



Environmental and Social Management

Framework DEFIS+ Project

FINAL REPORT



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EXECUTIVE SUMMARY

Introduction

Madagascar has been ranked the fifth most vulnerable country to climate change in the world, and the ND-Gain index, which ranks the climate adaptation performance of 181 countries, has classified Madagascar's exposure, sensibility, and ability to adapt to the negative impacts of climate change as one of the least adapted to cope with climate events (rank 169 out of 181 countries). Madagascar belongs to the group of least developed countries (LDCs), more than 80% of the population lives below the poverty level, with \$ 2 per day, and 80% of the population lives in rural zones, most of them in very remote areas with limited access to basic infrastructure. The poverty rate (at \$1.9/day) is estimated to rise in 2023 and it was 74.3% in 2019, corresponding to an increase of 1.38 million people per year. Madagascar has experienced unprecedented, excessive, and consecutive droughts from 2017 to 2022, affecting crop production, food, and nutrition security across the country. The southwest and the extreme south are characterised by semi-desert environments with erratic and low rainfall of less than 800 mm per year. Thus, a decrease in average annual precipitation of up to -8% is projected by 2050. There is no significant change to be expected in terms of average annual rainfall accumulation, however, it is predicted that there will be an increase in the amplitude of inter-annual rainfall variability with greater extreme events. This is particularly true in the project area, which is formed by six regions of Amoron'i Mania, Haute Matsiatra, Vatovavy, Fitovinany, Atsimo-Atsinanana, and Ihorombe in the southern part of the country. Thus, the great variability of rainfall in the project area leads to either droughts or situations where the water balance is very much in surplus due to floods and heavy rains. Projected temperature increases in southern Madagascar are estimated to be between +1.2 and +2.1°C by 2050. In the next decade, under the RCP4.5 scenario, the number of days subject to extreme heat events is projected to increase from 9.2 days to 18.5 days, and by 2050, the average number of days subject to extreme heat events will increase from 32.4 days to 54.7 days, posing extreme high risks to human lives.

High occurrence of climate related disasters, limited climate resilience investments and capacity, and lack of access to formal safety nets and markets characterise the vulnerability context of rural Malagasy smallholders in the project area. The main climate-related changes include: (i) the decrease in the amount of precipitation annually, with more marked and / or more frequent periods of drought; (ii) a delay in the arrival of the rains, which requires adaptation (lag) in the agricultural calendars; (iii) the increase intensity of extreme climatic phenomena (cyclones, droughts, floods, storms, and strong winds); and (iv) a very high temporal and spatial variability in rainfall, which is unpredictable. Additionally, smallholders are frequently exposed to pest and disease outbreaks which cause significant crop and income losses. Since 2010, the areas most affected by drought events are in the project area, including the Atsimo-Atsinanana, Vatovavy, and Fitovinany regions. The GHG emissions in Madagascar come predominantly from the land-based sectors: agriculture, forestry, and land use change (AFOLU) and represent 80.5% of Madagascar's national emissions. The emissions are mainly from livestock (enteric fermentation and manure) and agriculture (methane from rice cultivation, poor soil management, deforestation for agricultural purposes, and fertiliser application).

The proposed project, Increase Resilience to Climate Change of Smallholders Receiving the Services of the Inclusive Agricultural Value Chains Programme (**DEFIS+**) has the ambition of reducing the negative impact of climate change by applying sustainable adaptation and mitigation measures. DEFIS+ may have environmental and social risks resulting from its activities, particularly the agricultural productivity enhancement and infrastructure development. In order to ensure that potential adverse impacts are minimised, environmental, social standards will be applied. This Environmental and Social Management Framework (ESMF) is intended to provide guidance to the management of environmental and social related risks and potential impacts of DEFIS+ activities. The ESMF identifies specific criteria for screening of investments and steps for managing the identified risks.

Project description

DEFIS+ will be organised around the following complementary outcomes, which are strategically conceived to contribute to climate change adaptation with mitigation co-benefits:

Outcome 1: Strengthened climate resilience of agricultural production systems through enhancement and maintenance of ecosystem services by: (i) improving access to efficient water management systems for sustainable agriculture, which includes enhancing the resilience of 15,000 ha of irrigated schemes and 8,100 ha of sub-watersheds

through nature-based flood protection and ecosystem-based approaches to restore 5,500 ha of landscape; (ii) improving access to regular and appropriate agro-climatic information for weather forecast and disaster risk reduction using automated agro-meteorological stations for flood and drought monitoring; (iii) improving the climate resilience of food production systems for 45,000 small family farms through the promotion of climate resilient farming technologies and practices, water conservation and storage techniques and integrated pest management techniques; and (iv) promoting resilient fodder production, CSA and agroforestry good practices.

Outcome 2: Increased income generation through improved market accessibility. This outcome revolves around promoting green roads for water approach, supporting the climate resilience of rural infrastructure for access to markets and utilising the water harvesting potential of roads. This includes: (i) investing in reinforcing works including well-designed cross drainage systems on 540 km of rural roads to protect the roads from damage due to climate hazards, such as heavy rainfall and floods and to harvest water for drought resilience by efficiently managing the runoff water from catchments upstream of roads with water retention and artificial recharge infrastructure associated with roads; (ii) training 2,000 trainers, construction workers and technicians on construction and maintenance standards that build upon a labour-intensive construction approach, which will be more sustainable in the long-term due to the reliance on local green technology; and (iii) improving climate resilience by introducing water harvesting options for increased water availability for farming, soil moisture improvement and aquifer recharge.

Outcome 3: Improved food and nutrition security through managing knowledge on food production systems. Local skills and knowledge will be leveraged for instance, through the development of operations manuals for Farmer Field Schools, in order to scale up innovations such as stress tolerant seed varieties and CSA practices. Outcome 3 will also promote non-timber forest products (NTFPs) and neglected and underutilised climate-tolerant food species (NUS), as a strategy to adapt to climate change, improve agricultural diversification, livelihoods and food security. The technologies that will be disseminated will not only help respond to the climate change challenge but will also contribute to reducing women's workload and time burden during farm and off-farm activities, with a positive impact on their health, education and those of their children. This outcome is inherently linked to Outcomes 1 and 2 as it benefits from the introduction of climate-smart practices and from increased income generation, both of which result in enhanced food and nutrition security and mitigate the negative impact of extreme climate events.

Project implementation arrangements

The Executing Entity is the Republic of Madagascar (RoM) through its Ministry of Economy and Finance (MEF) and Ministry of Agriculture and Livestock (MINAE). A Programme Coordination Unit (PCU) within MINAE will coordinate and manage DEFIS+ resources and activities in accordance with the financing agreement, project manuals (operations, financial management and administration procedures and monitoring and evaluation) and AWP/Bs, under the supervision of the Regional Steering and Monitoring Committee, the National Steering Committee and IFAD.

The PCU will be responsible for: (i) the management of the project's human, financial and physical resources; (ii) the preparation of AWP/Bs and project procurement plans; (iii) the coordination of the implementation of the activities; (iv) the monitoring and evaluation (M&E) of the project's activities and results; (v) the coordination and monitoring of the work/activities of partners and service providers; (vi) reporting and submitting activity and financial reports to the MEF, the MINAE and IFAD on a regular basis (minimum twice a year in the case of IFAD, so as to fulfil IFAD's semi-annual reporting obligation vis-à-vis GCF); (vii) liaising regularly with regional government authorities and decentralised services and other actors in the DEFIS+ intervention zones; (ix) ensuring the compliance of IFAD's safeguards during project implementation activities (i.e. ESMF, Gender Action Plan).

Planning and coordination of activities at the regional level will be provided by two inter-regional coordination units located in: (i) Fianarantsoa for the Ihorombe, Haute Matsiatra and Amoron'i Mania regions; (ii) Manakara for the Vatovavy, Fitovinany and Atsimo Atsinanana regions.

For the implementation of the activities, the PCU will establish operational partnerships with state institutions and service contracts with private operators and NGOs awarded through competitive processes. For both private and public sector operators, the condition for the continuation of their collaboration on the project is the delivery of the annual results defined in the conventions/contracts/protocols. Identified partners included government institutions such as the Office National de Nutrition and Offices Régional de Nutrition, and NGOs such as FAFAFI, CTAS, AFAFI, CFAMMA, FOFIFA, FIFAMANOR and private sector players such as STOI, Société 3S, SSM, OM Kompiva, agrival LFL, Tozzi Green, MAC SIOU KING Alixia (ENTREPRISE PLUS), Sté 3S Union MAMIBE and La Myriade.

IFAD Social Environment and Climate Assessment Procedures

IFAD has developed safeguard policies to support the sustainable implementation of its activities and interventions in achieving its mandate to eradicate rural poverty and food insecurity. These include policies and strategies on: Improving Access to Land and Tenure Security; Disclosure of Documents; Environment and Natural Resources; Gender Equality and Women’s Empowerment; Preventing and Responding to Sexual Harassment, Sexual Exploitation and Abuse; Targeting; Climate Change Strategy; Social, Environment and Climate Assessment Procedures (SECAP) and Strategy and Action Plan on Environment and Climate Change. SECAP provides 14 Guidance Statements, namely: Biodiversity; Agrochemicals; Energy; Fisheries and Aquaculture; Forest Resources; Rangeland-based Livestock Production; Water; Dams, their Safety and SECAP; Physical Cultural Resources; Rural Roads; Development of Value Chains, Microenterprises and Small Enterprises; Rural Finance; Physical and Economic Resettlement; and Community Health.

Stakeholder Consultation

Three public consultation meetings were held in Fianarantsoa, Manakara and Farafangana according to the intervention zones of the DEFIS+ project. The participants in the meetings included the administrative authorities, the technical services concerned by the Programme (Ministerial Directorate in charge of the Environment, Agriculture and Livestock, National Environment Office in Fort Dauphin, etc.), the various partners of the Project (FDA, Tranoben'ny Tantsaha, etc.) and representatives of the beneficiaries and local communities concerned by the Project. During Project start-up, extensive consultations will be held at the national, regional and subregional levels.

Potential environmental, social and climate-related impacts

Potential impacts of DEFIS+ component 1 activities

Impacted component of the environment	Potential impacts
Rehabilitation of irrigated schemes	
Water	Resuspension of solids, and degradation of water quality through increased turbidity. Risks of water pollution related to solid and liquid waste spills during works Pollution of water resources in the area through the use of inputs for agriculture. Accumulation of sediments at dams.
Soil	Soil pollution by waste Erosion in material extraction areas. Soil pollution from the use of inputs for agriculture. Soil compaction and increased risk of erosion by clearing vegetation for the development of the site facility. . Risk of pollution from cleaning products from canal maintenance.
Human and socio-economic environment	Risks of social conflicts with local communities Disruption of rural activities Risk of encroachment on exploited areas; loss of sources of income or livelihood Risk of conflicts related to water use. Risk of conflicts between WUAs for infrastructure maintenance activities. Deterioration and dysfunction of built/rehabilitated infrastructure due to erosion and silting. Risks of various accidents, construction sites, traffic Risks of disease spread Child Labor Risks Community health and safety risks Risks of gender-based violence Risks of increased ambient noise Risk of conflicts between WUAs for infrastructure maintenance activities. Deterioration and dysfunction of the infrastructures built/rehabilitated by the phenomena of erosion and silting. Risks of land conflicts Risks of non-involvement of vulnerable people and women
Air	Atmospheric pollution, dust emissions by the circulation of construction machinery and vehicles , exhaust gases, wastes
Habitats, biodiversity, vegetation, fauna	Loss of vegetation

Impacted component of the environment	Potential impacts
	Disturbance of wildlife through destruction of natural habitats , risk of encroachment on sensitive areas
Introduction of adapted varieties: Seed multiplication	
Water	Risk of depletion of local water resources
Biodiversity	Large-scale distribution of certain varieties of seeds: abandonment of old varieties, which can lead to a reduction in floristic biodiversity.
Protection of sub-watershed	
Biodiversity	Loss of floral resources through earthworks. Loss of wildlife habitat. Restriction livestock mobility Risk of proliferation of invasive plants.
Water	Input of solids into downstream water bodies/streams through run-off from the earthwork areas. Set up nurseries: risk of depletion of local water resources
Human and socio-economic environment	Risk of interference with exploited areas; loss of sources of income or livelihood. Risk of accidents during earthworks. Restriction of human and livestock mobility Risks of non-involvement of vulnerable people and women Growing demand for agricultural land: risk of land disputes between farmers / pastoralists or between villages / communities
Construction of water tanks	
Soil	Exposing the soil by stripping the topsoil. Facilitation of erosion by rainwater runoff.
Water	Risks of conflicts linked to the use of water Risk of bacteriological contamination of stored water, by runoff water from residential areas; health risk for users
Biodiversity	Loss of floral resources through stripping of the reservoir right-of-way. Loss of wildlife habitat.
Human and socio-economic environment	Risk of interference with inhabited and/or exploited areas; loss of sources of income or subsistence. Risk of accidents during work Risks of various accidents, construction sites, traffic Risks of disease spread Child Labor Risks Community health and safety risks Risks of gender-based violence Risks of interference with the areas exploited by excavated products Risks of non-involvement of vulnerable people and women
Creation of Farmer Field Schools	
Water	Increased pressure on local water resources; risk of depletion of these water resources. Pollution of local water resources if excess inputs are used for cropping techniques.
Human and socio-economic environment	Risk of interference with inhabited and/or exploited areas; loss of sources of income or livelihood. Potential for conflict over water use.
Production of resilient fodder	
Soil	Facilitation of erosion by rainwater runoff after fodder harvest.
Human and socio-economic environment	Risk of interference with inhabited and/or exploited areas; loss of sources of income or livelihood.

Potential impacts of Component 2 activities

Component impacted by the environment	Potential impacts
Rehabilitation of rural roads	
Biodiversity	Loss of plant resources by stripping the right-of-way. Loss of wildlife habitat. Loss of significant natural resources if encroachment on conservation areas. Increased risk of illegal logging and poaching due to the opening of the road.
Water	Disruption of water flow if the route crosses a watercourse.
Soils	Soil pollution by waste Erosion in material extraction areas Soil compaction and increased risk of erosion by clearing vegetation for the development of the site facility Siltation of downstream water bodies/courses.
Human and socio-economic environment	Risks of social conflicts Traffic disruptions Risk of encroachment on inhabited and/or exploited areas; loss of sources of income or livelihood. Risk of accident for users and local populations of the rehabilitated road. Risks of various accidents, construction sites, traffic Risks of disease spread (HIV/AIDS, COVID 19, other water-related diseases, malaria) Child Labor Risks Community health and safety risks Risks of gender-based violence Risk of increased ambient noise Increase in population due to visitors Loss of cultural, religious, historical, aesthetic resources Induced population movements and natural resource exploitation activities, due to improved access (eg conversion of forest to pasture, or of sustainable land use to unsustainable, short-cycle cropping; illegal or unsustainable hunting
Air	Atmospheric pollution, dust emissions by the circulation of construction machinery and vehicles, exhaust gases, garbage

General risks for both Component 1 and 2 activities	
Risk	Mitigation measures
Health risk to workers	Promote safe work through Standard Operating Procedures, training and awareness raising Encourage and enforce the use of PPE Supporting first-aid box and to provide minimal level of training; Enlisting the names and numbers of village doctors in nearby community places/shops; Encourage regular workplace cleaning
COVID – 19 infection risk	Promote COVID-19 guidelines (WHO compliant) Monitor uptake of guidelines through field visits Organize awareness raising sessions Promote early closure of facilities and enterprises in case of suspicion of COVID-19 cases
General poor working conditions	Ensure contractors adopt principles of decent work and the associated work programme Encourage and enforce the use of PPE Ensure grievance mechanisms are known and accessible to workers Promotion of nutrition-sensitive meals during working hours Supporting first-aid box and to provide minimal level of training;

Quarterly and Annual Reviews

Quarterly and annual reviews will be undertaken by the PMU. Annual workshops will be held where environmental and social performance of the Project will be reviewed and discussed, and recommendations made for improved Project performance.

Monitoring and Reporting

Monitoring of DEFIS+ supported activities at PMU will be done primarily by the Environment Specialist. The Environmental Specialist will produce quarterly and annual environmental and social performance reports, which the PMU Project Coordinator will review and then submit to the NSC and IFAD.

Environmental and Social Auditing

Where ESIA's have been prepared for given activities/interventions, annual environmental and social auditing as required by national Office of Environment.

ESMF implementation budget

The estimated budget for the ESMF is approximately 2% of the overall project costs i.e. approximately USD 1 000 000. These costs are mostly linked to the site-specific infrastructure ESMPs and the capacity building activities. The costs are mostly incorporated in the activities related to infrastructure development and capacity building of technical teams and communities.

1. INTRODUCTION

1.1. GENERAL CONTEXT

The Government of Madagascar and the International Fund for Agricultural Development (IFAD) signed an agreement in December 2017 for the financing of the Programme for the Development of Inclusive Agricultural Sectors (DEFIS). The Programme is part of the implementation of national policies and programmes, including: (i) the National Development Plan (NDP), (ii) the Agriculture, Livestock and Fisheries Sector Programme (PSAEP), and (iii) the National Environment Policy for Sustainable Development (PNEDD). It also responds to the Government's priorities in terms of adapting agricultural production systems to the effects of climate change and improving the management of the country's water resources. In addition, DEFIS is intended to be an instrument for the implementation of the Regional Programme for Food and Nutritional Security (PRESAN) of the Indian Ocean Commission (IOC).

In addition, the programme has been adjusted to the new government orientation described in the General State Programme and specified in the Plan Emergence Madagascar (PEM). The aim is to contribute to the implementation of the major strategic orientations of the IEM-PGE, which includes the increase of the productivity and added value of economic agents. The Velirano n°9 "food self-sufficiency" constitutes the framework for the overall insertion of the DEFIS mission, and this in the vision of the Ministry of Agriculture, Livestock and Fisheries (MAEP), which consists in ensuring "food self-sufficiency and the emergence of a modern agricultural sector".

The main mission of DEFIS is to transform family farming through the large-scale adoption of efficient and resilient production systems and their integration into profitable agricultural sectors.

Thus, DEFIS interventions will be concentrated on 8 sectors, namely: rice, maize, cassava, groundnuts, coffee, onions, small ruminants and honey.

DEFIS will intervene in 8 regions of central, south-eastern, southern and south-western in Madagascar: Amoron'i Mania, Haute Matsiatra, Ihorombe, Androy, Anosy, Vatovavy-Fitovinany, Atsimo Atsinanana and Atsimo Andrefana

1.2. TARGET REGIONS OF THE DEFIS+ PROJECT

The DEFIS+ project will intervene in six target regions, namely: Atsimo Atsinanana, Vatovavy, Fitovinany, Ihorombe, Haute Matsiatra and Amoron'i Mania (see Figure 1).

These six DEFIS+ intervention regions are also covered by the current DEFIS. The DEFIS+ project will thus support the DEFIS programme in these five target regions which can be grouped into two zones: (i) the South-East zone (Atsimo Atsinanana, Vatovavy and Fitovinany) characterised by a humid climate, high exposure to cyclones and irregular and intense rainfall; and (ii) the South-Central Highlands zone (Ihorombe, Matsiatra Ambony and Amoron'i Mania), characterised by a humid climate and increasing drought and flooding.

Agriculture is the main economic activity in all DEFIS+ target regions. These regions were selected based on their vulnerability to climate change, their high incidence of rural poverty, but also their high potential for agricultural development and market access.



Figure 1 – The six intervention areas of the DEFIS+ project

1.3. CLIMATE CONTEXT AND JUSTIFICATION

Geographical location, relief, maritime influence and wind patterns result in a variety of climatic conditions in Madagascar. Madagascar has two main seasons: a hot, rainy season (November to April) and a cooler, dry season (May to October). The eastern part of the coast is the wettest and has a hot and humid climate. It receives a minimum of 1.70 m of rain and a maximum of 3.70 m per year. The highlands have a tropical highland climate, characterised mainly by a cold winter. The average rainfall varies from 0.9 to 1.5 m per year. The southwest and extreme south are characterised by semi-desert environments with irregular and low rainfall (≤ 800 mm / year). Average annual temperatures range from 23°C to 27°C along the coast and from 16 ° C to 19 ° C in the highlands. Madagascar is also a very exposed and vulnerable country to cyclones and floods. During the 2007-2012 rainy season, the Vatovavy Fitovinany region appears to be the region most at risk of flooding.

The change in the rainfall regime due to climate change in the form of floods affects the irrigated schemes and lowlands of Madagascar. It intensifies the process of soil erosion in the watershed areas, with sediments being washed away and silted up in the irrigated schemes and lowlands. Floods also damage civil engineering structures such as hydro-agricultural networks and roads. The combined effects impact on agricultural production leading to food insecurity.

- **Climate trends:**

Over the past few decades, the average temperature in the southern half of Madagascar has risen from 21.5 to 22.4°C. While average rainfall has decreased and become more erratic, extreme rainfall has become more intense, leading to an increased risk of flooding. Data provided by the National Meteorological Agency (NMA) show that up to 60 per cent of the south is regularly facing water shortages. There has been a marked increase (both in frequency and duration) in extreme water deficits since the turn of the century. In the central and eastern coastal regions of southern Madagascar, there has been a steady decline in rainfall between 1961 and 2005, accompanied by an increase in the duration of drought periods.

Sea level is gradually rising, at a rate of 1.57 mm/year between 1993 and 2017, and sea temperature in the western Indian Ocean increased by 0.60°C between 1950 and 2009. Climate projections: In Madagascar, rainfall variability is expected to increase in intensity and extreme rainfall and drought will become more frequent. A likely decrease in average annual rainfall, ranging from -8 to +1%, will be projected by 2050. Projected temperature increases in southern Madagascar are estimated at between 1.1°C and 2.6°C by 2065. Recent research suggests that the frequency of cyclones will decrease with climate change, reducing the total amount of rainfall in southeastern Madagascar. However, the intensity of these cyclones is expected to increase and, with them, the intensity of associated flooding. In addition, El Niño cycles can significantly reduce the amount of rainfall that the southern regions of Madagascar receive. This can occur for an extended period of time, resulting in drought conditions. These events are expected to become more frequent and can have extremely negative impacts on rainfall. For example, during the 2015/16 El Niño event, during the crucial growing months of January to March, there was a 28 per cent reduction in rainfall over the 3-month period.

▪ **Climate change impacts and vulnerability:**

With its unique flora and fauna, Madagascar is identified as a biodiversity hotspot and is ranked as the fifth most vulnerable country to climate change in the world. ND-Gain measured Madagascar's exposure, sensitivity and capacity to adapt to the negative impacts of climate change and ranked it 169th out of 181 countries. Agriculture is the backbone of Madagascar's economy: it accounts for 20% of its GDP and employs 80% of the population. The agricultural sector in Madagascar is mainly rain-fed, characterised by subsistence farming and based on traditional practices and technologies, such as slash-and-burn agriculture, which contribute to deforestation and soil erosion, further exacerbating the vulnerability of the sector. Indeed, rural populations' dependence on low-yielding rainfed staple crops and their over-reliance on single sectors (most often rice) makes them extremely vulnerable to climate change. In irrigated systems, rice yields are projected to decline by 10.98% over the next 30 years, while in rainfed systems wheat will decline by 37.45% and maize by 30.68%, threatening the livelihoods and well-being of the rural population. Moreover, these projections will be exacerbated by climate shocks not included in the analysis. For example, the aforementioned 28 percent reduction in rainfall during the main growing months caused by the 2015/16 El Niño event resulted in a loss of about 80 percent of the 2016 crop in southern Madagascar. This compounded the negative impacts of sequential droughts over the previous four-year period, catastrophically reducing the coping mechanisms of smallholders.

In addition, the variation in rainfall and temperature patterns, as well as the increasing intensity of extreme weather events, are altering cropping calendars and consequently increasing crop failure. In some regions, planting or harvesting seasons have been shifted by a few weeks due to climate change. Irrigation, where available, is not efficient and reduced rainfall further reduces the overall water supply for agriculture.

These extreme events can jeopardise the fragility and reduce the sustainability of infrastructure, such as the irrigation network, and lead to production losses, and in another case, destroy roads that become unusable. They result in more frequent regular maintenance and then in high rehabilitation costs.

In addition, extreme weather events lead to losses in rural infrastructure, which in turn affects overall agricultural productivity. The yield loss generated by extreme weather events is estimated at 1.01 tonnes/ha for irrigated rice (caused by floods), 1.4 tonnes/ha for cassava, 0.240 tonnes/ha for maize (caused by drought events). Other structural economic and institutional problems further undermine resilience (e.g. limited access to credit, high interest rates, barriers to market access, etc.).

In collaboration with DEFIS, DEFIS + will support an integrated and climate-sensitive approach to address these challenges.

1.4. INSTITUTIONAL FRAMEWORK FOR THE IMPLEMENTATION OF THE DEFIS PROGRAMME

The institutional set-up of the DEFIS programme is based on the achievements of the AROPA project, but also of the PROSPERER and AD2M projects, which place a strong emphasis on the integration of family farmers and rural microenterprises in promising agricultural and rural sectors.

The general organisation of the project implementation is summarised in the table below.

Table 1 – Institutional organisation in the implementation of the DEFIS programme

Function	Entity	Responsibilities
Trusteeship and steering		
Trusteeship	Ministry of Agriculture, Livestock and Fisheries (MAEP)	<ul style="list-style-type: none"> ● Supervision of the work of the PCU ● Facilitation of coordination and harmonisation of implementation approaches with those of other MAEP projects/programmes; ● Ensuring that National Steering Committee (CNP) meetings are organised regularly; ● Participation in UCP field monitoring missions or IFAD supervision missions.
Steering (at national level)	National Steering Committee (CNP)	<ul style="list-style-type: none"> ● Validation of the annual work programmes and budget of DEFIS; ● Evaluation of the Programme activities and results progress level and their alignment with the strategies of the rural sector.
Steering (at regional level)	Regional Steering and Monitoring Committees (CROS)	Same functions as the CNP but limited to the regional level.
Coordination and management		
Coordination and management of DEFIS	Programme Coordination Unit (PCU)	<p>Implementation of DEFIS activities:</p> <ul style="list-style-type: none"> ● Prepare the AWPB, the procurement plans (PP), the monthly financial report, the quarterly financial reports and the activity reports (half-yearly and annual) of the whole Programme; ● Contractualise partners or service providers and sign partnership agreements, and monitor the proper implementation of these contracts and agreements; ● Ensure the management of the financial, material and human resources of DEFIS; ● Coordinate the activities of DEFIS with those of other stakeholders in the Programme's intervention zones (technical and financial partners, decentralised services, etc.); ● Ensure the timely transmission of activity, financial and supervision reports to the MPAE, the MFB and all the partner ministries of the Programme; ● Implement a simple, reliable and regularly updated monitoring and evaluation system to ensure monthly, quarterly and annual monitoring of activities, results and impact of DEFIS; ● Consolidate and prepare the data and information necessary for the interphase and mid-term review missions of the Programme;

Function	Entity	Responsibilities
		<ul style="list-style-type: none"> ● Document, capitalise and disseminate the knowledge acquired during the implementation of DEFIS.
	Interregional coordinations	<ul style="list-style-type: none"> ● Prepare the AWPB, the procurement plans (PP), the quarterly activity reports at the level of their intervention zone; ● Prepare and monitor the proper implementation of these contracts and agreements; ● Ensure the management of financial, material and human resources in their area of intervention; ● Coordinate the activities of DEFIS with those of other stakeholders in their area of intervention; ● Ensure the timely transmission of activity reports to the national coordination of the Programme; ● Implement a simple, reliable and regularly updated monitoring and evaluation system to ensure monthly, quarterly and annual monitoring of the activities, results and impact of DEFIS; ● Consolidate and prepare the data and information necessary for the interphase and mid-term review missions of the Programme; ● Document, capitalise and disseminate the knowledge acquired during the implementation of DEFIS.

2. DESCRIPTION OF THE PROJECT

2.1. CONTEXT AND OBJECTIVES OF THE DEFIS+ PROJECT

The proposed project for funding by the GCF, entitled "Increasing Climate Change Resilience of Smallholder Farmers benefiting from the Inclusive Agricultural Value Chains (DEFIS+) Program", will build on the efforts and investments made by an ongoing pro-poor agricultural investment program (DEFIS program, funded by IFAD and OFID).

The objective of the DEFIS program is to sustainably improve the incomes and food security of climate-vulnerable rural populations in targeted areas. It aims to transform the family farming sector through the adoption of efficient and resilient production systems on a larger scale and the integration of family farmers into profitable value chains. The areas in which DEFIS focuses its interventions have been selected based on their vulnerability to climate change, high incidence of rural poverty, but also high potential for agricultural development and market access. By operating in eight regions in the southern half of the country and targeting 320,000 family farms (1.6 million people), DEFIS intends to make a decisive contribution to the achievement of Madagascar's sustainable development objectives.

The objective of the interventions proposed here to be financed by the Green Climate Fund ("DEFIS+ project"), is to further strengthen the climate change resilience of agricultural systems and vulnerable communities targeted by DEFIS. Complementary and catalytic investments in climate change adaptation through DEFIS+ will be made in 5 target regions over a 6-year period. The 5 regions, which are Amoron'i Mania, Haute Matsiatra, Ihorombe, Vatovavy Fitovinany and Atsimo Atsinanana, are located in the central-southern highlands and south-eastern part of Madagascar. They were selected on the basis of national priorities, including Madagascar's Nationally Determined Expected Contribution (CPDN or "INDC") (2015), which identifies southern Madagascar as the region most vulnerable to climate change. Other selection criteria used were: (i) poverty incidence; (ii) food security vulnerability; and (iii) complementarity and potential for scaling up lessons learned from previous IFAD-funded projects (AROPA, AD2M, PROSPERER and FORMAPROD). The six regions of intervention of DEFIS+ are also covered by the current DEFIS Programme.

The beneficiaries of the DEFIS+ interventions will be about 104,000 family farms, or about 692,000 individual beneficiaries. Of the total number of beneficiary households, 30% will be headed by women and 30% by rural youth..

2.2. DESCRIPTION OF THE PROJECT

Building on IFAD's 40 years of experience in family farming in Madagascar, DEFIS is an integrated programme approved by IFAD's Executive Board in December 2017 and implemented in 2019. DEFIS aims to develop resilient agricultural crops and provide a structural response to poverty, food and nutrition insecurity in the southern half of Madagascar by building on the results developed by previous investment projects. It aims to reach at least 320,000 family farms, of which at least 30% are managed by women and 30% by youth. The total number of beneficiaries is 1.6 million people.

The objective of the proposals to be funded by the GCF ("DEFIS+") is to further build resilience to the impacts of climate change on the farming systems and vulnerable communities targeted by DEFIS. This will contribute to the DEFIS objective of sustainably improving the income, food and nutrition security of vulnerable rural populations living in the programme area.

DEFIS + will take into account the measures needed to better adapt agricultural practices and technologies to climate change. It will be fully integrated into the DEFIS programme using the same terms and conditions of implementation. DEFIS+ funding will complement other sources of DEFIS funding, namely IFAD, OFID, the government and the beneficiaries. It will mainly be used to disseminate climate change adaptation actions and resilient investments in remote and poor rural areas, which will be concentrated in agricultural growth poles (agropoles) and on priority value chains (rice, maize, cassava, groundnut, coffee, onion, small ruminants and honey). The climate adaptation activities implemented under DEFIS + will be carried out in six of the nine target regions of the DEFIS programme (Ihorombe, Haute Matsiatra, Amoron'i Mania, Vatovavy-Fitovinany and AtsimoAtsinanana) over a six-year period. Approximately 104,000 resource-poor rural households (about 692,000 people), of which at least 30% are headed by women and youth, will directly benefit from DEFIS+ project interventions. DEFIS+ interventions will be in synergy with the current and planned investments of all technical and financial partners in the field of climate change.

The expected impacts are: (i) increased resilience and improved livelihoods of the most vulnerable people, communities and regions; (ii) improved resilience of basic rural infrastructure to the effects of climate change; and (iii) improved resilience of ecosystems and ecosystem services.

The activities planned under the DEFIS+ Project are:

- **Outcome 1: Strengthened climate resilience of agricultural production systems** through enhancement and maintenance of ecosystem services by: (i) improving access to efficient water management systems for sustainable agriculture, which includes enhancing the resilience of 15,000 ha of irrigated schemes and 8,100 ha of sub-watersheds through nature-based flood protection and ecosystem-based approaches to restore 5,500 ha of landscape; (ii) improving access to regular and appropriate agro-climatic information for weather forecast and disaster risk reduction using automated agro-meteorological stations for flood and drought monitoring; (iii) improving the climate resilience of food production systems for 45,000 small family farms through the promotion of climate resilient farming technologies and practices, water conservation and storage techniques and integrated pest management techniques; and (iv) promoting resilient fodder production, CSA and agroforestry good practices.
- **Outcome 2: Increased income generation through improved market accessibility.** This outcome revolves around promoting green roads for water approach, supporting the climate resilience of rural infrastructure for access to markets and utilising the water harvesting potential of roads. This includes: (i) investing in reinforcing works including well-designed cross drainage systems on 540 km of rural roads to protect the roads from damage due to climate hazards, such as heavy rainfall and floods and to harvest water for drought resilience by efficiently managing the runoff water from catchments upstream of roads with water retention and artificial recharge infrastructure associated with roads; (ii) training 2,000 trainers, construction workers and technicians on construction and maintenance standards that build upon a labour-intensive construction approach, which will be more sustainable in the long-term due to the reliance on local green technology; and (iii) improving climate resilience by introducing water harvesting options for increased water availability for farming, soil moisture improvement and aquifer recharge.

- **Outcome 3: Improved food and nutrition security** through managing knowledge on food production systems. Local skills and knowledge will be leveraged for instance, through the development of operations manuals for Farmer Field Schools, in order to scale up innovations such as stress tolerant seed varieties and CSA practices. Outcome 3 will also promote non-timber forest products (NTFPs) and neglected and underutilised climate-tolerant food species (NUS), as a strategy to adapt to climate change, improve agricultural diversification, livelihoods and food security. The technologies that will be disseminated will not only help respond to the climate change challenge but will also contribute to reducing women's workload and time burden during farm and off-farm activities, with a positive impact on their health, education and those of their children. This outcome is inherently linked to Outcomes 1 and 2 as it benefits from the introduction of climate-smart practices and from increased income generation, both of which result in enhanced food and nutrition security and mitigate the negative impact of extreme climate events.

2.2.1. Component 1 « Strengthened climate resilience of agricultural production systems »

DEFIS aims to build infrastructure such as hydro-agricultural irrigation and will improve agricultural systems. DEFIS supports the production of improved seeds at the local level through a seed support centre and producer organisations specialised in seed production. In addition, DEFIS provides support for the dissemination of improved agricultural practices.

Within this framework, the DEFIS+ project will contribute to the protection of the sub-watershed and the promotion of anti-erosion systems to protect the infrastructure put in place. One of the objectives of DEFIS+ is also to disseminate climate resilient systems, such as resilient seeds and fodder. To ensure production, the DEFIS+ project will disseminate new adapted technologies such as the promotion of water-saving technologies (micro irrigation system, water storage by gravity), renewable energy and energy-saving technologies (solar pump, biogas and improved stoves).

The activities of this DEFIS+ component 1 aim to improve the availability of water for agriculture, particularly during the dry season, as well as the ability of cropping systems to adapt to more variable, mainly drier, climatic conditions. The proposed water management practices and the adoption of agroforestry, stress resistant seeds and SRI provide an adaptive strategy to climate-induced water shortages and soil erosion and, compared to other practices, are found to be high yielding and cost effective. In addition, the focus on Farmer Field Schools (FFS) allows for a long-term model change towards sustainable agriculture.

2.2.1.1. Water management for sustainable agriculture

Longer periods of drought, and their increased frequency combined with more intense rainfall, will have two foreseeable impacts on irrigation systems: (i) an increase in wind and water erosion and thus the need to protect infrastructure from flooding and siltation of irrigation canals; and (ii) an increased need to increase water storage capacity by constructing more structures to collect and retain rainwater in order to ensure water availability during dry periods.

The climate change adaptation measures proposed in the framework of hydro-agricultural management will focus on

- Strengthening irrigating schemes to protect them from heavy rains and to increase water storage capacity and water reserves for dry periods. The works to be undertaken will include the strengthening of drainage networks and canals in irrigated areas, as well as de-silting systems for irrigation networks, etc. Other works may include the construction of reservoirs in the higher areas of the watersheds to collect water during heavy rains.
- Landscape restoration and reforestation, as well as the adoption of biological measures (planting of herbaceous or shrubby species along the contour lines or perpendicular to prevailing winds) and mechanical measures (benches, terraces, gully prevention techniques and lavakas) to protect sub-watersheds in the vicinity of irrigated areas from wind and water erosion, improve vegetation cover and water infiltration, and reduce erosion
- Capacity building of engineering and construction companies in terms of standards (NIHYCRI), protection of irrigated schemes and anti-erosion devices on watersheds.

- Promotion of cooperation between family farmers in the sub-watersheds and adjacent irrigated areas, to create synergies in the use of the sub-watersheds, improve their productivity and protect them from erosion. Collaboration between users will be facilitated through participatory approaches (e.g. farmer field schools) to develop conservation and management plans for sub-watersheds.
- The organisation of training and exchange visits for members and technicians of the Water Users Associations (WUAs) on national standards for the construction of hydro-agricultural infrastructure against floods (NIHYCRI) and good management practices and adaptation to climate change.

The expected results are: (i) the climatic resilience of 15,000 hectares of irrigated schemes is improved; (ii) anti-erosion measures are implemented on 8,100 hectares of sub-watersheds that drain into irrigated schemes, of which 5,500 hectares of landscape are restored and reforested, and 900 technicians are trained; (iii) 98,000 family farmers cooperate to ensure effective management of sub-watersheds and connected irrigating schemes; (iv) 1,400 WUA members and technicians are trained on climate change adaptation, water resources conservation and management plans; (v) 150 water tank units are installed.

2.2.1.2. Promoting climate-resilient farming systems

The DEFIS+ project will enhance the climate resilience of dryland or rainfed upland farming systems through the promotion of resilient agricultural and agroforestry development and improved technologies such as stress-tolerant varieties, planting materials and the installation of conventional water storage tanks (gravity water tanks) or buried sand-filled water tanks (USWT).

The proposed climate change adaptation measures are

- Promotion of resilient agroforestry and landscape management systems, which will aim to (i) harvest runoff and heavy rainfall more efficiently by constructing and feeding conventional water storage tanks (gravity water tank) in sub-watersheds, or REEPS; and (ii) protect against soil erosion and improve soil fertility management to increase their agricultural production potential, while strengthening crop rotations and using compost. Depending on the topography, integrated crop management practices and techniques to be promoted include: implementing microsoil bunds, trenches and pits to prevent erosion; planting rows of shrubs and trees or strip cropping to prevent erosion or as protective belts; and diversifying plant varieties and increasing plant density by integrating cover crops, shrubs, soil amendments or fodder crops into crop rotations. Through the Farmer Field Schools (FFS), the DEFIS+ project will intensify land management techniques successfully tested in Madagascar such as the "agroecological blocks" of the CTAS, the agroecological systems developed by the PAPAM project.
- Promotion of the intensive rice growing system (SRI) and its variants (PAPRIZ system). Developed in Madagascar, SRI has proven to be both a high-yielding and climate-friendly agro-ecological approach due to its water efficiency and low dependence on external, productivity-enhancing inputs such as mineral fertilisers. SRI relies on the adoption of a few agronomic crop management practices (such as transplanting "8-day-old" seedlings, minimum water during the vegetative growth period, and a thin layer of water maintained during the flowering and grain filling phase, use of compost to improve soil nutrient content, weeding at least 3 times, etc.). Experiences from previous IFAD-funded projects indicate that access to irrigation creates a favourable condition for the adoption of SRI by smallholders.
- Support to the National Centre for Applied Research and Rural Development (FOFIFA) and FIFAMANOR in collaboration with international agricultural research centres, such as the International Potato Centre (CIP) in partnership with IITA, the Africa Rice Centre (AfricaRice) and the International Centre for Insect Physiology and Ecology (ICIPE), for the production of basic seeds of stress resistant varieties (biotic and abiotic stresses such as drought resistant, heat resistant, short cycle, etc.), the practice of pest management techniques and the development of a new crop.), the practice of integrated pest management techniques.
- Multiplication and dissemination of locally adapted seeds and planting materials, using community-based participatory approaches and DEFIS-supported seed producers: the DEFIS+ project will build on the network of seed multiplier farmers and seed production sites. The RWHS will be used for the dissemination of these innovations.

