the communication component**

	Planned activities	Indicator	Target	Achievement				
				year 1	year 2	year 3	Cumulative achievement	%
4.1.1	Organization of regional field days targeting government authorities and development actors	Number of regional field days	1	0	1	0	1	100%
		Number of participants (authorities, donors, local actors, main farmers, researchers, development actors, farmers' unions and journalists)	150	0	167	0	167	111%
4.1.2	Conception of other communication tools like streamers, roll up and mass communication	Number of streamers	6	4	1	0	5	83%
		Number of roll-ups	2	1	1	2	4	200%
4.1.3	Car rental for any communication and visibility action	Number of car rental days	60	28	0	12	40	67%
4.2.1	Broadcasting on national TV	Number of TV broadcasts	2	1	6	4	11	550%
4.2.2	Broadcasting on national radio	Number of radio broadcasts	30	10	12	15	37	123%
4.2.3	Expenses related to attendance of journalists or reporters in events for publication on TV or newspapers	Man-days of reporters (20 reporters x 5 events)	100	32	17	16	65	65%
		Number of newspaper publications	24	9	3	3	15	63%
		Number of post types (online and social media)	2	2	7	55	64	3200%
		Number of TV events broadcast	6	12		4	16	267%
		Number of radio events broadcast	6	7		4	11	183%
4.3.1	Edition documents and tools for technicians and producers	Number of document packs and tools edited	1	1	0	1	2	200%
4.3.2	Producing films for each event of the project	Number of movies	5	0	6	4	10	200%
4.3.3	Capitalization leaflets	Number of capitalization leaflets	1	0	1	0	1	100%

Source: Quarterly Report on MANIFATRA 2 Project, september 2021

## 2.3 Efficiency

### 2.3.1 A framework system with skills and distribution differentiated between areas

The implementation of field staff was completed in September 2018 and all the equipment necessary for its operation has been acquired. The project manager and his assistant, in charge of general coordination, planning and monitoring of the project, are accomplishing their missions without any apparent problems in Antsirabe.

7 technicians work within the project to provide technical support in the field (monitoring and implementation at the level of the FFS, secondary schools, and farmers, assistance in seed distribution). They work mainly at the level of communes but sometimes they can also take care of the fokontany directly, especially during the sensitization and training at the beginning of the campaign in collaboration with the LFs. The distribution of the technicians' intervention zones depends on the location of their place of residence in relation to the Communes but their dynamism is also considered. In the Highlands, an average of 3 communes are under the responsibility of a technician compared to 1.75 communes in the Middle West. The number of communes and fokontany under the responsibility of technicians varies from one zone to another.

**Table 40 : Rate of communes' supervision by technicians**

Areas	Communes	Number of Technicians	Commune supervision rate (%)
Highland	10	3	3
Middle West	7	4	2
Total	17	7	3

*Source : Consultant group survey, September 2021*

The technicians are supervised by the project manager and his assistant. Those from the Middle West have extensive experience in AE and some have already worked in their area with MANITATRA 1. The majority of technicians in the Highlands also have experience in supervising the dissemination of AE with previous projects and programs. However, it should be noted that the highlands area is a new zone of AE dissemination.

The project adopts the “farmer to farmer” approach for the dissemination of AE<sup>17</sup>. Lead farmers have thus been recruited (LF). The criteria for choosing the lead farmers are based on experience in sensitization/animation, good relationship with the community, being a farmer, previous adoption of CA, availability of at least 50 ares of demonstration plots, level of education (at least literate). Women and youth will be particularly targeted to become lead farmers. These conditions are not always met, especially in the highlands because of the lack of CA experiences in the area. A fairly large proportion of the lead farmers in the highland have, however, been employed by previous projects or organizations working in rural development such as FIFAMANOR, and they are often recruited on the recommendation of project partners. Project partners' technicians and experts ensure the capacity building of the LFs. In total, 48 LF are working with the project, including 19 in the Highlands and 29 in the Middle West.

Each LF works within a radius of about 5km and thus only affects a tiny part of the intervention communes. In this way they remain unknown to the landlocked fokontany. A LF works 7 days a month, often divided into 14 half-days per month. With such a workload, a certain number of LFs are obliged to depend on labor force to take care of their own plots. There is also a certain imbalance in the employment of lead farmers.

**Table 41 : Rate of supervision of Fokontany by LF**

Areas	Fokontany	Number of LF	Fokontany supervision rate
Highlands	20	19	0.95
Middle West	19	29	0.63
Total	39	48	0.76

*Source : Group of Consultants, September 2021*

<sup>17</sup> The principle is outlined in Appendix 2 of this report

On the Highlands, each LF supervise practically 1 fokontany. In the Middle West, practically every fokontany is supervised by 2 LFs. This difference is explained by the greater volume of activities that the LF must realize in the Middle West.

The responsibility of the lead farmers consists in raising awareness, mainly at the hamlet level, training producers and monitoring reforestation. The training of farmers can take place either on the LF's plots that serve as farm fields school, or on the farmers' plot. Following the "farmer to farmer" approach adopted by the project, a set of activities is developed in the FFS.

Annually, an objective of achievement (area cultivated on CA, number of adopters, reforestation) is assigned to each LF. Most of the current LFs have worked with the project since its inception but departures are recorded for various reasons but mainly due to insufficient performance in the highlands.

**Table 42 : Comparison of supervision rates between BVPI, MANITATRA 1 and MANITATRA 2**

Area	Highlands		Middle West	
	Number of farmers per technician	CA area per technician (Ha)	Number of farmers per technician	CA area per technician (Ha)
BVPI SE/HP	187	9	388	186
Manitatra 1	-	-	1,118	190
Manitatra 2 (mid-term)	1,156	190	1,802	237
Manitatra 2 (final)	1,518	287	1,993	299

*Source : BVPI SEHP, 2012 / Mid-term evaluation of the MANITATRA 2 project, January 2021 / Consultant group survey, September 2021*

The majority of the nurserymen are professionals before MANITATRA 2, but some of them, especially in the highlands, are trying their first experiences with the project. In some cases, the nurseryman and the LF have family relationship (husband, brothers...) and the function of nurseryman can also be combined with LF. The local nurserymen and LF recognition can be seen through such a situation.

The number of nurserymen has remained stable, even increased, since the start of the project: they have carried out their mandate without major problems. However, the imbalance in the distribution of nurserymen by zone should also be noted.

**Table 43 : Nurserymen supervision rate**

Areas	Communes	Number of nurserymen	Nurserymen by communes
Highlands	10	21	0.48
Middle West	7	37	0.19
Total	17	58	0.29

*Source : Group of Consultants, September 2021*

In the highlands, an average of 2 nurserymen supply farmers for each commune while this average is around 5 nurserymen per commune in the Middle West. As the objectives on reforestation have been exceeded, a reduction in the number of nurserymen collaborating with the project is planned.

Schools can be considered both as beneficiaries and intervening structure for the project. Indeed, the involved schools are supported by technicians and/or LFs for the implementation and monitoring of their fields of application and these schools are responsible for training students on sustainable agriculture to 5<sup>th</sup> and 6<sup>th</sup> grade students, who in turn should sensitize their parents on CSA techniques.

The collaboration of the schools with the project is marked by the Charter of Commitment establishment defining the attributions of each party. In this sense, the project provides the necessary tools for the realization of the planned activities on the application fields and the schools, apart from the training of students, contribute to the dissemination of AE practices with parents of students.

The school application sites are functioning fairly well overall, with the exception of a few recorded losses resulting from drought or fall armyworm attacks that occurred in the region during the 2019/2020 crop

season. The recommended systems were put in place and conducted as recommended, and the harvest was satisfactory. The schools were able to mobilize and sensitize a certain number of parents through field visits or exchange visits to the project intervention sites and in particular through the transmission of the students' knowledge to their parents. However, the level of (spontaneous) adoption by parents is not monitored by the project, except in cases where these types of producers have requested the assistance of LFs or technicians.

