# Building Urban Climate Resilience in South-Eastern Africa

## ~ Madagascar ~

## Baseline Review Report

Oxfam in Madagascar

2021

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# Acronyms

| | |
|---|---|
| AF | Adaptation Fund |
| BNGRC | National Office of Risk and Disaster Management |
| CCJ | Communal Youth Council |
| CPT | Municipal project committee |
| DGM | Directorate General of Meteorology |
| DREDD | Regional Directorate for the Environment and Sustainable Development |
| FID | Development Intervention Fund |
| HIMO | High labour intensive |
| NGO | Non-governmental organization |
| RN35 | National Route 35 |
| SAP | Early warning system |
| SEA | South-Eastern Africa |

# Introduction

The Building Urban Climate Resilience in South-Eastern Africa project is a four-year project which started in June 2020 and will run up to June 2024 funded by the Adaptation fund (AF). In alignment with the AF Results Framework (see annex 1), the project has two objectives: to develop capacities and establish conditions to adapt to the adverse effects of climate change in vulnerable cities of Madagascar, Malawi, Mozambique and the Union of the Comoros; and to promote inter-country experience sharing and cross-fertilization regarding the adaptation to transboundary climate-related natural hazards and disseminate lessons learned for progressively building urban climate resilience in south-eastern Africa (SEA). Oxfam is responsible for the implementation of component one at the municipal level.

In Madagascar, the city of Morondava will benefit from eight priority sub-projects: the rehabilitation of mangroves; the development of urban green spaces in risk areas; the establishment of an early warning system in case of floods; construction of a resilient and multi-purpose safe haven; construction of elevated roads; reconstruction of bridges; improvement of city drainage capacity; and improvement of solid waste management.

Oxfam South Africa, the African subsidiary of Oxfam International, will support Oxfam in Madagascar in the implementation of the sub-projects directly benefitting 11 out of 18 *fokontany* (villages): Ampasy, Andabatoara, Andakabe, Ankisirasira North, Ankisirasira South, Avaradrova, Bemokijy, Morondava Centre, Nosikely, Sanfily and Tanambao. See annex 2.

## Context

*National level*

Madagascar is extremely exposed to cyclones that originate in the Indian Ocean. A quarter of the country's population (around 5 million people) live in areas at high risk of natural disasters including tropical cyclones, storm surges, floods and drought. Each year on average three to four cyclones affect Madagascar. Floods are associated with cyclones and represent the second major natural threat to the country. The impact of floods has been exacerbated by the effects of climate change as well as by human activities leading to deforestation, erosion and general land degradation. Another major climate-related threat is drought, especially in the south. According to the Global Facility for Disaster Reduction and Recovery, the country has low adaptive capacity influenced by high poverty rate, rapid population growth, high dependence on natural resources and weak institutional capacity. The adverse effects of floods are significant in urban areas due to a lack of early warning systems, unplanned urbanization and poorly maintained drainage infrastructure.

*Local level*

Morondava is located on the south-west coast of Madagascar between the Mozambique channel and the delta of the Morondava River, and is the capital of the Menabe region (see figure 1). Today, Morondava has an estimated population of 60,000 and is urbanizing very quickly, with a relatively young population (around 60 per cent are under 25, while only 3 per cent are over 60). About 45 per cent of neighbourhoods are considered informal and 25 per cent of residents live below the national poverty line. A coastal town positioned in the middle of a delta, Morondava is crossed by two rivers. The Morondava River divides into two branches: its mouth is located about 5 km north of the city limit in an uninhabited area.