- Support to the Agnarafaly Seed Production Centre (CPSA) and the Kianjavato Centre in the multiplication and promotion of the adoption of certified or quality declared seeds. These will target crop varieties or species with short growing seasons, greater resistance to drought, stress, and better adaptation to climate change. These crops include improved varieties of cassava, legumes, fodder crops and orange-fleshed sweet potatoes that are water efficient or better adapted to water stress.

2.2.1.3. Scaling up new technologies to combat climate change

The DEFIS+ project will promote water-saving technologies such as drip or micro-irrigation systems, solar pumps, gravity-fed watershed storage, water mills, and wastewater collection systems to harness water resources collected along roads for the agricultural system.

DEFIS+ will also promote renewable energy and energy efficient technologies such as improved cookstoves and artisanal briquettes, using local materials thus reducing deforestation, solar pumping for irrigation, biogas production with livestock activities, solar milling and solar dryer for product processing. DEFIS+ will ensure the establishment of pilot model systems for these new technologies and the training of trainers, and the FDA will ensure the extension of the system to producers.

2.2.2. Component 2 « Increased income generation through improved market accessibility »

DEFIS promotes producers' access to markets in the intervention areas. In order to reduce post-harvest losses and improve market access, competitiveness and income, the programme will support, among other things, (i) the establishment of storage facilities, (ii) the creation of collection centres and processing units, (iii) the rehabilitation of rural roads linking production areas to these facilities.

The DEFIS+ project will thus contribute to (i) improving drainage systems to channel runoff water away from tracks and store it for later use; (ii) making roads more resistant by using tarmac or paving stones to prevent gullyng; (iii) revegetating embankments exposed to erosion due to runoff, to stabilise roads; (iv) disseminating Malagasy building and road standard.

2.2.2.1. Reducing the impacts of climatic hazards on unpaved rural access roads

DEFIS will finance the rehabilitation of tracks through a structured labour-intensive approach. Within this framework, the DEFIS+ project will make substantial improvements to critical sections of rural access roads, sanitation, pavement, e.g. by protecting the pavement with stones or by implementing concrete road sections.

The expected result is to improve the climate resilience of 540 km of unpaved rural access roads.

2.2.2.2. Availability of local and professional actors capable of building and maintaining rural infrastructure

DEFIS is setting up small processing centres or storage facilities, and roads. The road rehabilitation works will be financed by DEFIS through a structured labour-intensive approach. All these infrastructures will be implemented using new Malagasy standards in infrastructure construction. Most of these standards are recent or updated, and the contribution of the DEFIS+ project to the DEFIS programme in this respect is the dissemination of these standards through training, so that rural municipal infrastructure is climate change resistant.

The expected results are 2000 trainers, stakeholders and professionals trained in the new standards, such as Protection Standards against Flood for road infrastructure construction.

2.2.3. Component 3 « Improved food and nutrition security »

DEFIS will support the development of productive infrastructure and agricultural service tools to increase production and enable additional production for the market. DEFIS aims to support nutrition education, improving the nutrition of

targeted households, especially vulnerable households such as under-fives, pregnant and lactating mothers. The project will also promote the exchange of knowledge and best practices on climate resilient system and support the dissemination of agro-climatic information system.

2.2.3.1. Knowledge management on adaptation of the food production system to climate change

To promote the exchange of knowledge and good practices related to climate resilient agricultural practices, the DEFIS+ project will support exchange visits and study tours at community and local levels. DEFIS+ will also support knowledge acquisition studies on adaptation options and strategies developed by smallholder farmers. As part of this capitalisation process, DEFIS+ will consolidate the efforts of the World Bank-funded programmes to enrich and improve the database on LAUREL (Land Use Planning for Enhanced Resilience of Landscape) platforms for studying, simulating, evaluating and reorienting the land use and land use change process: development of a baseline on land degradation and a prototype of land use change simulation platform (LANDSIM-P).

2.2.3.2. Support to the agro-climatic information system

The DEFIS+ project will support the upgrading of agrometeorological information systems by strengthening the agrometeorological data collection and processing network in the target areas. The project will support the expansion of the existing national network through the acquisition and installation of automated agrometeorological stations. It will also provide support at the regional level to the staff of the Regional Meteorological Services (SRM) and the Regional Directorates of Agriculture, Livestock and Fisheries (DRAEP) through training in the analysis, communication and dissemination of agrometeorological information. The national institutions and civil society organisations concerned will be trained and mobilised to better inform farmers and their rural organisations, and to strengthen their capacity to integrate climate risk into their decision-making process and their agricultural practices.

The expected results for Component 3 of the DEFIS+ Project are: (i) 60 trainings on climate change for 2500 farmers using new adapted technologies (renewable energy and small scale energy efficient technologies, water efficient technologies); (ii) 30 exchange visits are organised to disseminate good practices in climate change adaptation; (iv) at least 20 thematic knowledge products are published by capitalising on good practices and knowledge on climate change adaptation measures, disseminated through the DEFIS regions and others to all stakeholders, NGOs, agricultural business school, Regional Directorate of Agriculture, programmes and projects, etc. ... by developing and proposing the design and composition of a set of materials, and communication formats, e.g. Documentary Clip Game Primer, educational games, radio broadcasts, data sheet, voice mail (Micro irrigation, solar pump, biogas); and (v) six automated agro-meteorological stations are installed and SRM / DRAEP teams are set up to provide support and training on data processing and dissemination.

2.3. BENEFITS IN TERMS OF ADAPTATION TO CLIMATE CHANGE

The Strategic Opportunities Programme for the country, developed jointly by the Government and IFAD, notes that poor agricultural performance is attributable to overexploitation of natural resources, vulnerability to natural disasters and climatic hazards such as cyclones, drought, locust invasions and increasing soil erosion, and access constraints. In particular, in the southern part of the country, the effects of the El Niño / La Niña phenomenon are exacerbating the frequency and duration of droughts as well as heavy rainfall events during the rest of the year.

DEFIS interventions were specifically selected to address the root causes of underperformance in the agricultural sector. In addition, the DEFIS+ project addresses the impacts of climate change on the sector to improve the livelihoods of the target population in order to ensure sustainable market linkages and positioning in value chains. Thus, DEFIS+ activities specifically aim to strengthen the resilience of agricultural and livestock production systems, and to improve environmental management in the context of climate change in southern Madagascar. In addition, the economic and financial analysis carried out justifies the choice of DEFIS+ project activities and the benefits envisaged in terms of adaptation to climate change.

2.4. GEOGRAPHICAL AREAS OF INTERVENTION

2.4.1. South-East zone

The South-East zone includes the regions of Vatovavy, Fitovinany and Atsimo Atsinanana. This zone is characterised by an inadequate road network consisting mainly of the RN25 and RN12 national roads.

Vatovavy development pole

The Vatovavy pole extends from the mid-hill zone to the coastal zone. It covers 14 Communes, 10 of which are in the District of Mananjary and 4 in the District of Ifanadiana: Ambohimiarina II, Antsenavolo, Kianjavato, Mahatsara Sud, Manakana Nord, Mananjary, Marokarima, Tsarahafatra, Tsaravary, Tsiatosika, Androrangavola, Antaretra, Ifanadiana and Kelilalina.

Within this pole, from west to east, there is a zone of medium hills, a zone of low hills and a zone of coastal plains. The low and mid-hill areas in which the lowlands are located are also covered with forest patches, mosaics of crops, coastal meadows, and savannahs with or without woody elements. The practice of tavy is still customary in the area and constitutes a threat to the local environment. The hydrographic network is essentially composed of the Mananjary River and its tributaries.

The DEFIS programme has chosen rice, coffee and honey as the sectors developed in the Vatovavy pole.

Fitovinany Development Pole

The Fitovinany pole is located in the coastal zone and includes 41 Communes, 22 of which are in the District of Manakara and 19 in the District of Vohipeno: Ambahive, Ambalaroka, Ambandrika, Ambila, Amboanjo, Ambohitrova, Ampasimanjeva, Analavory, Anorombato, Bekatra, Betampona, Lokomby, Marofarihy, Mitanty, Mizilo, Nosiala, Sakoana, Sorombo, Tataho, Vatana, Vinanitelo, Vohimasina, Amborobe, Andemaka, Ankarimbary, Anoloka, Ifatsy, Ilakatra, Ivato, Lanivo, Mahabo, Mahasoabe, Mahazoarivo, Nato, Onjatsy, Sahalava, Savana, Vohilany, Vohindava, Vohipeno and Vohitrindry.

This pole is a zone rich in hydrographic networks which gives a strong potential in irrigation. The presence of lowlands and rice basins located in the low hills and coastal plains is also a major asset for the development of rice cultivation. Rice cultivation is by far the main activity in the area.

Some hills are also characterised by the presence of forest patches alternating with agroforestry and crop mosaics.

Thanks to the particular climate and the large cultivable area, agricultural intensification is possible. The DEFIS programme has chosen rice, coffee and honey as the sectors to be developed in this pole.

Farafangana-Vondrozo development pole

The Farafangana-Vondrozo pole covers 31 Communes: Ambalatany, Amporoforo, Ambalavato Nord, Ambohigogo, Ambohimandroso, Ankarana Miraihina, Anosivelo, Anosy Tsararafa, Antsiranambe, Beretra Bevoay, Efatsy, Etrotroka Atsimo, Evato, Fenoarivo, Ivandrika Mahabo Mananivo, Marovandrika, Mahafasa Centre, Mahavelo, Maheriraty, Namohora laborano, Tangainony, Vohilava, Vohilengo, Vohimasy, Vohitromby, Ambodirano, Anandravy, Andoharano, Mahatsinjo and lamonta.

It has important hydrographic resources and lowlands that can be used for rice cultivation. Large rice-growing basins are present in the area, namely Manambavana, Manapatrana, Manambato, Menagnivo. The fertile soil is favourable to several types of crops.

Thanks to the particular climate and the large cultivable area, agricultural intensification is possible. The DEFIS programme has thus chosen rice, coffee and honey as the sectors developed in the Farafangana-Vondrozo pole.

Vangaindrano development pole

The Vangaindrano pole covers 4 Communes: Iara, Anilobe, Vohitrambo, Fonilaza.

The humid climate and the density of the hydrographic network of the area constitute an asset for agricultural activities. The hydrographic network is articulated around the Mananara River, which gave its name to the large rice-growing basin of Mananara. The lowlands and plains of the basin form a large irrigable area. Wooded areas cover the hills surrounding the lowlands.

Thanks to the particular climate and the large cultivable area, agricultural intensification is possible. The DEFIS programme has chosen rice, coffee and honey as the sectors to be developed in this area..

2.4.2. Centre Zone

The Centre zone encompasses three regions: Amoron'i Mania, Haute Matsiatra and Ihorombe. This zone is characterized by a road network articulated around the RN7.

Ianakona Ihadilanana Development Pole

The Ianakona Ihadilanana pole is located in the Amoron'i mania Region and covers the following Communes: Ilaka centre, Mahazina Ambohipierenana, Tsarasaotra, Ihadilanana, Andina, Ambatomarina, Ivony Miaramiasa, Anjoman'Ankona, Vinany Andakantanikely and Ambovombe centre.

This pole is characterised by a mountainous relief criss-crossed by valleys of varying sizes, most of which are already developed as rice fields. Due to the topography, the hillsides are also developed as rice fields or crop fields.

The hydrographic network is mainly composed of the Mania River, whose tributaries can be used for irrigation. The climate of the area requires the practice of irrigated rice cultivation to avoid a water deficit.

Food crops play an important role in the diet, as a complement to rice, and the DEFIS programme has chosen to develop the rice and maize sectors, which are among its priority sectors.

Imadiala development pole

The Imadiala pole includes the following Communes Alakamisy Ambohimahazo, Imerina Imady, Fahizay, Marosoa, Kianjandrakafina, Ambohimombo I, Ambohimombo II and Antoetra.

This pole is located in the east of the Amoron'i Mania Region, near the forest corridor. It is characterised by a landscape of hills interspersed with more or less narrow valleys. The valleys are practically exploited for rice production. Amongst the water resources that can be used, we note the presence of the Sahanofa River in the South and the Maintinandry River in the North, as well as their tributaries.

Beekeeping is being developed in the area and the DEFIS programme has chosen rice and honey as the sectors to be developed in this pole.

Fisakana Development Pole

Located at the north-eastern end of the Amoron'imania Region, the Fisakana pole is made up of 9 Communes in the Fandriana District: Tsarazaza, Fandriana, Tatamalaza, Miarinavaratra, Milamaina, Sahamadio Fisakana, Sandrandahy, Fiadanana and Imito.

This pole presents a landscape of hills interspersed with more or less narrow valleys which are generally exploited in rice fields, and it is crossed from East to West by the Fisakana river which forms the Mania river in its downstream part. The tributaries of the Fisakana can be used for irrigation.

Beekeeping is also being developed in the area and the DEFIS programme has chosen rice and honey as the sectors to be developed in this pole.

Bemahazemona Development Pole

The 4 Communes that make up the Bemahazemona pole are: Ambatofinandrahana, Ambondromisotra, Soavina and Ambatomifanongoa; they belong administratively to the District of Ambatofinandrahana. The pole is crossed in its southern part by the RN35, which constitutes the access from the RN7.

The Mania River crosses the pole in its north-eastern part and then delimits its northern part. The western part is bounded by the Imorona River. The tributaries of these rivers are all exploitable resources for irrigation in the pole.

The relief of the area is formed by mountains and hills with valleys and plains. The climate is generally warmer and slightly drier than that of the other poles of the Amoron'i Mania Region, namely Ianakona Ihadilanana, Imadiala and Fisakana; hence the importance of irrigation. There are three types of rice fields: lowland rice fields, bottomland rice fields and rice terraces. Dry crops such as cassava and maize are grown on the tany. The DEFIS programme has thus chosen rice and maize as the crops to be developed.

Matsiatra Avaratra Development Pole

Located in the highlands, the Matsiatra Avaratra pole is characterized by a mountainous relief, with isolated vigorous massifs criss-crossed by narrow depressions. It covers the following Communes: Ambohinamboarina, Ankerana, Isaka, Sahave, Befeta, Vohiposa, Ambohimahaso, Ampitana, Safata, Ambalamahaso, Alakamisy Ambohimaha, Androy, Morafeno, Ambalakin-dresy and Sahambavy.

This pole is bordered to the east by the forest corridor, including the Ranomafana Park, while reforested areas are located in the central part.

The hydrographic network in the Matsiatra Avaratra pole is essentially formed by the tributaries of the Matsiatra and Namorona rivers. The marshy lowlands constitute an important area for rice cultivation but are poorly exploited. The DEFIS programme has chosen rice, maize and honey as the sectors to be developed in this pole.

Matsiatra Andrefana Development Pole

The Matsiatra Andrefana Pole is crossed by the RN42 and covers the following Communes: Fitampito, Ambatomainty, Ikalavony, Solila, Mangidy, Nasandratrony, Soatanana, Mahazoarivo, Isorana, Anjoma Itsara and Ankarinarivo Manirisoa.

The eastern part of this pole is characterised by a mountainous relief crossed by more or less narrow valleys. In the western part, there is a landscape of large plains and peneplains.

This pole is furrowed by the tributaries of the Matsiatra and Mananantanana rivers. It is a zone that is favourable to the extension of rice cultivation and the DEFIS programme has chosen rice, maize and honey as the sectors to be developed in this pole.

Ambalavao development pole

The Ambalavao pole covers the following Communes: Ambinaniroa, Ankaramena, Vohitsaoka, Volamena, Iarintsena, Besoa, Ambohimandroso, Sendrisoa, Namoly, Mirinarivo, Mahazony, Andrainjato, Anjoma, Ambinanindovoka and Ambohimahasina, all of which are located in the District of Ambalavao

The central and eastern zone of this pole is characterized by a mainly mountainous relief with deep valleys. The western zone is composed of plains and small hills. In its southern part, it is crossed by the Andringitra massif. The pole is limited to the East by the Forest Corridor.

The hydrographic network is essentially concentrated on the Zomandao and Mananantanana rivers and their tributaries.

The DEFIS programme has chosen rice, maize and honey as the sectors developed in this pole.

Matsiatra Atsinanana Development Pole

The Matsiatra Atsinanana pole is located in the east of the Haute Matsiatra Region and covers the following Communes Alakamisy Itenina, Lamosina, Vohimarina, Andranovorivato, Andoharanomaitso, Vohitrafeno, Mahasoabe, Ihazoara, Andranomiditra and Vinanitelo.

Located in the central highlands, this pole has a mountainous relief criss-crossed by more or less narrow valleys. Its eastern part is more wooded with stands of pine, eucalyptus and fragments of dense forests.

This region offers typical rice paddy landscapes, but many rice paddies have also been developed in the valleys and in the flooded areas of the rivers, such as the Matsiatra.

The DEFIS programme has chosen rice, maize and honey as the sectors developed in this pole.

Ivohibe-lakora development pole

The Ivohibe-lakora pole covers the following 6 Communes: Andranombao, lakora, Ivohibe, Maropaika, Ranotsara Nord and Volambita.

This pole is located near the eastern limit of the Ihorombe Region with a rather varied relief mixing plains, hills and valleys. The hydrographic network is well developed and offers a strong potential for irrigation.

The DEFIS programme has chosen rice, maize and onions as the sectors to be developed in this pole.

Ambavan'Ihosal development pole

The Ambavan'Ihosal pole covers 8 communes: Ambia, Zazafotsy, Sahambano, Sakalalina, Analavoka, Kotipa, Ankily and Mahaso.

It has a cultivable area that is still not very well exploited and important hydro-agricultural networks that are favourable for the cultivation of rice, maize and manioc.

The geographical situation and the large cultivable areas allow for the development and diversification of crops. The DEFIS programme will strengthen the development of the rice, maize and onion sectors through the reinforcement of agricultural infrastructures, the supply of equipment, support for producers and assistance in finding markets.

Tampon'Ihorombe development pole

The Tampon'Ihorombe pole is located in the District of Ihosal and consists of 5 Communes: Andiolava, Satrokala, Ambatolahy, Ilakakabe and Ranohira.

The western zone of the pole includes a small part of the Isalo Massif, but the pole is mainly spread over the Ihorombe Plateau, which is an immense expanse of small hills and meadows with low slopes and small valleys. A vast area of cultivable land is found here, which is still little or not exploited.

This area is crossed by many small rivers, notably Ilakaka, Ihazofotsy, Sakavatony, Andranombilahy, Mavoita and Benahy.

Rice cultivation, generally irrigated, is essentially practised on the floodable zones of perennial rivers or depressions, while other food crops are located on certain tanety. The DEFIS programme has thus chosen the following crops to be developed in this pole: rice, maize and onions.

3. ANALYSIS OF THE INITIAL STATE OF THE PROJECT INTERVENTION AREAS AND ITS ENVIRONMENT

3.1. DESCRIPTION OF THE ENVIRONMENTAL AND SOCIAL BASELINE OF THE CENTRAL AREA

3.1.1. Physical environment characteristic of the Centre Zone

3.1.1.1. Geomorphology and soils

The geology of the area is marked by the existence of:

- The Vohibory system, which extends and narrows from north to south.
- The graphite system, in the eastern part and parallel to the coast.

- The Androyen system, in the southern and south-western part. It rests on a crystalline basement of Precambrian age.
- The extreme southwest is marked by the Karoo system. It consists more of sedimentary layers dominated by sandstone massifs and ferruginous shells formed on sandstone.

Between the Vohibory and Graphite systems are veneered:

- Granitic rocks and migmatites of Tampoketsa, in the form of thin elongated nets along the Regions of Amoron'i Mania, Haute Matsiatra and Ihorombe, always from North to South.
- Elongated layers parallel to the coast and discontinuous islands of granitic rocks

The Androyen system is found in the Ihorombe Region and in part of the Haute Matsiatra Region. From Ihosy to Zazafotsy, the main geological formations are composed of gneiss, migmatite, leptynites with lateritic clays, and sometimes granitoid migmatite formations. From Zazafotsy onwards, the geological formations are generally composed of gneiss, migmatite sculpting an increasingly rugged relief until the south of Fianarantsoa.

The karoo system of the area includes the Sakamena group, corresponding to the Permian to Secondary transition and the Isalo group above the Sakamena, corresponding to the Triassic to Middle Jurassic era.

A large part of the area, located in the North, is part of the Central Highlands. The relief of the area is thus mainly mountainous, with isolated vigorous massifs criss-crossed by narrow depressions. The relief of the area changes in altitude from west to east. The eastern part is dominated by a hilly landscape and in the west there is a succession of high plains. The south-eastern part is characterised by the presence of the Andringitra chain, while the south-western part spreads over the Ihorombe plateau and includes a small part of the Isalo Massif.

The area is characterised by residual rocky reliefs. These reliefs are characterised by rocky outcrops and clearings, in smooth domes, in chaos of large balls, sometimes in "inselbergs". All around, ferrallitic alterites cover the steep slopes, dotted with descended granitic balls. The residual reliefs form the ridges of the watersheds.

Sometimes the slopes are truncated by eroded surfaces, sometimes of considerable size with the existence of several "lavaka" formations which are the consequences of natural erosion processes.



Hilly landscape in the central highlands (Amoron'i Mania Region)



Rocky Mountains in the Ambalavao District

Photo 1 – Relief in the Centre Zone

In terms of soil characteristics, the Centre Zone is mainly characterised by ferrallitic soils, tropical ferruginous soils, weak ferrallitic soils, lithosols and hydromorphic soils.

- Ferrallitic soils: characterised by their iron and alumina content, their exchange capacity, their low base content, their red colour and their low pH. In the area, a distinction can be made between typical red ferrallitic soils on crystalline rocks and ferrallitic soils with armour and concretions. The typical red ferrallitic soils are characterised by the presence of short grasses (*Aristida*) or taller grasses (*Hypparhenia*) corresponding to a longer dry season. They are found throughout the area and are common in the central highlands. Ferrallitic soils with armour and concretions are found on migmatitic penepains or flat volcanic flows. The cuirasses are present or fossil but always due to poor drainage of the flat surface. Ferrallitic soils with armour and concretions on crystalline rocks are identified on the Ihorombe plateau.

- Tropical ferruginous soils on sandstone or sand: identified on the extreme south-western part of the area belonging to the Ihorombe Region. Produced from the decomposition of gneiss, sandstone, sand etc., they are generally sandy. They are red or yellow soils depending on their good or bad drainage, often containing some altered minerals that constitute chemical reserves. The tropical ferruginous soils give way to ferralitic and weakly ferralitic soils as we move eastwards.
- Low ferralitic soils and ferrisols: characterised by their lack of organic matter, they are present in the western part of the zone, on the edge of the high plateaus, where they can be associated with tropical ferruginous soils. They can also be of the hydromorphic type with spots or concretions.
- Lithosols: these are raw erosion soils that are common on the high plateaus and are red to yellow in colour. Lithosols on quartzite are found in the northern part of the zone, located to the north and west of Ambatofinandrahana, in the Amoron'i Mania Region, and are very sandy. The lithosols on granite are arenaceous yellow or red sandy-clay soils. Large, rounded, weathering granite blocks are mixed with the soil mass. The large granitic masses (in the form of batholiths) remain in relief from the surface of the peneplains. Lithosols on granite are present in the north and south of Ambalavao. They are humus-bearing in the Andringitra massif.
- Hydromorphic soils: located in the lowlands and occupy the valleys and plains of the highlands. Drainage is naturally poor, resulting in a continuous series of soils ranging from unevolved alluvium to peaty marsh soils, depending on waterlogging.

3.1.1.2. Hydrography

The hydrography of the area is mainly characterised by the Tsiribihina and Mangoky watersheds. From North to South, the main rivers of the area are: Mania, Matsiatra, Mananantanana, Zomandao, Ihosy.

The Tsiribihina is the third largest river in Madagascar in terms of surface area and second only to the Betsiboka in terms of annual water flow. The hydrographic network of the Tsiribihina watershed in the area is composed of the Mania River and its tributaries. The Mania, under the name of Fisakana, is born at the edge of the eastern cliff, to the north-east of Fandriana, at an altitude of around 1,800m. Its course is very sinuous with a general East-West orientation while crossing several mountain ranges.

The Mangoky is the largest river in Madagascar by the surface area of its watershed after the Betsiboka-Mahajamba. It is also the longest river in Madagascar from its source in Ihosy. The hydrographic network of the Mangoky watershed in the area is composed of the Matsiatra, Mananantanana, Zomandao and Ihosy rivers (within the Haute Matsiatra and Ihorombe regions).

The Matsiatra River has its sources at an altitude of 1,250 m in the Tsitondroina massif in the east of Ambalavao, and crosses the DEFIS project area from east to west, sometimes passing through deep gorges. It forms part of the boundary between the Amoron'i Mania and Haute Matsiatra Regions. The Mananantanana River has its source on the eastern slopes of Tsitondroina, at an altitude of 1,850 m, and flows in an East-West direction parallel to the Matsiatra. The confluence of the Matsiatra and Mananantanana rivers forms the Mangoky. The Zomandao, a tributary of the Mangoky, has its source on the north-east face of Boby Peak, in the Andringitra massif, at an altitude of around 2,500 m. Its slope is very steep over the first fifty kilometres. This slope becomes gentle when the river enters the plain to the east of Ankaramena. The Ihosy, a tributary of the Zomandao, is characterised by a long and very narrow basin that widens after passing the town of Ihosy.

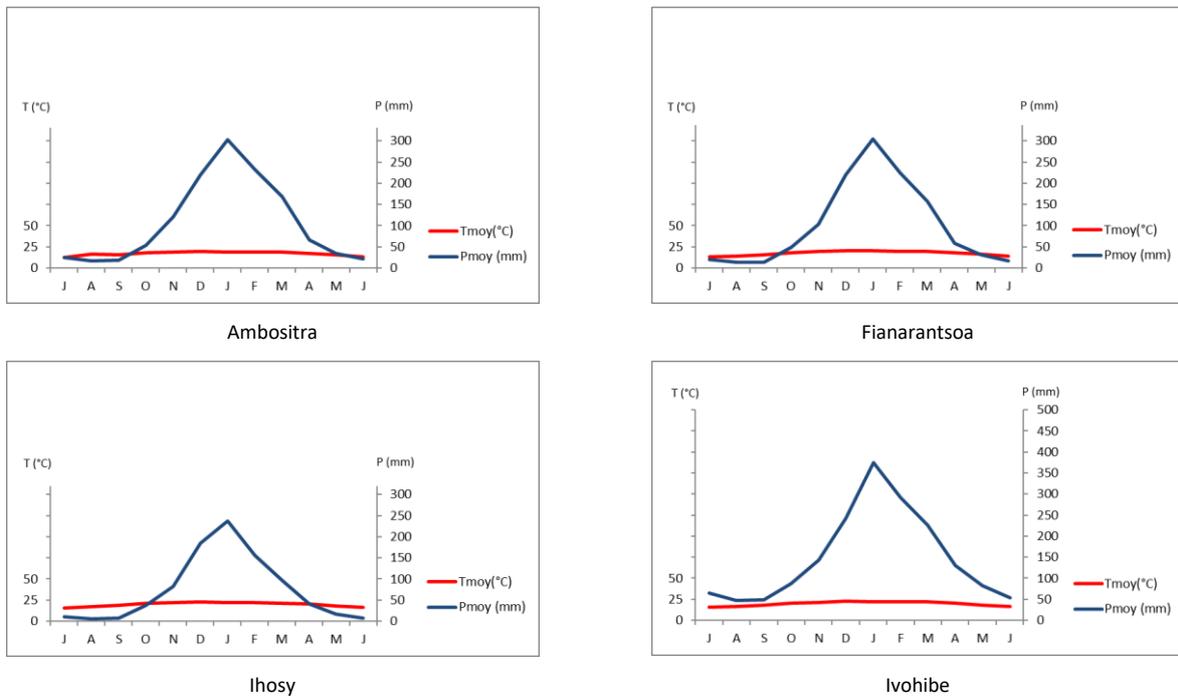
The southern and south-eastern part of the area is made up of small streams that connect to each other to form small complexes:

- The Maloto/Iagnana (tributaries of the Onilahy), Menamaty, Malio and Ihosy complexes in the Ihosy District;
- The Manampatrana complex in the Ivohibe District;
- The complexes of Ionaivo and Menarahaka in the District of Iakora.

3.1.1.3. Climate

The Centre zone generally enjoys a tropical climate at high altitude, characterised mainly by two distinct seasons: a rainy season and a cooler dry season. The average temperature varies between 12°C and 23°C, with a maximum average temperature recorded at the Ihosy station, and a minimum average temperature recorded at the Ambositra station.

The average temperature increases towards the southern part of the area (towards Ihosy), while precipitation tends to increase towards the north and towards the eastern part.



Source :<https://fr.climate-data.org/afrique/madagascar> (climate data between 1999 and 2019)

Figure 2 – Umbrothermal curves for the Centre Zone

The three umbrothermal curves representing the stations of Ambositra, Fianarantsoa and Ihosy above distinguish the two marked seasons (rainfall curve below the temperature curve) characteristic of the climate in the Central Zone. The rainy season is thus located between October and April. In addition, it is noted that the Ivohibe rainfall is characteristic of the eastern part of Madagascar, i.e. although the rainfall decreases sharply during the period between April and October, the rainfall and temperature curves never cross. Thus, a certain amount of rainfall persists throughout the year.

The umbrothermal curves for the Ambositra and Fianarantsoa stations are very similar, whereas the Ihosy station is more spread out with a lower peak for the average rainfall curve. This confirms that the southern part of the country experiences lower rainfall than the rest of the Centre Zone.

The forests are highland forest formations, mainly located in the mountainous areas in the eastern part of the zone. They are strips of forest attached to the eastern forest corridors that include the Andringitra Protected Area. They occupy only a small part of the area and are populated mostly by bryophytes, lichens, ferns or large trees depending on altitude and relief. In addition, the presence of sclerophyllous forests with Uapaca and Chaenaceae is noted in the central northern part of the zone, in the Amoron'i Mania Region.

Grassy savannahs dominate the area. They are found in the western and south-western part of the zone and on the hilltops, particularly around Ambalavao. The area around Ilakaka has a grassy savannah with Bismarkia. The shrub savannah is located in the southern part of the zone, in the districts of Ambalavao and Ihosy.

Particular vegetation borders the riverbeds or occupies the marshy areas. They can be riparian forests, bamboos or cyperacea.



Savannah on the Ihorombe plateau



Bismarkia savannah near Ilakaka

Photo 2 – Main ecosystems in the Centre Zone

3.1.3. Socio-economic environment characteristic of the Centre Zone

3.1.3.1. Population and demography

The Centre Zone comprises three regions: Amoron'i Mania, Haute Matsiatra and Ihorombe.

Table 2 – Demography of the Centre Zone

Region	District	Number of inhabitants	Density (inhabitants/km ²)	Average household size
Amoron'i Mania	Ambositra	297 535	102,1	4,7
	Fandriana	215 642	94,9	4,8
	Ambatofinandrahana	217 493	21,1	5,1
	Manandriana	106 446	108,5	4,9
Haute Matsiatra	Fianarantsoa I	191 776	2229,6	4,0
	Ambohimahasoa	271 233	140,7	5,2
	Ikalavony	125 327	12,8	5,0
	Isandra	151 056	112,6	5,0
	Lalangina	184 162	175,2	5,3
	Vohibato	222 629	121,8	5,0
	Ambalavao	298 404	62,	4,8
	Ihorombe	Ihosy	292 880	17,1
Ivohibe	69 052	16,0	4,6	
Iakora	55 380	12,2	5,1	

Source: RGPH3, 2019

The Centre Zone is part of the Highlands. The majority of the region's inhabitants are ethnic Betsileo: the Ambositra and Ambatofinandrahana core is a predominantly Betsileo area (90%). There are a few other ethnic groups, Merina and

Antandroy in each district. On the eastern margins are concentrated Tanala and Zafimaniry, and on the western margins Bara.

3.1.3.2. Socio-economic activities

Amoron'i Mania Region

The Amoron'i Mania Region can be described as an agricultural region both in terms of the number of people employed in agriculture and the diversity of crops grown. Throughout the year, 76.4% of the communes are permanently accessible by light car.

The Amoron'i Mania Region has an agricultural potential measured by the existence of a cultivable area of 270,000 ha divided between the four districts of Ambatofinandrahana (96,907 ha), Ambositra (64,529 ha), Fandriana (50,638 ha), Manandriana (57,926 ha). The ratio of cultivated area to arable land at the regional level is 44.12% and is relatively equal at the level of the region's districts, compared to the national average of 51.7%.

Food crops, generally of mixed destination (self-consumption and marketing): rice, cassava, maize, sweet potatoes, beans, groundnuts, potatoes and voanjobory. Cash crops, on the other hand, are almost exclusively commercial crops, the main ones being coffee, sugar cane, tomatoes, cabbage, peaches and citrus fruits.

These food crops play a fundamental role in the diet, as a complement to rice, and in particular cassava, sweet potato, potato, maize, and to a lesser extent beans, voanjobory and groundnuts. Potatoes and maize in particular are important sources of income, as most of the produce is sold outside the region. In the highlands, almost all the valleys are cultivated and the slopes with irrigation possibilities are occupied by rice fields. Other food crops (cassava, sweet potatoes, beans, maize, etc.), mainly for self-consumption, are grown using appropriate techniques.

Depending on the type of crop grown, the districts can be broadly classified into two categories: the districts of Ambositra, Fandriana and Manandriana are predominantly food crops, especially rice and the districts of Ambatofinandrahana and Ambositra are predominantly cash crops, especially groundnuts, sugar cane and coffee.

Regarding the use of improved cultivation methods and fertilisers, farmers in the Amoron'i Mania Region use organic fertilisers for 70% of the area, mineral fertilisers for 0.5%, mixed fertilisers for 0.96% and no fertilisation for 28.54%. As for the agricultural techniques used, semi-mechanised techniques are the most used in the four districts of Amoron'i Mania. The traditional technique comes second but remains dominant. This situation is explained by the fact that the plots are small and their topography on tanety limits the use of towed equipment. This justifies the non-use of the mechanised technique in this region.

Rainfed crops, planted at the beginning of the rainy season (October-November), cover three quarters of the cultivated area. The first rains are decisive for the agricultural campaigns because soil preparation work, particularly on the tanety, can only be carried out if the soil is sufficiently loose. This is one of the reasons that limit the extension of tanety crops. In terms of manual ploughing, an active person cannot plough more than 40 ares of tanety in two months. This is all the more so as the rainfall deficit and the lack of a hydrographic network are very marked, particularly in the Middle West.

Work on rice fields has priority over other agricultural work. Second season rice cultivation (transplanting in October-December, harvesting in March-June) occupies 89% of the rice-growing area. Rainfed rice, which is very little used, always suffers from a water deficit during the first months of vegetation (October-November). Weeding, which is more or less generalised in the highlands, takes place from one month after transplanting. Tanety crops are planted before December, except for sweet potatoes, which wait until February-March to be planted.

The Amoron'i Mania Region is an agropastoral area par excellence, with climatic conditions that are conducive to diversified agricultural activities. The region can be divided into two geographical zones according to its importance: the mid-west, essentially for extensive breeding and promotion of cattle and small ruminants (large expanse of natural pasture); the highlands crossed by the RN7: importance of short-cycle breeding including pigs, poultry, beekeeping (one of the priority sectors) and dairy development/area included in the dairy triangle. As regards cattle breeding, the districts of Ambatofinandrahana, Ambositra and Fandriana are the main breeders.

The secondary sector activities in the region are mainly made up of the processing of crop products, wood, fibres, horns and mining products. In the western part of Ambatofinandrahana, a pegmatite field has been identified (beryl, Malakialina columbite and feldspar); beryl production is estimated at 2,500 tonnes.)

The region has significant potential, particularly in terms of tourist sites: the Zafimaniry country; the thermal springs; the primary forests of the eastern slope with their specific biodiversity; the Itazonana waterfall; the Itremo massif; the caves and underground passages. The handicrafts of this region have contributed to making the country known to tourists and to the outside world. It is a more than secular activity that is explained by the insufficiency of agricultural production and by a well-established tradition in the Ambositra area. This area is especially famous for sculpture, marquetry, basketry, rabane weaving and silk work. The Ambositra area retains its reputation as an important artisanal nucleus, both regionally and nationally, but the various difficulties encountered both in terms of supervision and the smallness of the markets, risk altering this image and discouraging the artisans.

Haute Matsiatra Region

The Haute Matsiatra Region has an agricultural potential measured by the availability of a cultivable area of 503,905 ha distributed among the seven districts: Ambalavao (111,822 ha), Ambohimahaso (126,700 ha), Fianarantsoa I (1,154 ha), Isandra (19,228 ha), Lalangina (89,128 ha) and Vohibato (40,425 ha). The cultivated area is very disparate in the region, with districts such as Isandra and Vohibato having a cultivated area representing 60.6% and 55.8% of the cultivable area, and districts such as Ambalavao and Ambohimahaso where the agricultural potential remains poorly exploited with a cultivated area representing only 9.8% and 14.4% of the cultivable area.

Compared to the national situation, the Haute Matsiatra Region represents 4.9% of the total cultivable area and 2.1% of the cultivated area. The ratio of cultivated area to arable land shows a relatively low proportion of cultivated land in the region, only 22% compared to a national average of 51.7%.

Generally on the high plateaus, almost all the valleys are cultivated and the slopes with irrigation possibilities are occupied by rice fields in tiers. Other food crops (cassava, sweet potatoes, beans, maize, etc.), mainly for self-consumption, are grown using appropriate techniques. In addition, there is an abundance of market gardening and fruit growing (especially citrus) and wine growing. The eastern part of the region is devoted to cash crops such as Arabica coffee. In the south, tobacco is more prosperous. In the Middle West, however, cassava, groundnuts and maize are abundant, apart from rice.

In terms of livestock farming, the Middle West zone is mainly engaged in extensive cattle and small ruminant farming. In the highlands, short-cycle livestock farming, including pigs, poultry, beekeeping (one of the priority sectors) and dairy development is much more common. Poultry farming, which is one of the priority sectors, ranks first, followed by zebu, pig, goat and sheep farming. As far as cattle breeding is concerned, the districts of Ambalavao and Ikalamavony are the main breeders.

The secondary sector activities in the region are mainly made up of the processing of crop products, wood, mining products and metal works. Mining is relatively important in four districts of the region. Data from the 2009 CREAM survey show that in Ikalamavony, 62.5% of communes are involved in mining, 57.1% in Vohibato, 50% in Ambohimahaso and 35.3% in Ambalavao.