It should be noted that the Vinaninkarena commune is devoid of any real supervision system despite the participation of 2 schools. In fact, Vinaninkarena is an intervention zone of PAPAM but this project does not deal with the support of the schools and MANITATRA has mandated one technician (the head of the Ivory center) to follow-up these schools.

### **2.3.2 Satisfactory cost per hectare compared to the previous project**

As of September 30, 2021, the cumulative disbursement rate for the project is estimated at 81.10% of the budget and a commitment rate of 89.06%<sup>18</sup> at 39 months of implementation out of 42 months (92.85% regarding the project execution time). The budget commitment is significantly close to the time elapsed for implementation and deemed acceptable.

Considering the cumulative disbursement of result 1 as of September 30, 2021 amounting to €258,358.89 and the 2058.70 Ha of land under conservation agriculture, a direct result of the activities carried out in this component of the project, the cost per hectare is estimated at 125.49 €/Ha, or 151.85 USD/Ha<sup>19</sup>, if it was 317 USD/Ha at the end of the MANITATRA-1 project. This cost per hectare is close to the cost evaluated during the mid-term evaluation of the project around the third quarter of 2020 but remains much lower than the cost per hectare evaluated during the final evaluation of the MANITATRA 1 project which is taken as the reference cost for the comparison.

### **2.3.3 Questionable project timeframe**

A work plan and budget is established annually by the project team. The global action plan is disaggregated by technician for field implementation. Each plan takes into account the evolution of the activities observed over the previous period and a specific reorientation may occur depending on the situation.

Based on past experiences, the timeframe for project implementation appears to be appropriate given the implementation requirements and expected impacts. Indeed, the activities in the first year of intervention are essentially devoted to sensitization/information, the second year serves for the effective action and the third year for the extension. Farmers begin to be aware of the benefits of the project in the 3rd year. The reorientations that occurred during planning are however at the origin of new measures to be taken.

In addition, some aspects of the project, especially the impacts, are not visible within the 3-year period granted to the project: the impact of CA on the yield of rainfed rice, which is a particular concern of the project, is not completely verifiable only after 2 crop rotations, i.e. 4 years.

### **2.3.4 An operational monitoring and evaluation system**

The design of the M&E system adopted by the project follows the normal project cycle. The implementation of this system is marked by regular monitoring materialized by the intervention of the concerned parties according to the schedule established in the project document.

- The annual Work Plan and Budget for the first year was approved by the GSDM Board and for the following year this approval of the APWB was returned to the project steering committee set up in 2019.
- Supervision missions were carried out by COMESA in September and November 2018.
- The project inception workshop took place in November 2018.

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<sup>18</sup> Quarterly report as of September 30th, 2021

<sup>19</sup> Conversion rate of December 13, 2020, 1€ = 1.21USD

- The project inception report was prepared in December 2018: this report mentioned the request for a budget readjustment which was approved by the donor.
- The establishment of the baseline situation was the subject of a consultancy contract in 2018 but the report provided was not approved, so the project team undertook the mission and the document was prepared.
- The project coordination prepares quarterly reports to the GSDM headquarters for ongoing monitoring.
- Annual reports are prepared by the project coordination and finalized by GSDM management for presentation to donors. These reports are prepared at the end of each project year, from July to June of the following year. The 2019 report was approved by the donors, while the 2020 report was sent to the donors after June 2020 (outside the evaluation period).
- Annual reports covering the calendar year are also prepared to monitor periodic achievements.
- Baseline, mid-term and final evaluation are an integral part of the monitoring-evaluation system.

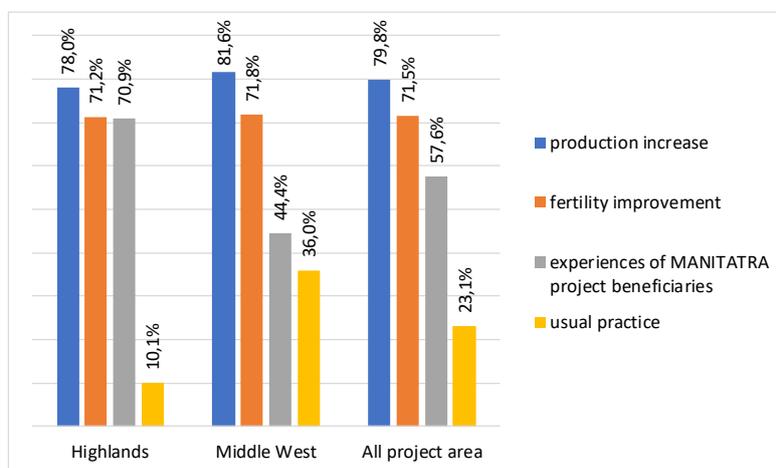
## 2.4 Effects and impacts of the project

### 2.4.1 Spontaneous adoption of some practices at the level of non-beneficiaries

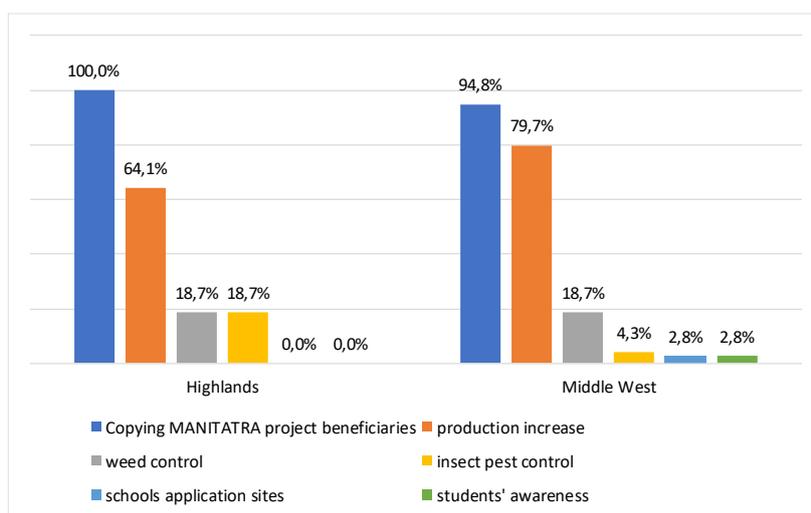
Spontaneous adoption of some practices by non-beneficiaries reflects the scaling up of good agroecological practices targeted by the project. The success of the beneficiaries' experiences, the effects of awareness-raising and communication actions, the need to improve soil fertility for better production are the main leverage effects for the adoption of conservation and good agroecological practices.

In this sense, cases of spontaneous adoption in areas outside of the project's intervention have been recorded, such as those observed in Fokontany Mandritsarakely (Rural Commune Antsoatany) and the hamlet Ambohikely (Rural Commune Antanifotsy); also in Vinaninkarena (outside the intervention zone) where farmers and parents have obtained specific seeds from the secondary school of Vinaninkarena. The same is observed at the school level, the trained teachers testify to the advantages of AE and not only practice at the level of their own farms, but also disseminate best practices with their peers in their respective *fokontany*. Also, in secondary school in Ambohimandroso where producers coming from other surrounding Communes come there to obtain seeds of mucuna. Some lead farmers in Antanifotsy move to the Communes of Ambohitompoina to disseminate the techniques following the request of certain producers.

In general, the desire to have a good production motivates producers to explore other technical alternatives, proving in this perspective that the productivity of the cultivation plots has decreased considerably. It can be seen that only 10% of cases state that the production of organic manure is a usual practice for producers. For information, the following graph ranks the reasons for the adoption of good practices, in particular the production of organic manure by non-beneficiaries of the project.



Graph 6 : Reasons for the adoption of organic manure production by non-beneficiaries



**Graph 7 : Reasons for adoption of CA by non-beneficiaries**

Several factors contributed to these spontaneous adoptions by non-beneficiaries. Among the most important are the communication actions, more particularly, the broadcasting of the E-see Magazine program in the FIVOHY program of the national TV. The television show filmed in Andranotsara is a very important step for the project in scaling up of agroecology. Since the broadcast of the program on national TV (TVM), Mrs Théodile, the main film director, has received unexpected visits from other people interested in agroecology, showing the interest of other actors and people in the topic.