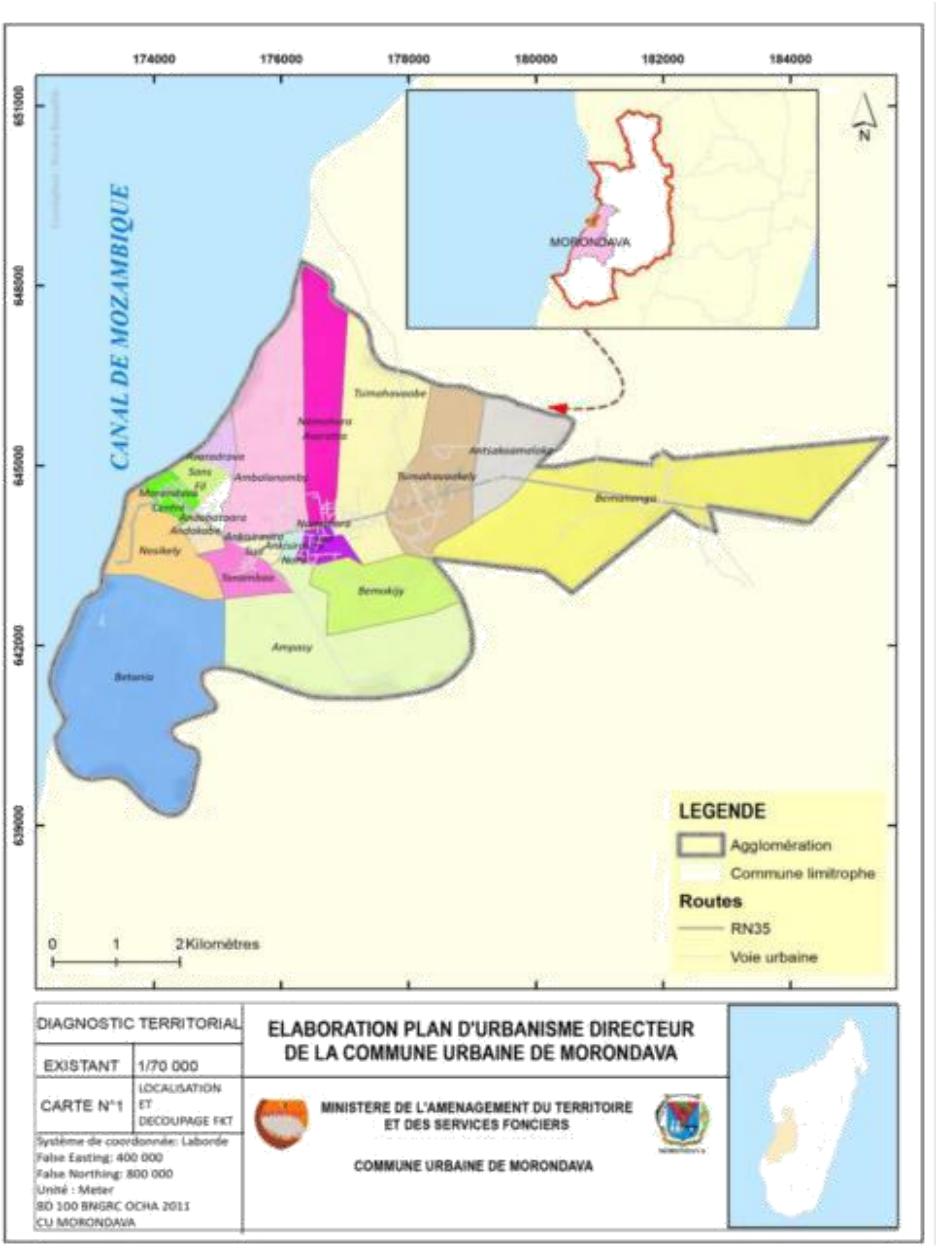


*Figure 1: Location of Morondava and its administrative division.*
*Source: Master Planning Plan of the City of Morondava, 2020.*

The Kabatomena River is located south of the city. During the dry season it discharges 7–10 $m^3/s$ and during the wet season and/or storms the discharge reaches 200–300 $m^3/s$. Kabatomena is an alluvial river consisting of sandy banks which, with high flows, are eroded and the sand is transported to the mouth. The water spills over the banks and due to the low elevation north of the river, the water then flows to the city.

The western part of the city is located next to the sea with an eroding coast. In general, along this coastal stretch of Morondava, the main type of flooding is from swelling waves. According to several local sources, moderate to weak waves are observed under normal conditions. Swell waves are wind-generated waves that are transformed into longer, faster, lower and smoother waves in a process called frequency dispersion and frequency-dependent damping. During cyclones, the estimated wave height can be up to two metres and swell waves have more strength.

Because of the factors affecting both upstream and downstream, extreme weather events cause major flooding in both the northern and southern sides of the city, especially in the neighbourhoods near the Hellot Canal. The districts of Ankisirasira, Avaradrova, Sans Fil (west) and Tanambao (south-east) are the most affected.