Nevertheless, there are opportunities to develop the sector, such as exploiting the tourist vocation of Fianarantsoa (Sahambavy) by transiting flights from the South-East to Antananarivo or the transit of tourists from Sakaraha or Isalo. The FCE (Fianarantsoa-Côte Est) line is also a tourist attraction because it crosses the large forest formations of the East. On the other hand, it ensures part of the transport of travellers, notably those from isolated areas, the evacuation of the sick, the transport of goods, exotic products (bananas, litchi, etc.), and the provisioning and supply of the region.

Ihorombe Region

In the south of the area, the Ihorombe Region is the territory of the Bara, but other ethnic groups are present in the Region, notably the Merina, Betsileo, Antandroy and Antesaka. One of the particularities of the Ihorombe Region is the close association between agriculture and livestock. Cattle breeding is the central activity around which agricultural activities and other types of breeding revolve. It also has a cultural dimension. Cattle rearing is practised by about half of the farmers and 70% of the breeders in the region, with an average of 26 to 30 heads per breeder (RNA 2005 & CREAM 2008-2009). The Bara, who are major cattle breeders, practice itinerant agriculture due to transhumance. This leads them to move constantly from one place to another, in search of new grazing areas for their zebu herds. Land use, crop types and cultivation techniques in the region are thus strongly influenced by this agro-pastoral activity.

The Ihorombe Region mainly produces rice. Other food crops such as cassava, maize and sweet potato are also grown. Crops are grown on small plots (household scale) and still using traditional equipment and techniques. Cultivation is relatively more intense in Ivohibe district, where 71.1% of the cultivable area is cultivated, and less intense in the larger

Ihosy district, where 38.9% is cultivated. In addition, a jatropha plantation for the production of biofuel and a moringa plantation for the extraction of essential oils have been set up by Tozzi Green in Satrokala on several thousand hectares.

Given the poor road network in the Ihorombe Region, many of its areas are completely isolated. Nearly half of the Region's Communes are landlocked, notably in the Ivohibe district and part of the Iakora district.



Photo 3 – Agricultural land in the Centre Zone

3.2. DESCRIPTION OF THE ENVIRONMENTAL AND SOCIAL BASELINE SITUATION IN THE SOUTH EAST ZONE

3.2.1. Physical environment characteristic of the South-East Zone

3.2.1.1. Geomorphology and soils

The South-East Zone, made up of the Vatovavy Fitovinany and Atsimo Atsinanana Regions, is characterised by three geological types:

- The western part (facing inland) rests on a crystalline basement of Precambrian age, which extends over a width of more than 80 km. This is the igneous and metamorphic parent rock. It is characterised by the graphite system made up of two series, which are, from West to East, the Tolongoina graphite series and the Vondrozo migmatite series.
- The eastern part (turned towards the Indian Ocean) is based on a sedimentary terrain. These are volcanic flows (lavas) of Cretaceous origin with basalts, rhyolites and dacites. These flows contain three lithologically distinct episodes: a general basic series at the base, a discontinuous acidic medium series and a second general basic series at the top. The whole is presented in the form of superimposed flows slightly inclined towards the Indian Ocean and totalling a few hundred metres in thickness. Associated with this geological type are alluvial formations and lacustrine deposits that cut into the Cretaceous volcanic flows in certain places.
- The coastal part is made up of a recent formation of unconsolidated sands and dunes with a width of 500 m to 5 km.

From a geomorphological point of view, the South-East Zone is divided into three distinct sub-areas:

- The **cliff zone** corresponds to the forest zone in the interior of the country. It is characterised by a dissection relief with very steep slopes, from Ranomafana to the large and very uneven areas of Midongy and Befotaka.
- The **hilly area** constitutes an intermediate zone with the coast, located in the central part of the region. It is characterized by a rejuvenated ferrallitic soil subject to relatively intense leaching. There are also large areas of plateau along these hilltops. This zone is favourable for the creation of hillside reservoirs.

- The **coastal zone** is either in the form of large alluvial or colluvial lowlands with flat or slightly sloping topography, or in the form of peaty marshes with difficult drainage. It is also the domain of dunes and coastal strips.

The main soil types found in the area are:

- Ferrallitic soils are found in forested areas and in the hills, while erosional and sandy soils are found on the edges of lakes, rivers and in the valleys. The lowlands and swampy areas are characterised by hydromorphic soils.
- The cliff zone is characterised by ferrallitic soils under forest, which are found under rainforest in a humid tropical climate and therefore on the eastern cliff. Under the forest, leaf fall and the numerous superficial roots create a thin humus horizon on the surface.
- The ferrallitic soils under savoka are found in the hilly area at the edge of the eastern forest. They have a very black humus.
- The indurated ferrallitic soils, concretioned or cuirassed in red or yellow, on basic rocks are found mainly in the coastal zone. These soils are characterised by enrichment in iron hydroxides through leaching or oblique migration. In forest areas, armouring is not very common. The yellow horizon is related to the action of primary or degraded forest vegetation, which is generally dense, but the leaching of clay and iron is often unclear.
- Typical red ferrallitic soils on acidic rocks are characteristic of the grassland areas and are located between the ferrallitic soils under savoka and the red or yellow indurated, concretioned or cuirassed ferrallitic soils on basic rocks.
- In poorly drained areas, hydromorphic mineral or low-humidity soils with gley or pseudo-gley are formed. The practice of irrigated rice cultivation accentuates the hydromorphy phenomenon.
- On the coastal strip, the unconsolidated sandy soil is very permeable and poor in organic matter. The roots are not deep and the humus is thin. Along the coast, the dune sand has a certain degree of salinity and the phenomenon of podzolisation is very rapid.

3.2.1.2. Hydrography

The south-eastern zone, located on the eastern side of Madagascar, has a dense hydrographic network. The latter is often composed of small coastal rivers due to its relief.

From north to south, the main rivers in the area are: the Sakaleona, the Mananjary, the Nomorona, the Faraony, the Matitanana, the Manampatrana, the Mananara du Sud, the Masihanaka, the Manambondro and the Isandra. In addition to the small rivers that characterise the region, there are also numerous marshes.

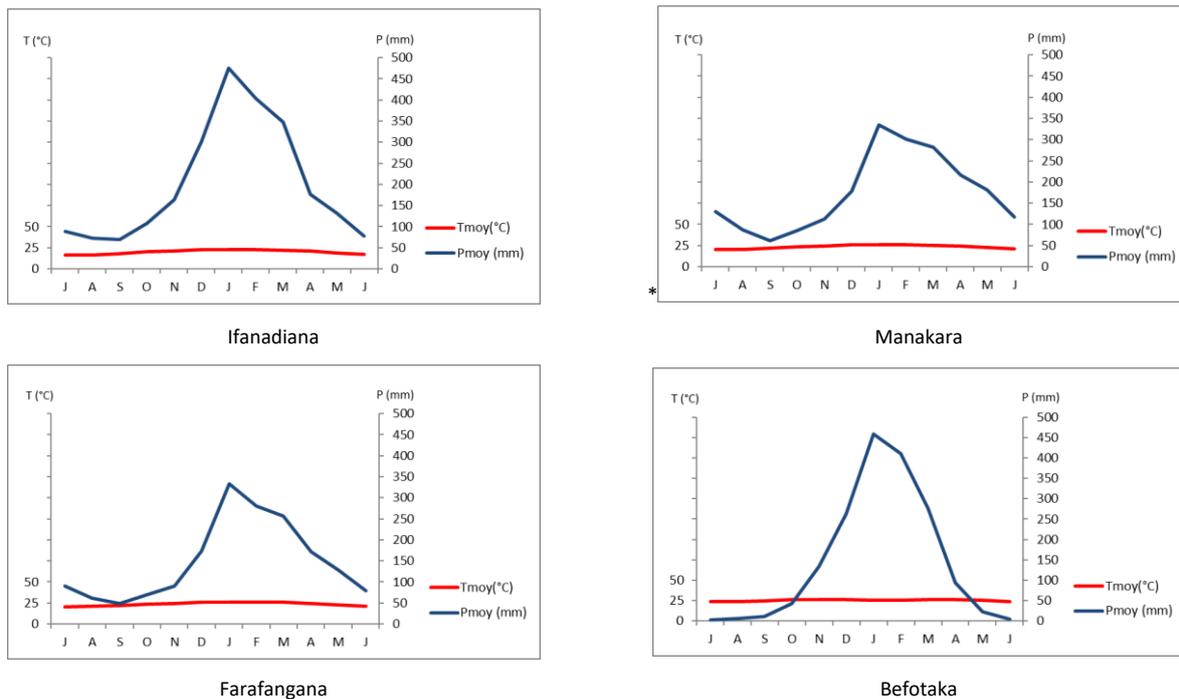
The Sakaleona joins the ocean at Nosy Varika, the Manapatrana flows into the ocean at the town of Farafangana and the Mananara du Sud borders the town of Vangaindrano before joining the ocean.

There is also the Pangalanes Canal which runs along the eastern coastline and links various lagoons. In the South-East zone, the canal crosses the Districts of Nosy Varika, Mananjary, Manakara and Farafangana.

3.2.1.3. Climate

The South-East Zone is subject to the climate of the eastern part of Madagascar, which is characterised by persistent rainfall throughout the year. Indeed, although it decreases during the southern winter, the average monthly rainfall remains above 60mm. However, in the southern inland part, the dry season and the rainy season become more pronounced, even reaching average values below 5mm per month.

Furthermore, it is noted that the average annual temperature varies between 20°C and 26°C for the stations of Manakara and Farafangana (eastern coast) and Befotaka (in the south of the area and further inland). The Ifanadiana region is still under the influence of the Highlands climate, which results in a much lower average temperature than the rest of the zone (monthly temperature varying between 16°C and 23°C on average).



Source : <https://fr.climate-data.org/afrique/madagascar> (climate data between 1999 and 2019)

Figure 5 – Umbrothermal curves for the South East Zone

The 3 umbrothermal curves representing the stations of Ifanadiana, Manakara and Farafangana above are characteristic of the eastern part of Madagascar. The rainfall and temperature curves never cross. A certain amount of rain persists throughout the year. Rainfall is concentrated in the period between December and March. It then decreases sharply during the rest of the year, although a certain amount of rain still persists. For Befotaka, the rainfall and temperature curves intersect, thus determining two distinct seasons: the rainy season (between October and April) and the dry season (between May and September). It is also noted that the peak rainfall is reached in January with almost 500mm for the stations of Ifanadiana and Befotaka, located further inland than the other two stations.

Being on the eastern side of Madagascar, the coastal part of the zone, in particular the Nosy Varika - Mananjary corridor, is regularly subjected to particularly powerful cyclones.

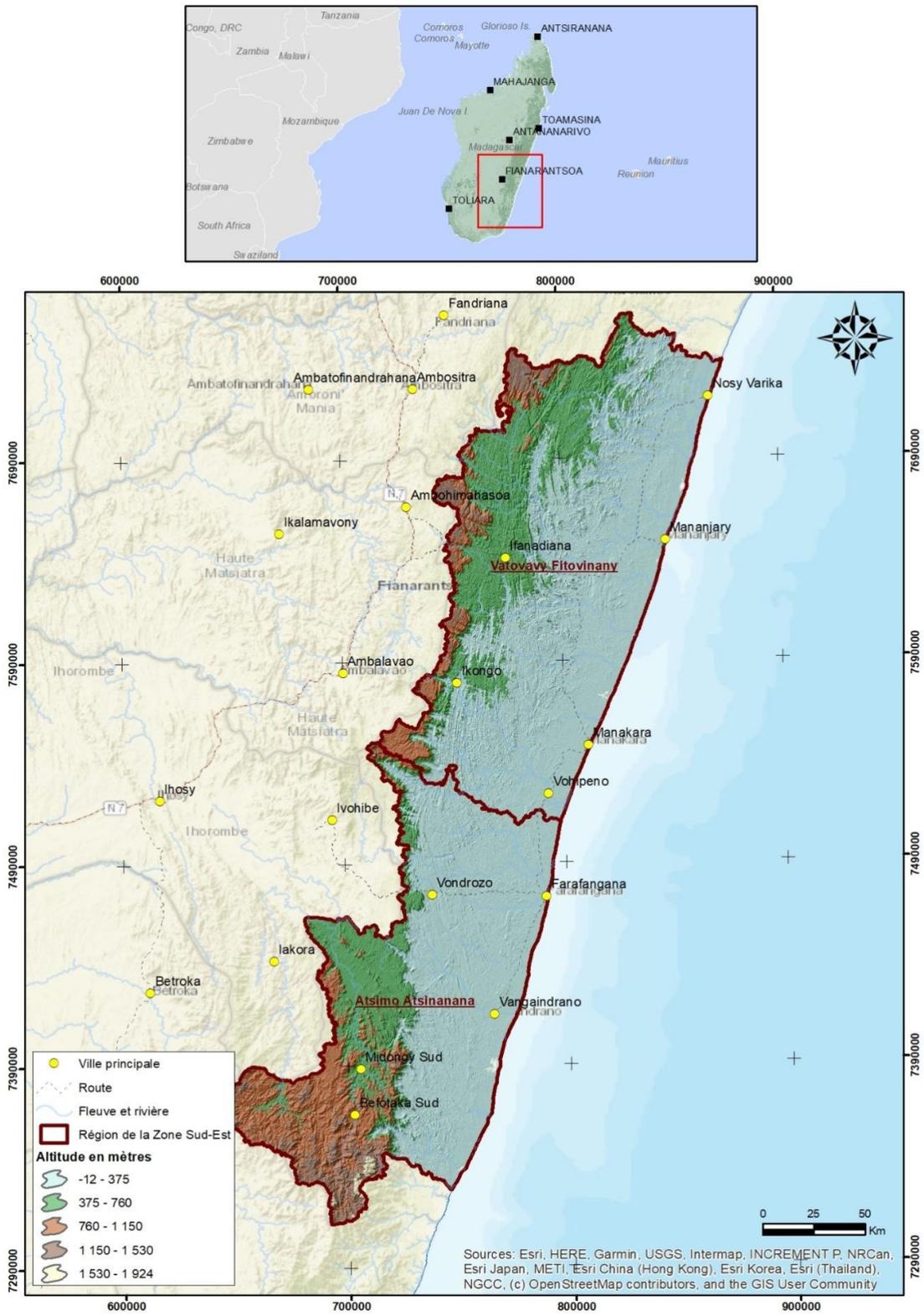


Figure 6 – Geomorphology of the south east area

The vegetation cover of the area is made up of remnants of primary forests, secondary forests (savoka), savannahs, marshland vegetation and cultivated areas.

The primary forests are mainly located in the mountainous areas, in the western part of the zone, and represent nearly 15% of the total area of the Vatovavy Fitovinany and Atsimo Atsinanana Regions, the bulk of which is located in the Districts of Ifanadiana, Ikongo, Vondrozo, Midongy and Befotaka. The forest ecosystems of the other Districts are subject to greater anthropic pressure.

Secondary forests (savoka) are mainly found in the mid-hill areas between the mountainous interior and the coastal zone. They are vegetation formations with a forest-like appearance but dominated by shrub/heliophilous species that develop on land left abandoned after the practice of shifting cultivation or tavy. Ravinala and bamboo are frequently found in the savannas.

The savannahs of the south-eastern zone are mainly composed of plants of the graminea family and extend mainly over the mid-hill area. The savannas have succeeded the initial forest formation, which developed after numerous burnings of the secondary forest. Depending on the state of degradation and the stage of reconstitution of the secondary forest (the "Savoka"), one can distinguish savannas with woody elements and savannas without woody elements. These grassy formations are very sensitive from the point of view of erosion. The woody elements found in this ecosystem can be allogenic species arranged in isolated groups: Eucalyptus, Pinus spp., Acacia spp.

The vegetation of marshes and swamps develops in wet valleys and floodplains. It is characterised by the presence of *Melaleuca spp*, *Typhonodorum lindleyanum* and *Cyperus latifolius*.



Savoka at Ravinala



Typhonodorum lindleyanum and *Cyperus latifolius*

Photo 4 – Ecosystem types in the zone

3.2.3. Socio-economic environment characteristic of the South-East Zone

3.2.3.1. Population and demography

The Centre East Zone comprises the following Regions: Atsimo Atsinanana, Vatovavy and Fitovinany, the latter two having recently become two separate Regions.

Table 3 – Demographics of the South East zone

Region	District	Number of inhabitants	Density	Average household size
Vatovavy	Ifanadiana	174 444	43,9	4,6
	Mananjary	276 887	50,6	4,2
	Nosy Varika	254 344	66,4	4,7
Fitovinany	Ikongo	204 475	64,8	5,0
	Manakara Atsimo	385 860	121,9	4,7

Region	District	Number of inhabitants	Density	Average household size
	Vohipeno	144 647	125,6	4,6
Atsimo Atsinanana	Farafangana	407 943	144,4	5,4
	Vondrozo	164 971	51,5	4,8
	Vangaindrano	317 734	73,9	5,2
	Midongy Atsimo	47 779	18,8	5,6
	Befotaka	53 440	16,5	5,3

Source: RGPH3, 2019

The Vatovavy and Fitovinany Regions are inhabited by different ethnic groups: the Antambahoaka and Antemoro, the dominant groups, and the Antanala and Betsimisaraka. The chiefdoms play an important role in the organisation and maintenance of social cohesion. Atsimo Atsinanana stands out as an original region; however, it does not correspond to a specific reference in terms of ethnic entity in the same way as the other regions of Madagascar. Although the population is of diverse origins, the region is further personified by almost identical human activities. The population settled in the region of Atsimo Atsinanana is thus composed of several ethnic groups, of which the best known are, from North to South: the Antambahoaka, the Tanala, the Antemoro, the Antefasy and the Antesaka.

The social structure in general has a similar form, although different names are used. Generally, the «Tranobe» is the basis of the social organisation of the ethnic groups in the area. Literally, «Tranobe» means big house, but in its deeper meaning it refers to the house of the family from the same lineage or clan or ancestor. There is also another specific terminology for Atsimo Atsinanana: the «Fatränge». Designating belonging to a village social universe, the «Fatränge» is often symbolised by monuments (e.g. stone, pointed wood, sheaf) planted just east of the «Tranobe».

For the Antesaka, in particular, the «Tranobe» is called «Tranondonaky» (literally, house of «Lonaky»). For the Antesaka, the «Lonaky» represents the clan that claims a single ancestor, and the law of eldership plays a role in the hierarchy of clan members according to age and gender. The «Lonaky» does not have full and unwavering power, but is limited to being a sort of representative of the «Tranobe» or clan vis-à-vis the other Tranobe. In addition, there is also a particular social organisation determining the roles of the «Ampanjaka» and «Lonaky» vis-à-vis other people. The subgroup is led by an «Ampanjaka» who has power over the «Lonaky» (lineage leader).

The «Tranobe» is thus the meeting place of the community, village or kingdom; it is here that disputes are settled and palabres or kabaro are held, at the end of which decisions are made. Traditional ceremonies and the reception of visitors take place in this house. All ceremonies or meetings held in the trañobe must be presided over by the Ampanjaka. Each ethnic group has its own traditions, including specific laws and fady (taboos, prohibitions). For example, traditions and «Fombandrazana» (literally, ancestral customs) are accompanied by ceremonies, including: «Hazolahy» and «Faty»: funeral ceremonies; «Fora»: a festivity linked to a circumcision; «Saotra» or «Velatry»: worship of the ancestors to bless an event that arises, during which a zebu is slaughtered and a festivity is organised. Families perpetuate the tradition of fady days, i.e. one or two days a week when men and zebras are forbidden to work. To this can be added many days of ceremonies that punctuate village life (circumcision, funerals, etc.).

3.2.3.2. Socio-economic activities

Vatovavy and Fitovinany Regions

The Vatovavy and Fitovinany Regions benefit from a humid tropical climate and are structured from East to West by a cliff zone where ferrallitic soils predominate and characterised by strong slope indices; a hilly zone, an entity deforested by tavy crops, a fruit and cash production sector, and a coastal zone, interspersed with small alluvial plains. Fishing is practiced on the coasts (lobster, prawns, shrimps, elvers, etc.).

The majority of the population lives from agriculture. In the past, development policies have sought to exploit the ecological potential of the area by favouring the development of cash crops to the detriment of food crops. The fall in commodity prices (particularly coffee) has had a strong impact on family incomes, and then on the quality of plantations (pick-your-own agriculture). At the same time, high population densities in these fragile environments prevent farming families from developing alternatives for diversifying production (Capfida, 2016). Alluvial valleys and lowlands, where land is often flooded, favour human concentrations. Within these ecosystems, the finages now look very fragmented,

and the areas controlled by households no longer meet their needs. The length of the hunger gap is very critical in some areas.

For the Vatofavy and Fitovinany regions, 300,000 hectares are under cultivation in the region. The main crops are rice, cassava, coffee, banana, sugar cane, pineapple, lechi and cloves. Extensive cattle rearing is poorly developed (around 50,000 head), reflecting the poverty level of farming households. Fruit crops are particularly affected by the narrowness of the market and the absence of artisanal or industrial processing units. Fishing, both inland and maritime, is still little practised. However, the lobster industry is beginning to develop with the presence of several operators and fishermen's organisations. In addition, the area is known for the production of bichique and elvers.

The level of access to social services for the population is low. Imbalances in production, the fall in exports and prices, the weakness of the local market, and the fact that it is landlocked have all contributed to making the region one of the most vulnerable in the country. In particular, the cliff area and the district of Nosy Varika (which can be accessed via the Pangalanes Canal) are landlocked throughout the rainy season (6 months), impacting on the economic development of this area.

Atsimo Atsinanana regions

Similarly, agriculture is also the basis of the economic life of the Atsimo Atsinanana region in general. Although the Region has large agricultural areas, the production is not sufficient. This imbalance is mainly due to the increase in population, the stagnation or even regression of cultivated areas, the exhaustion of soils and the decrease in yield. On the other hand, the rice seasons are subject to climatic hazards: i) flooding during cyclone periods, and ii) drought between August and September, the irrigation system and water control being insufficient.

Other food crops include cassava, sweet potato and taro. The use of forest products for food (e.g. "ovy ala", ravenala kernel) is also noted. These agricultural products have a dual purpose: on the one hand, they are intended for self-consumption, and on the other hand, they are marketed in order to provide for the purchase of basic necessities. Fruit trees (e.g. peach, mango, pineapple, sugar cane, letchis, avocado) are also substantial sources of income for the farmers in the region.

The Atsimo Atsinanana Region is characterised by the economic importance of cash crops, notably coffee, cloves and pepper. Vanilla cultivation is also beginning to flourish in the region. Historically, coffee was introduced to Madagascar during colonisation. The canephora type is the most adapted to the region. Yields are tending to fall due to the dilapidated state of the coffee trees. For cloves, the Atsimo Atsinanana region provides 1/5th of the national production¹. Clove trees are very sensitive to cyclones and young trees only come into production after about ten years.

Concerning livestock farming, livestock farming activities are limited in the South-East. Livestock farming is not well thought out from a zootechnical point of view, either in terms of animal feed or reproduction. Not all farm households own zebus, but cattle rearing is important for several reasons. Zebu ownership is not in the majority, and it is often an indicator of relative wealth. It is therefore a traditional element of social prestige. The zebu reduces the drudgery of working the land. Soil preparation is faster and saves labour. Zebu are mainly used for puddling rice fields, by the traditional system of trampling the plots. Pig farming is limited due to the fact that this animal is considered taboo or fady in many areas.

Although sometimes limiting the accessibility of cars, the presence of rivers gives this Region an important halieutic potential in addition to the sea. There are also several bodies of water, such as Lake Masihanaka, which contain fishery resources. However, overall, the fishing industry is not very developed in the area. River fishing, which is more widespread, is practised by farmers, often as a side activity, initially for their own consumption, but increasingly for commercial purposes. Sea fishing, on the other hand, is an activity in its own right, practised by men with a particular know-how. It is associated with agricultural activities because of the sometimes very difficult and variable conditions at sea. Fishermen catch various varieties of sea fish, as well as shrimps, prawns and lobsters.

¹Madagascar was the world's second largest clove producer in 2004 (15 500T) [source : FAO, 2004-2005]



Agricultural land



Watercourses requiring a ferry crossing

Photo 5 – Socio-economic characteristics of the South East Zone

3.3. SENSITIVE AREAS, THREATS AND PRESSURES

The following map presents the Madagascar Protected Area System in the DEFIS Programme intervention zone. Due to the size of the area, the conservation sites observed within it are relatively numerous and concern a variety of sensitive ecosystems (e.g. xerophytic formation, eastern forest, rock formation, wetlands, etc.) depending on the phytogeographical region. These conservation sites have specific management/governance modes depending on their category. However, the manager of a site is the main person responsible for the conservation activities carried out.

In addition, there are pressures on natural ecosystems, in particular the cutting of wood (service wood or fuel wood) in both dry forest formations (e.g. thorny ferns) and wet forest formations (eastern wet forest), and the use of fire for agriculture and livestock. The reduction of forest areas in favour of crop fields is very visible: forest patches are surrounded by crop fields, or by recently or formerly formed savannah/grassland formations. In particular, secondary formations or "savoka" (at different levels of degradation of primary forest ecosystems) are the most frequent

ecosystems in the landscape of the eastern part of the study area. Wetlands are threatened by the expansion of cultivated areas, especially in the central and eastern part of the study zone.

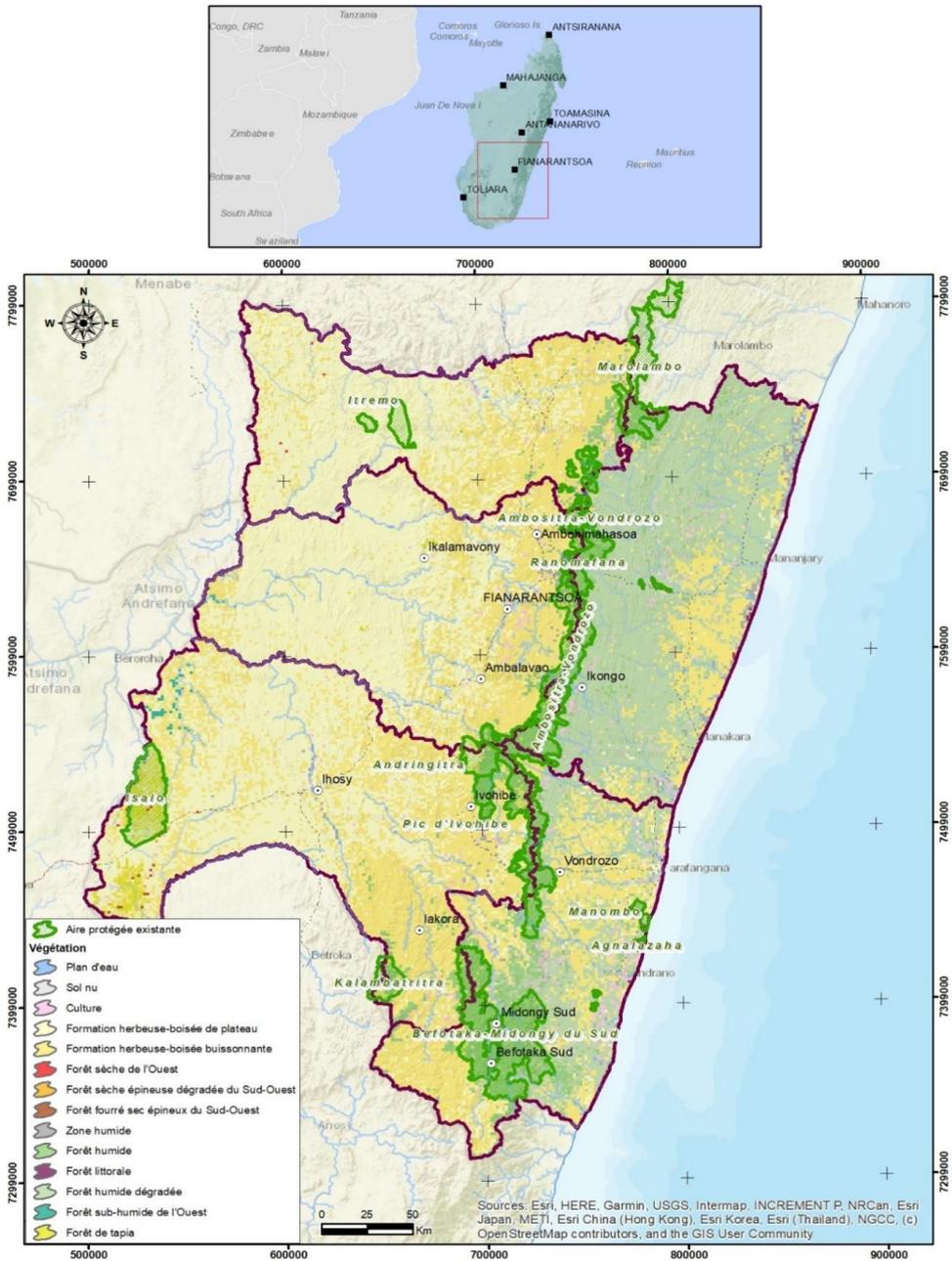


Figure 8 – SAPM in the DEFIS programme area

3.4. ROAD NETWORKS

The Defis Programme intervention area is served by a sparse road network consisting mainly of national roads (RN) and provincial interest roads (RIP). The national roads from the South East zone to the South zone are

- RN25, starting from the intersection with RN7 south of Ambohimahasoa at PK355, connects Vohiparara and Mananjary via Ranomafana, Ifanadiana and Irondro. It is a paved road in good condition.
- The RN14 connects Ifanadiana to Ikongo and is only passable in the dry season.

- The RN11 connects Mananjary to Nosy Varika, it is an unpaved road that is only passable in the dry season.
- The RN24 connects the RN11 at the level of the Fokontany Tsiatosika to Vohilava Avaratra, it is an unsurfaced track.
- The RN12 connects Irondro to Vangaindrano through Manakara and Farafangana, the road is in good condition, it is paved on almost its entirety. The section of the RN12 located in the Atsimo Atsinanana Region is the only paved road in this Region.
- The RN12A links Vangaindrano to Taolagnaro. The road is unpaved and includes river crossings by ferry.
- The RN27 links Farafangana to Ihosy but has been cut between Vondrozo and Ivohibe for several years. The Farafangana-Vondrozo section remains passable in the dry season.
- The RN18 connects Vangaindrano and Befotaka via Midongy Atsimo, but it is not covered and remains difficult to drive. Between Midongy Atsimo and Befotaka, it is only passable for the first 8 kilometres from Midongy Atsimo. Befotaka is therefore totally isolated and only accessible on foot.
- The RN12A links Vangaindrano to Taolagnaro. The road is unpaved and includes river crossings by ferry.

The road network is composed of national roads (RN) and roads of provincial interest (RIP). The RN7 is the main artery of the central zone, crossing the Amoron'i Mania, Haute Matsiatra and Ihorombe regions from north to south. Other roads then connect to the RN7 to link the localities of the zone.

- The RN41 connects Fandriana to the RN7; it is covered but is beginning to deteriorate.
- The RN35 connects Ivato centre on the RN7 to Malaimbandy via Ambatofinandrahana. A large part of the road is hardly passable.
- The RN47 connects Ivato centre to Antoetra, in the south-east.
- The RN46 connects the RN7, from an intersection about twenty kilometres north of Vohiposa, to Andalandranobe, then passes through Ambohimahazo to join the RN35.
- The RN25 connects the central zone to the south-eastern zone from the RN7. The section between RN7 and Vohiparara is not covered and is in a state of disrepair.
- The RN42 connects Fianarantsoa to Ikalamavony then the route joins the RN35.
- The RN45 links Alakamisy Amohimahazo, on the RN7, to the RN25 at Vohiparara. It is paved and in good condition.
- The RN16 connects the RN27 to Iakora via Ranotsara Nord.
- The RIP144T connects the RN35 to the RN34 at Betafo.
- RIP205 connects RN7, near Sandrakely, to Ambinaniroa (Andonaka), Fenoarivo Atsimo, Tsitondroina and Tanamarina. The road is not paved but passable up to Ambinaniroa.
- The RIP102 connects Fianarantsoa to Mahasoabe.
- The RIP110 connects Talata Ampano to Alakamisy Itenina and RIP201 connects Ambalavao to Ambohimahamasina.
- The RIP209 connects the RN7, at the level of Morafeno Sud to Vohitsaoka.

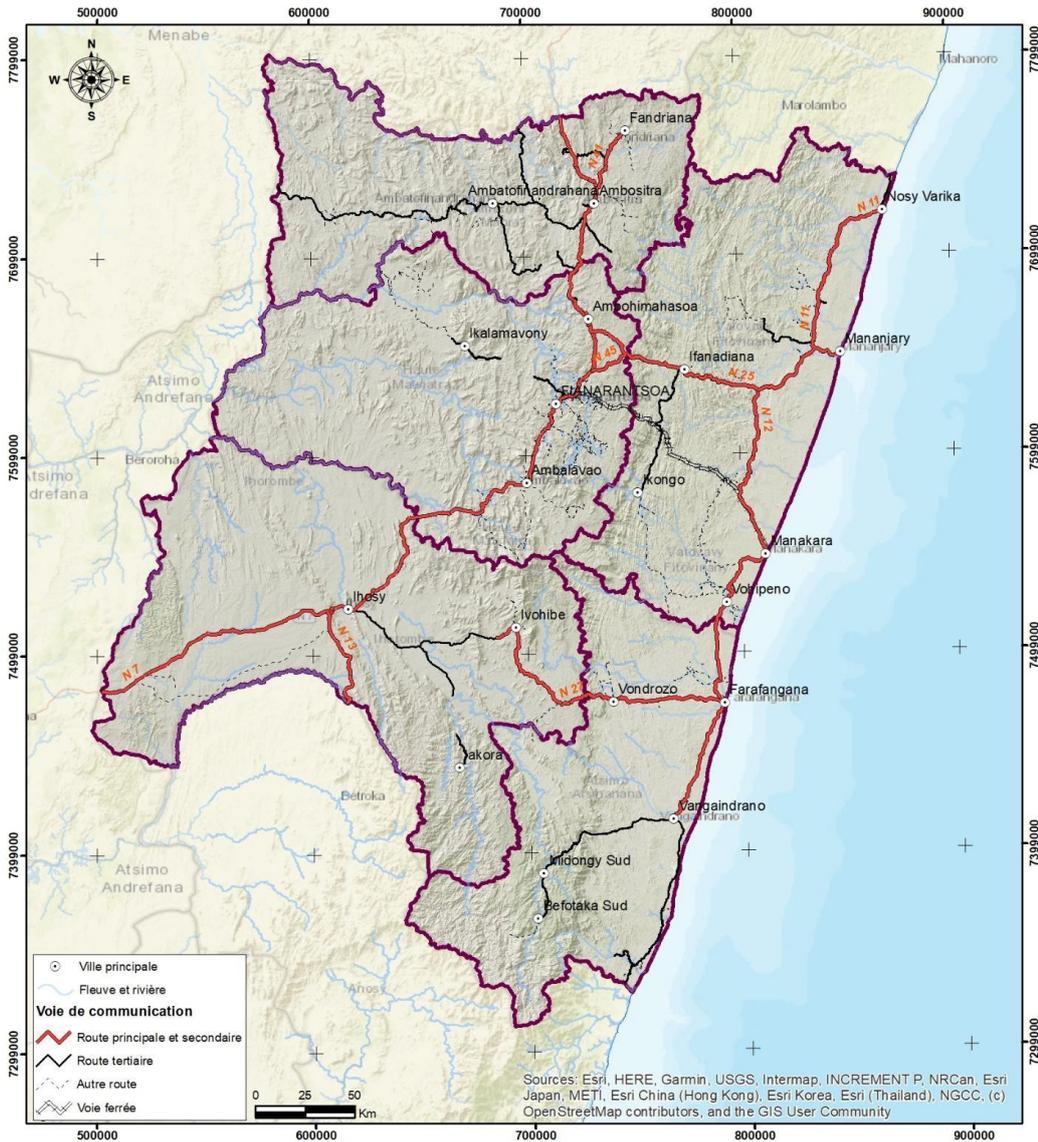


Table 4 – Road network serving the Project zone

3.5. CLIMATE CHANGE

Madagascar is the most cyclone-prone country in the Indian Ocean region due to its location and size. Coastal livelihoods are vulnerable to climate change risks, while agricultural development throughout the country will be severely compromised by more erratic rainfall patterns. Poverty makes Madagascar particularly vulnerable. Outside the main urban centres, few people live in masonry houses, making them particularly vulnerable to the adverse impacts of cyclones.

Tropical cyclones, a major hazard in Madagascar, approach the island from the east, particularly from December to March. For example, in 2008, cyclones Fame, Ivan and Jokwe affected 342,000 people and caused nearly USD 333 million in disaster-related damage and losses, or 4% of GDP.

Madagascar has experienced 35 cyclones, 8 floods and 5 periods of severe drought in 20 years (three times worse than the previous 20 years). The cost has been estimated at US\$1 billion, with consequences for food security, drinking water and irrigation, health systems, environmental management and quality of life.

Agriculture is negatively affected by poor practices and degraded soil productivity, coupled with increasingly unpredictable rainfall patterns, droughts and floods. Forest fires are likely to increase due to temperature changes and more frequent droughts. Similarly, landslides may be triggered by extreme rainfall events. Traditional slash-and-burn agriculture and uncontrolled deforestation continue to expose larger areas of land to soil erosion from torrential storms.

Some people who have lost their livelihood base in agriculture - following the forced sale of cattle and other assets due to drought - are said to be resorting to a survival strategy by taking up fishing, without the traditional knowledge of coastal fishing communities who have long experience of outrigger maintenance, the sea (tides, seasonal fishing grounds, local currents, ...) and local weather systems. If climate change increases the severity of storms, vulnerable people will be even more at risk.

The CPDN document² of the Republic of Madagascar, established in 2015, cites several examples of already observed impacts of climate trends for Madagascar, such as:

- Average sea level rise of 7-8 mm per year, leading to coastal erosion and recession;
- Repeated cases of mortality due to consumption of fish that have ingested toxic algae as a result of rising sea temperatures;
- Medium to high index of direct mortality due to cyclonic events (index value: 6);
- Total or partial destruction of social infrastructure (schools, basic health centres, dispensaries) as a result of cyclonic events (heavy rains, floods and wind gusts);
- Destruction of mangroves following flooding events, destruction of coral reefs, habitats and associated species (mangroves, sea grass beds, etc.);
- Destruction of crop fields and agricultural infrastructure, following cyclonic events (intense rainfall, flooding and wind gusts);
- Destruction of administrative buildings, roads and tracks, following cyclonic events (intense rains, floods and gusts of wind);
- Decrease in agricultural yields and soil fertility;
- Droughts: water stress (uneven and irregular distribution of rainfall; dryness and deficits in places);
- Droughts: 30-60% of the population in the South of the country suffer from food insecure due to periodic drought events;
- Migration (particularly to the highlands) of vector-borne disease endemics, particularly malaria.

The same document also specifies the potential impacts associated with climate change, if no action is taken, as follows:

- Very significant decline in agricultural yields, decrease in fisheries and aquaculture production and worsening of household poverty;
- Infrastructure unfit and repeatedly destroyed by cyclone events;
- Very significant changes in the prevalence rate of acute respiratory infections and expansion of the distribution areas of vector-borne diseases;
- Modification of the distribution range of certain species and risks of disappearance of a species due to global warming at the habitat level;
- Food insecurity and social conflicts caused by water stress crises.

This is already the present case, particularly in the southern region of the country.