Given that the effects and impacts of the project on rainfed rice constitute one of the high-level objectives of the project, the evaluation is particularly interested in this point without excluding the effects and impacts on other crops.

#### **2.4.2 Adoption of measures for the restoration or sustainable management of natural resources and the climate change effects**

“Madagascar is one of the most vulnerable countries to climate change. 90% of the population works in agriculture, a sector that contributes 26% to GDP”<sup>20</sup>. With this situation, the MANITATRA 2 project is positioning itself as an initiative to reduce the harmful effects of climate change by scaling up agroecological practices.

All the activities developed within the framework of the project represent in themselves measures aimed at the restoration and management of natural resources. The themes addressed by the project during the awareness raising are mainly oriented towards environmental degradation and climate change. The population of the areas of intervention have become aware of this.

Farmers' perception of climate change was measured only at the level of surveyed farmers in order to consider the panel in a perception survey. But in general, the problem of rainfall is the main manifestation of climate change felt by producers without being able to distinguish, however, whether it is a question of a poor distribution of rainfall over time or of an insufficient quantity of rain fell.

<sup>20</sup> GCCA+, May 2020

**Table 44 : Climate change manifestations perceived by producers**

Climate change manifestation		Insufficient rain	Violent wind	Temperature increase	Others
Commune	Ampitatafika	100%	55%	84%	1%
	Ankazomiriotra	100%	91%	98%	2%
	Antanifotsy	100%	70%	50%	0%
	Antsoatany	100%	53%	87%	0%
	Fidirana	98%	15%	75%	16%
	Soamanandrarinny	97%	67%	73%	3%
	Soavina	99%	56%	70%	14%
Area	Highlands	100%	59%	75%	1%
	Middle West	99%	60%	85%	9%
	Total	99%	60%	83%	7%

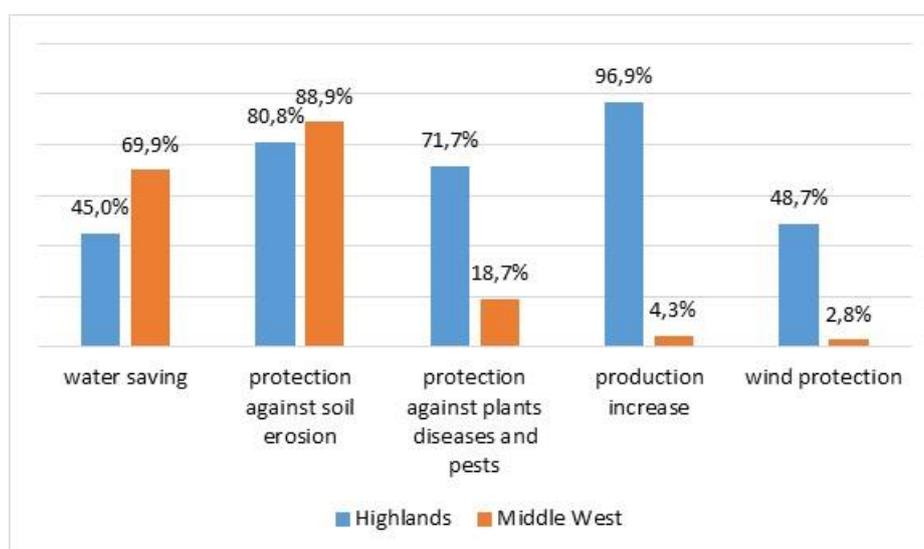
Source : Consultants Group Survey, September 2021

In the majority of cases, the lack of rainfall or the poor distribution of rainfall is noted by 91% of producers. And faced with this situation, the activities of the MANITATRA 2 project are positioning themselves as a pioneer in adaptation by increasing production, in particular on conservation agriculture practices that improve soil fertility and allow the water saving at crop plot level.

**Table 45 : Climate change effects perceived by producers**

Effect of climate change		Production decrease	Soil erosion	pest disease problem	No effect
Commune	Ampitatafika	96%	52%	82%	0%
	Ankazomiriotra	80%	48%	81%	0%
	Antanifotsy	97%	43%	93%	0%
	Antsoatany	100%	50%	77%	0%
	fidirana	96%	47%	56%	0%
	Soamanandrarinny	97%	52%	82%	0%
	Soavina	100%	62%	71%	2%
Area	Highlands	98%	49%	83%	0%
	Middle West	88%	51%	71%	0%
	Total	91%	50%	74%	0%

Source : Consultants Group Survey, September 2021



**Graph 8 : Effects of project activities in adaptation to climate change (farmers' perception)**

The application of Agroecology contributes to the improvement of soil fertility through the maintenance of humidity and particularly in the Middle West, for the fight against striga. Through the application of techniques, the old plots degraded by erosion (infertile) have regenerated; which demonstrates the interest of agroecology in the development of sustainable agriculture.

In addition, live hedges contribute to limiting the wanderings of zebus and the emission of greenhouse gases.

### 2.4.3 Increase production and lean period reduction

The practice of CA has allowed an increase in production at the level of adopters but also observed at the level of schools where the techniques have been disseminated.

According to graph n°2, 77% of beneficiaries adopt practices with CA practices. Among these 77%, almost 99% of the adopters declare that their rainfed rice yield has increased compared to the usual cultivation technique. This increase, according to the declarations of the adopters, is estimated for the most part between 25 to 75% of the usual yield.

It is noted that at the school level, in the demonstration plots, this increase would amount to 3 times more than the usual yield according to the declarations of the schools. At the Lutheran Private High School in Antanifotsy, if the usual yield of rainfed rice was 1.5 t/ha, with CA techniques, the school is currently recording a yield of 4 t/ Ha.



**Photo 2 : Demonstration site in CA system based on mucuna at Private Lutheran High School in Antanifotsy**

This difference in perception of the increase in rainfed rice yield is due to the effective performance measurement by some schools, unlike on-farm practices.

**Table 46 : Beneficiaries' perception of yield evolution in rainfed rice (CA)**

Area	Commune	Increase	Decrease	No change	Total
Highlands	Ampitatafika	19.1%	0.6%	0.6%	20.2%
	Antanifotsy	4.7%			4.7%
	Antsoatany	50.9%			50.9%
	Soamanandrarinny	24.1%			24.1%
	<b>Total Highlands</b>	<b>98.8%</b>	<b>0.6%</b>	<b>0.6%</b>	<b>100.0%</b>
Middle West	Ankazomiriotra	34.2%		0.1%	34.3%
	Fidirana	37.1%		1.0%	38.0%
	Soavina	27.7%			27.7%
	<b>Total Middle West</b>	<b>98.9%</b>		<b>1.1%</b>	<b>100.0%</b>
<b>Total</b>		<b>98.9%</b>	<b>0.3%</b>	<b>0.8%</b>	<b>100.0%</b>

*Source : Consultants Group Survey, September 2021*

On average, the rainfed rice yield with the conservation agriculture system is 2.81 t/ha, with large variation depending on the producer. Almost 12% of producers say that the rice yield would reach 4.91 t/ha; which is however to be qualified as there could be either an overestimation of production, or an underestimate of production during the surveys while noting that the measured yields only concern only the *Fokontany* intervention of the project where the surveys were conducted. The majority of producers, almost 82%, report an average yield of around 2.6 t/ha.

Between the two areas of intervention, the yield in rainfed rice is highest in Highlands, reflecting the effectiveness of CA based on mucuna which is highly developed in this area.