The city also regularly experiences severe flooding during high tides, a phenomenon already increasing in intensity which will worsen due to the rise in sea level. Over the past 50 years, the coastline has receded by approximately 1 km. The city's main street and many buildings have been submerged and damaged by the sea. Flooding in low areas is reported fortnightly, correlating with dead tide cycles. During high tides, sea water enters the mouths of the rivers.

The majority of the city of Morondava is at an altitude of 2–14 m. A high number of temporary migrants – Vezo fishermen who live all along the south-west coast of Madagascar – can be found in the Nosikely peninsula on the west coast where the altitude is around 0 m and very vulnerable to flooding.

The *fokontany* of Bemokijy and Ampasy are part of the extension zones of the city, however unplanned urbanization, informal settlements on land without property rights and precarious housing types (Director’s Urban Plan, Morondava, 2020) leaves them very vulnerable to floods. Many people continue to settle in the *fokontany* because rents or the purchase price of land is lower.

The Kabatomena River is a flood risk for the *fokontany* of Ampasy, part of Ankisirasira North, Ankisirasira South and Tanambao, and also causes the rice paddies to become silted up in these neighbourhoods. The northern arm of the Morondava River also threatens part of the city, in particular the *fokontany* of Andabatoara and Avaradrova.

The districts of Sanfily, Morondava Centre and Andakabe in downtown Morondava are also vulnerable to flooding because of the solid household waste that accumulates and then

blocks the drainage channels – especially the open channels. And it is very difficult to clear the drains, especially during the rainy season.

### Baseline review objectives

The objectives of the baseline review are to:

- Check whether the sub-projects described in the project document are still relevant and meet the needs and priorities of communities and local authorities;
- Identify and justify the modifications which may be necessary in the implementation of sub-projects;
- Identify other stakeholders who may be relevant to establish synergy in the implementation of sub-projects; and
- Determine for each expected result indicator, its reference value (value at the start of the project), its target value (value at the end of the project in four years) and, where applicable, intermediate target values (in two years).

The expected result indicators are classified into four categories:

- Indicators calculated from national and local documents;
- Indicators from the results of surveys and interviews;
- Indicators directly linked to the implementation of activities (project execution). At the start of the project, these indicators are zero because activities have not started. The target values correspond to the project quantities (number of expected results achieved); and
- Other indicators.

## Methodology

The baseline review was carried out on the basis of statistical data and surveys carried out at the local level. The surveys and interviews in the field relate to the collection of additional data to that already collected during the documentary review to update activities described in the project document.

A qualitative approach was adopted for the collection of primary and secondary information and interview guides have been developed according to the actors, favouring individual interviews with local authorities, technical services, marginalized and vulnerable groups. For the collection of quantitative data, consultants (students) carried out bibliographic reviews.

The following intervention principles were retained:

- Qualitative approach: the collection of qualitative data was carried out to define effective approaches, develop a community mobilization, engagement and communication strategy/plan, and develop a municipal engagement strategy to improve the design and implementation of the project;

- Quantitative approach: quantitative data was researched in order to systematically measure the evolution of key indicators during the life of the project;
- A participatory approach: the involvement of all stakeholders guarantees their commitment to the sustainability of actions and ensures a good understanding of the starting point of the project; and
- An inclusive approach that takes into account gender and inclusion aspects.

Data was collected from 20 December 2020 to 20 February 2021 and consolidated in July, August and September 2021. Two standard questionnaires in the Malagasy language were used: 1. An individual questionnaire for collecting information from administrative and customary authorities; and 2. A 'focus group' questionnaire in a semi-structured format for use in communities.

Interviews were conducted with the following stakeholders:

- Urban municipality of Morondava;
- Menabe region;
- General Directorate of Regional Planning and Equipment;
- National Office for Climate Change, Carbon and Reducing Emissions from Deforestation and Forest Degradation +;
- Regional Directorate for the Environment and Sustainable Development (DREDD) Menabe;
- Regional Directorate of Population;
- Regional Directorate of Land Use Planning and Public Works Menabe;
- Regional Service of the National Office for Risk and Disaster Management;
- Administrative, customary and notable authorities;
- Non-governmental organizations (NGOs): Medair, Manoa Manga and the World Wildlife Fund;
- Groups of people from the 11 *fokontany* involved in the project;
- Youth associations;
- Women's associations; and
- Older persons' associations.