² CPDN : Nationally Determined Contribution

4. REGULATORY FRAMEWORK

4.1. BASIC NATIONAL REGULATORY TEXTS

A complex and rich set of legal and regulatory frameworks must be considered for the application of the environmental and social safeguards of the DEFIS+ Project. Without claiming to be exhaustive, these series of texts are cited below.

4.1.1. Basic texts on environmental management

- Law n°2015-003 on the updated Malagasy Environment Charter. This is a framework law setting out the rules and fundamental principles for the management of the environment and its enhancement. It repealed the provisions of laws 90-033, 97-012 and 2004/015.
- Decree n°2016-298 fixing the attributions of the Minister of Environment, Ecology and Forests as well as the General Organisation of his Ministry.
- Decree n°99-954 of 15 December 1999 relating to the compatibility of investments with the environment modified by Decree n° 2004-167 of 03 February 2004 (MECIE decree). The objective of this decree is to set out the rules and procedures to be followed in order to ensure the compatibility of investments with the environment and to specify the nature, the respective attributions and the degree of authority of the institutions or bodies empowered for this purpose. Decree N°. 2004-167 sets out the project annexes that must be subject to an environmental and social impact assessment (ESIA) and an environmental commitment programme (ECP).
- Decree No. 2008-600 on the creation and organisation of the National Environment Office, whose main missions are (i) the prevention of environmental risks in public and private investments and the fight against pollution; (ii) the management of the environmental information system, monitoring and evaluation of the state of the environment to support environmental assessment and for better decision-making at all levels and (iii) environmental labelling and certification
- Order N°6830/2001 establishing the modalities and procedures for public participation in the environmental assessment. This decree was made in application of the provisions of the preceding decree n°99-954 (MECIE).
- Inter-ministerial Order N° 4355/97 defining and delimiting sensitive areas. This is part of the application of Decree N° 95-377 (MECIE). It presents in annex the definition and delimitation of ten (10) sensitive marine, coastal and terrestrial ecosystems. This decree was implemented by Inter-ministerial Order N° 18177/04.

4.1.2. Texts on environmental assessment

According to Article 13 of the new updated Malagasy Environmental Charter Law, «all public or private investment projects, whether or not they are subject to authorisation or approval by an administrative authority, or whether they are likely to affect the environment, must be subject to an impact study».

Generally speaking, according to the MECIE Decree cited above, after a preliminary sorting, the required environmental studies can be classified, on the basis of the brief description of the project and its location, as follows:

- Full Environmental and Social Impact Assessment (ESIA): National Environment Office (ONE) is responsible for examining the related files.
- Environmental Commitment Programme (PREE): the relevant files are examined by the Ministry responsible for the activity in question.
- No study required

The environmental impact study is an obligation that applies to projects likely to have significant effects, whereas the environmental commitment programme is aimed at projects likely to have more circumscribed effects.

The MECIE decree establishes the stages of the ESIA process, the powers of the public institutions, the duties of the promoter, the mechanisms for the evaluation of the study by a Technical Committee, the stages of investigation and public hearings, the issuance of the permit and its conditions of execution, as well as the rules governing the monitoring of the latter. It does the same for the PREE process, although the latter has much simpler administrative features.

Annex I of the MECIE decree identifies various categories of projects that must undergo a full ESIA.

For example, projects meeting the following criteria are: works that may affect sensitive areas, developments, works and works that are likely, due to their technical nature, their scale and the sensitivity of the environment in which they are located, to have harmful consequences for the environment, such as any road construction and development project, whether paved or not; any hydro-agricultural or agricultural development or rehabilitation project of more than 1,000 ha; any water withdrawal (surface water or groundwater) of more than 30 m³/h; any project for the spreading of chemical products likely, due to its scale, to harm the environment and human health; etc.

The activities that are subject to a mandatory PREE are defined in Annex II of the MECIE decree.

For example, the following types of projects must be subject to an PREE: any periodic maintenance project for an unpaved road of more than 30km; any hydro-agricultural or agricultural development or rehabilitation project with a surface area of between 200 and 1,000 ha; any semi-industrial and artisanal livestock farming project; etc.

In all cases, account is taken of the technical nature and scale of the projects, as well as the sensitivity of the environment in which they are implemented. The National Environment Office (ONE) is the only body authorised to establish or validate a preliminary environmental examination (screening) on the basis of a brief description of the project and its location.

In application of Article 14 of the Charter and the provisions of the MECIE decree, Inter-ministerial Order N°6830/2001 of 28 June 2001 lays down the methods and procedures for public participation in the environmental assessment. This order recommends informing the public concerned by the project about the existence of the project and collecting their opinions on this subject either by on-site consultation of the documents, or by public enquiry, or by public hearing, and includes an information phase on the project and a consultation phase during which the opinions of the public concerned by the project are collected.

4.1.3. Texts on the agricultural sector

- Decree n°62-190 of 24 April 1962 sets out the terms of application of Law n°61-034 of 15 November 1961 on the irrigation of rice fields and cultivated land.
- Law n°2014-042 governs the rehabilitation, management, maintenance, preservation and policing of hydro-agricultural networks, and the implementation of infrastructure works and structures contributing to the development and enhancement of the land served by them, as well as the adjoining watersheds, without distinction of mode or source of financing.
- Decree No. 2013-070 sets the standards for the construction, extension and rehabilitation of hydro-agricultural infrastructure, designed to protect them from the effects of floods.
- Law n°94-038 of 3 January 1995 regulates seeds. The categories of seeds and seedlings provided for by this law are: breeder, foundation, registered, certified and ordinary seeds.
- Decree n°85-129 of 3 May 1985 sets the Malagasy standard for green coffee intended for marketing. It specifies in particular that Malagasy green coffees must belong to one of the varieties and their hybrids designated below: *coffea arabica*, *coffea canephora*, *coffea Liberia*.
- Decree n°2004-1135 of 21 December 2004 regulates beekeeping in Madagascar. It specifies in particular the regulatory provisions relating to the exploitation and establishment of bee farms, and those relating to hive products.

- Ordinance n°62-123 of 1 October 1962 classifies Madagascar's land into forestry, pastoral and agricultural zones.

4.1.4. Texts on the road sector

- Law n° 98-026, which recasts the Road Charter in Madagascar, defines the modalities of rational management of road assets and determines the levels of responsibility of the State, decentralised territorial collectivities and private operators, in terms of construction, rehabilitation, maintenance and operation of the road, in close relation with environmental protection (article 1).
- Ordinance N°60-106 of 30 October 1960 sets the right-of-way reserve, a strip of land coaxial to the road, at 30m wide for national roads and 20m wide for provincial roads, which is intended to accommodate subsequent widening works. It imposes easements within the right-of-way reserve, including a ban on encroachment by construction or cultivation. There is nevertheless the possibility of temporary occupation authorisation for seasonal crops, by the Ministry in charge of Public Works, revocable at any time and without compensation other than the value of the authorised crops.
- Law N°2017-002 on the Road Code in Madagascar determines the conditions of use of roads open to public traffic. Its objective is to ensure the safety and security of traffic and road transport of goods and people.
- Law n°99-023 of 19 August 1999 on the regulation of public contracting and project management for works of general interest, mentions the attributions of project owners and the parts or all of those that can be entrusted to a delegated project owner such as the definition of the administrative and technical conditions of the work, the management of the operation, the choice of contractors, the payment of project owners, contractors and service providers, etc.

4.1.5. Texts on land

- Law N°2005-019 of 17 October 2005 sets out the principles governing the status of land. There are thus three statuses of land: i) State domain, decentralised communities and other legal persons under public law; ii) land belonging to private persons; and iii) land included in areas subject to specific legal regimes. In particular, this law specifies that private land is divided into land that is the subject of a property right recognised by a land title, i.e. 1) land that has been the subject of an individual or collective registration procedure; and 2) land held by virtue of an untitled property right that can be established/recognised by an appropriate procedure.
- Ordinance N°62-023 of 19 September 1962 provides a framework for expropriation in the public interest, for the amicable acquisition of real estate by the State or secondary public authorities, and for capital gains on land.
- Decree N°63-030 of 16 January 1963 sets out the terms of application of Ordinance N°62-023 of 19 September 1962.

4.1.6. Texts on resources

- Inter-ministerial Order N° 4355/97 on the definition and delimitation of sensitive areas stipulates, in Article 3, that the following are considered sensitive areas [...] areas subject to erosion [...] swampy areas, natural conservation areas, drinking, mineral or underground water protection areas [...]. The areas where protected and/or endangered species are found are merged with the natural conservation areas in which they are found. Furthermore, this decree n°4355 /97 recalls in its introductory note that the MECIE decree recommends that preliminary environmental impact studies be systematically required each time these sensitive areas are envisaged as a location for any activity of any kind, in order to ensure special protection of these areas whose ecological functions are important.

- Law n° 2015-005 of 26 February 2015 on the revision of the Protected Areas Management Code, specifies that a Protected Area (PA) is a delimited territory, terrestrial, marine, coastal or aquatic, whose components have a particular value, notably biological, natural, aesthetic, morphological, historical, archaeological, cultural or religious, and which requires, in the general interest, a multi-faceted preservation.
- Law n° 98-029 on the Water Code describes the general framework for the protection and management of water resources.
- Decree n°2003-464 of 15 April 2003, on the classification of surface waters, presents the quality classes in force in Madagascar to assess the quality of watercourses and determine possible uses. This decree distinguishes between (i) watercourses of good quality where multiple uses are possible (class A); (ii) watercourses of average quality, with the possibility of recreational use, but bathing may be prohibited (class B); (iii) watercourses of poor quality, where all bathing is prohibited (class C); and (iv) watercourses with excessive contamination, and where no use is possible except for navigation (out of class).
- Ordinance N°28-029 on the protection, safeguarding and conservation of the national heritage applies to natural and cultural heritage.

4.1.7. Texts governing the field of work

- Law n°2003-044 of 28 July 2004 on the Labour Code. This law sets out the general principles applicable to all workers whose employment contract is executed in Madagascar, with the exception of State employees and workers governed by the Merchant Navy Code; and to all employers, regardless of their status or sector of activity. It aims to develop a stable and effectively applied body of rules for both the worker and the employer. Decree N°95-175 of 23 November 1995 is a decree implementing the provisions of Law N°94-029 of 25 August 1995 on the Labour Code.
- Decree N°2011-626 Implementing Law N°2003 - 044 of 28 July 2004 on the Labour Code, on the fight against HIV/AIDS in the workplace. This decree aims at (i) integrating the HIV/AIDS component into the company's work programme; (ii) taking the necessary measures to prevent any HIV/AIDS infection in the workplace; and referring the patient (if necessary) to a medical centre and (iii) prohibiting any discrimination against the patient.
- Law N°94 027 of 18 November 1994 on the hygiene, safety and environment at work code. This law stipulates the collective and individual protection of the life and health of workers against all risks inherent to the workplace; as well as the hygiene and safety measures to be followed.
- Law N° 2011 - 002 of 15 July 2001 on the Health Code. This law aims to provide health professionals and the population with an updated legal instrument that is credible and accessible to all. Above all, it defines the general principles of the organisation and functioning of the Health Sector.

4.2. IFAD'S ENVIRONMENTAL PROCEDURES

Social, Environmental and Climate Assessment Procedures (PESEC)³ of IFAD, are one of the core elements of IFAD's approach to promoting sustainable development. They refine the criteria for integrating environmental aspects into IFAD's operations and give priority to social aspects through a set of principles, tools and obligations set out in them. These procedures also define the limits of IFAD's role and the responsibility of other parties, including the originating institutions, that fund IFAD interventions.

The PESECs draw lessons from past and recent environmental experience of IFAD and its partners, and guide IFAD's future activities on the environment and natural resources for the long term. The focus is on the integrated assessment of environmental, social and economic factors, which are essential for poverty reduction and sustainable development, plus broader factors such as institutions and governance.

³ IFAD. Social, Environmental and Climate Assessment Procedures. 2017 Edition

PESECs also take into account the changing global context and realities that influence environmental sustainability. In this way, they define a common approach that is sufficiently flexible to allow environmental and social assessment to be undertaken in different contexts. However, they emphasize the need to work with borrowing countries and partners to develop and implement policies, plans, programmes and investments that take into account the linkages between environment and poverty and that tailor IFAD support to the different environmental management capacities of each country.

IFAD's PESECs differ from other existing environmental guidelines in that they focus on the rural poor and the vital role of good environmental and natural resource management in improving livelihoods in poor rural areas.

Thus, IFAD-funded projects are assigned to one of three categories (A, B or C) according to the likely importance of environmental and social problems, based on established criteria. The three project categories are as follows

- **Category A:** The programme/project may have adverse environmental and/or social impacts: i) that are significant, irreversible or unprecedented; ii) that affect an area larger than the sites or facilities subject to physical interventions; and iii) that cannot be easily remedied by preventive or mitigating measures. For Category A programmes/projects, a formal ESIA is required for the whole programme/project or for one or more of the components, with details in the ESMP.
- **Category B:** The programme/project may have a negative environmental and/or social impact on human populations or ecologically significant areas, but this impact: i) is less negative than in category A; ii) is site-specific and rarely irreversible; and iii) can be easily remedied by appropriate prevention and/or mitigation measures. Although no formal ESIA is required for Category B programmes/projects, in many cases further environmental analysis may be undertaken during project preparation or implementation. Category B project operations usually require an ESMP, which can either be a stand-alone document or the result of an environmental analysis.
- **Category C:** The environmental or social impacts of the programme/project will be negligible or nil. No further environmental analysis is required.

The design report for the DEFIS project has highlighted that at this stage several potential risks are identified, but the description of the actions in the project framework document and the implementation of the environmental procedures show that they are well identified by the design. Thus, **the socio-environmental risk of the DEFIS programme has been assessed as moderate, category B.**

4.3. GCF'S SAFEGUARD POLICIES

The Green Climate Fund (GCF) has a number of policies that govern the operation of the projects, programmes and activities it funds. The most relevant to this study are :

- The **Environmental and Social Policy**⁴, which aims to regulate the protection against environmental and social risks of funded projects and programmes.

The Green Climate Fund's Environmental and Social Management System (ESMS) is composed of processes and procedures that help the Green Climate Fund to identify, analyse, avoid, minimise and mitigate any potential negative environmental and social impacts of climate finance activities. The ESMS is designed not only to avoid harm, but also to improve the environmental and social performance of the Green Climate Fund and the activities it finances, consistently over time.

- The **Gender Equality Policy**⁵, which aims to effectively promote the gender approach to achieve more equitable and sustainable climate action.

The impacts of climate change affect women and men differently. Women are the hardest hit by dramatic changes in climate conditions. Women's mortality from climate-related disasters is higher than that of men.

⁴<https://www.greenclimate.fund/projects/safeguards/ess>

⁵<https://www.greenclimate.fund/projects/gender>

Compared to men, women's domestic burdens (e.g. collecting firewood and water) increase significantly with various manifestations of climate change.

Women tend to be more dependent on natural resources for their livelihoods. Any decline in land and biomass productivity affects women more than men, especially in rural areas. In urban areas, after climate-related disasters, it is more difficult for poor women than poor men to regain their economic status and well-being. Women, as well as men, contribute significantly to the fight against climate change as knowledgeable small-scale farmers and leaders of climate change adaptation and mitigation initiatives

- The **Indigenous Peoples' Policy**⁶, which helps the Fund to specifically protect indigenous peoples and communities from the negative impacts of its projects and activities, and to facilitate their access to financing.

Indigenous peoples are unique and a distinct stakeholder of the GCF. The rights of indigenous peoples are affirmed by international human rights instruments, including binding treaties and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Indigenous peoples have invaluable and essential contributions to make to climate change mitigation and adaptation. Yet they also face serious threats to the realisation of their rights from climate change-related actions.

The importance of engaging with indigenous peoples in climate change policies and actions has been recognised by the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC), including in the Cancun Agreement. The preamble to the Paris Agreement also recognises that Parties should, in taking action to address climate change, respect, promote and take into account their respective obligations regarding, inter alia, the rights of indigenous peoples. The COP decision adopting the Paris Agreement recognised the need to strengthen the practices and efforts of local communities and indigenous peoples related to addressing and responding to climate change and operationalised the Local Communities and Indigenous Peoples' Platform to achieve this. The COP further requested the Green Climate Fund to consider a recommendation "to enhance [its] consideration of local, indigenous and traditional knowledge and practices and their integration into adaptation planning and practices, as well as monitoring, assessment and reporting procedures".

4.4. ANALYSIS OF THE APPLICABILITY OF IFAD OPERATIONAL POLICIES:

Guidance Note	Applicability
Guidance Note 1 on Biodiversity	<p>Yes: The project is located in areas providing ecosystem services that project stakeholders depend on for survival, food, livelihoods, or primary income, or that are used to support the project. Biodiversity Guidance Standard is triggered</p> <p>Mitigation measures will be taken to minimize the impact of the project on biodiversity</p> <p>The ESMF assessment demonstrated that Project activities will not affect natural habitats. Indeed, the environmental assessments carried out for the selected tracks and irrigated perimeters, the field visits and the public consultations during the preparation of the ESIA and the ESMF did not indicate any negative impacts on the natural habitats due to their location. out of sensitive areas</p>
Guidance note 2: Resource efficiency and pollution prevention	<p>Yes: Natural resource harvesting activities are planned as part of the project. Construction activities can pollute the air, water and soil</p> <p>Waste during construction activities may be generated.</p> <p>However, in the context of DEFIS+, the use of pest control, no Pest and Pesticide Management Plan (PGPP) has been prepared, the project is classified as category B and does not require the development of this plan.</p>

⁶<https://www.greenclimate.fund/projects/safeguards/ip>

Guidance note 3: Cultural heritage	Yes: Construction work on new infrastructure will not affect recognized “heritage” sites. But it could be that while carrying out the work, accidental encounters on cultural sites may occur (fortuitous discovery of tombs, etc.). In this case, reference should be made to the relevant provisions mentioned in the ESMF. In addition, the provisions of Ordinance No. 82-029 of November 6, 1982 relating to the safeguarding, protection and conservation of national heritage can be applied. In addition, public consultations must inform the Project beforehand about the existence of physical cultural resources (case of sacred trees if there are any).
Guidance note 4 Indigenous peoples	No: No Project activities will be carried out in areas where indigenous peoples reside.
Guidance note 5 Labor and working conditions	Yes: All activities are likely to cause direct and indirect environmental and social impacts on the principals in the areas of action of the Project. In addition, the health risks (including STD / AIDS) and the safety of workers and local residents are significant. The standard is therefore triggered because the proposed activities have the potential to have adverse environmental and social impacts.
Guidance note 6: Community health and safety	Yes: Misplaced infrastructure rehabilitation activities can cause negative impacts on communities such as pollution, water-related diseases, communicable and non-communicable diseases, injuries, nutritional disorders, failure or malfunction of infrastructure put in place could threaten the safety of communities, accidents that may occur during construction, violence against women, including sexual exploitation and abuse, the influx of workers could have potential impacts on community health and safety
Guidance note 7 Resettlement and economic reintegration	Yes: All The rural road rehabilitation works will make the effort to avoid any displacement of people. Indeed, it was agreed that the DEFIS Program will rehabilitate the current tracks as it stands and will not generally affect the other environments and will not affect the livelihoods of the population. Thus, no RAP will not be drawn up, the project does not provide for the acquisition of land or displacement of the population, the project is a category B project and does not require the development of a Resettlement Action Plan, but an abbreviated Resettlement Action Plan in this case. Indeed, in a few rare cases, especially for irrigated perimeters, some people could lose their land, it should be dealt with on a case-by-case basis. Thus, these affected people will be compensated for their losses and pays particular attention to the needs of vulnerable groups within the populations.
Guidance note 8 Financial intermediaries and direct investments	Yes: This standard is triggered, the DEFIS Program contributes to the Agricultural Development Fund for the scaling up of these activities, and these partners assume delegated responsibility for environmental and social assessment
Guidance Standard 9 Climate Change	Yes The project areas are affected by climatic hazards. However, the DEFIS+ project will be implemented to reduce vulnerabilities to climate change

4.5. MEASURES OF COMPLIANCE OF PROJECT ACTIVITIES WITH NATIONAL LEGISLATION AND IFAD SAFEGUARD POLICIES

Analysis of the applicability of IFAD operational policies:

Activities of the project concerned	National legal framework	IFAD safeguard policies	Measures planned by the Program to comply with the legal framework
Rehabilitation of irrigated perimeters Rehabilitation of rural roads	The law on the environment; The MECIE decree	Guidance Note on Resettlement and Economic Reintegration Guidance note 3: Cultural heritage Guidance note 2: Resource efficiency and pollution prevention Guidance Note 1 on Biodiversity	Systematic screening of sub-projects; Prepare a PREE
Irrigation works	Water management (Law n°98-028 on the water code)	Guidance note 2: Resource efficiency and pollution prevention Guidance Note 1 on Biodiversity	Dimension the works on the capacities of the basins; Comply with the measures on the management of the 62 opening up (culverts, viaduct) wharf site waste
Use of firewood; Reforestation, Forestry	Renewable natural resources Law No. 97-017 of 8 August 1997 revising forestry legislation;	Guidance Note 1 on Biodiversity Guidance note 2: Resource efficiency and pollution prevention	Participatory Development Plan; Prioritize indigenous species; Comply with forestry legislation Deforest only the areas required for the implementation of the sub-project; Acquire clearance authorization
Use of local labor in the works (roads, rehabilitation of irrigated perimeters), other investments	Law No. 2003-044 on the labor code	fundamental labor standards issued by the International Labor Organization (ILO), Guidance note 6: Community health and safety Guidance note 5 Labor and working conditions	Compliance with directives related to the use of labor

In short, the national legislative and regulatory framework of the Republic of Madagascar consists of a relatively complete normative framework that supports all the activities planned under the project. These are support activities for water management (dam rehabilitation) and the development of irrigated areas, reforestation and reforestation activities. All these activities are framed by the provisions of the law on the environment (the MECIE code of the territory, the law on the management of biodiversity and forest legislation, the law on the water code which regulates the different uses of water). water, the law on the labor code which guarantees the safety and well-being of workers and the land law which organizes access to land and the securing of family farms. These national legal provisions are not contradictory. On the contrary, the two frameworks (national and the standards) complement each other.

4.5.1. Summary of the analysis of the national regulatory framework and IFAD policy about resettlement

Legal and regulatory framework of the project within the framework of resettlement is defined by the laws and regulations of the Malagasy State and the policy on involuntary resettlement of IFAD:

	Compliance with the Malagasy legal framework	IFAD provisions	Procedures to adopt
Preparation of a Resettlement Action Plan	The national legal framework does not clearly define the preparation of a plan related to resettlement.	The guidance note applies when physical displacement of people and loss of assets are unavoidable. A Resettlement Action Plan must then be developed in order to reduce as much as possible the impacts that may be generated by the resettlement but also to provide the PAPs with assistance during all the resettlement phases.	A Resettlement Action Plan document will be prepared as part of the project, including the inventory and census of goods and populations likely to be affected by the project and procedures related to compensation.
Public participation and consultation	Public consultation must be organized to validate and complete the identification of people likely to be affected by the project through commodo and incommodo surveys	The local population must be informed of the project and the resettlement to be considered. The completion of the RAP must be preceded by procedures for dissemination, involvement and the holding of a hearing or interview with all the stakeholders. The holding of public consultation sessions must take into account the identification and consultation of vulnerable groups or individuals.	Public consultation sessions will be conducted in all the localities concerned by the area covered by the project to publicize the various components of the project in order to collect the opinions and wishes of the local populations. Add to this the commodo and incommodo surveys in the localities concerned by the project
Identification of Project Affected Persons and Project Affected Assets	The preliminary identification of the assets (buildings and land) affected and their status must be established by carrying out parcel statements. The legal framework only takes into account the affected assets.	Resettlement Action Plan includes a socio-economic survey, a census of PAPs , an inventory of affected assets and a list of beneficiaries entitled to compensation.	The resettlement action plan considers the complementarity of the recommendations. Thus, a socio-economic survey of the People affected by the project will be carried out during the preparation of the resettlement action plan together with the development of a statement of georeferenced plot plans in the area of influence.
Eligibility for compensation	According to Malagasy legislation, two categories of people are eligible: formal occupant and traditional occupant (usufruct). – Article 18 of State Law No. 2006-031 of 24 November 2006	The note recognizes the rights of the following three groups of people: – People who have formal legal rights to land or other property recognized under the laws of the country concerned. – People who would not have formal legal rights to land or other assets at the time of the census or assessment, but can prove that they have a claim	The Resettlement Action Plan will apply the provisions of the ADB as well as the Malagasy legislation. Anyone affected by expropriation under the project will be compensated for both land and livelihood.

	<p>relates to land development</p> <p>– Law No. 2005-019 instituting untitled private properties of land without status or in the private domain of public persons</p> <p>– Article 33 of Law No. 2005-019 on land tenure defining untitled land</p>	<p>that would be recognized by the customary laws of the country.</p> <p>– Those who do not have legal rights or recognizable claims to the lands they occupy within the project's area of influence, and who do not belong to either of the two categories described above, but who by themselves - themselves or through other witnesses, can prove that they occupied the area of influence of the project for a certain time</p>	
Eligibility deadline	Malagasy legislation specifies a deadline for the inventory of property and assets affected by an investment project, whose rights holders are eligible for compensation.	The note recommends national legislation to determine the procedure for establishing an eligibility cut-off date. In the event that no text specifies it, it will be necessary to set a deadline for the definition of rights, while ensuring that the information relating to the deadline for eligibility is disseminated in the project area.	The resettlement plan provides for fair and equitable compensation to all Project Affected Persons. The eligibility date will be communicated by posting and during public consultations.
Assessment of the value of the property affected	Constitution of an Administrative Commission which determines the value of the goods affected.	Affected persons should be compensated for their losses at full replacement cost, prior to their actual relocation, prior to the taking of land and related assets, or prior to commencement of project activities when the project is implemented in phases. To this end, a quality control and monitoring system has been put in place to validate that the promised compensation package has actually been acquired.	Establishment of an Administrative Evaluation Commission which determines the compensation and validates the amount of compensation received by the People affected by the project
Clearing mode	In cash	Affected people can choose resettlement options. When possible, the note recommends as a priority the offer of land in return for that lost or compensation in kind and not in cash, when possible.	.Any option is possible, as far as possible, the option of being able to compensate the people affected in kind, in particular in terms of replacement will be preferred, but compensation in cash remains open.

GAP ASSESSMENT GAP ASSESSMENT OF INDIGENOUS PEOPLE:

There's no indigenous people in the area, but DEFIS work with vulnerable communities

National framework	IFAD Framework	
At national level, Madagascar recognizes the rights of indigenous peoples in the preamble to its constitution, in line with the	For IFAD, the fundamental principles for its Policy of Engagement with Indigenous Peoples are (i) recognizing cultural heritage and	<p>The Project will develop these activities in vulnerable communities</p> <p>And implement the fundamental principles for its Policy of</p>

<p>International Bill of Human Rights and the African Bill of Human Rights; nevertheless, there are no specific legal provisions concerning indigenous peoples. The law recognizes customary law in general, and customary land status and use rights in particular. The empowerment of local communities in the management of their land resources.</p> <p>The MECIE decree and the Sector Guide for carrying out an environmental impact assessment (EIA), focusing on social, economic, cultural and spatial impacts.</p>	<p>identity as assets; (ii) obtaining free, prior and informed consent (FPIC); (iii) strengthening community-driven development; (iv) promote equitable access to lands, territories and resources; (v) value indigenous peoples' knowledge; (vi) increase the resilience of indigenous peoples' ecosystems (environmental issues and climate change); (vii) promote access to markets; (viii) support empowerment; (ix) promote gender equality.</p>	<p>Engagement with Indigenous Peoples such as: (i) recognizing cultural heritage and identity as assets; (ii) obtaining free, prior and informed consent (FPIC); (iii) strengthening community-driven development; (iv) promoting equitable access to lands, territories and resources; (v) valuing indigenous peoples' knowledge; (vi) increasing the resilience of indigenous peoples' ecosystems (environmental issues and climate change); (vii) promoting access to markets; (viii) supporting empowerment; (ix) promoting gender equality.</p>
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4.5.1. Measures in case of accidental discovery of cultural / archaeological objects:

If during the implementation of project activities, archaeological sites, historical sites, remains, and objects, including cemeteries and / or individual graves, the Contractor/ Executing Agency shall:

- ◆ Halt construction activities in the chance find area;
- ◆ Delineate the discovery site or region;
- ◆ Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remains, a night guard must be present until the responsible local authorities and the Ministry of Information, Culture and Communication take over;
- ◆ Notify the supervisor or authority in charge of works control, who in turn will inform the responsible local authorities and the Ministry of Information, Culture and Communication immediately (less than 24 hours).
- ◆ Contact the local authorities and/or the Ministry of Information, Culture and Communication, which would be responsible for the protection and preservation of the site before deciding on the appropriate procedures to follow. This would require a preliminary assessment of the finds to be made by archaeologists from the relevant Ministry of Information, Culture and Communication (within 72 hours).
- ◆ The significance and significance of the findings should be assessed against the various criteria relevant to cultural heritage, including aesthetic, historical, scientific or research, social and economic values.
- ◆ Ensure that decisions on how to handle the discovery are taken by the responsible authorities and/or the Ministry of Information, Culture and Communication. This could include changes in the plan (such as when the find is an immovable remains of cultural or archaeological significance) for conservation, preservation, restoration and recovery
- . ◆ Work will only resume after authorization has been given by the competent local authorities and/or the Ministry of Information, Culture and Communication, as the case may be. When moving a grave, the following steps are followed:
 1. The project managers notify the inheriting family.
 2. The family then asks for the blessing and permission of the deceased;
 3. The rituals identical to the famadihana (reversal of death) are carried out during which the body is exhumed;
 4. The body is transferred to the newly constructed grave. The expenses incurred by the blessing request ritual, the construction of a new tomb, the famadihana or alafaditra ritual are borne by the project. It is customary for the project

to make a sacrifice of zebu to honor the deceased and his family. In the case of a sacred site, it is the same rite except that there is transfer of sacred objects instead of famadihana or alafaditra.

The national legal framework and ancestral and customary provisions	Cultural Heritage Guidance Note	Conclusion and retained provisions
<p>ORDER N° 82-029 OF NOVEMBER 6, 1982 relating to the safeguarding, protection and conservation of the national heritage; • Art 45 When, as a result of any work, discoveries likely to be of interest to art, history, prehistory, archeology and science or technology in general are made, any inventor is required to notify local authorities within three days of discovery. • Art 46 if the discovery takes place on land belonging to a public authority, classification is automatic... If it is private land, the land is classified with the owner's agreement. In the event of refusal, the State may proceed to expropriation for reasons of public utility.</p> <p>• In the event of displacement of graves, the ritual identical to famadihana or alafaditra (turning of death) should be practiced</p>	<p>Procedures: Develop a concise management plan related to cultural heritage (which can be a component of the overall environmental and social management plan). These plans ensure compliance with the general policy defined by the authorities of the country, national legislation and international standards for the protection of cultural heritage and describe the institutional responsibilities for its protection.</p> <p>Community consultation</p>	<p>National law provides for heritage protection and conservation measures through Articles 45 and 46. As part of the project, national law will be applied In the event of a chance discovery, national law recommends notifying the authorities within three days. The project will apply the national provisions.</p> <p>Apply ancestral provisions</p>

4.6. ENVIRONMENTAL AND SOCIAL ASSESSMENT PROCESS:

4.6.1. Screening of activities

Environmental and social sorting consists of identifying the characteristics of the activity in order to determine the scope of its potential negative impacts and which consists of determining whether a project requires an ESIA or a PREE or ESMP. This should make it possible to categorize the activity and thus define the level of environmental and social assessment that will be applied to it. The sorting will also make it possible to identify the level of environmental analysis to be carried out. The selection of sub-projects can only be made after the specific site and location of the sub-project is identified. Conducting a field visit to the sub-project site and developing understanding of the biophysical and socio-economic environments, including the rural setting around the project site is essential to assess how environmentally friendly sub-project activities are. environment and socially acceptable

The screening process thus consists of determining:

- The nature of the project and the works,
- Potential environmental and social issues,
- Specific activities having particular impacts on the environment and requiring appropriate mitigation measures (e.g. extraction of materials, etc.),
- The type of public consultation to be conducted,
- The type of environmental analysis to be performed.

It should be noted that the DEFIS Program has been classified in category “B” by IFAD. The reason is that the project includes activities for the development of irrigated perimeters, rehabilitation of hydraulic structures, rehabilitation of tracks, construction of storage equipment and agricultural development which can have moderate to low impacts on the environment. environment and social. In addition, the project includes social aspects of reforestation. In this respect, the results of the selection must lead to environmental category B or C.

Program activities categorized as “B” will require environmental work:

- a) either the application of simple mitigation measures; or
- b) preparation of Environmental impact assessment or Environmental engagement program

Category C indicates that the potential environmental and social impacts are considered insignificant and require either simple environmental measures or no mitigation measures. After analyzing the information contained in the selection results and after determining the correct environmental category, and therefore the extent of the environmental work required, the Project's Environmental and Social Experts will make a recommendation as to whether: (a) a 100 environmental labor will not be required; (b) the application of simple mitigation measures will suffice; or (c) an Environmental impact assessment or Environmental engagement program will have to be carried out.

4.6.2. Categorization of activities

a) IFAD environmental categories

Based on the results of the screening, the activity is classified according to IFAD's environmental categories:

- Category A: The project may have negative environmental and/or social impacts: (i) significant, irreversible or unprecedented; (ii) affecting an area larger than the sites or facilities subject to physical interventions; and (iii) which would not be easily remedied through preventive or mitigative measures. A formal Environmental impact assessment is then necessary, with details in the ESMP;
- Category B: The project may have a negative environmental and/or social impact on human populations or on areas of ecological importance, but this impact: i) is less negative than that of category A; ii) is site-specific and rarely irreversible; and iii) can be easily corrected by appropriate prevention and/or mitigation measures. A formal Environmental impact assessment is not required, but further environmental analysis may be undertaken, during project preparation or implementation. Category B project operations usually require an ESMP, which can either be a stand-alone document or be the result of an environmental analysis. ;
- Category C: The environmental or social impacts of the programme/project will be negligible or nil. No other environmental analysis is required.

During the design of the DEFIS Program, the socio-environmental risk of its activities was assessed as moderate, category B. Thus, for most DEFIS activities, it is possible to prepare an ESMP without an environmental analysis and further social support is required, and that only routine mitigation measures are sufficient. Category A sub-projects are not eligible under the DEFIS Program.

b) Pre-categorization of activities / sub-projects according to national regulations

Compared to national regulations, the sub-projects categorized A and which will have to be the subject of ESIA, will comply with the provisions of Annex I of the MECIE decree (ESIA). For categorized B sub-projects, environmental sorting or "screening" is necessary to determine the form of the impact study, i.e. by complying with the provisions of Appendix I of the MECIE decree Environmental impact assessment (ESIA) or the provisions of Annex II of the MECIE decree (Environmental engagement program).

Regional office for the Environment is the entity empowered to establish or validate an environmental “screening” according to national regulations. In consultation with ONE, it was decided that a pre-categorization of activities / sub-projects will be made at the stage of the development of the ESMF in order to determine those which will be the subject of environmental sorting by Regional Office for the Environment (“screening”). This pre-categorization was carried out with the approval of the Regional Office for the Environment.

Indeed, it was found that sub-projects can be subject to simple environmental guidelines and do not necessarily require categorization by ONE. Sub-projects that do not require ONE categorization generally meet at least one of the following criteria: low footprint, low environmental and social risk, duplicable in the Program intervention localities, is not listed in Annexes 1 and 2 of the MECIE decree.

Table 1– Pre-categorization of sub-projects

Project components	Under Project	Category of the sub-projects	Categorization of ONE
Component I: Strengthening the climate resilience of agricultural production systems and increasing carbon sequestration through the adoption of technological innovations and climate-smart practices			Yes
Improved water management for sustainable agriculture	Protection of irrigated perimeters against the impacts of climate change	Category B	Yes
	Sustainable management of sub-watersheds (adjacent to irrigated perimeters) and landscape restoration: Establishment of nurseries, earthworks, biological control, agroforestry	Category C	No
	Strengthening of consultants and capacity building of companies with improved standards	Category C	
	Capacity building of water user associations to manage water and apply sustainable practices to reduce siltation	Category C	No
	Construction of water reservoirs for drip irrigation and for small livestock	Category B	No
Improved agro-climatic information systems	Installation of automated agro-meteorological stations and development of a flood and drought monitoring and forecasting system	Category C	No
	Strengthening the capacities of the decentralized administration		
	Dissemination of meteorological data		
Adoption and application of new technologies that build climate resilience, sequester carbon and reduce GHG emissions	Promotion of new adapted technologies: renewable energies and energy and water saving technologies: drip micro-irrigation, improved stoves, solar pumps, dryers, solar, biogas, solar crushers	Category B	No
	Research partnership with national and international institutions for the promotion of high-	Category C	No

Project components	Under Project	Category of the sub-projects	Categorization of ONE
Rural access roads strengthened	performance species/varieties that are resilient to climate change		
	Support for the Seed Production Center	Category C	No
	Reinforce unpaved rural access roads to reduce the impacts of climatic hazards: drainage systems, pavement	Category B	Yes
	Training on construction standards related to climate change (PCU/ILO/Technical Institutes)	Category C	No
	Train rural development actors on climate change adaptation and mitigation of food production systems for better nutrition	Category C	No
	Exchange visits on the adaptation of food systems to climate change and on the carbon sequestration potential of improved agricultural practices	Category C	No
	Capitalization of good practices and knowledge on climate change adaptation and mitigation measures	Category C	No

A) Environmental and Social Impact Assessment

Depending on the categorization of the activity, the environmental assessment is carried out in the required form (Environmental and Social Impact Assessment or Environmental Engagement Program / Environmental and Social Management Plan (ESMP)).

■ Case of an Environmental and Social Impact Assessment (ESIA):

For projects with significant and varied environmental and social impacts on the environment, an Environmental and Social Impact Assessment (ESIA), including a detailed Environmental and Social Management Plan (ESMP), must be prepared, in accordance with the national regulations and IFAD's environmental procedures. A template Terms of Reference (ToRs) for conducting ESIA's is provided in **Annex 1**.

The ESIA's must be the subject of public consultations at the level of the localities concerned by the activities in question. The results of these public consultations will be incorporated into the ESIA document.

■ Case of an environmental analysis - Environmental Engagement Program/ Environmental and Social Management Plan (ESMP):

For projects whose environmental and social impacts will be considered low and for which the preparation of an ESIA is not considered necessary, an Environmental Engagement Program in the form of a simplified Environmental and Social Management Plan will be prepared. In particular, it will specify the corrective measures appropriate to the project, based on the indicative mitigation measures already proposed in this ESMF (see chapter **Error! Reference source not found.**).

The measures defined in the simplified Environmental and Social Management Plan must be included in the specifications of the Company in charge of the works.

■ Case of sub-projects not requiring categorization by regional Office of Environment

For sub-projects that do not require “screening” by regional Office of Environment, environmental and social directives will have to be considered for their implementation. To do this, the companies as well as the entities in charge of the implementation and those of the follow-up of the sub-projects / activities will have to take into account:

- the indicative mitigation measures for each type of activity concerned, already proposed in this ESMF (see chapter **Error! Reference source not found.**);
- the environmental and social clauses to be included in the BDs (see Appendix 4).

The types of environmental assessment to be conducted, depending on the category of the sub-project considered, are summarized in the following table.