**Table 47 : Average yield in rainfed rice (CA) among adopters**

Area	Yield (T/ha)	Standard deviation
Highlands	3.16	167,192
Middle West	2.47	210.085
All project areas	2.81	198.51

Source : Consultants Group Survey, September 2021

As an indication, among the farmers monitored by the lead farmers, according to the capitalization of the results in conservation agriculture by the GSDM in December 2020, the average yield is 2.63 t/ha but varies according to the CA system; the systems based on Mucuna give very good yields in a farmer environment as shown in the following table:

**Table 48 : Average yield in rainfed rice (CA) per system**

	Average yield (kg/ha)
<b>Rainfed rice</b>	<b>2634.1</b>
CA based on Mucuna	3286.1
CA based on crotalaria, tephrosia	2554.6
CA based on stylosanthes	1850.7

Source : GSDM, December 2020, Capitalization of results in conservation agriculture

A good production was observed at the secondary school level, FFS and beneficiaries monitored by the project. However, isolated cases make exceptions with the drought experienced in the 2019/2020 crop year. CA allows for increased production and even to produce under difficult conditions (drought). The extension of the areas conducted with the system allows to obtain and store an additional quantity of rice for adopting households. In Ambohimandroso, a case of increased yield in beans is also observed by the use of vermicompost to obtain 150 kg of beans on 70m<sup>2</sup> if this area only produced about 50 kg of beans with the use of chemical fertilizers and poultry droppings.

For the project's beneficiaries, for 73% of the cases, the surplus production in rainfed rice is mainly intended for self-consumption, 16% for sale and 8% to repay debts. This situation leads to a reduction in the time of food difficulty perceived by 90.5% of the beneficiaries by comparing the period of 2019 - 2020 with that of 2020 - 2021.

**Table 49 : Use of surplus rainfed rice production**

Area	Commune	Self-consumption	Other	Debt	Social	Sale	Total
Highlands	Ampitatafika	16.6%			0.5%	2.2%	19.3%
	Antanifotsy	4.2%	0.4%	0.1%			4.7%
	Antsoatany	44.6%				6.9%	51.5%
	Soamanandrarinny	22.0%		2.6%			24.5%
	<b>Total HT</b>	<b>87.4%</b>	<b>0.4%</b>	<b>2.7%</b>	<b>0.5%</b>	<b>9.1%</b>	<b>100.0%</b>
Middle West	Ankazomiriotra	24.2%				10.4%	34.6%
	Fidirana	13.8%	2.1%	10.8%	1.0%	9.7%	37.4%
	Soavina	21.9%	1.3%	1.7%		3.0%	28.0%
	<b>Total OM</b>	<b>60.0%</b>	<b>3.4%</b>	<b>12.5%</b>	<b>1.0%</b>	<b>23.1%</b>	<b>100.0%</b>
<b>Total</b>		<b>73.2%</b>	<b>1.9%</b>	<b>7.8%</b>	<b>0.7%</b>	<b>16.4%</b>	<b>100.0%</b>

Source : Consultants Group Survey, September 2021

The introduction of the orange-fleshed sweet potato, a short-cycle, non-photoperiodic variety, has improved food availability in the beneficiary areas.

The seeds of cover crops (especially cajanus) are edible, so some farmers incorporate it into their daily menu.

In the medium term, fruit trees will improve producers' incomes, while the wood produced will prevent them from travelling outside their locality for construction and will absorb both the cost of wood and travel costs.

According to these various situations, practicing households can afford to save on their current production expenses. The project's collaborators (nurserymen and LF) have seen their income improve: the nurserymen sell a significant additional quantity of plants and for the PL the sale of vermicompost and repellent plants provides a significant income.

All of these factors contribute to a reduction in the lean season, generally between November and February. Comparing 2019/2020 to 2020/2021, an average reduction of 1 month is felt by producers.

**Table 50 : Comparison of the duration of the lean season 2019/2020 to 2020/2021**

Duration of the lean season		2019/2020		2020/2021	
		Mean	CV	Mean	CV
Commune	Ampitatafika	4.4	42%	3.7	55%
	Ankazomiriotra	4.0	55%	3.5	67%
	Antanifotsy	4.6	38%	3.0	47%
	Antsoatany	5.0	36%	3.9	44%
	fidirana	3.9	46%	2.8	59%
	Soamanandrarinny	4.9	29%	3.7	37%
	Soavina	4.5	39%	3.9	48%
Zoned	Uplands	4.7	39%	3.7	50%
	Middle West	4.1	49%	3.4	61%
	Together	4.3	46%	3.5	57%

*Source : Consultants Group Survey, September 2021*

The improvement in the food situation is much more noticeable at the level of the beneficiaries compared to the non-beneficiaries. As shown in the following tables, project beneficiaries experienced a less pronounced food difficulty in the second year of the project compared to non-beneficiaries. But as producers begin to benefit from the positive results of the project, the average length of the lean period between the two categories of producers clearly begins to differ.

Nevertheless, non-beneficiaries copying the practices also perceive a reduction in their period of food difficulty between the two periods considered in the comparison (2019/2020 and 2020/2021); while reminding that the main factor which allowed the spontaneous adoption of the practices remains the success of the experiences of the beneficiaries of the project.

**Table 51: Comparison of the average length of lean season between beneficiaries and non-beneficiaries in the Highlands**

Farmer	Beneficiaries		Non-beneficiaries		Total	
Lean period	Mean	CV	Mean	CV	Mean	CV
2019-2020	4.7	36%	4.6	40%	4.7	39%
2020-2021	3.2	53%	3.9	48%	3.7	50%

*Source : Consultants Group Survey, September 2021*

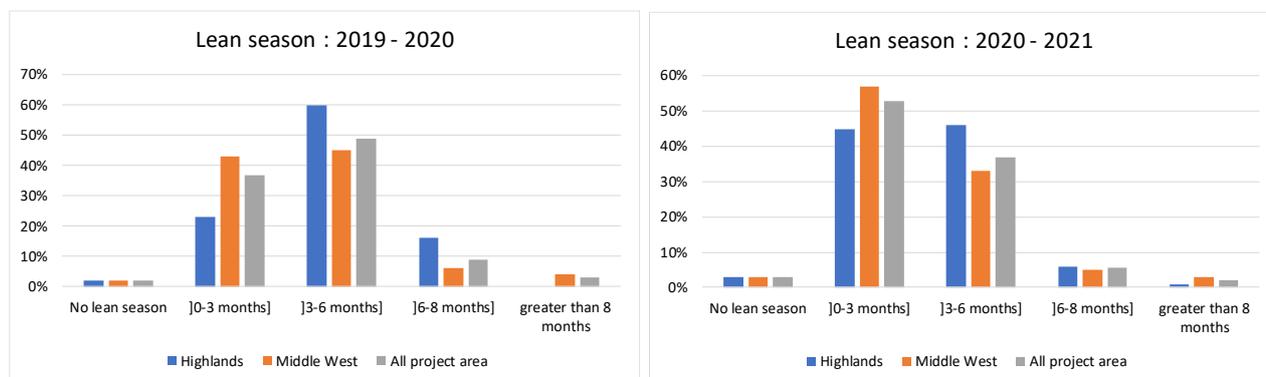
**Table 52 : Comparison of the average length of lean season between beneficiaries and non-beneficiaries in the Middle West**

Farmer	Beneficiaries		Non-beneficiaries		Total	
Lean period	Mean	CV	Mean	CV	Mean	CV
2019-2020	2.6	54%	4.2	47%	4.1	49%
2020-2021	2.6	68%	3.8	55%	3.4	61%