Certain difficulties were encountered throughout this review due to the absence of reliable statistical data for the *fokontany* concerned and the difficulty of obtaining statistical data from the technical services concerned (National Social Security Fund, Directorate of Population, etc.).

### Baseline review guidelines

In order to harmonize and adjust the scope of the baseline review, the following guidelines were provided:

1. For each initiative, check whether the proposals as described in the project document are still relevant and meet the needs and priorities of communities and local government. The information gathered will be useful for developing a community mobilization, engagement and communication strategy/plan, and developing the municipal engagement strategy and sustainability plan;
2. For each initiative, identify and justify (with evidence) any adjustments/changes that may be necessary in the approach and/or in the activity plan for the initiatives. The information gathered will also be useful for a. the detailed technical review/activity design for each initiative b. development of a strategy/plan for community mobilization, engagement and communication; and c. development of a municipal engagement strategy and sustainability plan;
3. For each initiative, map all existing/future initiatives (beyond these initiatives) that could be complementary; identify other stakeholders and actors who may be relevant to establish synergy, collaboration and coordination while avoiding duplication; and
4. For each community, clearly define the initial conditions (status of indicators) in order to facilitate monitoring of progress, respect for the principles of the Adaptation Fund, the gender strategy and a human rights approach, and assess the final impact.

## Results for each initiative

### Relevance of interventions

*Sub-project 5.1.1 Rehabilitation of 180 ha of mangroves*
The city of Morondava is characterized by two types of forests: dry forest (boy, katrafay, arofy) typical of the western part of Madagascar, and mangroves. These forest resources are home to fauna species such as molluscs, crabs, fish, reptiles, birds, etc. and ensure the functions of supply, regulation and protection of urban spaces. The mangrove, particularly, is a maritime marsh ecosystem that only develops in the tidal zone or *estran* of the low coasts of tropical regions such as Morondava. Mangroves are present in the north-west (Avaradrova) and south-west parts (Andakabe, Nosikely, Tanambao) of Morondava as indicated in the project document and this still reflects the current situation.

Unfortunately, the mangrove areas are being cut for firewood and fencing. Clearing and backfilling activities for future construction were observed in the mangrove floodplains using a technique not suited to these areas. This has a negative effect on the ecosystem as deforested areas have a lower density of fauna and a decrease in biodiversity. The

mangroves are home to several species of fish and crustaceans and the loss of the crab and shrimp population can already be seen today which has negative repercussions on the economy and livelihoods of fishermen.

Rehabilitation of the mangrove zone as a buffer basin (north-west and south-west) is of paramount importance. The mangrove area (mostly cleared) is now full of human pollution which is increasing the city's vulnerability to natural hazards. The restoration of mangrove swamps is therefore a priority action confirmed by local actors during interviews with administrative and customary authorities.

The implementation of *Sub-project 5.1.1 Rehabilitation of 180 ha of mangroves* remains relevant and responds to the needs and priorities of communities and local authorities. The intervention aims at rehabilitating a mangrove area totalling 180 ha.

*Sub-project 5.1.2 Development of urban green spaces in high-risk areas*

Morondava is spatially divided into two main areas, the historic and colonial centre in the west and the extension of the city – or vast and extensible sub-territory – urbanization in the east. The two areas are connected by National Road 35 (RN35) which is surrounded by floodplains to the north and south, and is of crucial importance to the city in an emergency. This road constitutes the main axis and the city spreads out along it. See figure 2.

The area around the road was once covered with mangroves and green space but due to logging and unplanned urbanization, the area and the road itself are now vulnerable to cyclones and flooding. Revegetation along the main axis is necessary to mitigate any damage caused by natural hazards on urban mobility in and around the city.

Implementation of *Sub-project 5.1.2 Development of urban green spaces in high-risk areas* remains relevant and meets the needs and priorities of the city. This intervention consists of developing green buffer zones along the main road connecting the two sides (west-east) of the city which is also used as the main evacuation route in the event of flooding.