Category	Environmental assessment required
Category B sub-project requiring environmental and/or social analysis	Environmental and Social Impact Assessment or Environmental Engagement Program of narrower scope than for a category A project and includes an Environmental and Social Management Plan (ESMP)
Category B subproject not requiring environmental and/or social analysis and for which standard mitigation measures are sufficient	Environmental and Social Management Plan (ESMP)
Category C sub-project	No environmental assessment is required To be certain that the impacts will be minimal, environmental / social prescriptions can always be formulated. Example: Training

Step 2: Validation of the selection and classification of sub-projects

Taking into account the pre-categorization mentioned above, the planned sub-projects classified in category B requiring an environmental analysis will be sent to regional Office of Environment for final validation if the sub-project will be the subject of an ESIA (the evaluation of the ESIA is done by the regional Office of Environment or an Environmental engagement program; the evaluation of the Environmental engagement program is done by Ministry in charge of the activity).

Once the screening is done, Regional Office of Environment mentions the type of study to be prepared (ESMP with environmental analysis or without environmental analysis)

Summary of selection steps and responsibilities:

Steps	Responsibilities
1. Environmental and social selection of the project:	Project coordination unit, service providers
2. Determination of appropriate environmental categories 2.1 Validation of the selection 2.2 Classification of the project and Determination of the environmental work (simple mitigation measures or EIA	Project coordination unit and Regional Office of Environment
3. Review and Approval	Project manager and Regional Office of Environment
4. If Impact Study is necessary	Project coordination unit and Regional Office of Environment

4.1 Choice of consultant	Project coordination unit
4.2 Carrying out the impact study	Consultant
4.3 Impact study approval	DEFIS, and/or Sector Ministries/Technical Evaluation Committee of the National Office for the Environment
5. Dissemination	DEFIS
6. Tracking	DEFIS, Regional Office for the Environment or sector ministries, region, municipalities, beneficiaries

5. IDENTIFICATION AND ASSESSMENT OF ENVIRONMENTAL AND SOCIAL IMPACTS

An Environmental and Social Management Framework (ESMF) has been prepared for the entire DEFIS Programme, which includes the DEFIS+ project that is the subject of this environmental and social assessment.

This chapter deals with the impact analysis of the different types of activities planned within the framework of the DEFIS+ project:

- First, the affected environmental components are identified and the corresponding potential impacts are characterised;
- Then, in a second step, the corresponding mitigation measures are proposed.

5.1. POTENTIAL IMPACTS

5.1.1. General impacts common to all «construction» activities

Activities of a «construction» or «works» nature involve general impacts common to all.

In addition, the potential negative impacts associated with construction sites are presented in the table below.

Table5 – Potential negative impacts common to the «worksite» type activities of the DEFIS+ project

Impacted component of the environment	Potential impacts
Air	Atmospheric pollution, dust emissions and noise pollution from the traffic of construction machinery and vehicles.
Biodiversity	Loss of vegetation due to the construction of the site. Disturbance of fauna through the destruction of natural habitats.
Soil	Soil compaction and increased risk of erosion due to clearing of vegetation for the construction facility. Soil pollution by infiltration or leaching of pollutants (e.g. fuel storage). Environmental degradation through the dispersion of waste.
Water	Alteration of the quality of water resources by wastewater discharges from the construction site. Pollution of water by infiltration or leaching of polluting elements (e.g. fuel storage).
Human and socio-economic environment	Risk of accidents to site personnel. Risk of accidents for local populations on the roads used by construction machinery and vehicles. Disturbance to the population due to dust emissions. Encroachment of the site installation on an inhabited and/or exploited property or land.

5.1.2. Potential impacts associated with component 1 of the DEFIS+ project

This first component of the DEFIS+ project includes the following activities

- Strengthening the resilience of 16,000 ha of irrigated areas by improving drainage networks, irrigation canals, desilting systems, water retention structures, etc.
- Protection of 8,100 ha of sub-watersheds by mechanical protection and restoration of 5,000 ha of landscape (development of terraces, reforestation activities, etc.)
- Construction of 150 water reservoirs to irrigate the terraces and reduce runoff
- Improving the climatic resilience of food production systems for 45,000 EAF, including the creation of farmer field schools, the production of resilient fodder on 1,500 ha, etc.

The expected impacts of these activities are mainly positive. Indeed, water management and the improvement of the climatic resilience of the food production systems of the EAF will improve agricultural productivity (reduction of losses due to lack of water or flooding, accentuated by climate change) and the resilience of households to the impacts of climate change (e.g. continuous availability of food production). In addition, efficient water mobilisation allows the optimisation of land use and thus limits the progression of agricultural land into natural resource areas requiring conservation measures. This also reduces land conflicts with regard to the use of agricultural land (reduction of right-of-way extension activities and searches for cultivable land). In addition, the construction of watering holes with drinking troughs also helps to preserve livestock. And by associating with drought-resistant fodder crops, livestock farmers should reduce their time spent searching for new pasture, which has become increasingly rare.

However, negative impacts may also occur. Thus, the potential negative impacts associated with the activities of the DEFIS+ project component 1 are presented in the table below.

Table 6 – Potential negative impacts of DEFIS+ project component 1 activities

Impacted component of the environment	Potential impacts
Rehabilitation of irrigated schemes	
Water	Resuspension of solids, and degradation of water quality through increased turbidity. Risks of water pollution related to solid and liquid waste spills during works Pollution of water resources in the area through the use of inputs for agriculture. Accumulation of sediments at dams.
Soil	Soil pollution by waste Erosion in material extraction areas. Soil pollution from the use of inputs for agriculture. Soil compaction and increased risk of erosion by clearing vegetation for the development of the site facility. . Risk of pollution from cleaning products from canal maintenance.
Human and socio-economic environment	Risks of social conflicts with local communities Disruption of rural activities Risk of encroachment on exploited areas; loss of sources of income or livelihood Risk of conflicts related to water use. Risk of conflicts between WUAs for infrastructure maintenance activities. Deterioration and dysfunction of built/rehabilitated infrastructure due to erosion and silting. Risks of various accidents, construction sites, traffic Risks of disease spread Child Labor Risks Community health and safety risks Risks of gender-based violence Risks of increased ambient noise Risk of conflicts between WUAs for infrastructure maintenance activities. Deterioration and dysfunction of the infrastructures built/rehabilitated by the phenomena of erosion and silting. Risks of land conflicts Risks of non-involvement of vulnerable people and women
Air	Atmospheric pollution, dust emissions by the circulation of construction machinery and vehicles , exhaust gases, wastes

Impacted component of the environment	Potential impacts
Habitats, biodiversity, vegetation, fauna	Loss of vegetation Disturbance of wildlife through destruction of natural habitats , risk of encroachment on sensitive areas
Introduction of adapted varieties: Seed multiplication	
Water	Risk of depletion of local water resources
Biodiversity	Large-scale distribution of certain varieties of seeds: abandonment of old varieties, which can lead to a reduction in floristic biodiversity.
Protection of sub-watershed	
Biodiversity	Loss of floral resources through earthworks. Loss of wildlife habitat. Restriction livestock mobility Risk of proliferation of invasive plants.
Water	Input of solids into downstream water bodies/streams through run-off from the earthworked areas. Set up nurseries: risk of depletion of local water resources
Human and socio-economic environment	Risk of interference with exploited areas; loss of sources of income or livelihood. Risk of accidents during earthworks. Restriction of human and livestock mobility Risks of non-involvement of vulnerable people and women Growing demand for agricultural land: risk of land disputes between farmers / pastoralists or between villages / communities
Construction of water tanks	
Soil	Exposing the soil by stripping the topsoil. Facilitation of erosion by rainwater runoff.
Water	Risks of conflicts linked to the use of water Risk of bacteriological contamination of stored water, by runoff water from residential areas; health risk for users
Biodiversity	Loss of floral resources through stripping of the reservoir right-of-way. Loss of wildlife habitat.
Human and socio-economic environment	Risk of interference with inhabited and/or exploited areas; loss of sources of income or subsistence. Risk of accidents during work Risks of various accidents, construction sites, traffic Risks of disease spread Child Labor Risks Community health and safety risks Risks of gender-based violence Risks of interference with the areas exploited by excavated products Risks of non-involvement of vulnerable people and women
Creation of farm field schools	
Water	Increased pressure on local water resources; risk of depletion of these water resources. Pollution of local water resources if excess inputs are used for cropping techniques.
Human and socio-economic environment	Risk of interference with inhabited and/or exploited areas; loss of sources of income or livelihood. Potential for conflict over water use.
Production of resilient fodder	
Soil	Facilitation of erosion by rainwater runoff after fodder harvest.
Human and socio-economic environment	Risk of interference with inhabited and/or exploited areas; loss of sources of income or livelihood.

5.1.3. Potential impacts associated with component 2 of the DEFIS project +

This second component of the DEFIS+ project will include the following activities:

- Strengthening of 540 km of rural roads to reduce the impacts of climatic hazards, by repairing critical sections of these rural roads and collecting run-off water
- Training of 2,000 technicians on new construction standards to improve resilience to CC

The expected impacts of these activities are mainly positive. Indeed, a reliable road network can help promote the economy and ensure that every inhabitant of the region has access to economic opportunities and services. However, road infrastructure is particularly vulnerable to climate change: most forecasts indicate that rising temperatures, increased rainfall and flooding will eventually take their toll on a road network already under extreme pressure. Therefore, when a climatic event closes a road/track or reduces its capacity, the consequences for supply chains, economic output and access to services can have a major impact on the populations concerned, especially if no alternative roads or routes exist. The works will thus make it possible to anticipate the consequences of climate change and limit these impacts linked to isolation.

Nevertheless, negative impacts may also occur. Thus, the potential negative impacts associated with the activities of Component 2 of the DEFIS+ project are presented in the table below. They relate to the activities of rehabilitation works of rural roads. The training activities do not include any works, nor do they have any notable negative impacts.

Table 7 – Potential negative impacts of DEFIS+ project component 2 activities

Component impacted by the environment	Potential impacts
Rehabilitation of rural roads	
Biodiversity	Loss of plant resources by stripping the right-of-way. Loss of wildlife habitat. Loss of significant natural resources if encroachment on conservation areas. Increased risk of illegal logging and poaching due to the opening of the road.
Water	Disruption of water flow if the route crosses a watercourse.
Floor	Soil pollution by waste Erosion in material extraction areas Soil compaction and increased risk of erosion by clearing vegetation for the development of the site facility Siltation of downstream water bodies/courses.
Human and socio-economic environment	Risks of social conflicts Traffic disruptions Risk of encroachment on inhabited and/or exploited areas; loss of sources of income or livelihood. Risk of accident for users and local populations of the rehabilitated road. Risks of various accidents, construction sites, traffic Risks of disease spread (HIV/AIDS, Covid 19, other water-related diseases, malaria) Child Labor Risks Community health and safety risks Risks of gender-based violence Risk of increased ambient noise Increase in population due to visitors Loss of cultural, religious, historical, aesthetic resources Induced population movements and natural resource exploitation activities, due to improved access (eg conversion of forest to pasture, or of sustainable land use to unsustainable, short-cycle cropping; illegal or unsustainable hunting
Air	Atmospheric pollution, dust emissions by the circulation of construction machinery and vehicles , exhaust gases, garbage

5.1.4. Potential impacts associated with component 3 of the DEFIS+ project

This third component of the DEFIS+ project includes the following activities

- Improving access to relevant agro-climatic data using the agro-climatic information system
- Introduction of innovative renewable energy efficient technologies
- Knowledge management on adaptation of food production systems to CC

The expected impacts of these activities are mainly positive. Indeed, this component will allow to improve knowledge and acquire skills necessary to anticipate / cope with the effects of climate change (e.g. adaptation of techniques, more resilient infrastructures, identification of the most vulnerable sectors / chains). Activities taking into account climate change will thus be more relevant to ensure sustainable development of households, farmers.

This component does not include any works or significant negative impacts.

Impacted component of the environment	Potential impacts
Human and socio-economic environment	Risks of non-involvement of vulnerable people and women
	Risk of conflicts between beneficiaries for infrastructure maintenance activities

5.2. MITIGATION MEASURES

5.2.1. Mitigation measures for impacts common to all «construction» activities

The following table proposes the common normative measures to be adopted for all DEFIS+ project worksites. They respond to the general impacts common to «construction site» and «works» activities (see chapter 5.1.).

Table 8 – Indicative mitigation measures common to the DEFIS+ project's « construction» type activities

Impacts	Mitigation measures
Atmospheric pollution, dust emissions and noise nuisance from the traffic of construction machinery and vehicles.	Mobilise materials, vehicles and equipment in good condition. Carry out regular maintenance of equipment, vehicles and machinery.
Loss of vegetation through the construction of the site. Disturbance of fauna through the destruction of natural habitats.	Limit the size of the construction site to what is strictly necessary. Avoid wooded areas when choosing a site. Prohibit the cutting of trees with a DHP of more than 15 cm.
Soil compaction and increased risk of erosion due to clearing of vegetation for the construction facility. Soil pollution by infiltration or leaching of pollutants (e.g. fuel storage). Environmental degradation through the dispersion of waste.	Limit the site installation to what is strictly necessary. Store stripped topsoil nearby and put it back in place at the end of the site's use. Store fuel in a waterproof area. Carry out all maintenance and repairs in a waterproof area. Implement a Site Waste Management Plan.
Alteration of the quality of water resources by wastewater discharges from the construction site. Pollution of water by infiltration or leaching of polluting elements (e.g. fuel storage).	Collect all effluents from the site installation and pre-treat them before discharge into the receiving environment. Store stripped topsoil nearby and put it back in place at the end of the site's use. Store fuel in a waterproof area. Carry out all maintenance and repairs on a waterproof area.

5.2.2. Mitigation measures for potential impacts of DEFIS+ Component 1

The following table proposes mitigation measures for the impacts associated with the activities of Component 1 of the DEFIS+ project, as analysed in the earlier chapter.

Table 9 – Indicative mitigation measures for the activities of the DEFIS+ project component 1

Potential impacts	Mitigation measures
Irrigated perimeters	
Risks of social conflicts	Organize information and awareness campaigns for local populations on the duration, ins and outs of future work to be carried out in the area Register company personnel in the Fokontany/Commune foreigners register

Potential impacts	Mitigation measures
	<p>Posting of the internal regulations visibly in the various facilities of the base camp, specifically prescribing: respect for local habits and customs; protection against STIs/HIV/AIDS; hygiene rules and safety measures</p> <p>Prioritize local recruitment</p>
<p>Disruption of rural activities</p>	<p>Organize information and awareness campaigns for local populations on the duration, ins and outs of future work to be carried out in the area</p> <p>Perform as needed for cultural rite</p>
<p>Release of rights-of-way: Property encroachment exploited</p>	<p>Consult with the local population to obtain the prior informed consent of the population to obtain agreements for the release of the right-of-way</p> <p>Limit the rights-of-way of the work sites to what is strictly necessary and carry out the ritual, use and custom with the population, if necessary, or compensate for not obtaining a voluntary transfer</p>
<p>Atmospheric pollution, dust emissions and noise pollution from the movement of construction machinery and vehicles.</p>	<p>Mobilize materials, vehicles and machinery in good condition.</p> <p>Carry out regular maintenance of equipment, vehicles and machinery.</p>
<p>Loss of vegetation due to the development of the construction site.</p> <p>Disturbance of wildlife by destruction of natural habitats.</p>	<p>Make an inventory of the vegetation on the sites that will be occupied/used by the company</p> <p>Clearly define the area to be stripped to the bare minimum</p> <p>Avoid wooded areas as much as possible. Prohibit any cutting of trees with a DBH greater than 20 cm.</p> <p>Minimize deforestation and restore vegetation in borrow areas</p> <p>Revegetate and reforest if possible in appropriate places</p>
<p>Soil compaction and increased risk of erosion by clearing vegetation for the development of the site facility.</p> <p>Soil pollution by infiltration or leaching of polluting elements (eg fuel storage).</p> <p>Environmental degradation through the dispersion of waste.</p>	<p>Limit the footprint of the site installation to what is strictly necessary.</p> <p>Store the stripped topsoil nearby and put it back in place at the end of use of the site.</p> <p>Store fuel in a sealed area.</p> <p>Perform all maintenance and repairs in a sealed area.</p> <p>Implement a Site Waste Management Plan.</p>
<p>Alteration of the quality of water resources by wastewater discharges from the site installation.</p> <p>Water pollution by infiltration or leaching of polluting elements (eg fuel storage).</p>	<p>Collect all the effluents from the site installation and pre-treat them before any discharge into the receiving environment.</p> <p>Store the stripped topsoil nearby and put it back in place at the end of use of the site.</p> <p>Store fuel in a sealed area.</p> <p>Perform all maintenance and repairs in a sealed area.</p>
<p>Risk of accident for the personnel and for the populations on the site.</p> <p>Risk of accident for the populations living near the axes used by construction machinery and vehicles.</p> <p>Disturbance for populations by dust emissions.</p> <p>Encroachment of the site installation on inhabited and/or operated property or land.</p>	<p>Equip staff with secure equipment adapted to the types of work (PPE)</p> <p>Educate staff on the risks and dangers on construction sites.</p> <p>Do not work during periods of low visibility (night, rain, etc.)</p> <p>Prohibit the consumption of alcohol during working hours</p> <p>Avoid inhabited or exploited areas when choosing the installation site.</p>

Potential impacts	Mitigation measures
	<p>Provide site personnel with an individual protection kit; establish the wearing of this safety equipment; set up medicine boxes with the basic drugs needed for emergency care</p> <p>Installation of first aid kits in the living quarters</p> <p>Implement a Site Health and Safety Plan.</p> <p>In case of encroachment on an exploited area, proceed to a formal agreement with the owner and the user of the site, for the temporary occupation of the site.</p> <p>Enclose the site installation and prohibit any entry of anyone outside the project.</p> <p>Limit construction vehicle traffic speeds to 30 km/h, and 20 km/h when crossing villages.</p>
Erosion risks	<p>Manage traffic well on construction sites and avoid driving outside access roads and in areas sensitive to erosion</p>
Various pollution risks	<p>Collect solid waste from the site and dispose of it at authorized locations; recover and store used oils and greases in sealed containers; send them to a recycling center</p> <p>Set up an autonomous sanitation system,</p> <p>Place hydrocarbon storage tanks in sealed warehouses</p> <p>The entire area of the base camp will be waterproofed with lean concrete to prevent any infiltration</p> <p>Any accidental spillage of hydrocarbons will be cleaned up immediately, absorption by sand and recovery of the soiled sand</p> <p>Maintenance, emptying and washing of trucks and machinery in a single suitable and waterproofed place</p> <p>Setting up parking, maintenance and emptying areas</p> <p>Sorting construction waste for recycling: i) solid biodegradable waste (leftover food, paper, cardboard, old fabrics) must be buried, ii) solid non-biodegradable waste must be distributed in bins, separate plastic waste, metal waste, as well as special waste (oil cans, used parts, batteries, etc.)</p> <p>Installation of latrines,</p> <p>Set up pit</p> <p>Set up an autonomous sanitation system,</p>
Risks of water and soil pollution	<p>Avoid preparing concreting materials along watercourses; avoid cement spillage into the watercourse</p> <p>Risks of soil pollution by the products of oil spills, dangerous products, etc.</p>
Risks of disease spread	<p>Inform and sensitize workers/site personnel and local populations on reproductive health, modes of transmission and prevention of STIs/STDs and especially HIV/AIDS</p> <p>Organize free screening sessions for workers.</p>

Potential impacts	Mitigation measures
	<p>-Keep the anonymity of the person concerned in the event of a positive result; and refer him to an appropriate care centre; and that this result does not constitute a reason for his dismissal</p> <p>Make available and free of charge condoms for the workers in the places</p> <p>Inform, educate and communicate on the safe use of drinking water</p> <p>Provide water disinfection products</p> <p>Provide mosquito nets to fight malaria</p> <p>Inform and raise awareness among workers and populations about the Covid 19 pandemic</p> <p>Keep soap and water on site for handwashing at all times</p> <p>Evacuate people at risk of contracting Covid 19</p>
Degradation of quarries and borrow pits	<p>Limit clearing as much as possible</p> <p>Obtain the relevant authorizations</p> <p>Level quarries and borrow areas with overdraft materials and then with topsoil (at site closure)</p> <p>revegetate</p>
Air pollution by waste Air pollution by the transport of loose materials	<p>Wet the tracks used by construction vehicles, especially when crossing villages.</p> <p>Equip trucks transporting loose materials with tarpaulins;</p> <p>fill in the pits and latrines at the end of the rehabilitation works</p>
Sexual exploitation, abuse and harassment, etc., among workers and community members ks of gender-based violence:	<p>Develop an information / awareness protocol with a specialized entity in order to anticipate otherwise, if necessary, to deal with related incidents</p> <p>Company employees (including subcontractors) as well as those of the Control / Surveillance Mission are required to attend information and awareness sessions on gender-based violence throughout the construction site.</p>
Risk of increased ambient noise	<p>Always put the base camp and the activities far from the villages as far as possible</p> <p>Work during working hours</p>
Risk of destruction or degradation of sites of cultural, religious, archaeological or historical significance	<p>In the event of the discovery of an object of cultural, archaeological or historical importance, protect the areas concerned with permanent fences and notify the local and direct responsible authorities.</p> <p>Cessation of activities</p> <p>Carry out an archaeological inventory in areas that contain valuable objects and preserve the discovered objects</p> <p>Negotiate with traditional authorities the preservation of sites and resources of cultural, religious, historical and aesthetic significance</p>
Re-suspension of solid matter, and degradation of water quality by an increase in turbidity. Accumulation of sediments at the dams.	<p>Implement a water quality monitoring program near the site during the work.</p> <p>Implement a program to monitor the quantity of sediments at the level of the dams during their operation.</p> <p>Carry out periodic maintenance to de-silt the dams.</p>
Pollution of water resources and soils in the area through the use of chemical inputs for agriculture.	<p>Make farmers aware of prioritizing the use of organic inputs (limit or even avoid the use of chemical inputs).</p> <p>Train farmers in the proper management and use of inputs.</p>

Potential impacts	Mitigation measures
Erosion in material extraction areas.	Choose sites already used as deposits for the extraction of materials. Drain the material extraction sites, and restore them at the end of the activities.
Risk of pollution linked to cleaning products resulting from the maintenance of irrigation canals.	Identify and choose in a concerted manner the disposal sites for cleaning products. Stabilize the disposal sites by revegetation.
Risk of conflicts related to water use. Risk of conflicts between WUAs for infrastructure maintenance activities. Deterioration and dysfunction of the infrastructures built/rehabilitated by the phenomena of erosion and silting.	Identify conflicting users of water resources beforehand and consult with them. Reinforce the training of WUAs on the use of water and the arbitration of conflicts Implement watershed protection actions. Energize users for the management and regular maintenance of structures. Establish a maintenance plan for the works, with a precise organization of the responsibilities of user associations. Establish close collaboration between the associations of users of the perimeters concerned.
Risks of non-involvement of vulnerable people and women	The program will follow an inclusive targeting strategy to reach poor households and vulnerable groups
Introduction of adapted varieties: Seed multiplication	
Risk of depletion of local water resources. Pollution of water resources in the area in the event of the use of excessive inputs for farming techniques.	Ensure rational use of water Sensitize farmers to the prioritization of the use of organic inputs. Train farmers in the proper use of inputs.
Large-scale distribution of certain varieties of seeds: abandonment of old varieties, which can lead to a reduction in floristic biodiversity.	Conduct specific research on native varieties (potential, adaptation, adapted cultivation technique, etc.) in order to optimize their local use. Conduct preliminary studies / analyzes of each variety to be introduced to anticipate their behavior in each type of environment / pedoclimatic condition Conduct quarantine checks and follow national guidelines for introduction of new germplasm
Protection of sub-watersheds/Nurseries, agroecologies, agroforestry, reforestation	
Set up nurseries: risk of depletion of local water resources	Ensure rational use of water.
Loss of plant resources through earthworks. Loss of wildlife habitat. Risk of proliferation of invasive plants.	Limit the area to be stripped to what is strictly necessary. Retain wooded areas for site selection. Prohibit any cutting of a tree with a DBH greater than 20 cm.
Risk of impact on irrigation structures; •Risk of introduction of colonizing species. • Risk of mono-cropping (resorting to one or two exotic species). Risk of wildlife, rodents and other pests	Carry out agroforestry and forestry within a radius of 5 to 10 meters from the hydraulic structures; •Ensure that the selected species adapt well to the environment Promote the reforestation of different species to promote biodiversity Community awareness and training on pest management, • Provide alternative routes formed for mobility

Potential impacts	Mitigation measures
Restriction of human and livestock mobility • Risk of introduction of invasive exotic species	Prior identification with local forest services of plant species for revegetation and/or reforestation. Non-invasive exotic and indigenous species • Use those species that disfavor pests (pest resistant crops) • Selection and use of non-invasive exotic and indigenous species, pest repellent and species that doesn't harbor rodents Prepare wildlife management plans and training of communities on cultural practices to manage pests, • Avoid appropriation of land or eviction of households • Prioritize indigenous and multiple mix of species for planting
Risks of non-involvement of vulnerable people and women	The program will follow an inclusive targeting strategy to reach poor households and vulnerable groups
Input of solids to downstream water bodies/courses by runoff from terraced areas.	Implementation of terrace drainage works.
Risk of interference with exploited areas; loss of sources of income or livelihood. Risk of accident during earthworks.	In case of encroachment on an exploited area, proceed to a fair and equitable compensation of the person affected. Marking of work areas and HSE training of workers.
Growing demand for agricultural land: risk of land disputes between farmers / pastoralists or between villages / communities	Sensitize the involvement of the local community, under the approval of the local authorities concerning the acquisition / extension of agricultural right-of-way on state lands Involve local authorities (traditional & administrative) in resolving land disputes. Involvement of the DEFIS Program in land tenure security programs for agricultural land, awareness raising on the land management of agricultural land.
Construction of water tanks	
Risks of social conflicts	Organize information and awareness campaigns for local populations on the duration, ins and outs of future work to be carried out in the area Register company personnel in the Fokontany/Commune foreigners register Posting of the internal regulations visibly in the various facilities of the base camp, specifically prescribing: respect for local habits and customs; protection against STIs/HIV/AIDS; hygiene rules and safety measures Prioritize local recruitment
Risk of accident	Educate staff on the risks and dangers on construction sites. Do not work during periods of low visibility (night, rain, etc.) Prohibit the consumption of alcohol during working hours Put up traffic signs Vehicle maintenance
Sexual exploitation, abuse and harassment, etc., among workers and community members	Develop an information / awareness protocol with a specialized entity in order to anticipate otherwise, if necessary, to deal with related incidents

Potential impacts	Mitigation measures
	Company employees (including subcontractors) as well as those of the Control / Surveillance Mission are required to attend information and awareness sessions on gender-based violence throughout the construction site.
Risks of disease spread	<p>Inform and sensitize workers/site personnel and local populations on reproductive health, modes of transmission and prevention of STIs/STDs and especially HIV/AIDS</p> <ul style="list-style-type: none"> - Organize free screening sessions for workers. - Keep the anonymity of the person concerned in the event of a positive result; and refer him to an appropriate care centre; and that this result does not constitute a reason for his dismissal - Make available and free of charge condoms for the workers in the places <p>Inform, educate and communicate on the safe use of drinking water</p> <p>Provide water disinfection products</p> <p>Provide mosquito nets to fight malaria</p> <p>Inform and raise awareness among workers and populations about the Covid 19 pandemic</p> <p>Keep soap and water on site for handwashing at all times</p> <p>Evacuate people at risk of contracting Covid 19</p>
Atmospheric pollution, dust emissions and noise pollution from the movement of construction machinery and vehicles.	<p>Mobilize materials, vehicles and machinery in good condition.</p> <p>Carry out regular maintenance of equipment, vehicles and machinery.</p>
Loss of vegetation due to the development of the construction site.	<p>Make an inventory of the vegetation on the sites that will be occupied/used by the company</p> <p>Clearly define the area to be stripped to the bare minimum</p> <p>Avoid wooded areas as much as possible. Prohibit any cutting of trees with a DBH greater than 20 cm.</p> <p>Revegetate if possible in appropriate places</p>
Exposing the soil by stripping the topsoil. Facilitation of erosion by stormwater runoff.	<p>Limit the area to be stripped to what is strictly necessary.</p> <p>Install site drainage systems.</p>
Loss of floristic resources by stripping the right-of-way of the reservoir. Loss of wildlife habitat.	<p>Limit the area to be stripped to what is strictly necessary.</p> <p>Avoid wooded areas for site selection.</p> <p>Prohibit any cutting of a tree with a DBH greater than 20 cm.</p>
Risk of interference with inhabited and/or exploited areas; loss of sources of income or livelihood.	<p>Avoid inhabited or exploited areas for site selection.</p> <p>In case of encroachment on an inhabited or exploited area, proceed to a fair and equitable compensation of the person affected.</p>
Risks of interference with areas mined by spoil products	<p>With the help of the local population, put the spoil products in an area designated for this purpose</p> <p>Treat the products of débalis</p>
Risk of bacteriological contamination of stored water, by runoff water from residential areas; health risk for users.	Do not choose the location of the REEPS downstream of the farm or village / residential area.

Potential impacts	Mitigation measures
<p>Risk of conflicts related to water use.</p> <p>Risk of conflicts between WUAs for infrastructure maintenance activities.</p> <p>Deterioration and dysfunction of the infrastructures built/rehabilitated by the phenomena of erosion and silting.</p>	<p>Identify conflicting users of water resources beforehand and consult with them.</p> <p>Reinforce the training of WUAs on the use of water and the arbitration of conflicts</p> <p>Implement watershed protection actions.</p> <p>Energize users for the management and regular maintenance of structures.</p> <p>Establish a maintenance plan for the works, with a precise organization of the responsibilities of user associations.</p>
Risks of non-involvement of vulnerable people and women	The program will follow an inclusive targeting strategy to reach poor households and vulnerable groups
Creation of a farmer field school (FFS)	
<p>Increased pressure on local water resources; risk of depletion of these water resources.</p> <p>Pollution of water resources in the area in the event of the use of chemical inputs for cultivation techniques.</p>	<p>Ensure rational use of water.</p> <p>Sensitize farmers to the prioritization of the use of organic inputs.</p> <p>Train farmers in the proper use of inputs.</p>
<p>Risk of interference with or operated areas; loss of sources of income or livelihood.</p> <p>Risk of conflicts related to water use.</p>	<p>Avoid inhabited or exploited areas for site selection.</p> <p>In case of encroachment on an inhabited or exploited area, proceed to a fair and equitable compensation of the person affected.</p> <p>Ensure rational use of water.</p>
Risks of non-involvement of vulnerable people and women	The program will follow an inclusive targeting strategy to reach poor households and vulnerable groups
Production of resilient fodder	
Facilitation of erosion by rainwater runoff after forage harvest.	<p>Do not leave the field empty too long between harvest and the next planting.</p> <p>Drain the site.</p>
Risk of interference with inhabited and/or exploited areas; loss of sources of income or livelihood.	<p>Avoid inhabited or exploited areas for site selection.</p> <p>In case of encroachment on an inhabited or exploited area, proceed to a fair and equitable compensation of the person affected.</p> <p>Carry out activities on community and private land</p>

General risks for both Component 1 and 2 activities	
Risk	Mitigation measures
Health risk to workers	<p>Promote safe work through Standard Operating Procedures, training and awareness raising</p> <p>Encourage and enforce the use of PPE</p> <p>Supporting first-aid box and to provide minimal level of training;</p> <p>Enlisting the names and numbers of village doctors in nearby community places/shops;</p> <p>Encourage regular workplace cleaning</p>
COVID – 19 infection risk	<p>Promote COVID-19 guidelines (WHO compliant)</p> <p>Monitor uptake of guidelines through field visits</p> <p>Organize awareness raising sessions</p> <p>Promote early closure of facilities and enterprises in case of suspicion of COVID-19 cases</p>
General poor working conditions	Ensure contractors adopt principles of decent work and the associated work programme

	<p>Encourage and enforce the use of PPE</p> <p>Ensure grievance mechanisms are known and accessible to workers</p> <p>Promotion of nutrition-sensitive meals during working hours</p> <p>Supporting first-aid box and to provide minimal level of training;</p>
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5.2.3. Labor and work conditions

The workers may be young people, women, men, graduates with or without diplomas, workers from outside the area or members of the local population.

For all staff mobilization activities, the service provider is required, in its relations with its staff, to respect national holidays, legal public holidays, religious holidays or other customs, as well as all local laws and regulations relating to the employment of labor. It shall grant its personnel annual leave, sick leave and maternity leave, as well as family leave, as required by applicable laws or as indicated in the specifications.

Forced labor. The contractor, including its subcontractors, shall refrain from the use of forced labor. Forced labor is defined as any work or service performed on a non-voluntary basis, obtained from an individual under threat of force or punishment; it includes any type of non-voluntary or compulsory labor, such as bonded labor, non-cancellable contract labor or any work performed on the basis of similar provisions.

When cases of forced labor are identified, immediate measures must be taken to correct and remedy them

Records relating to the employment of workers. The contractor is obliged to keep complete and accurate records relating to the employment of workers on the site. The name, age, sex, number of hours worked and wages paid to all employees must be recorded. A monthly summary of these records must be sent to the prime contractor.

The contractor is required to refrain from making decisions regarding the recruitment or treatment of its personnel on the basis of personal characteristics unrelated to the needs of the position to be filled. The contractor shall base the employment relationship with its personnel on the principles of equal opportunity and fair treatment, and shall not take any discriminatory measures concerning any aspect of the employment relationship, including recruitment and hiring, remuneration (including wages and other benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of the employment relationship and disciplinary measures.

Special protection or assistance measures designed to remedy past practices of discrimination or selection for a specific position based on the inherent needs of that position are not deemed to constitute discriminatory acts. The service provider must take the necessary protection and assistance measures to guarantee non-discrimination and equal opportunities, particularly for certain categories of workers, such as women, disabled people, migrant workers and children.

Child labor shall not be used in any IFAD-supported project. ii) any other work which is likely to be hazardous, to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development.

When cases of child labor are identified, immediate measures must be taken to correct and remedy them, including the child's rehabilitation and social integration. When a project operates in a sector or area at high risk of child labor, it must include measures that help to tackle the root causes of child labor.

Complaint resolution mechanism for employees of the contractor's company: The contractor's company is required to make a complaint resolution mechanism available to its employees.

The contractor's personnel must be informed of the existence of the complaint resolution mechanism at the time of hiring, and of the measures put in place to protect them from any reprisals for having used it. Steps must be taken to make it easily accessible to all members of the contractor's staff. This mechanism must not prevent access to any other judicial or administrative means of redress that may be available, nor must it replace dispute settlement mechanisms instituted by collective agreements.

The dispute resolution mechanism may make use of existing mechanisms, provided they are well designed and implemented, respond quickly to concerns and are easily accessible to the contractor's personnel. Existing dispute resolution mechanisms can be supplemented as required by provisions specific to the contract.

Staff training The contractor is required to provide appropriate training for its staff on the environmental and social aspects of the contract, raising their awareness in particular of the prohibition of sexual exploitation and abuse and of sexual harassment, as well as training on health and safety. The contractor must also enable the staff concerned to follow training on environmental and social aspects.

Hygiene, Health and Safety at Work Plan as part of their Site ESMP, the winning companies will draw up a Hygiene, Health and Safety at Work (HSST) Plan.

5.2.4. Mitigating measures for gender-based violence: (The codes of conduct for Enterprise, Enterprise staff are attached)

Gender-based violence and Sexual Exploitation, Abuse and Harassment (SEAH) undermines the security and well-being of individuals and entire communities and threatens efforts to end poverty and stimulate shared prosperity. To address this, recommendations for ESMPs linked to the elimination of gender-based violence will include the following actions:

1. Strengthen awareness of GBV and SEAH issues among staff and beneficiaries by developing orientation, training and continuous learning activities.
2. Develop an information/awareness protocol with a specialized entity in order to anticipate and, if necessary, deal with related incidents.
3. Strengthen operational processes for projects deemed to be at high risk of GBV and SEAH, including codes of conduct for public works contractors prohibiting all forms of GBV and SEAH- specifically against sexual activity with anyone under the age of 18, strengthening consultation considerations and grievance recommendations redress mechanisms, oversight engineers and third-party monitors
4. Information and awareness-raising on GBV and SEAH issues for those involved and beneficiaries.
5. Contractor contracts and collaboration agreements signed with the project will contain relevant clauses.

The various project stakeholders and communities will be informed of the existence of the project's complaint management mechanism, which is one of the entry points for identifying and recording cases of GBV and SEAH in activities linked to project implementation.

Reporting procedures for gender-based violence, SEAH and violence against children

All staff, volunteers, consultants and contractors are encouraged and required to report suspected or actual cases of GBV as they are responsible for complying with the company's commitments and hold their direct reports accountable for compliance with the individual Code of Conduct.

The project will provide information to employees and the community on how to report cases of violations of the GBV Codes of Conduct through the grievance resolution mechanism (GRM). The project will follow up on cases of GBV and Code of Conduct violations reported through the grievance mechanism.

Grievance mechanism

The project operates a Grievance Resolution Mechanism (GRM). Reports of GBV, SEAH, other complaints and concerns can be submitted online, by phone or mail, or in person. All complaints regarding GBV should be reported immediately to the Project Task Team. In accordance with the GBV action plan, the project will investigate the complaint and ultimately provide a resolution of the complaint, or the police if necessary. The confidentiality of the victim must also be kept in mind when reporting any incident to the police. After resolution, the project will inform the complainant of the outcome, unless it is done anonymously. Complaints addressed to managers, or the service provider will be forwarded for processing.

Service provider

In handling any cases of GBV and SEAH, DEFIS task team will work through a Service Provider. The service provider is a local organization that has the experience and capacity to support Victims of GBV. The client, contractor and consultant must establish a working relationship with the service provider so that GBV cases can be safely referred to it. The service provider will also provide support and advice to the GBV focal points as required.

GBV and SEAH focal point:

The project must confirm that all complaints related to GBV and SEAH have been forwarded to IFAD. The project must consider all GBV complaints and agree on a resolution plan. The Project will advise on resolution, including referral to the police if necessary. They will be assisted by the service provider where appropriate. All reports must be kept confidential and returned immediately to the service provider. In cases of GBV and SEAH warranting police action, the project must refer the complaint appropriately to: (i) the authorities; (ii) the service provider; and (iii) management for further action. The client and IFAD must be informed immediately.

Transparent measures

All reports of GBV and SEAH must be treated confidentially in order to protect the rights of all those involved. The client, contractor and consultant must maintain the confidentiality of employees who report any act or threat of violence and of employees accused of committing acts or threats of violence (unless a violation of confidentiality is required to protect harmed persons or property or when required by law). To ensure that Victims feel confident in disclosing their experience of GBV, they can report cases of GBV and SEAH through various channels: (i) online, (ii) by telephone, (iii) in person, (iv) the local service provider, (v) the manager(s), (vi) village councils; or, (vii) the police. To ensure confidentiality, only the service provider will have access to information about the Victim. The project will be the main point of contact for information and follow-up concerning the perpetrator.

Monitoring and evaluation

The project shall monitor the follow-up of reported cases and maintain all reported cases in a confidential and secure location. Monitoring should collect the number of cases that have been reported and the proportion of those managed by the police, NGOs, etc. These statistics should be reported for inclusion in the project's annual report. These statistics should be reported for inclusion in their reports. For all cases of GBV and ECV warranting police action, the project must be informed immediately.