*Source : Consultants Group Survey, September 2021*

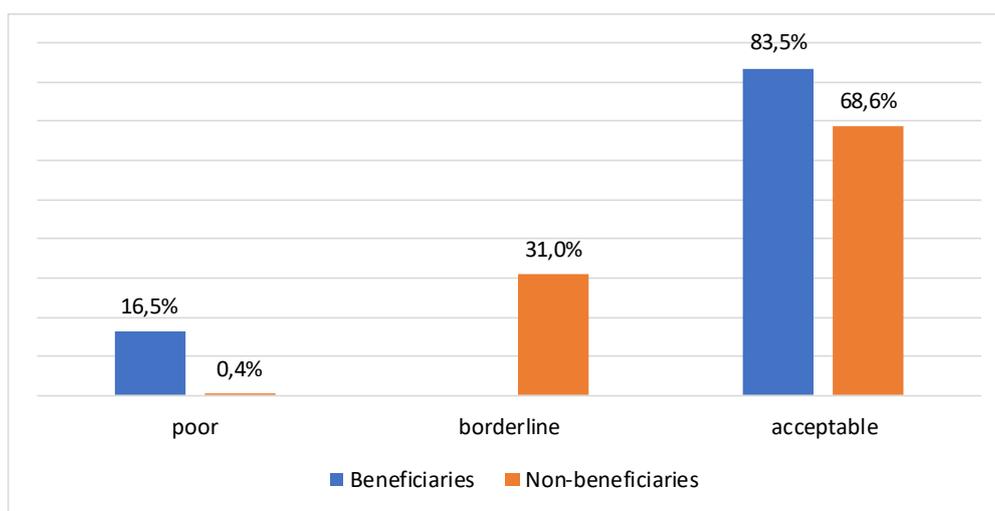
The two graphs below illustrate this decrease in the duration of the lean season in the project intervention areas between the periods of 2019/2020 and 2020/2021. This could however be

due to the annual variability (climatic, socio-economic) but we note however that the year 2020-2021 was the period of the COVID pandemic where the impact was felt everywhere in Madagascar, and that the variation should be the other way around. What is also important to underline is the short duration for project beneficiaries compared to non-beneficiaries (a clear reduction in the duration of the lean season for beneficiaries in the Highlands).



**Graph 9 : Comparison between the duration of the lean season 2019/2020 – 2020/201**

In terms of food security, one of the variables also considered is the food consumption score or FCS<sup>21</sup> whose calculation method is presented in Appendix 2. By comparing beneficiaries to non-beneficiaries' situation, it can be seen that the percentage of beneficiaries with an acceptable FCS (83.5%) is much higher than the non-beneficiaries (68.6%). This demonstrates that the beneficiaries have a balanced diet compared to the non-beneficiaries, showing in this sense a more comfortable standard of living than the non-beneficiaries.



**Graph 10 : Comparison of beneficiaries and non-beneficiaries FCS**

#### **2.4.4 New local competences vary according to the actors**

Various trainings were provided to various project stakeholders: technicians, PL, nurserymen, OEMC, school managers... Training topics vary from one type of actor to another but in general, the improvement in knowledge of these actors is evident.

The various training and capacity building at all levels will enable actors to have the necessary competences both in terms of designing, implementing and monitoring future projects.

<sup>21</sup> An essential element for measuring food security, the food consumption score or FCS is an indicator that reflects the quantity (kcal) and quality (nutritional importance of food) (Malick NDIAYE, WFP, 2014)

The FL have a relatively high level of control over the distributed techniques, but the AE systems are evolving and some adaptation is still needed. In this way the FL sometimes require the assistance of the technicians in the accomplishment of their mission.

The OEMC agents, after their training, became trainers on AE. Subsequently, the heads of some schools trained the entire teaching staff of their establishment: a cascading training chain appeared. It should be noted that the training provided by the OEMC does not indicate the methods of transmission to students, so each school organizes the AE courses according to their convenience.

Farmers observe and learn at the FFS and other CA adoption plots but they do not take notes: some technical details should be loosed.

Finally, the evaluation of students' knowledge within their respective establishment and during the competition organized by the project, made it possible to note the assimilation of the techniques by a majority of them.

#### 2.4.5 An interesting total margin generated by reforestation

A projection of economic gains calculation with reforestation is necessary given the importance of the reforestation activities undertaken by MANITATRA 2 project. For this, the same calculation basis adopted by the BVPI / SEHP project in its capitalization report in 2012 was taken over, but whose unit price was updated according to the evolution of the inflation rate<sup>22</sup>.

**Table 53 : Basis of economic calculation of the reforestation activity**

	Unity	Quantity
Mortality rate		30%
Number of plants / are	plants/ are	10
<b>Products</b>		
5-year valuation	Ar	4,000
10-year valuation	Ar	25,000
Percentage of trees valued at 5 years		90%
Percentage of trees valued at 10 years		10%
<b>Expenses</b>		
Plant cost		0
Maintenance cost	Ar/ are	2,000

*Source : BVPI/SEHP project capitalization report, 2012*

The margins obtained over 10 years with tree plantations will be given by the following table:

<sup>22</sup> Inflation rate in 2012: 6.4 and in 2020: 8.3, INSTAT

**Table 54 : Economic impact by adopting reforestation**

<b>Average assessment after 5 to 10 years</b>	<b>Unity</b>	<b>Highlands</b>	<b>Middle West</b>
Number of plants	plant	324,719	892 229
Number of adopters	adopting	828	4,372
Average number of plants per adopter	plant/ adopter	392	204
Number of living trees after 5 years per adopter	tree/ adopter	275	143
<b>Products</b>			
Number of trees valued after 5 years (90%)	tree/ adopter	247	129
Gross product at 5 years	MGA/ adopter	1,284,758	668 560
Number of trees valued after 10 years (10%)	tree/ adopter	27	14
Gross product at 10 years	MGA/ adopter	878 467	457 135
Total proceeds	MGA/ adopter	2,163,225	1,125,694
<b>Expenses</b>			
Seedlings	MGA/ adopter	0	0
Maintenance after 5 years	MGA	71,375	37,142
Maintenance after 10 years	MGA	64,238	33,428
Total load	MGA	135,613	70,570
<b>Margins</b>			
Margin after 5 years	MGA/ adopter	1,213,382	631 417
Margin after 10 years	MGA/ adopter	814 229	423 707
Total margin	MGA/ adopter	2,027,611	1,055,124

*Source : Group of Consultants, September 2021*

Apart from upgrading trees to produce compost after 3 years and the benefits of reforestation in carbon sequestration, an operation could, provide a margin ranging from 631,417 Ar to 1,213,382 Ar depending on the area after 5 years and from 1,055,124 Ar to 2,027,611 Ar after 10 years.

## **2.5 Potential for sustainability, replication and scaling up**

### **2.5.1 Commitment and ownership of activities by local stakeholders**

The fokontany and commune officials actively participate in awareness activities at the beginning of the campaign with technicians and LFs. In particular, the communes have facilitated the interventions of the LF and/or the GSDM technician: administrative paperwork, creation of associations, and intra-communal visits, provision of meeting rooms... some of them have requested the collaboration of the project for reforestation or are already setting up nurseries for the continuity of this activity.

The nurserymen who were operational before the project have joined and the farmers' demand for seedlings is steadily increasing and some farmers have planted mucuna in pure culture in order to produce seeds for their autonomy and for the supply of other farmers.

In summary, local actors have taken ownership of the project and have actively contributed to it.

### **2.5.2 A dissemination device for scaling up practices**

Farmer-to-farmer approach represents a close-quarter framework and thus facilitates contact between the parties. In fact, after a year of awareness, farmers, some schools (such as Ambohimandroso secondary school) contacted LF in the second and third year without being sensitized. The application of the techniques at FFS level has a persuasive visual effect for producers, and spontaneous visits to FFS are encouraged.

The LF and the nurserymen can reproduce the activities carried out on their plots without the help of the project: they have the necessary competences and means thanks to the improvement in their income (sale of seedlings, seeds, vermicompost, vegetable seeds, etc.).

The availability of the LF for constant assistance at the level of the farmers plots represents some handicap of the approach. In fact, without any compensation, a LF would not waste his time supervising their peers.

The advantage of collaborating with schools is especially in teaching students various notions of the sustainability of agricultural production. The target students certainly have a faster assimilating capacity than most of their parents and these notions will remain etched in their memory, but the young age of the students sometimes limits the transmission of knowledge. Moreover, the students could thus constitute more or less effective dissemination links, depending on their relationship with parents. Students' parents can be easily reached by schools, especially during regular parent meetings.

Continuity of the activity is, however, hampered by the financial problem for some schools: obligation to close annual plots, purchase of seeds for cover plants or seeds of culture, students' unavailability during holidays requiring the use of salaried labor. The non-integration of AE among educational program does not allow (public) schools to allocate a specific budget to it.