*Figure 2: Main access road through Morondava (RN35).*
*Source: Master Planning Plan of the City of Morondava, 2020.*

Acacias and coconut palms need to be planted in order to protect the city against soil erosion, to prevent the construction of new buildings in the flood plains and to take the opportunity to develop green public space (with benches, playgrounds, toilets, rubbish bins, etc.). in order to improve the quality of life of the communities.

*Sub-project 5.1.3 Establishment of an early warning system for floods*

According to the hydrological survey carried out by the technical team of the National Office for Risk and Disaster Management (BNGRC) Contingency Plan District of Morondava Cyclone and Flood, 2020–2021, the risk of flooding is very high in Morondava, especially during the rainy season.

Strong floods generally occur from an overflow of the Morondava River along with sea water, which occurs when the north-south coastal currents (tide and strong swell) meet upstream of the Morondava watershed (see figure 3).


*Figure 3: Overflow of sea and river water creating flood areas in Morondava. Source: Project 930 digital early warning system, 2020.*

The slum areas are most affected by floods which cause significant material damage, a negative impact on the environment and expose residents to disease. The city does not have sufficient resources to prepare for floods or cyclones before they hit.

It is essential to reduce the vulnerability of the city to flooding and to ensure that adequate measures are put in place before an event (increased capacity/resilience) and then to respond as effectively as possible to disasters when an event does occur. The establishment of an early warning system is necessary to provide information on potential floods and to allow Morondava to quickly take appropriate measures.

*Sub-project 5.1.3 Establishment of an early warning system for floods* is still relevant and appropriate to the needs and priorities of communities and local authorities.

*Sub-project 5.1.4 Construction of a resilient and multi-purpose safe haven*

A resilient and multi-purpose safe haven would provide assistance and temporary shelter to people affected by natural hazards. Intended initially only for the protection of victims during natural disasters (floods and cyclones), the resilient and multi-purpose safe haven can also serve as a venue (e.g. training centre, sports hall and other activities) where residents can meet.

Unfortunately, Morondava, like other cities in Madagascar, does not yet have this kind of infrastructure. Instead residents are temporarily accommodated at the Tranompokonolona, the public primary schools Avaradrova or Andakabe, and at the Fiangonana Loterana Malagasy Betala, etc. in the event of a natural disaster.

The community focus groups formed from representatives of the 11 *fokontany* reconfirmed the importance of the implementation of *Sub-project 5.1.4 Construction of a resilient and multi-purpose safe haven.* The construction of this building is therefore considered a priority and must be designed to withstand strong winds and high floods with a capacity of up to 200 people.

An inclusive approach will be respected since the infrastructure will be provided with facilities allowing easy access for the elderly and people with disabilities. Vocational training activities, targeting women and people with disabilities in particular, will also be provided.

*Sub-project 5.1.5 Urban road rehabilitation (raised road protected against flooding with improved drainage capacity)*

RN35 passes through Morondava connecting the city centre and the municipality of Bemanonga. It is the main thoroughfare and Morondava is spread out along both sides. Other roads crisscross the city and join up to RN35 forming veins of urban mobility and providing connectivity to the main thoroughfare and evacuation in the event of flooding.

Implementation of *Sub-project 5.1.5 Urban road rehabilitation* to connect the southern districts (Ankisirasira North, Ankisirasira South and Tanambao) to RN35 is essential for the city in order to provide residents with better access to key infrastructure and services. Under the Menabe region Presidential Project, the section of road from ESSO-Maty to the Hardware Gasy Namahora (960 m) is, with a few differences, the same stretch of road identified for rehabilitation in the project document. See figure 4.

On 11 December 2020, a meeting between the Governor of the Menabe region, the Interim Mayor of Morondava and Oxfam proposed the rehabilitation of the road from Tanambao to Ampasy (920 m) as an alternate. This would improve access to the waste recovery centre, particularly during high tides and the rainy season, as well as help easier evacuation of neighbourhoods in the south in the event of natural disasters. The Governor confirmed that

the Menabe region would rehabilitate the road from Tanambao to Ampasy Bridge if the SEA Building Urban Climate Resilience project would support the 920 m proposed project modification.