Response protocol

The project will be responsible for developing a written response protocol to meet project requirements, in accordance with national laws and protocols. The response protocol must include mechanisms for reporting and responding to aggressors in the workplace with a competent and confidential response to disclosures of GBV and SEAH.

Victim support measures

It is essential to respond appropriately to the Victim's complaint, respecting the Victim's choices to minimize the risk of further trauma and violence against the Victim. Refer the Victim to the service provider for appropriate support services in the community - including medical and psychosocial support, emergency accommodation, safety including police protection and livelihood - facilitating contact and coordination with these services. The client, contractor or consultant may, where possible, provide financial and other support to the Victims of GBV/ SEAH for these services. If the Victim is an employee, to ensure the safety of the Victim and the workplace in general, the client, contractor or consultant, in consultation with the Victim, will assess the risk of continued abuse to the Victim and the workplace. Reasonable adjustments will be made to the Victim's work schedule and work environment, as required. The employer will grant adequate leave to Victims who request services after having been victims of violence.

Sanctions:

In accordance with the Code of Conduct, any employee confirmed as a perpetrator of GBV will be sanctioned for disciplinary action in accordance with the sanctions and practices agreed in the individual Code of Conduct. It is important to note that, in each case, disciplinary sanctions are intended to be part of a process entirely internal to the employer, placed under the control and responsibility of its management and conducted in accordance with applicable national legislation. This process should be totally independent of any official investigation that the competent authorities (e.g. the police) may decide to carry out in relation to the same case, and in accordance with applicable national legislation. Similarly, any internal disciplinary measures that the employer's management may decide to adopt are intended to be separate from any charges or sanctions that may give rise to the official investigation (e.g. fines, detention, etc.).

5.2.5. Mitigation measures for potential impacts of DEFIS+ Component 2

The following table proposes mitigation measures for the impacts associated with the activities of Component 2 of the DEFIS+ project

Table 10 – Indicative mitigation measures for the activities of the DEFIS+ project component 2

Potential impacts	Mitigation measures
Rehabilitation of rural roads	
Risks of social conflicts	<p>Organize information and awareness campaigns for local populations on the duration, ins and outs of future works to be carried out in the area</p> <p>Register company personnel in the Fokontany/Commune foreigners register</p> <p>Posting of the internal regulations visibly in the various facilities of the base camp, specifically prescribing: respect for local habits and customs; protection against STIs/HIV/AIDS; hygiene rules and safety measures</p> <p>Prioritize local recruitment</p>
Traffic disruption	<p>Organize information and awareness campaigns for local populations on the duration, ins and outs of future work to be carried out in the area</p> <p>Perform as needed for cultural rite</p>
Release of rights-of-way: Property encroachment exploited	<p>Consult with the local population to obtain the prior informed consent of the population to obtain agreements for the release of the right-of-way</p> <p>Limit the rights-of-way of the work sites to what is strictly necessary and carry out the ritual, use and custom with the population, if necessary, or compensate for not obtaining a voluntary transfer</p>
Atmospheric pollution, dust emissions and noise pollution from the movement of construction machinery and vehicles.	<p>Mobilize materials, vehicles and machinery in good condition.</p> <p>Carry out regular maintenance of equipment, vehicles and machinery.</p>
<p>Loss of vegetation due to the development of the construction site.</p> <p>Disturbance of wildlife by destruction of natural habitats.</p>	<p>Make an inventory of the vegetation on the sites that will be occupied/used by the company</p> <p>Clearly define the area to be stripped to the bare minimum</p> <p>Avoid wooded areas as much as possible. Prohibit any cutting of trees with a DBH greater than 20 cm.</p> <p>Minimize deforestation and restore vegetation in borrow areas</p> <p>Revegetate and reforest if possible in appropriate places</p>
<p>Soil compaction and increased risk of erosion by clearing vegetation for the development of the site facility.</p> <p>Soil pollution by infiltration or leaching of polluting elements (eg fuel storage).</p> <p>Environmental degradation through the dispersion of waste.</p>	<p>Limit the footprint of the site installation to what is strictly necessary.</p> <p>Store the stripped topsoil nearby and put it back in place at the end of use of the site.</p> <p>Store fuel in a sealed area.</p> <p>Perform all maintenance and repairs in a sealed area.</p> <p>Implement a Site Waste Management Plan.</p>
<p>Alteration of the quality of water resources by wastewater discharges from the site installation.</p> <p>Water pollution by infiltration or leaching of polluting elements (eg fuel storage).</p>	<p>Collect all the effluents from the site installation and pre-treat them before any discharge into the receiving environment.</p> <p>Store the stripped topsoil nearby and put it back in place at the end of use of the site.</p> <p>Store fuel in a sealed area.</p> <p>Perform all maintenance and repairs in a sealed area.</p>
Risk of accident for the personnel and for the populations on the site.	<p>Carry out an adequate information campaign on road safety. on the risks and dangers on construction sites</p>

<p>Risk of accident for the populations living near the axes used by construction machinery and vehicles.</p> <p>Disturbance for populations by dust emissions.</p> <p>Encroachment of the site installation on inhabited and/or operated property or land.</p>	<p>Equip staff with secure equipment adapted to the types of work (PPE)</p> <p>Do not work during periods of low visibility (night, rain, etc.)</p> <p>Prohibit the consumption of alcohol during working hours</p> <p>Avoid inhabited or exploited areas when choosing the installation site.</p> <p>Provide site personnel with an individual protection kit; establish the wearing of this safety equipment; set up medicine boxes with the basic drugs needed for emergency care</p> <p>Installation of first aid kits in the living quarters</p> <p>Implement a Site Health and Safety Plan.</p> <p>In case of encroachment on an exploited area, proceed to a formal agreement with the owner and the user of the site, for the temporary occupation of the site; or proceed to a fair and equitable compensation of the person affected.</p> <p>Enclose the site installation and prohibit any entry of anyone outside the project.</p> <p>Limit construction vehicle traffic speeds to 30 km/h, and 20 km/h when crossing villages.</p>
<p>Various pollution risks</p>	<p>Carry out an adequate information campaign on sanitation</p> <p>Collect solid waste from the site and dispose of it at authorized locations; recover and store used oils and greases in sealed containers; send them to a recycling center</p> <p>Set up an autonomous sanitation system,</p> <p>Place hydrocarbon storage tanks in sealed warehouses</p> <p>The entire area of the base camp will be waterproofed with lean concrete to prevent any infiltration</p> <p>Any accidental spillage of hydrocarbons will be cleaned up immediately, absorption by sand and recovery of the soiled sand</p> <p>Maintenance, emptying and washing of trucks and machinery in a single suitable and waterproofed place</p> <p>Setting up parking, maintenance and emptying areas</p> <p>Sorting construction waste for recycling: i) solid biodegradable waste (leftover food, paper, cardboard, old fabrics) must be buried, ii) solid non-biodegradable waste must be distributed in bins, separate plastic waste, metal waste, as well as special waste (oil cans, used parts, batteries, etc.)</p> <p>Installation of latrines,</p> <p>Set up pit</p> <p>Set up an autonomous sanitation system,</p>
<p>Risks of water and soil pollution</p>	<p>Avoid preparing concreting materials along watercourses; avoid cement spillage into the watercourse</p> <p>Risks of soil pollution by the products of oil spills, dangerous products, etc.</p>
<p>Risks of disease spread</p>	<p>Inform and sensitize workers/site personnel and local populations on reproductive health, modes of transmission and prevention of STIs/STDs and especially HIV/AIDS</p> <p>Organize free screening sessions for workers.</p> <p>Keep the anonymity of the person concerned in the event of a positive result; and refer him to an appropriate care centre; and that this result does not constitute a reason for his dismissal</p> <p>Make available and free of charge condoms for the workers in the places</p> <p>Inform, educate and communicate on the safe use of drinking water</p>

	<p>Provide water disinfection products</p> <p>Provide mosquito nets to fight malaria</p> <p>Inform and raise awareness among workers and populations about the Covid 19 pandemic</p> <p>Keep soap and water on site for handwashing at all times</p> <p>Evacuate people at risk of contracting Covid 19</p>
Degradation of quarries and borrow pits	<p>Limit clearing as much as possible</p> <p>Obtain the relevant authorizations</p> <p>Level quarries and borrow areas with overdraft materials and then with topsoil (at site closure)</p> <p>revegetate</p>
<p>Air pollution by waste</p> <p>Air pollution by the transport of loose materials</p>	<p>Wet the tracks used by construction vehicles, especially when crossing villages.</p> <p>Equip trucks transporting loose materials with tarpaulins;</p> <p>fill in the pits and latrines at the end of the rehabilitation works</p>
<p>- Sexual exploitation, abuse and harassment, etc., among workers and community members</p>	<p>Develop an information / awareness protocol with a specialized entity in order to anticipate otherwise, if necessary, to deal with related incidents</p> <p>Company employees (including subcontractors) as well as those of the Control / Surveillance Mission are required to attend information and awareness sessions on gender-based violence throughout the construction site.</p>
Risk of increased ambient noise	<p>Always put the base camp and the activities far from the villages as far as possible</p> <p>Work during working hours</p>
Risk of destruction or degradation of sites of cultural, religious, archaeological or historical significance	<p>In the event of the discovery of an object of cultural, archaeological or historical importance, protect the areas concerned with permanent fences and notify the local and direct responsible authorities.</p> <p>Cessation of activities</p> <p>Carry out an archaeological inventory in areas that contain valuable objects and preserve the discovered objects</p> <p>Negotiate with traditional authorities the preservation of sites and resources of cultural, religious, historical and aesthetic significance</p>
Disruption of water flow if the route crosses a watercourse.	<p>Ensure hydraulic transparency at watercourse crossing points.</p>
<p>Risk of erosion.</p> <p>Silting of downstream water bodies/courses.</p>	<p>Put in place road drainage works, including manholes for the trapping of solid materials.</p> <p>Manage traffic well on construction sites and avoid driving outside access roads and in areas sensitive to erosion</p>
Induced population movements and natural resource exploitation activities, due to improved access (eg conversion of forest to pasture, or of sustainable land use to unsustainable, short-cycle cropping; illegal or unsustainable hunting	<p>A void infringing on Protected natural sites and Critical habitats or areas with significant biodiversity (e.g. wetlands)</p>

5.2.6. Mitigation measures for potential impacts of DEFIS+ Component 3

The following table proposes mitigation measures for the impacts associated with the activities of Component 3 of the DEFIS+ project

Impacted component of the environment	Potential impacts
Human and socio-economic environment	Risks of non-involvement of vulnerable people and women
	Risk of conflicts between beneficiaries for infrastructure maintenance activities

5.2.7. Compensatory measures for negative impacts

Guided by IFAD policies and international guidelines and best practices relating to protection measures against and economic displacement corresponding to a loss physical displacement of land, assets, access to resources, sources of income, or means of livelihood. It is the latter that could arise in the context of the DEFIS program. The compensation measures for the negative impacts of the project will mainly consist of the following provisions:

Compensation of people affected by the rights of way of the various projects:

After determining the final right-of-way required for each project, project managers must compensate any persons affected, in accordance with the legal provisions in force and IFAD's environmental and social procedures.

To this end, a compensation and mitigation plan – **abbreviated resettlement action plan** could be prepared and established. In accordance with the provisions of IFAD's Social, Environmental and Climate Assessment Procedures (SECAP), the key elements, the RAP will be the result of the process of free, prior and informed consent. The key points are the following:

- The identification of those likely to be affected must be completed before any major investment in order to determine the benefits to which those who could be displaced would be entitled, and the conditions that they would have to meet. A well-defined deadline must be set and respected;
- All users of land and natural resources will be considered (formal title holders, people with informal/customary rights or traditional use rights, occupants or users without recognized rights);
- Based on the assessment of losses, a fair and timely compensation plan and other mitigation measures will be defined, agreed with those affected, and put in place to meet the principles of safety and free, prior and informed consent;
- All those affected will get compensation, based on the loss they may suffer. In the case of cash compensation, it will be ensured that all members of the community and of the household are involved in the decisions of acceptance and investment of the compensation thus approved;
- Grievance mechanisms must be put in place by the DEFIS Program in order to support the persons concerned by the resettlement process and to respond to their needs and requests;
- Throughout the process of identifying the planning, implementation and evaluation of the various elements of resettlement or economic displacement and their impact, the necessary attention to gender issues will be lost.

Compensatory plantations:

Compensatory plantations can be carried out in two complementary ways:

- Alignment plantations along the rehabilitated tracks, in particular at the entrance and exit of the villages, with a spacing of 5 meters between the plants;
- Plantation in groves for localities whose vegetation will be most degraded by project activities.

Resettlement and economic reintegration can be either accepted/negotiated or involuntary:

For involuntary resettlements, because national legislation overrides their right to refuse, such is the case for with regard to easements, Article 8 of Framework Law n°2005-019 of October 17, 2005 setting out the principles governing land status in Madagascar specifies the areas dedicated to reserved right-of-way easements, namely: the banks of watercourses, lakes, ponds and lagoons belonging to the public domain, as well as the edges of islands; areas allowing maintenance or repair work to be carried out on the embankments of canals, drains and works of all kinds belonging to the public authorities and forming part of a hydro-agricultural network, and more generally for the execution of all development or infrastructure works belonging to the public domain. The width of the right-of-way for these easements is set by the law governing public law.

The DEIFS program is classified as Category B: low probability that the program/project will lead to resettlement and economic displacement. Normally, for Category B projects, no Resettlement Action Plan will be developed. In such cases, the ESMP and project design document will indicate the consultation processes leading to free, prior and informed consent for agreement with affected people, and the mitigation and monitoring measures required to ensure that the impact on affected people is not negative.

Within the framework of the DEFIS program, the program will avoid or minimize, as far as possible, any resettlement or economic displacement that could have a negative impact on the populations concerned; in any case where people lose land and means of subsistence, means of compensation will be implemented. Within the framework of the program, there have been no cases of physical displacement, since the project plans to rehabilitate the rural tracks as they are, but cases of economic displacement may arise in the case of irrigated perimeters and tracks. In such cases, accepted/negotiated resettlement: resettlement is considered accepted/negotiated when, in compliance with the do-no-harm principle and after people have been properly informed and the process of free, prior and informed consent has been applied, the people potentially affected by the resettlement agree to give up access to assets and to obtain fair and timely compensation for their losses.

In some cases, the people affected donate the land, since only part of the land is affected. In such cases, the owners sign deeds of land donation, which will be registered with the commune concerned. At this stage, however, the studies for these sub-projects have not yet begun,

During implementation, there will be an evaluation, and a short Action Plan may be drawn up where appropriate. Based on this assessment, a fair and timely compensation plan and other mitigation measures will be defined, agreed with those affected, and implemented to respect the principles of safety and free, prior and informed consent. Different types of compensation and mitigation measures will be considered (cash, land, jobs, in-kind compensation, alternative livelihood solutions, land and natural resource conservation measures, or in terms of donations etc.) depending on the context, the nature of the right of use or occupation, the type of losses and the purpose of the economic displacement. In line with international best practice, in-kind compensation should be the preferred option.

The assessment must include: Category of people affected, Methods for valuing assets and determining compensation rates, Approach to estimating losses and compensation.

Eligibility criteria, land compensation, land replacement and compensation scales, monetary, crop and land compensation scales, institutional arrangements for implementation of the Action Plan, an institutional arrangement for implementation of the Action Plan will be drawn up, with a mechanism for consultation and participation of beneficiaries in planning, execution and monitoring, information dissemination, follow-up and implementation of the resettlement.

6. PUBLIC CONSULTATIONS

6.1. PUBLIC CONSULTATIONS CARRIED OUT

Three (03) public consultation meetings were held according to the intervention zones of the DEFIS Programme. The minutes and attendance sheets are attached to this document.

The following people were invited to participate in the meetings

- The administrative authorities
- The technical services concerned by the Programme (Ministerial Directorate in charge of the Environment, Agriculture and Livestock, National Environment Office in Fort Dauphin, etc.)
- The various partners of the Programme (FDA, Tranoben'ny Tantsaha, etc.)
- Representatives of the beneficiaries and local communities concerned by the Programme

Table 11 – Public consultation meetings carried out

Venue	Date	Men	Women	Total
Fianarantsoa	07/09/2021	32	12	43
Manakara	09/09/2021	29	12	41
Farafangana	10/09/2021	45	9	54

6.2. CONDUCT OF PUBLIC CONSULTATIONS

Each consultation meeting was conducted as follows:

- Opening of the meeting by the local authorities present and/or the DEFIS Programme representative
- Presentation of the DEFIS Programme by the local programme representative
- Contextualisation of the meeting in relation to the CGES study and presentation of the objectives of the meeting by the DEFIS Programme environmental officer
- Presentation of the results of the study by ARTELIA:
 - o Environmental and social issues associated with the project
 - o Mitigation measures
 - o Environmental and Social Management Framework Plan (ESMP)
 - o Question and answer session - Exchanges
- Closing of the meeting by the local authorities present and/or the DEFIS Programme representative

6.3. SYNTHESIS OF THE PUBLIC CONSULTATIONS RESULTS

- **Fianarantsoa**

Opinions / concerns	Answers
<p>Complaints management: a structure is currently in place and its integration into the Defis programme should be relevant.</p>	<p>Proposal to be considered in the ESMC.</p>
<p>Reforestation: does Defis have a target to achieve? Avoid the use of wood in Defis activities/works as much as possible.</p> <p>Solar stills can be one of the alternatives to reduce the use of wood.</p> <p>For the protection of watersheds, reforest upstream.</p> <p>Local communities would like to have fruit tree nurseries.</p> <p>The Ihorombe Region needs large-scale reforestation, preferably with fruit species (a lot of bare land).</p> <p>The area to be reforested should be increased and reforestation carried out at the locality or commune level.</p> <p>Sensitise local communities about the legal environmental framework, and consider updating this framework.</p> <p>Close collaboration of the Defis programme with field technicians is necessary to achieve short-term results;</p> <p>A specific structure concerning reforestation must be put in place (institutional and technical support), what about the measures taken by the Ministry concerned with regard to tree cutting? The services involved in the fight against bushfires/forests should be much more accompanied/supported in their tasks for better results.</p>	<p>Procedures/steps will have to be respected to carry out reforestation. In particular, the participatory approach will be applied in the reforestation activities of the programme.</p> <p>A reforestation programme will be established in collaboration with the different stakeholders.</p> <p>The different stakeholders will be solicited/involved in the resolution of the different concerns/proposals raised.</p>
<p>Water use: advise ANDEA on the use of natural water resources;</p> <p>Multi-use (water supply, irrigation, watering) of water to be taken into account in the rehabilitation or construction of water supply infrastructure, then find the right organisation for water management;</p> <p>Problem of availability and access to water for users upstream of the dam, which is generally very far from the water source: these users will have to benefit from the dam, otherwise they will further degrade the watershed (e.g. clearing land to find other land for cultivation).</p> <p>Farmers in the Ihorombe onion sector (FIMPAO) are asking for a water point or a borehole to be set up.</p>	<p>The development of water sources for multiple uses is possible and will be taken into account in the programme activities</p> <p>The water resources will remain accessible as far as possible during the works.</p> <p>The Defis programme is working to protect the watershed affected by the works, and an organisation will be set up with the users to manage the activities. In addition, technical studies are and will be carried out for each rehabilitation / construction of hydro-agricultural / water supply infrastructures in order to ensure the availability of resources for all users of the BV. The local context and local demands will be particularly taken into account in these technical studies.</p>

Opinions / concerns	Answers
<p>What are the forbidden chemical inputs? The ozone focal point in Antananarivo has a list of prohibited chemical inputs.</p> <p>At the level of the RWHs, convincing results have been observed thanks to the use of "ady gasy" inputs (e.g. voandelaka).</p>	<p>A list of prohibited chemical inputs is available and will be annexed to the ESMC.</p>
<p>Proposal from the Prosperer programme: also consider the bamboo sector in the Defis programme as a resource (source of income, alternative wood, etc.) and because of the ecological role of the species (soil protection).</p>	<p>The different stakeholders will be solicited / involved in the resolution of the different concerns / proposals mentioned..</p>
<p>Consider and respect local customs and practices in the framework of the activities (works).</p>	<p>Customs and traditions will be investigated during the studies and will have to be respected by the companies during the works, to ensure their good social integration.</p>
<p>Are there any indicators of the initial state of the environment?</p>	<p>The initial state of the environment will be presented in the CGES.</p>
<p>What about the consideration of vulnerable people?</p>	<p>Support will be provided within the framework of the programme by the Vulnerable Targeted Mechanism (MCV).</p>
<p>Resilience to climate change: the rice varieties used in Ikalamavony were tolerant to the drought in 2017; The cropping method and calendar require adaptation to climate change; Sensitization on climate change should be carried out.</p>	<p>Sensitization activities will be planned, in particular the adaptation of the crop calendar to climate change.</p>
<p>Greater involvement of VOIs is needed to ensure the effectiveness of the approaches/strategies for the different projects;</p> <p>Involve also the researchers with the farmer-researchers in relation to seeds, adapted and efficient; «ady gasy»</p> <p>Highlighting the economic impact of the Defis programme activities;</p> <p>Implementing responsible agriculture for the success of the programme;</p> <p>The environmental aspect must be more considered for the success of the programme.</p>	<p>The various stakeholders will be solicited/involved in the resolution of the various concerns/proposals mentioned.</p>

▪ **Manakara**

Opinions / concerns	Answers
<p>Honey and coffee sectors (wet processing) to be seen specifically. Highlight the specificities of each area</p>	<p>Observations to be considered in the ESMC. However, it should be noted that the ESMC is a management framework for the whole programme. Specific E&S studies on related activities/projects under the Defis programme will then be carried out (consultations, E&S investigations, etc.)</p>
<p>Environmental monitoring programme: what are the monitoring elements?</p>	<p>These are monitoring elements such as irrigated area, cleared areas. On the other hand, the implementation of environmental and social measures (E&S) will be carried out with the help of the monitoring plan.</p>
<p>Dams: technical studies to be carried out rigorously so that the results are convincing and the infrastructures are adapted to the effects of climate change; Location of dams to be rehabilitated/constructed under the programme, as there is a growing need for hydro-agricultural infrastructure? What are the measures against cyclones? Training and sensitisation on management and use of established structures needed. Non-functional dams: local communities are frustrated while waiting for works; need for transparency in the recruitment and management of works companies.</p>	<p>In-depth technical studies are carried out before any infrastructure is built (technical feasibility and E&S). Large schemes are prioritised under the Defis programme (e.g. Siranana, Marofarihy) Training/sensitization on water management is planned; in addition, specific studies on water management and the means to be implemented for the sustainability of the works are also planned. The beneficiaries/users have their roles in the maintenance of the works (dams, tracks) The protection of water bodies (integrated approach) is also planned. Risk and disaster management: establishment of an early warning system, use of adapted varieties, adaptation of the cropping calendar in progress. Company terminated because the terms of its contract were not respected. Any recruitment of a works company goes through the procurement procedures but these procedures should be well explained/clarified to those concerned. Communities/local authorities can and are encouraged to raise any non-compliance/complaints about the works company.</p>
<p>Particular interests in: rice cultivation, MCV, seed production, increase in cultivable land. Women entrepreneurs are open to possible cooperation with the programme. Female consideration in the development of the region. Problems of insecurity in the area (theft of livestock and agricultural products): need for cooperation at several levels, improvement of income to reduce insecurity.</p>	<p>It is advisable to approach local technicians for further explanation (organisation, beneficiary). The Defis programme may find opportunities and/or markets for agricultural products (e.g. participation in the Pangalanes fair, Fier Mada)</p>
<p>Involvement of the CGEAF in managing communication with local communities (introduction, presentation, exchanges with the Ampanjaka and fokonolona) in order to avoid possible conflicts. Prior information of the activities to be carried out, of the planned project to the local leaders in order</p>	<p>Observations / proposals to be considered in the CGES. Adoption of a new communication strategy/structure by the Defis programme to get even closer to local communities. There is already, for example, a radio programme that relays</p>

Opinions / concerns	Answers
to relay the communication and sensitize local communities.	information and ensures exchanges between farmers.
Exploitation of forest resources (firewood, manufacture of essential oils): endangers the honey industry and production / biodiversity (reduction in pollination by bees).	Many activities are planned in the framework of the reforestation of melliferous plants, collaborations between the different sectors will be necessary. In particular, collaboration with the Ministry in charge of Environment & Forestry is needed for the conservation of forest resources.
Distribution of seeds: cropping calendar to be respected necessarily. Difficulty for producers to set a good price for coffee; equal price for good and bad quality coffee.	Procedures & steps are needed before seeds can be distributed. However, organisational efforts will be needed to avoid delays in distribution in relation to the cropping calendar. The market price is discussed at the level of several administrative services.

▪ **Farafangana**

Opinions / concerns	Answers
<p>Need for "dams" to increase cultivable areas.</p> <p>Do not forget landlocked areas (difficult to access such as Befotaka, Midongy, Vondrozo). In particular, Defis needs to do activities in the Midongy area (no project is working there at the moment).</p> <p>Increasing production to combat malnutrition.</p> <p>Apart from activities in the existing poles, also consider areas outside the poles.</p> <p>Insecurity hampers agricultural development and production, and therefore requires special consideration.</p> <p>Large programmes such as Defis should allow different localities to benefit from the same infrastructure (e.g. dams) in order to allow the same level of development: many agricultural areas face diminishing water resources and have to wait for major rains such as during cyclones.</p> <p>The resources available to projects should be used wisely to achieve satisfactory results (e.g. increase resources for agriculture). Many projects/programmes have and are working with almost the same activities, and not in a coordinated way that is becoming more and more problematic in their areas of intervention.</p>	<p>Improvement of the FFS, the irrigated schemes and the objective of the sustainability of the infrastructures put in place within the framework of the Defis programme (especially at the end of the programme).</p> <p>The technical and administrative services and entities concerned will be solicited/consulted within the framework of the programme's activities (e.g. concerning insecurity, environmental protection).</p> <p>In-depth studies are carried out before any works (e.g. dams, runway) concerning technical (water availability; construction techniques ...), socio-environmental aspects. In addition, the construction companies have specific environmental specifications to follow when carrying out their work.</p> <p>Sensitization / communication campaigns concerning the management of works and capacity building are also planned. Studies are planned to see how to perpetuate the management of the infrastructures by the users' associations.</p> <p>The Defis programme is initiated by the Ministry (there is a Steering Committee that supports its implementation, monitoring and decision making).</p> <p>The development pole is only defined at the beginning of the programme but can be adapted as the programme evolves.</p> <p>For FDA funding: 80% is for development poles and 20% for non poles; however, care should be taken to ensure that the funds allocated for each activity are well managed. The collaboration with the FDA will be explained in other circumstances.</p>
The areas studied should be specified to see if they correspond to the local context. See the specifics of different Defis intervention areas.	The CGES is a framework document for the 8 intervention regions of the Defis programme. Inter-regional investigations have been carried out to

Opinions / concerns	Answers
	<p>identify the specificities of the programme intervention areas and will be integrated into the CGES. Further studies will be carried out for specific activities within the programme.</p>
<p>There is a need to work together within the Defis programme for development, to work with other projects/programmes; See how the different programmes/projects can work/collaborate so that their actions coordinate, complement each other in the same development objective. Also integrate/involve the different local authorities in the activities.</p>	<p>Proposals noted. In addition, the Defis programme also uses the PRD as a framework for its activities. In addition, the programme adopts the landscape/integrated approach which aims to increase agricultural production while preserving the environment (e.g. watershed).</p>
<p>Are there any activities dedicated to VBG/VCE in the Defis programme? What about social protection?</p>	<p>A budget line is foreseen for the consideration of women and children/youth. Training for women is planned (e.g. leadership).</p>
<p>Regarding environmental protection, see how to use improved stoves and solar energy. Pumping station: consider the use of solar energy</p>	<p>Training on improved stoves is planned as part of the programme.</p>
<p>Water management: analyse the types of works adapted to the area (e.g. irrigation dam vs. pumping station - which poses a problem for energy); see the sustainability of the works; need a rain gauge station to improve the technical data used for the design of the works. Marofarihy: currently dried up and requires in-depth technical studies for the choice of structures to be put in place. See also the Erato dam New cultivation techniques need to be developed to avoid "tavy". All development activities cannot be solely under the responsibility/charge of Defis but require collaboration with other entities.</p>	<p>The various proposals are noted and will be considered. In-depth technical studies are carried out before any infrastructure is built (technical feasibility and E&S). The setting up of a meteorological station is planned within the framework of the Green Fund.</p>

7. ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

7.1. OBJECTIVES

The main objective of the Project Environmental and Social Management Plan (ESMP) is to ensure that the planned mitigation measures for negative impacts correspond to the predictions for avoidance or minimisation of the predicted impacts. It thus ensures a better balance between the economic, social and environmental components of the project. It brings together both the parameters to be monitored on a daily basis and those to be followed over time.

7.2. MONITORING PLAN FOR THE IMPLEMENTATION OF MITIGATION MEASURES

The objective of environmental monitoring is to ensure that mitigation measures are effectively implemented.

The monitoring plan for the implementation of the mitigation programme for the significant impacts of the DEFIS+ project is presented in the table below. It summarises all the proposed measures, specifying the responsibilities for their implementation and the indicators of achievement.

Table 12 – Monitoring plan for the implementation of mitigation measures for potential impacts of the DEFIS+ project

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Irrigated perimeters					
Risks of social conflicts	<p>Organize information and awareness campaigns for local populations on the duration, ins and outs of future works to be carried out in the area</p> <p>Register company personnel in the Fokontany/Commune foreigners register</p> <p>Posting of the internal regulations visibly in the various facilities of the base camp, specifically prescribing: respect for local habits and customs; protection against STIs/HIV/AIDS; hygiene rules and safety measures</p> <p>Prioritize local recruitment</p>	EU BE, UCP DEFIS	PCU CHALLENGES	Before the start and during the work	<p>Display of the existing rules of procedure</p> <p>Register</p> <p>Number of people recruited</p> <p>Number of complaints obtained</p> <p>Number of staff registered</p> <p>Fokontany foreigners register</p> <p>Meeting minutes and attendance sheet</p>
Disruption of rural activities	<p>Organize information and awareness campaigns for local populations on the duration, ins and outs of future work to be carried out in the area</p> <p>Perform as needed for cultural rite</p>	EU BE, UCP DEFIS	PCU CHALLENGES	Before the start and during the work	Minutes of meeting
Release of rights-of-way: Property encroachment exploited	<p>Consult with the local population to obtain the prior informed consent of the population to obtain agreements for the release of the right-of-way</p> <p>Limit the rights-of-way of the work sites to what is strictly necessary and carry out the ritual, use and custom with the population, if necessary, or compensate for not obtaining a voluntary transfer</p>	EU BE, UCP DEFIS	PCU CHALLENGES	Before the start and during the work	<p>Agreement drawn up with the owner / <i>Copy of agreement minutes</i></p> <p>Number of people compensated</p> <p>Number of complaints obtained</p>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Atmospheric pollution, dust emissions and noise pollution from the movement of construction machinery and vehicles.	Mobilize materials, vehicles and machinery in good condition. Carry out regular maintenance of equipment, vehicles and machinery.	works company	BE work control	During the duration of the work	Inspection of equipment and vehicles / <i>Inspection report</i> Number of interviews carried out / <i>Interview register</i>
Loss of vegetation due to the development of the construction site. Disturbance of wildlife by destruction of natural habitats.	Make an inventory of the vegetation on the sites that will be occupied/used by the company Clearly define the area to be stripped to the bare minimum Avoid wooded areas as much as possible. Prohibit any cutting of trees with a DBH greater than 20 cm. Minimize deforestation and restore vegetation in borrow areas Revegetate and reforest if possible in appropriate places	works company	BE work control	Before the start of work	Area cleared; number of felled trees / <i>monitoring sheet; photo documentation</i>
Soil compaction and increased risk of erosion by clearing vegetation for the development of the site facility. Soil pollution by infiltration or leaching of polluting elements (eg fuel storage). Environmental degradation through the dispersion of waste.	Limit the footprint of the site installation to what is strictly necessary. Store the stripped topsoil nearby and put it back in place at the end of use of the site. Store fuel in a sealed area. Perform all maintenance and repairs in a sealed area. Implement a Site Waste Management Plan.	works company	BE work control	Before and during the works	Area cleared / <i>Monitoring sheet</i> Site rehabilitated at the end of the works / <i>Photo documentation</i> Fitted sealed area / <i>Ground plan; Photo documentation</i> Waste management plan available / <i>ESMP-site</i>
Alteration of the quality of water resources by wastewater discharges from the site installation. Water pollution by infiltration or leaching of polluting elements (eg fuel storage).	Collect all the effluents from the site installation and pre-treat them before any discharge into the receiving environment. Store the stripped topsoil nearby and put it back in place at the end of use of the site. Store fuel in a sealed area.	works company	BE work control	During the works	Collecting structures developed; Fitted sealed area / <i>Ground plan; Photo documentation</i>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
	Perform all maintenance and repairs in a sealed area.				
<p>Risk of accident for the personnel and for the populations on the site.</p> <p>Risk of accident for the populations living near the axes used by construction machinery and vehicles.</p> <p>Disturbance for populations by dust emissions.</p> <p>Encroachment of the site installation on inhabited and/or operated property or land.</p>	<p>Equip staff with secure equipment adapted to the types of work (PPE)</p> <p>Educate staff on the risks and dangers on construction sites.</p> <p>Do not work during periods of low visibility (night, rain, etc.)</p> <p>Prohibit the consumption of alcohol during working hours</p> <p>Avoid inhabited or exploited areas when choosing the installation site.</p> <p>Provide site personnel with an individual protection kit; establish the wearing of this safety equipment; set up medicine boxes with the basic drugs needed for emergency care</p> <p>Installation of first aid kits in the living quarters</p> <p>Implement a Site Health and Safety Plan.</p> <p>In case of encroachment on an exploited area, proceed to a formal agreement with the owner and the user of the site, for the temporary occupation of the site.</p> <p>Enclose the site installation and prohibit any entry of anyone outside the project.</p> <p>Limit construction vehicle traffic speeds to 30 km/h, and 20 km/h when crossing villages.</p>	works company	BE work control	Before and during the works	<p>Agreement drawn up with the owner / <i>Copy of agreement minutes</i></p> <p>Health and safety plan available / <i>ESMP-site</i></p> <p>Number of accidents / <i>Accident register</i></p> <p>Existing medicine box</p> <p>Existence of a traffic plan and itinerary for vehicles and machinery</p> <p>Equipment Distribution Sheet</p> <p>Number of fire extinguisher</p> <p>Periodic vehicle maintenance sheet</p> <p>Number of panels installed</p>
Various pollution risks	Collect solid waste from the site and dispose of it at authorized locations; recover and store used oils	works company	BE control, UCP	Before the works	Number of garbage pits, number of latrines

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
	<p>and greases in sealed containers; send them to a recycling center</p> <p>Set up an autonomous sanitation system,</p> <p>Place hydrocarbon storage tanks in sealed warehouses</p> <p>The entire area of the base camp will be waterproofed with lean concrete to prevent any infiltration</p> <p>Any accidental spillage of hydrocarbons will be cleaned up immediately, absorption by sand and recovery of the soiled sand</p> <p>Maintenance, emptying and washing of trucks and machinery in a single suitable and waterproofed place</p> <p>Setting up parking, maintenance and emptying areas</p> <p>Sorting construction waste for recycling: i) solid biodegradable waste (leftover food, paper, cardboard, old fabrics) must be buried, ii) solid non-biodegradable waste must be distributed in bins, separate plastic waste, metal waste, as well as special waste (oil cans, used parts, batteries, etc.)</p> <p>Installation of latrines,</p> <p>set up pit</p> <p>Set up an autonomous sanitation system,</p>				<p>Number of hydrocarbon retention tanks, used oil recycling</p> <p>works supervision report</p>
Risks of water and soil pollution	Avoid preparing concreting materials along watercourses; avoid cement spillage into the watercourse	works company	BE control, UCP	Before the works	Activity reports

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
	Risks of soil pollution by the products of oil spills, dangerous products, etc.				
Risks of disease spread	<p>Inform and sensitize workers/site personnel and local populations on reproductive health, modes of transmission and prevention of STIs/STDs and especially HIV/AIDS</p> <p>- Organize free screening sessions for workers.</p> <p>-Keep the anonymity of the person concerned in the event of a positive result; and refer him to an appropriate care centre; and that this result does not constitute a reason for his dismissal</p> <p>-Make available and free of charge condoms for the workers in the places</p> <p>Inform, educate and communicate on the safe use of drinking water</p> <p>Provide water disinfection products</p> <p>Provide mosquito nets to fight malaria</p> <p>Inform and raise awareness among workers and populations about the Covid 19 pandemic</p> <p>Keep soap and water on site for handwashing at all times</p> <p>Evacuate people at risk of contracting Covid 19</p>	works company	BE control, UCP	During the works	<p>Minutes of awareness meeting</p> <p>Number of mosquito nets distributed</p> <p>Existence of disinfectants</p> <p>Existence of hand washing station</p> <p>Condom distribution sheet</p>
Degradation of quarries and borrow pits	<p>Limit clearing as much as possible</p> <p>Obtain the relevant authorizations</p> <p>Level quarries and borrow areas with overdraft materials and then with topsoil (at site closure)</p> <p>revegetate</p>	works company	BE control, UCP	During the works	<p>Area cleared; number of felled trees / <i>Monitoring sheet; photo documentation</i></p> <p>Rehabilitated area</p>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Air pollution by waste Air pollution by the transport of loose materials	Wet the tracks used by construction vehicles, especially when crossing villages. Equip trucks transporting loose materials with tarpaulins; fill in the pits and latrines at the end of the rehabilitation works	works company	BE control, UCP	During the works	Activity reports Existence of watertight storage areas, Monitoring-evaluation sheet
Risks of gender-based violence: - Sexual exploitation, abuse and harassment, etc., among workers and community members	Develop an information / awareness protocol with a specialized entity in order to anticipate otherwise, if necessary, to deal with related incidents Company employees (including subcontractors) as well as those of the Control / Surveillance Mission are required to attend information and awareness sessions on gender-based violence throughout the construction site.	Works company	BE works control, PCU, local authorities	During the works	Report of sensitizations on gender-based violence Number of complaints
Risk of increased ambient noise	Always put the base camp and the activities far from the villages as far as possible Work during working hours	Works company	BE works control, PCU, local authorities	During the works	Properly chosen site/ground plan Activity Report
Risk of destruction or degradation of sites of cultural, religious, archaeological or historical significance	In the event of the discovery of an object of cultural, archaeological or historical importance, protect the areas concerned with permanent fences and notify the local and direct responsible authorities. Cessation of activities Carry out an archaeological inventory in areas that contain valuable objects and preserve the discovered objects Negotiate with traditional authorities the preservation of sites and resources of cultural, religious, historical and aesthetic significance	Works company	BE works control, PCU, local authorities	During the works	Inventory completed Work stoppage observed
Re-suspension of solid matter, and degradation of water quality by an increase in turbidity.	Implement a water quality monitoring program near the site during the work.	Works company	BE work control	During the works	Number of complaints / <i>Register of complaints</i>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Accumulation of sediments at the dams.	Implement a program to monitor the quantity of sediments at the level of the dams during their operation. Carry out periodic maintenance to de-silt the dams.				Results of water quality analyzes / <i>Environmental monitoring report</i> Volumes of sediment removed / <i>Dam maintenance report</i>
Pollution of water resources and soils in the area through the use of chemical inputs for agriculture.	Make farmers aware of prioritizing the use of organic inputs (limit or even avoid the use of chemical inputs). Train farmers in the proper management and use of inputs.	advocacy NGO	EU/CHALLE NGES	Once a year during operation	Number of awareness-training sessions; Number of farmers trained / <i>Copies of awareness-training minutes</i>
Erosion in material extraction areas.	Choose sites already used as deposits for the extraction of materials. Drain the material extraction sites, and restore them at the end of the activities.	Works company	BE work control	During the works	Extraction sites identified and described / <i>ESMP- site</i> Drainage devices arranged / <i>Ground plan; Photo documentation</i>
Risk of pollution linked to cleaning products resulting from the maintenance of irrigation canals.	Identify and choose in a concerted manner the disposal sites for cleaning products. Stabilize the disposal sites by revegetation.	User association	EU/CHALLE NGES	Once a year during operation	Properly stored cleaning products / <i>Activity report</i>
Risk of conflicts related to water use. Risk of conflicts between WUAs for infrastructure maintenance activities. Deterioration and dysfunction of the infrastructures built/rehabilitated by the phenomena of erosion and silting.	Identify conflicting users of water resources beforehand and consult with them. Reinforce the training of WUAs on the use of water and the arbitration of conflicts Implement watershed protection actions. Energize users for the management and regular maintenance of structures. Establish a maintenance plan for the works, with a precise organization of the responsibilities of user associations. Establish close collaboration between the associations of users of the perimeters concerned.	EU/CHALLE NGES	Local authorities	During infrastructure operation	Watershed protection actions carried out / <i>Activity report</i> WUAs trained, energized; Works maintenance plan drawn up / <i>Minutes of meetings; Activity Report</i>
Risks of non-involvement of vulnerable people and women	The program will follow an inclusive targeting strategy to reach poor households and vulnerable groups	NGO	PCU	During the implementation of activities	Number of women, young people, people with disabilities involved