**Table 55 : SWOT analysis of dissemination systems**

Device	Strengths	Weaknesses	Opportunities	Threat
<b>School</b>	Disseminating integrating the school system Ease of understanding of the booklets, reinforced by the distribution of the film The dissemination of practices at the level of 6th and 5th grades coincides with the reality Exchange visits encouraged at school level	Children are still very young to transmit knowledge to their parents	Planning the use of production from demonstration sites (the case of secondary school in Vinany investing in school infrastructure is a good example of the use of funds generated by the sale of products at school level)	Assignment of teachers trained in agroecology
<b>Lead farmers</b>	Horizontal transmission of knowledge Ownership of project LFs	Very limited working time	Increasing demand for training and seeds of cover crops in agroecology Evolution of LF into local service providers while noting that these LF during the implementation of the project acquire the knowledge and competences required of all the good practices of agroecology	Tendency towards LF nepotism
<b>FFS</b>	Diffusion proximity device Technical support by technicians and LF during awareness, training and information sessions Most PLs have worked with the project since its inception		Influx of other producers and other partners to the FFS	Abandonment of the coordination of the FFS after project

### **2.5.3 An undeniable expansion of reforestation**

Despite the systematic lack of farmers monitoring for reforestation, the activity interested farmers to all areas faced with growing wood daily needs. The nurserymen intend to perpetuate their activities with the production of species requested by the farmers.

The promotion of the nurserymen's activities will encourage the improvement of the seedlings and wood immediate supply in the medium term. Apart from the direct benefits to farmers in terms of wood

availability, the positive impact of reforestation on the environment and its contribution to reducing the impact of climate change will benefit the whole Region.

#### **2.5.4 A low level of Agroecology expected funding at the regional level**

For the agricultural development component, the Vakinankaratra Region is focused on value chain approach and has given priority to rice, milk, potatoes and fish farming. The Region chairs the CROA and can thus influence the decisions of the CROA regarding the projects to be financed by the FDA. Following the Region's approach, only rice, potato, fish farming and milk would be eligible for funding for the project. AE is considered a cross-cutting activity and currently not given priority.

#### **2.5.5 Decentralized technical services engaged**

The DREN, the DRAE, the DRTM, the DREDD have signed collaboration agreements with the project. The commitment of these different ministries is thus recognized, and is confirmed by various facts:

- The MINAE, DRAE and the DREDD are represented on the project steering committee. The Agriculture General Director of the MAEP even chairs this committee. These ministries participate in sessions aimed at the overall orientation of project activities and thus have the necessary knowledge to subsequently develop AE development strategies;
- For the MAEP in particular, in its objective of ensuring food self-sufficiency, agroecology would be considered among the systems envisaged for the areas devoted to food production extension. Furthermore, agroecology is considered an intermediate step towards the adoption of organic agriculture, one of the current agricultural development policy pillars. AE thus holds a fairly proven position within the department. The Environment, Climate and Emergency Response Unit (SECRU) of the MAEP plans to set up an agro-ecological site in Ambano (Antsirabe 2) in the near future;
- The DREN and the DREDD participated in the project actors training through the OEMC or through the direct intervention of regional agents. These two ministries have also set up the "one tree-one student" program to develop reforestation activities;
- The DREN supports the request of the schools collaborating with the project for the integration of AE in the school curriculum.

#### **2.5.6 Benefits that should be sustainable**

The project would leave a legacy of various benefits to different actors in the region after its closure.

- The commitment of LFs and nurseries to the FDA as Local Service Providers (LSPs) will promote business continuity. Indeed, the FDA would be a sustainable structure within the MAEP, and the LF and nursery service will have the chance to be sustainable.
- The project's support to own project management will enable the farmers' organizations to become familiar with the FDA funding process and therefore enable them to have possible access to funding for their activities.
- The implementation of the application fields allowed the schools participating in the project to find an extracurricular activity adapted to the rural world. The learning of AE at the school level will certainly develop: each school will look for the necessary means to renew the experience.
- Farmers will become accustomed to consulting LFs and FFS achievements even in the absence of the project and a formal organization. Indeed, the current frequency of visits and the attendance of the LFs' FFS will allow an improvement of the exchanges between farmers.
- The use of biopesticides in combination with chemicals will partly solve the problem of armyworm and some rice diseases and therefore allow better food availability in the area.

The findings at the school level are a guarantee of the replicability and sustainability of the project interventions and achievements:

- Strong interest of students, parents and teachers in Agroecology;
- Collective awareness and behavioral change of the beneficiaries on their environmental degradation perception and the need for agriculture adaptation to climate change;

- Perception of improved soil quality at the plot application level.
- Valuation of application plots
- Initiation to the Agroecological practices of parents (training/awareness raising).

### **2.5.7 Valuable partners for consultation and promotion of activities**

Permanent structures have been partners of the project since its implementation.

- The Vakinakaratra Region is a member of the project steering committee, along with the MAEP and its regional representative, the MEDD and its regional representative, the DGM and its regional office, and the MEN and its regional representative. It is represented by the Director of Economic and Social Development Support (DDES).
- CEFFEL has put to good use its expertise on fruits and vegetables, biopesticides and best practices,
- The ATDRM/ APDRA collaborated for the activities in fish and rice-fish farming;
- Research institutions (SPAD - FOFIFA - FIFAMANOR - LRI - University of Antananarivo, Africa Rice, CIRAD, IRD) contributed for research on dairy cows, tubers, rice variety and cereals.
- The FDAR, although recently operational, has been working with the project on preparations for the funding and development of services to farmers (advice, training, investment).
- Farmers' organizations, seed or seedling producers have always had a working relationship with the project.

### **2.5.8 Non-effective competences transfer to DRAE**

The project plans to transfer the agroecology database to the DRAE, but has not been completed. However, this database could be used by DRAE as a tool to steer actions to scale up agroecology in its constituency. The absence of this transfer could hamper DRAE's implementation of its main mission.

### 3. RECOMMENDATIONS

The following recommendations are mainly proposed for future actions and/or initiatives, and take into account the analyzes made in this evaluation, and in particular those aspects where the project was assessed less satisfactory, and the important and well-developed aspects of Manitra 2.

#### 3.1 Sustainability Strategy for project actions

We have taken up here the three expected results of the Project and the overall assessments that we have made of these results.

- **Result 1:** CSA and good agricultural practices are scaled up, extended in two ecosystems in the Vakinankaratra region, covering the Highlands and Middle West areas.
- **Result 2:** Stakeholder capacities are strengthened in the field of climate-smart agriculture (conservation agriculture and agroforestry).
- **Result 3:** Farmers' organizations are supported and linked with various agricultural actors for the sustainability of the project's results.

In our assessments (quantitatively quantified and qualitatively following feedback from beneficiaries and stakeholders, as well as in our analyses), results 1 and 2 are very satisfactory. In future actions, the pursuit of these types of actions will really contribute to the change of scale of the EA/CSA, to the change of the landscape and to contribute to the targeted issues (food security, adaptation to climate change, protection of natural resources).

It is on result 3 that the achievement of the set objectives is less satisfactory, and more specifically in connection with the sustainability of the actions of the Project (when there will be no continuation of financing of the actions). The recommendations below are therefore proposed.

##### 3.1.1 Linking Farmer Organizations

It was proposed to support the connection between FO and various actors in agriculture for the sustainability of the project. These actions have been carried out, but mainly with individual farmers, and fewer FOs, although some cooperatives and FOs have been developed. Currently, even if efforts are still necessary, the FOs are more and more structured, especially in the areas where the project operates, with members of FIFATA (VFTV for the branch of the Vakinankaratra region). Other farmers organizations exist but we find the FIFATA in full structuring. In future actions, the connection with the different grass-roots organizations (grass-roots FOs in the different communes and/or fokontany) is to be done, by carrying out diagnostics at the start of the Projects. This diagnosis will make it possible to strengthen this connection from the start of the project, and to link to the services that these FOs can provide and to link them to actions around AE. There will be more sustainability of actions with these more sustainable structures, although reinforcement still remains to be done.

##### 3.1.2 Developing the local partnership

According to the information noted, fokontany presidents are not systematically involved in the exchange visits organized by the project. However, it appears that the fokontany presidents are always called upon to intervene during the sensitizations at the beginning of the campaign. These local leaders certainly have some influence on the local community. The fokontany presidents to be integrated should not be limited to those of the project's current intervention fokontany but should extend to all the fokontany of project's intervention communes. Exchanges of viewpoints could be organized at the commune level between the technicians, the LFs, the presidents of the fokontany who participated in the exchange visits and the commune officials for any arrangements to be made.

Religious communities are also a means of dissemination used by some LFs. While (public) schools often suffer from a lack of financial resources for CA development, religious communities are always working to develop activities to sustain their own activities. Moreover, communication between members of a religious community is facilitated by the phenomenon of belonging.

### **3.1.3 Ensure a stable environment for the adoption of techniques**

The scaling up of CSA/CA techniques that increase agricultural production and any other form of innovation requiring investment would only be effective if a stable production environment for farmers is ensured. In this regard, two major points can be cited: the control of agricultural products prices and land tenure security. Firstly, whatever techniques are offered to farmers, the prices of agricultural products always condition their adoption and the speculation cultivated from year to year. More particularly in the Middle West of Vakinankaratra Region where the techniques recommended in CA (notably based on *Stylosanthes*) require fallow one year after the combination of food crops and cover crops. Even if the proposed techniques recommend this, the farmers are still cultivating speculations that could earn them much more money depending on the market price of the products. They will find it difficult to accept to have their plot fallow when the price of an agricultural product is interesting on the market. Advice to farmers - including not only the technical dimension but also financial management - is therefore recommended.

In addition, the greatest importance should be given to the control of value chains conditioning a better sale of agricultural products at the level of the farmers. This is a motivating factor for the producers to intensify much more in their farms and to adopt the new technical itineraries proposed. The assurance of an attractive selling price for the products will certainly facilitate their financial commitment.

Among the control of value chains, access to seeds and/or local production of seeds and linking up with local suppliers are very important in changing the dissemination of AE (integrating CSA/CA techniques). We can cite, for example, the very significant development dynamics of the system based on *mucuna*- in the Highlands and in the Middle West. For now, the project has always played the role of facilitating access to seeds (call for tenders, linking with suppliers outside the area, and supply of inputs through technicians). Without a support strategy for access to seeds (locally), the pursuit of these dynamics and dissemination will collapse without support from new projects.

Still in this sense, access to credit is one of the means proposed to encourage them to intensify their production. This aspect did not yield the expected results because priority is not given to agroecology in the financing of the FDAR. Parallel actions of reflection with the FDA are to be carried out. Other organizations can also contribute to agricultural financing, or to the supply (advance of inputs), namely the NGO Vahatra, or any private sector initiative. This also requires a diagnosis in this sense from the start of the project, in particular to see and analyze existing initiatives to link them with actions for the development of agroecology.

Then regarding to land tenure security, land problems are often linked to problems of social stratification (sharecropping, rental, etc.). Activities carried out by the State, going in this direction, will certainly favor the adoption of the techniques.

In its implementation, the project has developed different techniques to improve the balance of organic fertilizers (conventional compost, liquid compost, vermicompost, 7-day compost) in its areas of intervention. Considered as the main problem encountered by farmers in the production of compost, the insufficiency of biomass needs special attention from the project.

### **3.1.4 Organize socio-organizational activities**

Joining an association causes a real panic among farmers. With the experiences of previous projects where the various associations created are at the service of a minority, farmers avoid any form of exploitation by certain privileged members of society. However, the project's approach is based on the promotion of farmers' organizations, particularly in terms of accessing FDA funding. Specific activities relating to socio-organization are necessary. The current system does not have the necessary expertise for such a service. The project should either train field staff in socio-organization or hire specialists in this field to provide support to producers.

The objective would be to group together the beneficiaries of the project by speculation - especially those prioritized by the Vakinankaratra Region - considering the social affinity between these beneficiaries. Family type associations would be particularly recommended. Moreover, it would not be necessary to

create associations with several members in order to avoid any abuse by certain influential farmers. In addition, the LFs and technicians could identify existing associations that are operational or dormant in order to revitalize them and integrate them into the project. CEFFEL and FIFAMANOR will have to strengthen the capacities of these associations for the preparation and implementation of off-season crops, while ATDRM would work on capacity building and monitoring of fish farmers grouped in associations

### **3.1.5 Strengthening other aspects of agroecology**

According to 13 principles of agroecology developed in paragraph 2.1.2, the reflections in the accompaniment of EA should increasingly take these principles into account. A large part of these 13 principles is already taken into account and quite strongly in project actions, namely the principles related to: i) improving resource use efficiency (recycling and reduction inputs), and ii) building resilience (soil health, biodiversity, synergy, economic diversification, ... and animal health). On the other hand, actions around equity and social responsibility, beyond the co-creation of knowledge quite strongly integrated through participation in selection of rice varieties have not been sufficiently developed. This is not a criticism of the Manitra 2 project as these aspects have not been incorporated in the project conception, but to consider it as much as possible in the future GSDM initiatives/projects.

These are:

- Social values and types of food: by linking with food systems that ensure a healthy, diverse diet adapted to the seasons and to the culture. Basically, a link with the nutritional aspects is very important (is already done in our opinion in the actions of PROSAR and SANUVA in which the GSDM is involved, and the achievements of these projects are to be capitalized)
- Equity: by ensuring dignified and reliable livelihoods for all stakeholders involved in food systems, especially smallholder farmers, through fair trade, fair working conditions and fair treatment of intellectual property rights. Actions in this context are to be considered.
- Connectivity: by ensuring proximity and trust between farmers and consumers through the promotion of fair, short distribution circuits and the reintegration of food systems into local economies. This point should be considered in order to develop agroecological and diversified products, to replace supply chain approaches (very targeted for a single or a few products), an approach still widely developed by actors in the region.
- Governance of land and natural resources: by strengthening institutional structures to improve, in particular, the recognition and support for family farms and small food producers (both in the governance of land, and resources such as seeds). In land governance, it is difficult for a project to position itself, but it is important to link them with interministerial initiatives in this context.
- Participation: by encouraging social organization and increased participation of farmers and consumers in decision-making in order to foster decentralized governance and local adaptive management of agricultural and food systems.

A large part of these points remains very conceptual and global, but some reflections can be addressed at the project level, particularly, on nutrition, the short market for different products (without limiting it to a few sectors) and the participation of stakeholders/beneficiaries in the implementation of projects.

### **3.2 On the monitoring and evaluation system and indicator**

On the monitoring-evaluation systems, it is currently very important to further develop indicators making it possible to monitor the level of intensification in agroecology, and to limit activity indicators as much as possible (number of workshops, number of meetings, number of visits...). From the start of the project, more opportunities for measurement of outcome and impact indicators should be included from the M&E phase of the project and not only during the evaluation phase) and especially to develop indicators related to the 13 principles of agroecology from the monitoring systems

### **3.3 Further strengthen communication**

Communication was one of the very positive points of the Manitra 2 project. This aspect is very important and deserves more to be reinforced with each initiative or project. With the adoption of a communication plan, the project carried out a number of communication activities (TV, radio, newspaper, online publication, awareness raising and training). However, specific actions aimed at policy makers are insufficient, while they remain largely influential in their constituencies. There is a need to develop a communication strategy aimed at policy makers to make agroecology a priority at the level of the area of intervention, and to reduce the impact of climate change.

# Conclusion

The conception of the project is based on the ambition to develop results obtained during the previous MANITATRA 1 project, with regard to the dissemination of Agroecology. To do so, the selected areas cover two quite different ecosystems. Specific actions are implemented for each area in order to produce visible effects in a rather short period of time. The project aims to encourage the adoption of upland rice sustainability way of production and to provide solutions to climate change issues.