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Introduction of adapted varieties: Seed multiplication					
Risk of depletion of local water resources. Pollution of water resources in the area in the event of the use of excessive inputs for farming techniques.	Ensure rational use of water Sensitize farmers to the prioritization of the use of organic inputs. Train farmers in the proper use of inputs.	Partners	PCU, local authorities	During the implementation of activities	Number of training and sensitization carried out; Number of farmers trained / <i>Activity report</i>
Large-scale distribution of certain varieties of seeds: abandonment of old varieties, which can lead to a reduction in floristic biodiversity.	Conduct specific research on native varieties (potential, adaptation, adapted cultivation technique, etc.) in order to optimize their local use. Conduct preliminary studies / analyzes of each variety to be introduced to anticipate their behavior in each type of environment / pedoclimatic condition Conduct quarantine checks and follow national guidelines for introduction of new germplasm	Partners	PCU, local authorities	During the implementation of activities	List of species planted / <i>Activity report</i> ; <i>photo documentation</i>
Protection of sub-watersheds/Nurseries, agroecologies, agroforestry, reforestation					
Set up nurseries: risk of depletion of local water resources	Ensure rational use of water.	NGO	PCU	During the implementation of activities	Number of training and sensitization carried out; Number of farmers trained / <i>Activity report</i>
Loss of plant resources through earthworks. Loss of wildlife habitat. Risk of proliferation of invasive plants.	Limit the area to be stripped to what is strictly necessary. Retain wooded areas for site selection. Prohibit any cutting of a tree with a DBH greater than 20 cm.	NGO	PCU	During the implementation of activities	Area cleared; number of felled trees / <i>Monitoring sheet</i> ; <i>photo documentation</i> List of species planted / <i>Activity report</i> ; <i>photo documentation</i>
Risk of impact on irrigation structures; ●Risk of introduction of colonizing species.	Carry out agroforestry and forestry within a radius of 5 to 10 meters from the hydraulic structures;	NGO	PCU	During the implementation of activities	List of species planted / <i>Activity report</i> ; <i>photo documentation</i>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
<ul style="list-style-type: none"> • Risk of mono-cropping (resorting to one or two exotic species). <p>Risk of wildlife, rodents and other pests</p> <p>Restriction of human and livestock mobility • Risk of introduction of invasive exotic species</p>	<ul style="list-style-type: none"> • Ensure that the selected species adapt well to the environment Promote the reforestation of different species to promote biodiversity Community awareness and training on pest management, • Provide alternative routes formed for mobility Prior identification with local forest services of plant species for revegetation and/or reforestation. Non-invasive exotic and indigenous species • Use those species that disfavor pests (pest resistant crops) • Selection and use of non-invasive exotic and indigenous species, pest repellent and species that doesn't harbor rodents Prepare wildlife management plans and training of communities on cultural practices to manage pests, • Avoid appropriation of land or eviction of households • Prioritize indigenous and multiple mix of species for planting 				
Risks of non-involvement of vulnerable people and women	The program will follow an inclusive targeting strategy to reach poor households and vulnerable groups	NGO	PCU	During the implementation of activities	Number of women, young people, people with disabilities involved
Input of solids to downstream water bodies/courses by runoff from terraced areas.	Implementation of terrace drainage works.	NGO	PCU	During the implementation of activities	Drainage devices arranged / <i>Ground plan; Photo documentation</i>
<p>Risk of interference with exploited areas; loss of sources of income or livelihood.</p> <p>Risk of accident during earthworks.</p>	<p>In case of encroachment on an exploited area, proceed to a fair and equitable compensation of the person affected.</p> <p>Marking of work areas and HSE training of workers.</p>	NGO	PCU	During the implementation of activities	<p>Number of complaints / <i>Register of complaints</i></p> <p>Amount of compensation issued / <i>PAR document</i></p> <p>Number of accidents / <i>Accident register</i></p>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Growing demand for agricultural land: risk of land disputes between farmers / pastoralists or between villages / communities	<p>Sensitize the involvement of the local community, under the approval of the local authorities concerning the acquisition / extension of agricultural right-of-way on state lands</p> <p>Involve local authorities (traditional & administrative) in resolving land disputes.</p> <p>Involvement of the DEFIS Program in land tenure security programs for agricultural land, awareness raising on the land management of agricultural land.</p>	NGO	PCU	During the implementation of activities	<p>Number of complaints / <i>Register of complaints</i></p> <p>Amount of compensation issued / <i>PAR document</i></p> <p>Properly chosen installation site / <i>ground plan</i></p>
Construction of water tanks					
Risks of social conflicts	<p>Organize information and awareness campaigns for local populations on the duration, ins and outs of future work to be carried out in the area</p> <p>Register company personnel in the Fokontany/Commune foreigners register</p> <p>Posting of the internal regulations visibly in the various facilities of the base camp, specifically prescribing: respect for local habits and customs; protection against STIs/HIV/AIDS; hygiene rules and safety measures</p> <p>Prioritize local recruitment</p>	EU BE, UCP DEFIS	PCU CHALLENGES	Before the start and during the work	<p>Display of the existing rules of procedure</p> <p>Register</p> <p>Number of people recruited</p> <p>Number of complaints obtained</p> <p>Number of staff registered</p> <p>Fokontany foreigners register</p> <p>Meeting minutes and attendance sheet</p>
Risk of accident	<p>Educate staff on the risks and dangers on construction sites.</p> <p>Do not work during periods of low visibility (night, rain, etc.)</p> <p>Prohibit the consumption of alcohol during working hours</p> <p>Put up traffic signs</p> <p>Vehicle maintenance</p>	works company	BE work control	Before and during the works	<p>Health and safety plan available / <i>ESMP-site</i></p> <p>Number of accidents / <i>Accident register</i></p> <p>Existing medicine box</p> <p>Existence of a traffic plan and itinerary for vehicles and machinery</p> <p>Periodic vehicle maintenance sheet</p>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
					Number of panels installed
Risks of gender-based violence: - Sexual exploitation, abuse and harassment, etc., among workers and community members	<p>Develop an information / awareness protocol with a specialized entity in order to anticipate otherwise, if necessary, to deal with related incidents</p> <p>Company employees (including subcontractors) as well as those of the Control / Surveillance Mission are required to attend information and awareness sessions on gender-based violence throughout the construction site.</p>	Works company	BE works control, PCU, local authorities	During the works	<p>Report of sensitizations on gender-based violence</p> <p>Number of complaints</p>
Risks of disease spread	<p>Inform and sensitize workers/site personnel and local populations on reproductive health, modes of transmission and prevention of STIs/STDs and especially HIV/AIDS</p> <p>- Organize free screening sessions for workers.</p> <p>-Keep the anonymity of the person concerned in the event of a positive result; and refer him to an appropriate care centre; and that this result does not constitute a reason for his dismissal</p> <p>-Make available and free of charge condoms for the workers in the places</p> <p>Inform, educate and communicate on the safe use of drinking water</p> <p>Provide water disinfection products</p> <p>Provide mosquito nets to fight malaria</p> <p>Inform and raise awareness among workers and populations about the Covid 19 pandemic</p> <p>Keep soap and water on site for handwashing at all times</p> <p>Evacuate people at risk of contracting Covid 19</p>	Works company	BE control, UCP	During the works	<p>Minutes of awareness meeting</p> <p>Number of mosquito nets distributed</p> <p>Existence of disinfectants</p> <p>Existence of hand washing station</p> <p>Condom distribution sheet</p>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Atmospheric pollution, dust emissions and noise pollution from the movement of construction machinery and vehicles.	Mobilize materials, vehicles and machinery in good condition. Carry out regular maintenance of equipment, vehicles and machinery.	works company	BE work control	During the duration of the work	Inspection of equipment and vehicles / <i>Inspection report</i> Number of interviews carried out / <i>Interview register</i>
Loss of vegetation due to the development of the construction site.	Make an inventory of the vegetation on the sites that will be occupied/used by the company Clearly define the area to be stripped to the bare minimum Avoid wooded areas as much as possible. Prohibit any cutting of trees with a DBH greater than 20 cm. Revegetate if possible in appropriate places	works company	BE work control	Before the start of work	Area cleared; number of felled trees / <i>monitoring sheet; photo documentation</i>
Exposing the soil by stripping the topsoil. Facilitation of erosion by stormwater runoff.	Limit the area to be stripped to what is strictly necessary. Install site drainage systems.	Works company	BE works control, UE/DEFIS	During the works	Area cleared / <i>Monitoring sheet</i> Drainage devices arranged / <i>Ground plan; Photo documentation</i>
Loss of floristic resources by stripping the right-of-way of the reservoir. Loss of wildlife habitat.	Limit the area to be stripped to what is strictly necessary. Avoid wooded areas for site selection. Prohibit any cutting of a tree with a DBH greater than 20 cm.	Works company	BE works control, UE/DEFIS	During the works	Area cleared; number of felled trees / <i>monitoring sheet; photo documentation</i>
Risk of interference with inhabited and/or exploited areas; loss of sources of income or livelihood.	Avoid inhabited or exploited areas for site selection. In case of encroachment on an inhabited or exploited area, proceed to a fair and equitable compensation of the person affected.	Works company and UE/DEFIS	BE works control, UE/DEFIS	During the works	Number of complaints / <i>Register of complaints</i> Amount of compensation issued / <i>PAR document</i> Properly chosen installation site / <i>ground plan</i>
Risks of interference with areas mined by spoil products	With the help of the local population, put the spoil products in an area designated for this purpose Treat the products of débalis	Works company	EU/CHALLE NGES	During the works	Correctly chosen drop zone

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
		and UE/DEFIS			
Risk of bacteriological contamination of stored water, by runoff water from residential areas; health risk for users.	Do not choose the location of the REEPS downstream of the farm or village / residential area.				Properly chosen installation site / <i>ground plan</i>
Risk of conflicts related to water use. Risk of conflicts between WUAs for infrastructure maintenance activities. Deterioration and dysfunction of the infrastructures built/rehabilitated by the phenomena of erosion and silting.	Identify conflicting users of water resources beforehand and consult with them. Reinforce the training of WUAs on the use of water and the arbitration of conflicts Implement watershed protection actions. Energize users for the management and regular maintenance of structures. Establish a maintenance plan for the works, with a precise organization of the responsibilities of user associations.	EU/CHALLENGES	Local authorities	infrastructure operation	<i>Activity Report</i> WUAs trained, energized; Works maintenance plan drawn up / <i>Minutes of meetings; Activity Report</i>
Risks of non-involvement of vulnerable people and women	The program will follow an inclusive targeting strategy to reach poor households and vulnerable groups	NGO	PCU	During the implementation of activities	Number of women, young people, people with disabilities involved
Creation of a farmer field school (CEP)					
Increased pressure on local water resources; risk of depletion of these water resources. Pollution of water resources in the area in the event of the use of chemical inputs for cultivation techniques.	Ensure rational use of water. Sensitize farmers to the prioritization of the use of organic inputs. Train farmers in the proper use of inputs.	EU/CHALLENGES	Local authorities	During operation	Number of training and sensitization carried out; Number of farmers trained / <i>Activity report</i>
Risk of interference with or operated areas; loss of sources of income or livelihood.	Avoid inhabited or exploited areas for site selection.	EU/CHALLENGES	Local authorities	During plot development work	Number of complaints / <i>Register of complaints</i> Amount of compensation issued /

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Risk of conflicts related to water use.	In case of encroachment on an inhabited or exploited area, proceed to a fair and equitable compensation of the person affected. Ensure rational use of water.				Properly chosen installation site / <i>ground plan</i>
Risks of non-involvement of vulnerable people and women	The program will follow an inclusive targeting strategy to reach poor households and vulnerable groups	NGO	PCU	During the implementation of activities	Number of women, young people, people with disabilities involved
Rehabilitation of rural roads					
Risks of social conflicts	Organize information and awareness campaigns for local populations on the duration, ins and outs of future work to be carried out in the area Register company personnel in the Fokontany/Commune foreigners register Posting of the internal regulations visibly in the various facilities of the base camp, specifically prescribing: respect for local habits and customs; protection against STIs/HIV/AIDS; hygiene rules and safety measures Prioritize local recruitment	EU BE, UCP DEFIS	PCU CHALLENGES	Before the start and during the work	Display of the existing rules of procedure Register Number of people recruited Number of complaints obtained Number of staff registered Fokontany foreigners register Meeting minutes and attendance sheet
Traffic disruption	Organize information and awareness campaigns for local populations on the duration, ins and outs of future work to be carried out in the area Perform as needed for cultural rite	EU BE, UCP DEFIS	PCU CHALLENGES	Before the start and during the work	Minutes of meeting
Release of rights-of-way: Property encroachment exploited	Consult with the local population to obtain the prior informed consent of the population to obtain agreements for the release of the right-of-way Limit the rights-of-way of the work sites to what is strictly necessary and carry out the ritual, use and	EU BE, UCP DEFIS	PCU CHALLENGES	Before the start and during the work	Agreement drawn up with the owner / <i>Copy of agreement minutes</i> Number of people compensated Number of complaints obtained

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
	custom with the population, if necessary, or compensate for not obtaining a voluntary transfer				
Atmospheric pollution, dust emissions and noise pollution from the movement of construction machinery and vehicles.	Mobilize materials, vehicles and machinery in good condition. Carry out regular maintenance of equipment, vehicles and machinery.	works company	BE work control	During the duration of the work	Inspection of equipment and vehicles / <i>Inspection report</i> Number of interviews carried out / <i>Interview register</i>
Loss of vegetation due to the development of the construction site. Disturbance of wildlife by destruction of natural habitats.	Make an inventory of the vegetation on the sites that will be occupied/used by the company Clearly define the area to be stripped to the bare minimum Avoid wooded areas as much as possible. Prohibit any cutting of trees with a DBH greater than 20 cm. Minimize deforestation and restore vegetation in borrow areas Revegetate and reforest if possible in appropriate places	works company	BE work control	Before the start of work	Area cleared; number of felled trees / <i>monitoring sheet; photo documentation</i>
Soil compaction and increased risk of erosion by clearing vegetation for the development of the site facility. Soil pollution by infiltration or leaching of polluting elements (eg fuel storage). Environmental degradation through the dispersion of waste.	Limit the footprint of the site installation to what is strictly necessary. Store the stripped topsoil nearby and put it back in place at the end of use of the site. Store fuel in a sealed area. Perform all maintenance and repairs in a sealed area. Implement a Site Waste Management Plan.	works company	BE work control	Before and during the works	Area cleared / <i>Monitoring sheet</i> Site rehabilitated at the end of the works / <i>Photo documentation</i> Fitted sealed area / <i>Ground plan; Photo documentation</i> Waste management plan available / <i>ESMP-site</i>
Alteration of the quality of water resources by wastewater discharges from the site installation.	Collect all the effluents from the site installation and pre-treat them before any discharge into the receiving environment.	works company	BE work control	During the works	Collecting structures developed; Fitted sealed area / <i>Ground plan; Photo documentation</i>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Water pollution by infiltration or leaching of polluting elements (eg fuel storage).	<p>Store the stripped topsoil nearby and put it back in place at the end of use of the site.</p> <p>Store fuel in a sealed area.</p> <p>Perform all maintenance and repairs in a sealed area.</p>				
<p>Risk of accident for the personnel and for the populations on the site.</p> <p>Risk of accident for the populations living near the axes used by construction machinery and vehicles.</p> <p>Disturbance for populations by dust emissions.</p> <p>Encroachment of the site installation on inhabited and/or operated property or land.</p>	<p>Equip staff with secure equipment adapted to the types of work (PPE)</p> <p>Educate staff on the risks and dangers on construction sites.</p> <p>Do not work during periods of low visibility (night, rain, etc.)</p> <p>Prohibit the consumption of alcohol during working hours</p> <p>Avoid inhabited or exploited areas when choosing the installation site.</p> <p>Provide site personnel with an individual protection kit; establish the wearing of this safety equipment; set up medicine boxes with the basic drugs needed for emergency care</p> <p>Installation of first aid kits in the living quarters</p> <p>Implement a Site Health and Safety Plan.</p> <p>In case of encroachment on an exploited area, proceed to a formal agreement with the owner and the user of the site, for the temporary occupation of the site.</p> <p>Enclose the site installation and prohibit any entry of anyone outside the project.</p> <p>Limit construction vehicle traffic speeds to 30 km/h, and 20 km/h when crossing villages.</p>	works company	BE work control	Before and during the works	<p>Agreement drawn up with the owner / <i>Copy of agreement minutes</i></p> <p>Health and safety plan available / <i>ESMP-site</i></p> <p>Number of accidents / <i>Accident register</i></p> <p>Existing medicine box</p> <p>Existence of a traffic plan and itinerary for vehicles and machinery</p> <p>Equipment Distribution Sheet</p> <p>Number of fire extinguisher</p> <p>Periodic vehicle maintenance sheet</p> <p>Number of panels installed</p>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Various pollution risks	<p>Collect solid waste from the site and dispose of it at authorized locations; recover and store used oils and greases in sealed containers; send them to a recycling center</p> <p>Set up an autonomous sanitation system,</p> <p>Place hydrocarbon storage tanks in sealed warehouses</p>	Works company	BE control, UCP	Before the works	<p>Number of garbage pits, number of latrines</p> <p>Number of hydrocarbon retention tanks, used oil recycling</p> <p>works supervision report</p>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
	<p>The entire area of the base camp will be waterproofed with lean concrete to prevent any infiltration</p> <p>Any accidental spillage of hydrocarbons will be cleaned up immediately, absorption by sand and recovery of the soiled sand</p> <p>Maintenance, emptying and washing of trucks and machinery in a single suitable and waterproofed place</p> <p>Setting up parking, maintenance and emptying areas</p> <p>Sorting construction waste for recycling: i) solid biodegradable waste (leftover food, paper, cardboard, old fabrics) must be buried, ii) solid non-biodegradable waste must be distributed in bins, separate plastic waste, metal waste, as well as special waste (oil cans, used parts, batteries, etc.)</p> <p>Installation of latrines, set up pit</p> <p>Set up an autonomous sanitation system,</p>				
Risks of water and soil pollution	<p>Avoid preparing concreting materials along watercourses; avoid cement spillage into the watercourse</p> <p>Risks of soil pollution by the products of oil spills, dangerous products, etc.</p>	Works company	BE control, UCP	During the works	Monitoring-evaluation sheet
Risks of disease spread	Inform and sensitize workers/site personnel and local populations on reproductive health, modes of	Works company	BE control, UCP	During the works	<p>Minutes of awareness meeting</p> <p>Number of mosquito nets distributed</p> <p>Existence of disinfectants</p> <p>Existence of hand washing station</p>

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
	<p>transmission and prevention of STIs/STDs and especially HIV/AIDS</p> <ul style="list-style-type: none"> - Organize free screening sessions for workers. -Keep the anonymity of the person concerned in the event of a positive result; and refer him to an appropriate care centre; and that this result does not constitute a reason for his dismissal -Make available and free of charge condoms for the workers in the places <p>Inform, educate and communicate on the safe use of drinking water</p> <p>Provide water disinfection products</p> <p>Provide mosquito nets to fight malaria</p> <p>Inform and raise awareness among workers and populations about the Covid 19 pandemic</p> <p>Keep soap and water on site for handwashing at all times</p> <p>Evacuate people at risk of contracting Covid 19</p>				Condom distribution sheet
Degradation of quarries and borrow pits	<p>Limit clearing as much as possible</p> <p>Obtain the relevant authorizations</p> <p>Level quarries and borrow areas with overdraft materials and then with topsoil (at site closure)</p> <p>revegetate</p>	Works company	BE control, UCP	During the works	Area cleared; number of felled trees / <i>monitoring sheet; photo documentation</i> Rehabilitated area
Air pollution by waste Air pollution by the transport of loose materials	<p>Wet the tracks used by construction vehicles, especially when crossing villages.</p> <p>Equip trucks transporting loose materials with tarpaulins;</p> <p>fill in the pits and latrines at the end of the rehabilitation works</p>				Activity reports Existence of watertight storage areas,) Monitoring-evaluation sheet

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
Risks of gender-based violence: - Sexual exploitation, abuse and harassment, etc., among workers and community members	Develop an information / awareness protocol with a specialized entity in order to anticipate otherwise, if necessary, to deal with related incidents Company employees (including subcontractors) as well as those of the Control / Surveillance Mission are required to attend information and awareness sessions on gender-based violence throughout the construction site.	Works company	BE works control, PCU, local authorities	During the works	Report of sensitizations on gender-based violence Number of complaints
Risk of increased ambient noise	Always put the base camp and the activities far from the villages as far as possible Work during working hours	Works company	BE works control, PCU, local authorities	During the works	Properly chosen site/ground plan Activity Report
Risk of destruction or degradation of sites of cultural, religious, archaeological or historical significance	In the event of the discovery of an object of cultural, archaeological or historical importance, protect the areas concerned with permanent fences and notify the local and direct responsible authorities. Cessation of activities Carry out an archaeological inventory in areas that contain valuable objects and preserve the discovered objects Negotiate with traditional authorities the preservation of sites and resources of cultural, religious, historical and aesthetic significance	Works company	BE works control, PCU, local authorities	During the works	Inventory completed Work stoppage noted
Production of resilient fodder					
Facilitation of erosion by rainwater runoff after forage harvest.	Do not leave the field empty too long between harvest and the next planting. Drain the site.	NGO	PCU	During the activities	Activity Report
Risk of interference with inhabited and/or exploited areas; loss of sources of income or livelihood.	Avoid inhabited or exploited areas for site selection.	NGO	PCU	During the activities	Number of people compensated Community and private sites operated

Potential impacts	Mitigation measures	Execution	Control	Due date	Achievement Indicators / Sources of Verification
	In case of encroachment on an inhabited or exploited area, proceed to a fair and equitable compensation of the person affected. Carry out activities on community and private land				
Introduction of innovative renewable energy efficient technologies					
Risks of non-involvement of vulnerable people and women	The program will follow an inclusive targeting strategy to reach poor households and vulnerable groups	NGO	PCU	During the activities	Numbers of poor households and vulnerable groups implicated
Risk of conflicts between beneficiaries for infrastructure maintenance activities	Establish a maintenance plan for the works, with a precise organization of the responsibilities of user associations. Establishment of community funds collected from user member fees. Some community members will also be trained in the operation and maintenance of infrastructure and who will be paid by the tax collected.	NGO	PCU	During the activities	Maintenance plan establish Association members trained in operation and maintenance of infrastructure Funds collected for maintenance

7.3. ENVIRONMENTAL MONITORING PROGRAMME

Monitoring consists of following the evolution of certain components of the natural and human environments affected by the project. The purpose of this activity is to verify the validity of the assumptions made regarding the project's environmental performance and the effectiveness of mitigation measures, if any.

The knowledge gained from the environmental follow-up will make it possible to correct the mitigation measures and eventually take corrective action.

The environmental monitoring programme for the DEFIS+ project, presented in the table below, describes: (i) relevant elements to be monitored; (ii) monitoring indicators (iii) monitoring methods/devices; (iv) monitoring responsibilities; (v) timeline for monitoring.

Environmental and social monitoring

Environmental and social monitoring serves to ensure that the environmental and social mitigation measures to be implemented during the works are being carried out. Environmental and social monitoring is to be carried out by the control offices that the DEFIS Program Execution Unit, i.e. the Environmental and Social Managers. Environmental managers must ensure that the service provider complies with its contractual clauses.

Environmental and social monitoring – evaluation

Environmental monitoring refers to observation and measurement activities aimed at determining the actual impacts of a facility or activity compared with the impact predictions made. Monitoring and assessment are complementary. Monitoring aims to correct, in real time, through continuous surveillance, the methods used to carry out interventions and operate infrastructures. As for evaluation, its aim is (i) to check whether objectives have been met, and (ii) to draw lessons from operations in order to modify future intervention strategies. Monitoring will be carried out by the project's Environmental and Social Safeguards Managers.

A further monitoring phase will be carried out by the National Office of Environment for sub project requiring an Environment Impact Assessment study, with the support of the Commune concerned, or by the environmental department of the Ministry concerned, with the support by the government structures of these departments at regional level.

Responsible actors	Environmental and social components to follow
<ul style="list-style-type: none"> National Office for the Environment (ONE) or sectoral service concerned, municipality, DEFIS, study office, companies, municipalities 	<ul style="list-style-type: none"> Implementation of the Environmental and Social Management Plan
<ul style="list-style-type: none"> Regional Directorate of Agriculture 	<ul style="list-style-type: none"> Agricultural landscaping, agricultural production and productivity, agricultural equipment
<ul style="list-style-type: none"> Directorate of rural engineering 	<ul style="list-style-type: none"> Construction of hydraulic structures
<ul style="list-style-type: none"> Regional Hydraulic Service 	<ul style="list-style-type: none"> Standards on the use of water resources, water quality

<ul style="list-style-type: none"> Regional Department of Environment and Sustainable Development 	<ul style="list-style-type: none"> Compliance of forestry activities
<ul style="list-style-type: none"> Plant protection services 	<ul style="list-style-type: none"> Improved seeds, use of chemical inputs, Genetically modified organisms GMOs
<ul style="list-style-type: none"> Regional Health Directorate 	<ul style="list-style-type: none"> Diseases especially waterborne diseases
<ul style="list-style-type: none"> Directorate of Public Works 	<ul style="list-style-type: none"> Quality Safety Environment on the Construction of Rural Roads

Indicators monitoring for DEFIS national and regional environmental managers:

Number of projects subject to environmental and social screening

- Number of projects that have been subject to an Environmental and Social Impact Assessment or an Environmental Commitment Program with an Environmental and Social Management Program implemented;
- Number of awareness-raising campaign (on the project, hygiene, safety during work)
- Number of people affected and compensated by the project;
- Number and nature of social conflicts linked to the work;
- Number of accidents caused by the work;
- Number of complaints recorded and dealt with during work;
- Regularity and effectiveness of local monitoring.
- Level of application of environmental and social mitigation measures;
- Number of training sessions organized;
- Number of producers made aware of hygiene, safety and IST/HIV/AIDS measures.
- Number of jobs created locally (local labor used for work);
- Level of compliance with working conditions and health, hygiene and safety rules by companies.

Table 13 – Environmental monitoring programme of the DEFIS+ project:

Monitoring indicators and responsibilities:

Components	Tracking items	Types of indicators and elements to collect	Periodicity	Responsible

Waters	State of water resources, hydrometry and water quality	Physico-chemical and bacteriological analysis of water (pH, BOD, COD heavy metals, germs, pesticides, nitrates, etc.); Sedimentation Hydrological regime flood condition Water withdrawal	Once in 2 years	Water control laboratories Directorate of rural engineering DEFIS hydraulics branch
Soils	soil degradation	State of pollution of the work site Sensitivity to wind and water erosion (area affected)	Monthly	Control office, DEFIS, National Office for the Environment or Sectoral Ministry DEFIS Regional Directorate of Agriculture and Livestock
	Fertility	Organic matter rate Composition of mineral elements Saturation rate Exchange capacity	Annual	Soil control laboratory, Regional Department of Agriculture and Livestock, municipality, DEFIS
	Land behavior and use	Developed areas Yields of major crops Type of crop	Annual	Regional Directorate of Agriculture and Livestock, Directorate of Rural Engineering, municipality, DEFIS

Vegetation Fauna	Evolution of biodiversity during the works	Number of Destroyed tree roots; Area of denuded areas, Alteration of habitats And revegetation carried out	Monthly	Works control office Department of Environment and Sustainable Development, DEFIS
	Evolution of biodiversity during the works	Biomass production; Soil cover rate; Agroforestry reforestation and soil cover actions	Annual	Works control office Department of Environment and Sustainable Development, DEFIS
Production Systems	Typology of facilities	Areas of developed watersheds Developed areas Number of dams constructed	Every 3 months	Regional Directorate of Agriculture and Livestock Department of Environment and Sustainable Development, DEFIS Directorate of rural engineering Communes
	•Evolution of agricultural techniques and technical performance	Developed and resilient irrigated areas; Cultivated areas adopting climate-smart agriculture techniques Adoption of resilient production techniques, adapted varieties, intensive rice cultivation system, agroecology, agroforestry	Annual	Regional Directorate of Agriculture and Livestock, DEFIS, municipalities Plant Protection Department

Human environment	Hygiene and health Pollution and nuisance Safety during operations and works	Existence of a conflict prevention and resolution mechanism Number of social conflicts on the sites Compliance with hygiene measures on site <ul style="list-style-type: none"> •Waste management practices; •Actions to fight against waterborne diseases; •Prevalence of /HIV/AIDS; Prevalence rate of water-related diseases (malaria, schistosomiasis, diarrhoea, schistosomiasis, etc.), Wearing adequate protective equipment; hygiene measures on site availability of safety instructions in the event of an accident; Local recruitment for works Gender parity in recruitment for works and at the level of activities Existence in the contracts of the Companies of the health plan, safety sanitation, the respect of the working conditions	Monthly	Control office ; DEFIS Technical management of the Ministries concerned (Ministry of Public Works or Ministry of Agriculture and Livestock or the National Office for the Environment) Regional Health Directorate
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7.4. IMPLEMENTATION OF THE ESMF

7.4.1. Roles and responsibilities in the implementation of the ESMP

Many entities will be involved in the environmental management of the DEFIS+ project:

- The project leader (UEP/DEFIS) who assumes responsibility for all the impacts caused by the DEFIS+ project, and is accountable to the local populations and the authorities, whether governmental or decentralized;
- The DEFIS environmental and social safeguard team, responsible for monitoring the environmental and social aspects related to the DEFIS+ project, before and during the implementation of the works, then during the operation of the infrastructures; Staff training on environmental and social issues; • Sensitization and training of its partners on environmental and social issues; • Completion of the preliminary environmental assessment; • Monitoring the progress of the study; • Verification of the compliance of the study with the terms of reference; • Ensure that the ToRs and environmental studies take into account the general and specific HSE Directives by type of sub-project; • Preparation of required ESMPs • Implementation and internal monitoring of ESMPs
- The contracting companies for the works :

The implementation of most of the environmental and social measures that will be associated with the sub-projects will be the responsibility of the construction companies, in particular through the implementation of the requirements of the safeguard documents (ESIA, simplified ESMP, environmental directives and social...).

Regional Office of Environment is responsible for environmental screening of sub-projects requiring an environmental assessment, Participation in screening; •Participation in the monitoring of project activities, which issues environmental permits, issues the discharge for the case of an Environmental Impact Study.

- The Technical Project Manager (MOeT) :

The Technical Project Manager will be the entity selected by the Delegated Project Owner (UE/DEFIS) to monitor the execution of the works, under the conditions of time, quality and cost set by the latter and in accordance with the contract of works. It is the study office which will be responsible for carrying out the control and supervision of the works, the follow-up of deadlines and budgets according to the terms defined in his contract.

The Technical Project Manager thus assumes the responsibility of the project manager on behalf of the Project Owner. He will be the secretary of the site meetings and will lead any visit of the personalities or civil servants on an official visit to the site and will explain to them the technical-administrative and environmental explanations necessary for the progress of the work.

He will record any anomaly and decision taken on the site concerning the environment and social matters in the monthly environmental and social monitoring report which he will have validated by the UE/DEFIS. The MOeT Environmental Expert will therefore report on the effectiveness of the measures taken and may propose measures if necessary.

- Partners of the DEFIS Program

The implementing partners of the DEFIS Program (eg FDA / FDAR, TTMR, NGOs, POs) must ensure that all their interventions, activities under the Program comply with the ESMF.

- Ministry Technical services concerned

They contribute to the monitoring and approval of activities, to the mobilization / management of communities (local authorities), They will thus base themselves on the CGES for the accomplishment of their role within the framework of the DEFIS Program.

7.4.2. Management of social aspects

a) Relations with local communities:

The DEFIS+ project will ensure effective communication with the communities in the project areas (Communes and fokontany concerned) to avoid possible misunderstandings.

In particular, information meetings will be organised to inform them of the timetable and progress of the work.

b) Land aspects in the areas of intervention

Tensions related to land are always delicate. In order to avoid new negative impacts linked to sub-projects for the rehabilitation and development of irrigated perimeters and to guarantee the success of these projects, they must therefore be designed in such a way as to “do no harm” to the land interests of the rural poor, especially women and vulnerable groups.

Within the framework of the DEFIS Program, land tenure security is not taken into account since the investments of small farmers are made in their own farm. On the other hand, within the framework of development and/or extension of irrigated perimeters, the local community should be associated, the decentralized services and decentralized services of the State will be associated with any allocation of new agricultural plots.

The conduct of an awareness campaign is recommended by all available means and affecting all social strata in the beneficiary areas. This campaign must consider the dissemination of the necessary information, facilitate and support the sharing and dissemination of the results of the studies relating to the sub-projects with a view to its understanding and its appropriation by all social strata. This is to reassure the population and to adhere to the latter in all the processes on the technical and social level.

c) Involvement of women and vulnerable groups in agricultural activities

As part of the implementation of the project, all the activities of the sub-components of the project ensure that they particularly benefit women and young people, especially vulnerable groups, in fact, women and Women's Groups have certain advantages relating to Agriculture, the environment and the social sector to succeed in part of the activities of the sub-projects to participate fully in the achievement of food self-sufficiency. DEFIS will follow an inclusive targeting strategy to: (i) reach poor households and vulnerable groups, especially those suffering from chronic staple food deficits; and (ii) identify intervention sites and activities that will generate sustainable positive outcomes for the livelihoods of target households in a changing climate. This strategy will include: (i) geographic targeting; (ii) targeting of the most vulnerable groups (including households headed by women, persons with disabilities and unemployed young people and the elderly); and (iii) facilitation and empowerment measures. The project's intervention strategy takes gender aspects into account through the following measures: allocating a quota of plots to women (positive action) for a good positioning of female agricultural producers during new developments of the Program's irrigated perimeters; encourage and incite women and women's groups to invest mainly in the processing of products; strengthen IEC activities to improve the quality of women's training and access to information.

Taking gender into account should be based on a dual approach aimed at:

Strengthen the organizational dynamics of women, so that they can move towards specialization in certain sectors (small market gardening areas, marketing of rice, etc.) and have a more decisive influence in the decision-making processes within families and the community. community ; And

Provide women with local support/advice, with a view to promoting their access to credit and effective management of the activities they carry out. In this context, they will benefit from training in developing entrepreneurial capacities for empowerment through the GALS approach, the methodology of the Gender Action Learning System (GALS), widely promoted in the IFAD portfolio, is a cost-effective methodology for households capable of delivering both gender transformative and social inclusion outcomes in rural communities. On the other hand, Seikatsu Kaizen also aims to make populations autonomous, and also to strengthen women in the management and management of their economic activities.

8. DISCLOSURES ABOUT THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK AND ENVIRONMENTAL IMPACT ASSESSMENTS:

With a goal of ensuring that the project's achievements are appropriated and perpetuated by the local communities in the target areas, the project, in conjunction with the Communes concerned, must plan to support the process of preparing and implementing the project's activities with information, awareness-raising and training activities to bring about a change in behavior.

The Executing Unit will coordinate the implementation of information and awareness-raising campaigns among beneficiaries, Communes and fokontany concerned by the project, on the environmental and social management framework of the DEFIS Program.

In accordance with the Green Climate Fund's information disclosure policy, reports on environmental and social safeguards (from accredited entities) must be disclosed at various times, 30 days in advance of meetings of the FVC Board of Directors or of the accredited entity for category "B". Reports on environmental and social safeguards must be posted on the accredited entity's website, on the FVC website along with the other project proposal documents, and also in "appropriate places for the populations concerned. These documents should be available in English and the local language.

For infrastructure works requiring the preparation of an Environmental Impact Assessment or Environmental Commitment Program, meetings will be held to disseminate the Detailed Pre-Project and Environmental Reports at local level and in the local language. These documents will also be disseminated in appropriate places by the local population.

Finally, the project may assign local liaison officers who will have access to project documents. These will be made available to the local population and their representatives for review at any time during project implementation.

9. GRIEVANCE REDRESS/ COMPLAINTS MANAGEMENT MECHANISMS:

9.1. OBJECTIVE

The objective of this PMM can be defined as a system to collect, resolve and address stakeholder concerns and complaints within a reasonable time that can satisfy both the Complainants and the Program.

The main objectives of the mechanism are to:

- (i) put in place a system allowing beneficiaries to express their concerns or suggestions concerning the actions of the Programme;
- (ii) provide a means and a tool to identify, avoid, minimise, manage, and if necessary take charge of the actions/activities that have been the subject of grievances; And
- (iii) take appropriate corrective measures

The implementation of the MGP will allow the Program to:

- Involve direct and indirect beneficiaries throughout the Project and give them the opportunity to express their dissatisfactions - their concerns, questions, problems and claims in a rational and transparent manner
- Respond to concerns expressed, following a transparent process thus avoiding endless discussions about disputes,
- Improve the environmental and social performance of the Program,
- Establish and maintain a permanent dialogue between the various stakeholders on the management of the project and the reciprocal expectations of each other,

- Create and disseminate an appropriate framework for local communities to voice their complaints,
- Improve services and optimize the satisfaction of local communities,
- Implement fair and appropriate solutions in response to complaints and concerns raised.