In order to achieve a mass effect, the project has opted for the “farmer to farmer” approach. However, there is a disparity in skills between the two zones. The use of financial resources does not indicate any apparent problem.

The project document includes a results framework that is fairly simple in its structure. Supplemented by a detailed description of the types of activities to be implemented for each output, this approach gives clear guidance to the project team for implementation. The indicators for each expected result through the implementation of the various planned activities are thus presented in a way that allows for practical analysis.

Specifically, in terms of scaling up best agricultural practices, almost all the disseminated systems have been adopted in varying proportions but the AC based on is very representative among the three main cropping systems (CA based on mucuna, CA based on cajanus/crotalaria/tephrosia, CA based on stylosanthes). The system based on stylosanthes remains handicapped by the problem of equipment to control the plant.

In all the survey Communes, the practice of rainfed rice has improved. For rainfed rice in CA, at the end of the project, 77% of the beneficiaries had promoted this technique if it was only 10% for the non-beneficiaries. If in 2015, between 1 to 6% of rainfed rice cultivation plots are conducted with the CA system, at the end of the project intervention, 21% of producers practice the system in 75 to 100% of their cultivation plots of rice on *taney*. In the Highlands, the percentage of the CA system in rainfed rice cultivation varies from 2.3% to 16.9%. The baseline situation is zero because there was no rainfed rice in conservation agriculture before MANITATRA 2 in the Highlands.

Concerning reforestation, the demand in the Middle West is such that the quantity of plants usually produced by nurserymen is well below the real needs. The number of nurserymen operating in the area already trained by the various actors (BVPI and FAFIALA) are sufficient to produce the project seedlings' needs. In the highlands, the function of nurseryman constitutes a new job opportunity and despite the lack of experience of some nurserymen, the collaboration with the project is immediately granted. In this way, the number of nurserymen recruited by the project finally exceeds the number initially planned.

For composting, classic compost remains the most practiced, but slow progress in the adoption of liquid compost and 7-day compost has been noted. For vermicompost, the evolution is also quite gradual with the creation of an interesting commercial dynamic with markets created between farmers.

In general, the main objective of the project in terms of scaling up agroecology to adapt to climate change and ensure food security for producers is essentially achieved:

- spontaneous adoptions of CA are noted in some localities of the Vakinankaratra Region;
- an increase in production, mainly in rainfed rice, at the level of producers and at the level of schools where the techniques have been disseminated has been observed. At the school level, this increase would amount to 3 times more than the usual output. At farm level, the yield of rainfed rice is on average 2.63 to 2.81 t/ha with CA systems while it is around 1.6 to 1.7 t/ha in a conventional system. Surplus production is in most cases used for self-consumption;
- the introduction of the orange-fleshed sweet potato, a short-cycle, non-photoperiod variety, has led to better food availability in the beneficiary areas;

- an average reduction of 1 month in the lean season is felt by the producers by comparing 2019/2020 to 2020/2021. This improvement in the food situation is much more observed at the beneficiaries than to non-beneficiaries. As producers begin to benefit from the positive results of the project, the average length of the lean period between the two categories of farmers clearly begins to differ;
- in terms of food consumption score, by comparing the situation of the beneficiaries with the non-beneficiaries of the project, it is found that the percentage of beneficiaries with an acceptable FCS is much higher than the non-beneficiaries, demonstrating that the beneficiaries have a balanced diet compared to non-beneficiaries.

However, some points deserve to be considered in the dissemination of agroecology in a technical and social environment evolving. On the technical level, the results of the project are very satisfactory, both in terms of scaling up good practices and improving production. However, on the social and economic level, taking into account the local/regional market, strategic orientation of activities should be considered in future interventions, not only on scaling up in the strict and technical sense of the term. In fact, in addition to the advantages provided AE in improving the food situation of households, market behavior is a significant factor in the adoption of different practices. The sustainability of the adoption would only be guaranteed by the creation of substantial added value for farmers. Supporting producers towards the creation of cooperatives working in rural entrepreneurship (suppliers of cover crop seeds, marketing of agro-ecological products) is an option to be developed.

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# Appendix

Appendix 1 : Financial performance of the project as of September 30, 2021

Budget acc.	Planned Activities	Budget (€)	Budget (€)	TOTAL COMMITTED	TOTAL DISBURSED	TOTAL DISBURSED	TOTAL ENGAGED	TOTAL DISBURSED	TOTAL ENGAGED	% ENGAGED/	% DISBURSED
		PROJECT DOC	PROJECT REALLOC	€ (JULY 18- JUNE 21)	€ (JULY 18- JUNE 21)	EURO (JUL 21 - SEPT 21)	EURO (JULY 21 - SEPT 21)	€ (JULY 18- SEPT 21)	EURO (JUL 18 - SEPT 21)	Budget Realloc	/ Budget Realloc
1.	RESULT 1: CSA and best practices are up scaled in two ecosystems of the VAKINANKARATRA region, covering the Highland and Middle West regions in Madagascar	280,039.47	329,552.89	262,355.78	248,809.00	9,549.89	24,172.69	258,358.89	286,528.47	86.94%	78.40%
2.	RESULT 2: CapCSAty of various stakeholders is built in Climate smart Agriculture Conservation Agriculture and Agroforestry	103,022.11	88,857.87	82,121.99	73,305.37	4,192.29	4,192.29	77,497.66	86,441.96	97.28%	87.22%
3.	RESULT 3: Farmers organizations are supported and linked to various stakeholders in the Agriculture to support sustainability of the project results	32,512.20	25,614.84	12,008.77	7,188.74	-	-	7,188.74	12,008.77	46.88%	28.06%
4.	COMMUNICATION AND VISIBILITY	50,235.86	36,807.93	23,580.69	26,787.32	971.57	971.57	27,758.89	24,902.08	67.65%	75.42%
5.	PROJECT ADMINISTRATION (HUMAN AND EQUIPMENT)	168,093.87	165,057.26	146,382.43	145,329.43	9,433.57	9,301.41	154,763.00	155,683.84	94.32%	93.76%
6.	PROJECT OVERSIGHT	45,789.27	37,583.60	24,331.56	22,735.35	4,296.63	13,060.21	27,031.98	37,391.77	99.49%	71.92%
July 2018 to Sept 2021		679,692.79	683,474.40	550,781.21	524,155.22	28,443.95	51,698.17	552,599.16	602,956.88	88.22%	80.85%
7.2.1	Administrative charges	47,578.49	43,796.88	41,867.57	34,287.67	2,918.27	2,918.27	37,205.94	44,785.84	102.26%	84.95%
YEAR 3 TOTAL REALLOC BUDGET (EUROS)		727,271.28	727,271.28	592,648.78	558,442.88	31,362.22	54,616.44	589,805.10	647,742.72	89.06%	81.10%

Source: Quarterly Report on MANITATRA 2 Projectas of september 2021

**Appendix 2 : Food consumption score or FCS calculation**

<b>Food group</b>	<b>Food group type</b>	<b>Nutritional weight (AT)</b>	<b>Number of days of consumption in the last 7 days (B)</b>	<b>Score (A)×(B)</b>
1	Rice	2		A1xB1
	Other cereals (maize, sorghum, etc.)			A2 x B2
	Roots and tubers (cassava, etc.)			A3xB3
2	Beans, peas, peanut	3		A4xB4
3	Fruits	1		A5xB5
4	Brèdes and vegetables	1		A6xB6
5	Meat/ fish/ chicken	4		A7xB7
6	Oil, fat and butter	0.5		A8 x B8
7	Sugar	0.5		A9xB9
8	Milk, yogurt and other dairy products	4		A10 x B10
SCA				$\sum_{i=1}^{10} A_i B_i$

After calculation, households will be classified into 3 categories:

- (i) the household with an ACS  $\leq 21$  is classified as “poor”
- (ii) the household with a score between 21.5 and 35 has a “borderline”
- (iii) the household with an FCS  $> 35$  is classified as “acceptable”