9.2. DEFINITIONS

TERM	DEFINITION
Complaints	Expression of dissatisfaction or dissatisfaction with the quality or non-compliance of the services provided and with the effect or impact of the Project activities on the environment of the beneficiaries (general meaning) Denunciation of an offense by the person who has been the victim (in the context of legal proceedings).
Complaint/Grievance	Complaint or grievance, usually made by subordinates to a superior.
Claim	Action to protest, to claim, to claim something to which one feels entitled
Grievance	Subject, reason for complaint that one considers to have against someone or his attitude (general meaning) Statement of the reasons for a legal claim (in the context of legal proceedings)
Complaint management mechanism	An organized and institutionalized method, including clearly defined roles, and rules and procedures for systematically handling and resolving complaints, grievances, disputes or disputes.
Complainant	An individual or group of individuals with a question, concern, problem or claim that they want addressed and/or resolved.
Vulnerable person:	Fragile person, exposed to the risk of being injured and having their rights violated: person in a situation of weakness (physical and/or mental) pregnancy, illness, old age, disability

9.3. THE DIFFERENT TYPES OF COMPLAINTS:

Without being exhaustive, the complaints potentially formulated by the stakeholders can be grouped into the following three categories according to the reasons:

CATEGORIES	REASONS
Social, cultural	<ul style="list-style-type: none"> - Gender Based Violence, including sexual exploitation and abuse, and sexual harassment - Discrimination based on gender, ethnicity - Disputes arising in the environment of the Project and impacting its implementation - Dissatisfaction / fear in relation to the outcomes of the Project - Non-respect of habits and customs in the implementation of the Project - Non-involvement of local populations living near the project's area of influence - Accident cases - Land dispute

Environmental and ecological	<ul style="list-style-type: none"> - Damage to natural resources - Damage caused by Project activities and not repaired
Economic	<ul style="list-style-type: none"> - Corruption, conflicts of interest, fraud in procurement and payments (false invoices, etc.) - External interference in the awarding and management of contracts - Dissatisfaction with the targeting of beneficiaries, governing bodies, service providers, types of projects to be financed and the site of intervention - The delay in the availability of funds; - The feeling of having been wronged in the implementation of the project - Failure (real or perceived) of the Project in the management of funds
Technical and technological	<ul style="list-style-type: none"> - Dissatisfaction or fear with the outcome of the project - Delay (real or perceived) in implementation on the ground - Damage caused by Project activities and not repaired - Cases of serious accidents occurring as a result of Project activities - Failure (real or perceived) of the Project in terms of support and technical assistance - Technical termination
Political and institutional, legal	<ul style="list-style-type: none"> - Political disputes caused by the project, which may impact its implementation and tarnish its image - Disguised destabilization aimed at thwarting the realization of the Project and tarnishing its image
Procedures	<ul style="list-style-type: none"> - Procurement, fiduciary, administrative

9.4. PROCEDURE FOR HANDLING A COMPLAINT IN GENERAL

Dispute settlement procedures and bodies must be put in place to receive and decide on any disputes during the implementation of the DEFIS.

The proposed complaint management mechanism is illustrated in the figure below, from the receipt of the complaint until its resolution or conclusion.

a) Who can file a complaint

Any individual or group of individuals, beneficiaries, elected authorities (mayors, deputies, etc., etc.), populations, including DEFIS Program staff directly affected by the activities of DEFIS and its service providers within the framework of the Program, as well as those who may have interests in connection with the Program

b) Collection and recording of complaints

DEFIS will make available several channels or reporting tools and different formats for submitting complaints. Thus, each user will use the channel or format that suits him.

Depending on the types of channels available, complaints will be collected periodically as follows:

- Grievance boxes with the PCU: /DEFIS and the CIR (Interregional Coordination of DEFIS)
 - UCP: Batch IPA 112 Anosimasina Itaosy
 - Fianarantsoa Interregional Coordination: Rural Engineering Enclosure Kianjasoa 301
 - Fianarantsoa Fort Dauphin Interregional Coordination:
 - Interregional Coordination of Manakara

- Complainants can make their complaint orally via the email address (fitarainana.defis@gmail.com):
- Ordinary letter, registered letter and e-mail addressed directly to DEFIS: The counting of the letters and e-mails received by DEFIS will be carried out each day. A complaints register will be maintained to record the order of receipt of complaints;
- Complainants can lodge their complaint with the DRAE
- The project will make available to the Communes of intervention of the project “grievance boxes”.
- The project will set up a green line

c) Content of a good complaint: A good complaint should contain, among other things, the following elements

Elements	Information
Complainant's name	This is an element that makes it possible to verify the veracity of the information contained in the complaint and therefore to promote the processing of the complaint by the person or body responsible for it.
The description of the alleged act	The act complained of by the complainant must be described in detail, taking care to provide as much useful information as possible; Otherwise, in this section, it is appropriate to relate the facts as they were experienced
Name, function of the author of the alleged act	This is to contribute to the identification of the perpetrator of the alleged act by providing information on his name, his function or that of his accomplices. It would also be wise to specify the status of the perpetrator of the act alleged in the complaint;
Place of commission of the decried act	Geographic location of where the act was performed must also be revealed. This information makes it possible in turn to give credibility to the complaint, the veracity of the act decried in the complaint and above all to take measures so that these actions no longer occur.
Period (if possible) of commission of the alleged act	It is important that a complaint includes clear and precise information on the date or at least the period of commission of the decried act. These elements constitute important evidence to support the complaint
Any other useful information for handling the complaint	This is additional information that does not fit into one of the headings mentioned above but the consideration of which may help to strengthen the complaint or denunciation.

9.5. STEPS FOR HANDLING COMPLAINTS

Once registered in the complaints register, a rapid assessment of the complaint will be carried out to determine its nature and eligibility:

- Complaints for which the links with the activity components of the DEFIS are not established will be rejected. The reasons for the rejection will be formulated and sent to the complainants within five (5) working days of their receipt;
- Complaints deemed eligible will be sorted according to their nature and then classified according to their degree of seriousness: Once it has been decided how the grievance will be managed, the counting of complaints will be done every weekend for complaints received at the level of the CIR / UCP and will send the complainant an acknowledgment of receipt confirming the admissibility or otherwise of the complaint. For complaints received at the local level, the examination of complaints will be done every 15 days. The following stages of the complaints and appeals process will be presented in said acknowledgment of receipt. In the case of moderate severity or non-sensitive grievances, a response should be able to be provided within ten (10) working days, while higher severity or sensitive grievances may require a longer period of time. long due to the greater complexity of the investigation process without exceeding a period of forty (40) working days. The complainant should therefore be clearly notified. Responses should, whenever possible, be in writing and be recorded so that it can be verified that a response has been provided and acted upon.
- Visit to the site or place of the complaint to observe the situation on the ground

For some complaints, an on-site inspection or a cross-check on the complaints received must be made in order to verify the veracity and seriousness of the complaint. The actions to be taken are:

- Obtain as much information as possible from the person who received the complaint
- During the on-site visit or cross-checking, if it is damage caused by the execution of a DEFIS project, take a photo of the damage

A. Processing by the Project Management Committee: PCU/CIR:

Complaints are handled by a commission at the level of the PCU or the CIR depending on the case of existing complaints. He will be responsible

- Ensure that cases are handled in accordance with the mechanism;
- Ensure that complaints management follows a consistent approach;
- Analyze the results of the process at the national level;
- Give its opinion on the handling of these grievance cases, which is the final decision of the DEFIS Program; And
- Follow up on results of review and investigation initiated by RSES.

B. Referral to resource persons:

Under the direction of the National Coordinator or the Interregional Coordinator, the latter is responsible for determining whether other managers or other stakeholders are required for the solution proposal to review unresolved grievances at the first level of treatment or seriousness grievances. very high or sensitive Including referral to the DJAC (Department of Legal Affairs of the Ministry)

C. Legal treatment:

Legal recourse is the third and final level of complaint handling within the DEFIS Program. It will only be done after having exhausted all attempts at amicable settlement, whether it is a simple amicable treatment or amicable treatment by mediation.

The person who submitted the complaint and who remains dissatisfied will have the right to lodge his grievance with the competent court to hear it.

9.6. SEA/SH COMPLAINT MANAGEMENT STEPS (SEXUAL EXPLOITATION AND ABUSE)

Gender-based violence (GBV) and sexual exploitation, abuse and harassment (SEAH) cuts across multiple spheres including individual, relationship, community, institutional and policy levels. While sexual violence can impact anyone, sexual violence is largely considered a gender-based violence, with women and girls made as primary targets. IFAD has no tolerance towards acts of SEAH and takes action to prevent SEAH from occurring in the first place and ensures a prompt and effective response to allegations.

DEFIS+ component interventions, depending on their scope, can exacerbate existing risks or can create new ones. Risk factors may include:

- Unequitable sharing of income between men and women after sale of agricultural produce;
- Unequal access to markets for agricultural produce;
- Low employment rates of women;
- Low representation of women in decision-making positions in community organizations;
- Limited fertile land and other assets for agriculture, which may require hiring of land especially by the youth and women, often based on informal agreements.

All these can exacerbate already existing inequities between women, men, and youth.

The prevention and mitigation of GBV/SEAH requires interaction and collaboration between major actors within DEFIS+. These may include:

- i. Women and their children, as well as other vulnerable populations, in communities where DEFIS+ will be implemented;
- ii. The communities including cultural, religious and informal structures who may play a protection role;
- iii. PMU and implementing partners who are responsible for following contractually mandated social and labour practices that prevent abuse and violence;
- iv. Workers including extension officers who will need to abide by codes of work ethics or codes of conduct.

In the DEFIS+ context, SEAH/GBV assumes a medium risk level, and therefore the project will deploy the following strategies:

- Social and economic inclusion of women and young women in the project to improve their livelihoods and reduce poverty which is a risk factor for GBV;
- Use of the Gender Action Learning System (GALS) methodology to handle GBV/SEAH and other gender and youth related inequalities at the household, livestock farmer group and community level;
- Sensitize communities especially the vulnerable populations on the laws and services that can protect them and provide redress in case of an incident;
- Require every DEFIS+ Implementing Partner to sensitise their workforce on GBV/SEAH and sign a code of conduct;
- Awareness creation among PMU and implementing partners;
- Training the PMU team and Implementing Partners on conflict sensitivity and the 'Do No Harm' Principle.

Special provisions will be made in the case of sexual harassment, gender-based violence and sexual abuse of children. Partnership agreements will be developed with specialized entities or bodies to handle these complaints or

denunciations. Thus, all related complaints and denunciations will be directly transferred and processed by these specialized entities.

The only receipt and review procedures incumbent on a Mechanism are as follows:

- Receive the initial complaint
- Determine the immediate protection and assistance needs of the victim/complainant
- Establish the nature of the complaint
- Identify the organization to which the allegations will be forwarded
- Return allegations
- Notify the complainant that their complaint has been received (if not collected in person)
- Refer the survivor to appropriate victim protection services

9.7. RESPONSE AND TAKING ACTION

Following a review and investigation, something should be corrected, modified, or changed to improve the situation and resolve the problem. A formal complaint will require an obvious response from DEFIS. It is essential to communicate clearly to the complainant the findings resulting from the review and investigation process and to keep him duly informed of the measures that will be taken as a result of what has been decided. The information provided to the complainant constitutes an assurance on consideration of his complaint. Responses should be in writing and will be systematically documented.

9.8. APPEALS

If the response is not accepted and the parties involved cannot reach a resolution, the complainant may decide to appeal the response. The appeal will allow DEFIS to re-examine the investigation already carried out and to determine whether it is necessary to maintain the first decision or to take a new one on the basis of the findings resulting from this re-examination.

For greater objectivity, the new investigation should be conducted by people different from those who took part in the first investigation, in order to demonstrate to the complainant the impartiality and security of the procedure and to maintain confidence in the complaint management mechanism. The circuit for processing an appeal will be amicable by mediation.

9.9. MONITORING, CLOSING, CONSOLIDATION AND REPORTING

Once a resolution to the complaint has been agreed or a decision to close the case has been made, the final step will be to resolve, track, close and archive, and conclude the complaint. the complaint.

The closing of the file will occur after the verification of the implementation of a conceivable resolution for all. The RSES may ask the complainant to provide feedback on their level of satisfaction with the complaint handling process and the outcome.

Starting from the database, which is updated regularly, a report describing the situation of complaints must be drawn up periodically. A summary of this report will be included in the periodic report of the DEFIS Program to IFAD. In addition, serious complaints such as sexual harassment, gender-based violence and cases of corruption should be brought to the attention of IFAD as soon as possible.

To judge the proper functioning of the MGP, a monitoring system will be set up with the following quarterly performance indicators:

- Number of complaints received
- Number and rate of eligible complaints
- Number and rate of resolved complaints

- Response rate
- Number of cases of reprisals following denunciations
- Average processing and response time
- Channels used by the complainant to transmit the complaint: - person - telephone - SMS/text - Electronic message and/or mail – leaflet
- Recusal of Complaints Management Team Members
- Number of cases where solutions resulted in appeals by complainants

Archiving

The project will set up a physical and electronic filing system for complaints, consisting of three modules:

- (i) Complaints received
- (ii) Complaints handled
- (iii) Unresolved complaints requiring further action

9.10. MGP MANAGEMENT ACTION PLAN

This procedure will be distributed, implemented internally by DEFIS, to its technical partners, and to its various stakeholders to ensure that they are aware of this procedure and that all complaints are handled in the same way.

The complaint management mechanism will be published everywhere, as well as at all the places of execution of the works. The dissemination of the mechanism will mainly target the final beneficiaries (individuals, government agencies, local communities, etc.), bidders, indirect beneficiaries, etc.

This dissemination will be followed by outreach to stakeholders in order to also convince them to participate in the implementation of the mechanism.

In any case, major communication actions must be carried out to successfully implement the MGP.

Thus, it is necessary to:

- Raising awareness during audiovisual broadcasts
- Directly inform the beneficiaries through awareness sessions on the activities of the Project
- Publish in the neighborhoods/villages/groups affected by the Project, the complaints management mechanism - post on the Project website, a brief presentation of the complaints management system and the possibilities for filing complaints
- Make information and documents necessary for filing complaints available to stakeholders on the Project website, so that they can verify the steps in the process of their complaints - create banners, posters and other communication materials direct for preliminary meetings
- Sensitize NGOs and complaint management units or committees .

Social integration of the project & CSR approach:

In the framework of Corporate Social Responsibility (CSR), the DEFIS+ project will strengthen mutual trust with the communities in the DEFIS+ project areas, by adopting ethical and transparent behaviour contributing to the social development of the communities, integrating social and environmental concerns. The project will thus ensure that the Companies in charge of the works give priority to local people when recruiting workers for the works, within the limits of the available skills and according to the needs of the project, and will contribute as far as possible, through a voluntary approach, to actions of public interest.

9.10.1. Environmental report

For each sub-project, the environmental monitoring report will be prepared by the Works Control Mission on a monthly basis.

The objectives of the environmental monitoring report will be to (i) report on the implementation by the Contractor of the environmental requirements of the ESMP of the project (which the Contractor will have previously accepted and signed), (ii) report on non-conformities and formulate measures to be taken, and (iii) propose solutions for unanticipated environmental problems. The monitoring report will be based on the findings of the Monitoring Mission during its inspections at the various works sites.

9.11. CAPACITY BUILDING

Training of the Consulting firms and Companies pre-selected for the implementation of the DEFIS+ project would be more than beneficial for the project. Indeed, these actors will be responsible for ensuring the effective and efficient integration of the environmental and social dimensions in the implementation of the various sub-projects envisaged. They will be responsible for the preparation, implementation, environmental and social monitoring or control, and supervision of these sub-projects.

The training will thus aim to strengthen their skills in environmental and social assessment, environmental and social control of works, and environmental and social monitoring, so that they can play their respective roles effectively in the implementation of the various activities.

Information and sensitization campaigns among the beneficiary municipalities would also be useful. The objectives of these campaigns would be to: prepare the local communities to ensure the maintenance and management of the built/rehabilitated infrastructures; sensitize the population on aspects relating to hygiene, health and safety; sensitize the communal services for the maintenance of the infrastructures.

10. CONCLUSION

The DEFIS+ project constitutes a real opportunity to improve the living conditions of local communities in the beneficiary communes, particularly in terms of resilience to risks and climate change.

The analysis of the potential impacts of the project has highlighted some impacts that have been assessed as significant. However, these can be mitigated by environmental and social measures that will reduce the risks to an acceptable level.

The project's Environmental and Social Management Framework has been prepared to ensure that the environmental and social measures defined are effectively implemented during the different phases of the project (construction phase, operation phase of the built infrastructure).

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ANNEX 1: ESIA ENVIRONMENTAL IMPACT ASSESSMENT TORs

ESIA Environmental Impact Assessment TORs :

Thus, the environmental and social impact study will include the following main information :

Summary . Concise presentation of the significant results of the impact study and the recommended measures.

Intro . Rationale for ESIA, based on critical review of environmental, social and climate issues. Concise presentation of significant findings and recommended actions. Presentation of the approach and methodology adopted.

Political, legal and administrative framework . Examination of the general policy framework of public authorities, and of the legal and administrative frameworks in the context of which the ESIA is prepared. Presentation of national policies concerning the environment and climate change, and relevance of the project for these frameworks. Relevant international conventions and treaties ratified by Madagascar.

Description of the project . Concise description of the project and its geographical, climatic, ecological, social and temporal context, with particular emphasis on the specific components of the project subject to the ESIA – i.e. those likely to have an impact positive or negative – in line with the environmental, social and climate screening and scoping exercise.

Reference situation . Definition of the study area and description of the relevant physical changes observed and predictions relating to climate change, biological and socio-economic conditions (including the level of environmental awareness of the community), including any changes expected before the start of the project . Description of ongoing or proposed development activities in the project area. Description of the environmental, social and climatic context in a quantitative form to enable measurement of project results.

Anticipated socio-economic impact and risks and mitigation measures . This involves assessing the positive and negative social and economic impact likely to result from the proposed project or a component of this project. Particular attention will be given to optimizing possible alternatives, avoiding involuntary resettlement, enhancing gender equality and empowering women, and reducing vulnerability to the risks/effects of climate change and variability. In all cases, the Consultant should emphasize the participation of key stakeholders, and especially vulnerable groups and marginalized poor communities, in the environmental and social assessment process, and taking into account public health concerns. (such as HIV/AIDS, Covid-19).

Anticipated environmental impact and risks and mitigation measures (including climate change) . This involves determining and evaluating the positive and negative impact likely to result from the proposed project or a component of this project, and vice versa (preventive measures and/or mitigation measures should be determined, as well as the possible residual negative impact that cannot be mitigated). Opportunities for building resilience to climate shocks and making improvements to environmental issues will be explored. Analysis and in-depth analysis of the risks associated with climate change in the project area should be undertaken so that adequate adaptation measures are planned among the interventions, and in the analysis of the project's risk for long-term sustainability results. The extent and quality of available data, major data gaps, and uncertainties associated with predictions should be identified and estimated. Topics that do not require additional attention should be specified. The environmental and social category of the project will be confirmed, in accordance with the provisions of the ESMF of the DEFIS Program.

Cumulative Impact Assessment . This will involve determining the potential environmental and social impact, positive and negative, of the project, as well as other relevant activities, ongoing or planned, or activities that can reasonably be expected to be undertaken. Consideration will be given to the effects of these other activities on the project's vulnerability to climate change. The ESIA should explain how the DEFIS Program can maximize opportunities and avoid, minimise, mitigate or compensate for cumulative impact. For a significant impact beyond the control of the project, the ESIA should identify the necessary actions to be taken by other parties.

Analysis of alternatives (analysis of alternatives to the project). Systematic comparison of proposed investment and design, site and technology, and operational alternatives, from the perspective of their potential environmental impact, resilience and social aspects; capital expenditure and recurrent expenditure; good adaptation to local conditions; and guidance on institutional, training and monitoring plans.

Recommendations for changes in project design. Identification of feasible and cost-effective measures that can reduce climate vulnerability and reduce potentially significant adverse environmental impact to acceptable levels, and estimation of potential environmental impact; capital expenditure and recurrent expenditure; and orientations on the institutional plans, training and follow-up of these measures. The Consultant shall consider compensatory measures if the mitigation measures are not feasible or cost-effective.

Institutional aspects. Assessment of the existence, role, capacity and capability of formal and informal institutions for climate change and natural resource management, including government departments responsible for environmental issues at the site (at site level. agency and ministry), and informal and community-level institutions. Organizations responsible for managing social impact should be included in this assessment. The Consultant will make recommendations regarding the strengthening, creation and/or expansion of these services, as well as training adapted to the identified target groups, to the point where the recommendations of the ESIA can be implemented.

Arbitration procedure (complaints management mechanism). This section will describe the grievance procedure (formal and informal channels), indicating the timeline and processes for resolving complaints related to the environmental and social performance of the project.

ESMP (including implementation arrangements). Determine preventive measures and/or mitigation measures recommended to eliminate, reduce or mitigate climate risks and the potentially negative environmental and social impact of the project, as well as the parties responsible for the implementation of these actions/measures, schedule of activities related to project phases, environmental monitoring and follow-up plans, cost estimate, etc. The ESMP may also consider the protection of investments against climatic hazards.

Report of consultations. Records of consultations conducted during the ESIA should be included to gather the informed views of affected people and local stakeholders. The report must document the consideration of the results of the public consultation, in terms of influence on the design of the project and/or its execution. The report will also specify the means other than consultations used to gather the views of affected people and local stakeholders .

II.2. Deliverables

The Consultant will produce the following deliverables:

- Draft ESIA report
- ESIA report final version, taking into account comments from DEFIS and IFAD on the draft version

III. Consultant Profile

The Consultant will be a firm with proven skills and experience in conducting similar studies: 10 years in environmental and social assessment, with sufficient knowledge of national legislation on environmental and social assessment, as well as environmental and social procedures of IFAD.

The firm must therefore have a team with at least the following key personnel, with experience in the preparation of environmental and social safeguard tools:

Team leader, specialist in the field of the environment and/or social, with an engineering degree (Bac+5) in environment or socio-economics or related sciences. At least 8 years of experience in environmental and social impact studies in developing countries. Very good knowledge of the local context of rural Madagascar. Experiences in the field of public consultations. Have coordinated at least 5 environmental and social impact studies.

An Environmentalist with at least a Bac+4 diploma, in environmental sciences, agronomy, forestry or related sciences. At least 5 years of experience in ecological studies and/or environmental impact studies. Very good knowledge of the local context of rural Madagascar.

A socio-economist, with at least a Bac+4 diploma, in sociology, anthropology, geography or related disciplines. At least 5 years of experience in socio-economic studies, social impact studies. Very good knowledge of the local context of rural Madagascar. Experiences in the field of public consultations.

IV. Completion time

The duration of the mission is *[to be completed]*. Delivery of the draft ESIA report: T0 + *[to be completed]* Delivery of the draft ESIA report: T0 + *[to be completed]*

Annex 2 – IFAD environmental and social exclusion list

IFAD will not knowingly finance, directly or indirectly, projects involving the following:

- (i) Production or activities involving harmful or exploitative forms of forced labour⁷, or practices, which prevent employees from lawfully exercising their rights of association and collective bargaining;
- (ii) Production or activities involving harmful or exploitative forms of child labour⁸;
- (iii) Production or activities that impinge on the lands owned, or claimed under adjudication, by indigenous peoples, without full documented consent of such peoples;
- (iv) Activities prohibited by host-country legislation or international conventions relating to the protection of biodiversity resources, cultural heritage or other legally protected areas⁹;
- (v) The production, trade in or use of any product or activity deemed illegal under host country (i.e. national) laws or regulations, international conventions and agreements, or subject to international phase-out or bans, such as:
 - (a) Products containing polychlorinated biphenyls (PCBs);
 - (b) Pharmaceuticals, pesticides, herbicides and other hazardous substances subject to international phase-outs or bans¹⁰;
 - (c) Ozone-depleting substances subject to international phase-outs regulated by the Montreal Protocol¹¹;
 - (d) Wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)¹²; and
 - (e) Transboundary trade in waste or waste products, as defined by the Basel Convention¹³;

⁷ Forced labour is work exacted under the threat of penalty and for which the worker has not offered himself or herself voluntarily. It can involve threats of dismissal or physical violence, the withholding of identity documents or wages, threats to report workers to immigration authorities and entangling workers in fraudulent debt.

⁸ Child labour includes: (i) labour below the host country's minimum age of employment; and (ii) any other work that may be hazardous, may interfere with a child's education, or may be harmful to a child's health or physical, mental, spiritual, moral or social development. If national laws or regulations provide for employment of children of at least 16 years of age (in line with ILO's 1973 Minimum Age Convention), on the condition that their health, safety and morals are fully protected, and they have received adequate instruction or vocational training in the relevant branch of activity, then child labour means employing children for work that does not comply with these laws and regulations.

⁹ Relevant international conventions include the: Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention); Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention); Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention); World Heritage Convention; and Convention on Biological Diversity.

¹⁰ Relevant international conventions include the: United Nations Consolidated List of Products whose Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or not Approved by Governments; Convention on the Prior Informed Consent Procedures for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention); Stockholm Convention on Persistent Organic Pollutants; and WHO Classification of Pesticides by Hazard. A list of pesticides, herbicides and other hazardous substances subject to phase-outs or bans is available at <http://www.pic.int>.

¹¹ A list of the chemical compounds regulated by the Montreal Protocol, together with details of signatory countries and phase-out target dates, is available from UNEP.

¹² A list of CITES species is available from the CITES secretariat.

¹³ See <http://www.basel.int>.

- (vi) Commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old-growth forests;
- (vii) Production or trade in wood or other forestry products other than from sustainably managed forests;
- (viii) Production or trade in alcoholic beverages (excluding beer and wine), tobacco or drugs;
- (ix) Marine and coastal fishing practices such as blast fishing, large-scale pelagic drift net fishing using nets in excess of 2.5 km in length or fine mesh net fishing harmful to vulnerable and protected species in large numbers and damaging to marine biodiversity and habitats;
- (x) Trade in goods without required export or import licenses or other evidence of authorization of transit from the relevant countries of export, import and, if applicable, transit;
- (xi) Production of, trade in or use of unbounded asbestos fibres;
- (xii) All mining, mineral processing and extraction activities;
- (xiii) Production or trade in radioactive materials¹⁴;
- (xiv) Gambling, casinos and equivalent enterprises, trade related to pornography or prostitution;
- (xv) Money laundering, terrorism financing, tax avoidance, tax fraud and tax evasion;
- (xvi) Production and distribution, or investment in media that are racist, antidemocratic or that advocate discrimination against an individual, group or part of the population;
- (xvii) Activities prohibited by host country legislation or other legally binding agreements regarding genetically modified organisms (GMOs);
- (xviii) Production of or trade in palm oil, unless from growers and companies with internationally recognised certification¹⁵124, or undergoing certification¹⁶;
- (xix) Production of soy in the Amazon region or trade in soy produced in the Amazon region, unless from growers with internationally recognised certification¹⁷.

¹⁴ This does not apply to the purchase of medical or veterinary equipment, quality control (measurement) equipment and any similar equipment where the radioactive source is trivial and/or adequately shielded.

¹⁵ For example, Round Table on Sustainable Palm Oil (RSPO).

¹⁶ This includes growers and companies that have initiated such certification process.

¹⁷ For example, Round Table on Responsible Soy Association (RTRS).

Annex 3- Environmental & Social Screening Form

(Guidelines: Site inspection of project site. The evaluation results to be a consensus of at least three officials)

Project Name:	District:
Project Location:	Name of Catchment
Name of Village:	Nature/Size:
Name, Signature & Designation of Evaluator(s): 1..... 2.....	Date of Field Evaluation:
	Sector

		Appraisal		Significance			<i>Potential Mitigation Measures</i>
		Yes	No	Low	medium	high	
1.0	Environmental and Social Screening						
	Will the project generate the following negative impacts						
1.1	Loss of trees/vegetation						
1.2	Soil erosion/siltation in the area						
1.3	Pollution to land- e.g. from diesel, oils						
1.4	Dust emissions						
1.5	Solid and liquid wastes e.g. open defecation						
1.6	Spread of HIV/Aids and other STI						
1.7	Borrow pits and pools of stagnant water						
1.8	Rubble/heaps of excavated soils						
1.9	Alien / Invasive species						
1.10	Spread of water borne diseases e.g. Malaria						

1.1 1	Loss of soil fertility						
1.1 2	Contamination from agrochemicals and pesticides						
1.1 3	Nuisance from smell or noise						
1.1 4	Reduced water quality and quantity						
1.1 5	Incidence of flooding						
1.1 6	Disruption of marriages						
1.1 7	Health hazards to workers and communities						
1.1 8	Removal of native trees						
2.0	Resettlement Screening						
	Will the project generate the following negative social and economic impacts?						
2.1	Loss of land by households						
2.2	Loss of properties –houses, structures						
2.3	Loss of trees by households						
2.4	Loss of crops by people						
2.5	Loss of access to river/forests/grazing area						
2.6	Loss of cultural site, graveyard land						
2.7	Conflicts over use of local water resources						
2.8	Disruption of important pathways, roads						
2.9	Loss communal facilities –churches						

Consultation (comments from beneficiaries)

ANNEX 4 ENVIRONMENTAL AND SOCIAL FIELD APPRAISAL FORM

The Field Appraisal is a process to confirm whether the sub-project is likely to have some significant impacts. It is a scoping exercise to determine possible project impacts on the ground, and it is applied when the District Screening team is not satisfied with the information in the screening form.

NAME OF PROJECT

Application Number:

PART 1: IDENTIFICATION

1. Project Name:

2. Project Location:

3. Reason for Field Appraisal: Summarize the issues from the Screening form that determine the need for a Field Appraisal.

4. Date(s) of Field Appraisal:

5. Field Appraisal Officer and Address:

6. Extension Team Representative and Address:

7. Community Representative and Address:

PART 2: DESCRIPTION OF THE PROJECT

8. Project Details: Provide details that are not adequately presented in the sub-project application. If needed to clarify sub-project details, attach sketches of the sub-project component(s) in relation to the community and to existing facilities.

PART 3: ENVIRONMENTAL AND SOCIAL ISSUES

9. Will the project:

Yes No

* Need to acquire land?

* Affect an individual or the community's access to land or available resources?

* Displace or result in the involuntary resettlement of an individual or family?

DRAFT REPORT

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK OF THE DEFIS+ PROJECT

ARTELIA MADAGASCAR / DÉCEMBER 2021 / MG2104

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If "Yes", tick one of the following boxes:

- The Resettlement Action Plan (RAP/ARAP) included in the sub-project application is adequate. No further action required.
- The RAP/ARAP included in the sub-project application must be improved before the application can be considered further.
- An RAP/ARAP must be prepared and approved before the application can be considered further.

10. Will the project:

Yes No

* Encroach onto an important natural habitat?

* Negatively affect ecologically sensitive ecosystems?

If "Yes", tick one of the following boxes:

- The Environmental and Social Management Plan (ESMP) included in the sub-project application is adequate. No further action required.
- The EMP included in the sub-project application must be improved before the application can be considered further.
- An EMP must be prepared and approved before the application can be considered further.

11. Will this project involve or introduce pesticides?

Yes No

If "Yes", tick one of the following boxes:

- The Pest Management Plan (PMP) included in the sub-project application is adequate. No further action is required.
- The PMP included in the sub-project application must be improved before the application can be considered further.
- A PMP must be prepared and approved before the application can be considered further.

12. Will this project involve or result in:

Yes No

* Diversion or use of surface waters?

* Production of waste (e.g. slaughterhouse waste)?

* New or rebuilt irrigation or drainage systems?

If "Yes", tick one of the following boxes:

- The application describes suitable measures for managing the potential adverse environmental effects of these activities. No further action required.
- The application does not describe suitable measures for managing the potential adverse environmental effects of these activities. An ESMP must be prepared and approved before the application is considered further.

13. Will this project require the construction of a small dam or weir? Yes No

If "Yes", tick one of the following boxes:

- The application demonstrates that the structure(s) will be designed by qualified engineers, and will be built by qualified and adequately supervised contractors. No further action is required.
- The application does not demonstrate that the structure(s) will be designed by qualified engineers, and will be built by qualified and adequately supervised contractors. The application needs to be amended before it can be considered further.

14. Will this project rely on water supplied from an existing dam or weir? Yes No

If "Yes", tick one of the following boxes:

- The application demonstrates that a dam safety report has been prepared, the dam is safe, and no remedial work is required. No further action is required.
- The application does not demonstrate that a dam safety report has been prepared, the dam is safe, and no remedial work is required. A dam safety report must be prepared and approved before the application is considered further.

15. Will the activities potentially have impacts on the working conditions, particularly the terms of employment, worker's organization, non-discrimination, equal opportunity, child labour, and forced labour of direct, contracted and third-party workers? Yes No

16. Will the project activities pose occupational health and safety risks to workers including supply chain workers? Yes No

17. Will the activities utilize significant amount of natural resources including water and energy? Yes No

18. Are there any other environmental or social issues that have not been adequately addressed?

Yes No

If "Yes", summarize them:

and tick one of the following boxes:

- Before it is considered further, the application needs to be amended to include suitable measures for addressing these environmental or social issues.
- An ESMP needs to be prepared and approved before the application is considered further.

PART 4: FIELD APPRAISAL DECISION

- **The sub-project can be considered for Funding.** Based on a site visit and consultations with both interested and affected parties, the field appraisal determined that the community and its proposed project adequately address environmental and/or social issues as required by the ESMF.
- **Further sub-project preparation work is required before the application can be considered further.** The field appraisal has identified environmental and/or social issues that have not been adequately addressed. The following work needs to be undertaken before further consideration of the application:

Any Further EA work such as ESIA, RAP/ARAP, or PMP will be added to the sub-projects file before the sub-projects is considered for Certification by the National Office of Environment.

Name of field appraisal officer (print):

Signature:Date:

Annex 5 – Evidence of Consultations



MINISTRE DE L'AGRICULTURE, DE L'ELEVAGE ET DE LA PECHE

SECRETARIAT GENERAL

PROGRAMME DE DEVELOPPEMENT DES FILIERES AGRICOLES INCLUSIVES (DEFIS)

COORDINATION INTER-REGIONALE DE MANAKARA

FICHE DE PRESENCE

Date : 02 Avril 2019

Objet : Atelier de consultation publique

Lieu : Nanampobonolona - Manakara

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24	FIDISON Léonard	RTM/CPM V7V	H	Ranokara	0342529777	
25	Thomas Jean Pierre	Maire	M	Bekatra	0349217565	
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MINISTRE DE L'AGRICULTURE DE L'ELEVAGE ET DE LA PECHE

SECRETARIAT GENERAL

PROGRAMME DE DEVELOPPEMENT DES FILIERES AGRICOLES INCLUSIVES
(DEFIS)_CIR FIANARANTSOA

FICHE DE PRESENCE

Date : 22 Mars 2019

Lieu : Espace Andry

Objet : Lancement officiel DEFIS (Apres midi)

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MINISTRE DE L'AGRICULTURE DE L'ELEVAGE ET DE LA PECHE

SECRETARIAT GENERAL

PROGRAMME DE DEVELOPPEMENT DES FILIERES AGRICOLES INCLUSIVES
(DEFIS)_CIR FIANARANTSOA

FICHE DE PRESENCE

Date : 22 Mars 2019

Lieu : Ecole Andry

Objet : lancement officiel DEFIS (Après-midi)

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MINISTRE DE L'AGRICULTURE DE L'ELEVAGE ET DE LA PECHE

SECRETARIAT GENERAL

PROGRAMME DE DEVELOPPEMENT DES FILIERES AGRICOLES INCLUSIVES
(DEFIS)_CIR FIANARANTSOA

FICHE DE PRESENCE

Date : 22 Mars 2019
Lieu : Espace Andry
Objet : Remue-méninges officiels DEFIS (Après midi)

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MINISTRE DE L'AGRICULTURE DE L'ELEVAGE ET DE LA PECHE

SECRETARIAT GENERAL

PROGRAMME DE DEVELOPPEMENT DES FILIERES AGRICOLES INCLUSIVES
(DEFIS)_CIR FIANARANTSOA

FICHE DE PRESENCE

Date : 22 Mars 2019
Lieu : Espace Andry
Objet : Lancement officiel DEFIS (Amis - midi)

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52	RAZANOLOSO & Fiononana	COM NPAE	Reporter Radio	0330495505	F	
53	IONIARILALA Haingonina	COM NPAE	Redacteur web	0340356095	F	
54	RATOVONINA Jean Epe	OPR MAIS	Technicien Agricole	0342697351	H	
55	RALAIMAMPANDRY Haristina	DRAEP Amoron'i Mania	Technicien SERR	0340561346	H	
56	RAZAFIARISAOVA Naliharina	OPR TIAMAM	Technicien TIAMAM	0346108035	F	
57	Razafimahabaha Solofonina Donna	Président TIAMAM	Président		H	
58	RABOTOVAO Estelle	DRAEP AMM	SRA / DRAEP pi	0340568219	F	
59	Koko Chantal de Cupertino	DRAEP AMM	SRPA	0340587077	F	
60	RAZAHY	ORN/ORN	CR ORN ILOBOMBE	0340211000	H	
61	RAJONARISONJ Tulren Bernard	ORN/ORN	CR ORN Amoron'i Mania	0341137753	H	
62	MAHINIQUINA Epercharitel	Technisiana CPM	Technisiana	0348122569	F	
63	MAKORISON Niina	CPM (maïs)	Président	0347625514	H	
64	RAJONANANDRASANA Andrianandimby Facelina	OPR MAÏS Amoron'i Mania	Filoha Amoron'i Mania	0340846199	H	



MINISTRE DE L'AGRICULTURE DE L'ELEVAGE ET DE LA PECHE

SECRETARIAT GENERAL

PROGRAMME DE DEVELOPPEMENT DES FILIERES AGRICOLES INCLUSIVES
(DEFIS)_CIR FIANARANTSOA

FICHE DE PRESENCE

Date : 22 Mars 2019

Lieu : email Andry

Objet : bonnement officiel DEFIS (Après-midi)

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74	RIVOLALATIANA Eugenie	DRAEP HM	chef CIRDE Vohibato	0343227712	F	[Signature]
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MINISTRE DE L'AGRICULTURE DE L'ELEVAGE ET DE LA PECHE

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(DEFIS)_CIR FIANARANTSOA

FICHE DE PRESENCE

Date : 22 Mars 2019
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90	RASABADEBASANDRA S Anicete	DRAEP	technicien FAR	0348346465	F	[Signature]
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Annex 6 Chance finds procedure for culturally significant artifacts'

The Contractor is responsible for familiarizing themselves with the following "Chance Finds Procedures", in case culturally valuable materials are uncovered during excavation, including:

- Stop work immediately following the discovery of any materials with possible archaeological, historical, paleontological, or other cultural value, announce findings to project manager and notify relevant authorities;
- Protect artifacts' as well as possible using plastic covers, and implement measures to stabilize the area, if necessary, to properly protect artifacts'
- Prevent and penalize any unauthorized access to the artifact
- Restart construction works only upon the authorization of the relevant authorities.

The Authority shall take all appropriate measures to examine, take delivery and register the Cultural heritage so discovered. Where the Authority fails to take appropriate measures within 6 months, the person that discovered the cultural heritage may be released from the responsibility by submitting a written notification with a full description of the situation to the Regional Government official.

Cost of Compliance: It is expected that compliance with these conditions is already part of standard good workmanship and state of art as generally required under this Contract. The item "Compliance with Environmental Management Conditions" in the Bill of Quantities covers these costs. No other payments will be made to the Contractor for compliance with any request to avoid and/or mitigate an avoidable Environmental and social impact.

Water Resources Management

- The Contractor shall at all costs avoid conflicting with water demands of local communities.
- Abstraction of both surface and underground water shall only be done with the consultation of the local community and after obtaining a permit from the relevant Water Authority.
- Abstraction of water from wetlands shall be avoided. Where necessary, authority has to be obtained from relevant authorities.
- Temporary damming of streams and rivers shall be done in such a way avoids disrupting water supplies to communities downstream and maintains the ecological balance of the river system.
- No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.
- Wash water from washing out of equipment shall not be discharged into watercourses or roads drain.
- Site spoils and temporary stockpiles shall be located away from the drainage system and surface runoff shall be directed away from stockpiles to prevent erosion.