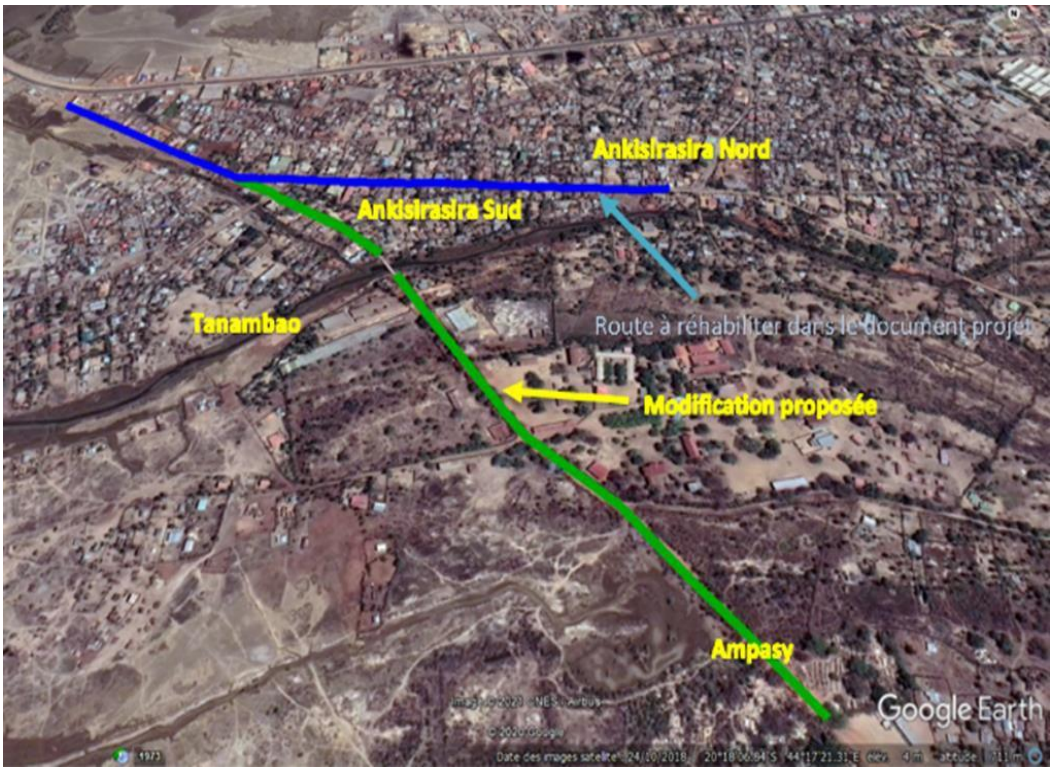


*Figure 4: Amendment to proposed road rehabilitation under sub-project 5.1.5.*

Work under the Presidential Project was started on 19 December 2020 and the local authorities carried out a field visit on 7 January 2021 to monitor progress. This part of the road rehabilitation between Ankisirasira North, Ankisirasira South and Tanambao is now complete and the road is operational and passable in all seasons.

*Sub-project 5.1.6 Rehabilitation of three bridges*

Kabatomena (the southern arm of the Morondava River) and Morondava River (the northern arm of the Morondava River) are the two main waterways in Morondava, plus an artificial canal (Hellot) was built in the colonial days to irrigate crops of rice, corn and cape peas for export.

Whilst these hydrographic networks offer river transport and irrigation, they unfortunately also create urban mobility difficulties for the residents. Implementation of *Sub-project 5.1.6 Rehabilitation of three bridges* (Bemokijy, Rapiera and Tanambao), as identified in the project document, are crucial to improve the flow of the city's population and particularly important for evacuation of disaster victims during cyclonic periods.

During a meeting between Oxfam and Morondava City Council in October 2020, the Mayor of Morondava agreed that the Development Intervention Fund (FID) would support the urgent repair of Tanambao bridge and he proposed the rehabilitation of Ampasy bridge as the third bridge in this sub-project instead. See figure 5. Oxfam sought validation for the third bridge (Tanambao or Ampasy) in a meeting on 11 December 2020 with the Governor of the Menabe Region and the Mayor of Morondava.

In mid-January 2021, a FID consultant along with the Chief of Tanambao *fokontany* visited the Mayor to endorse their commitment to repairing Tanambao bridge. FID began the rehabilitation work in April and it was completed in August 2021.

Morondava therefore proposes the rehabilitation of Ampasy bridge as it is necessary for supplying the city with agricultural products and for the evacuation of residents south of the Kabatomena River in the event of natural disasters.

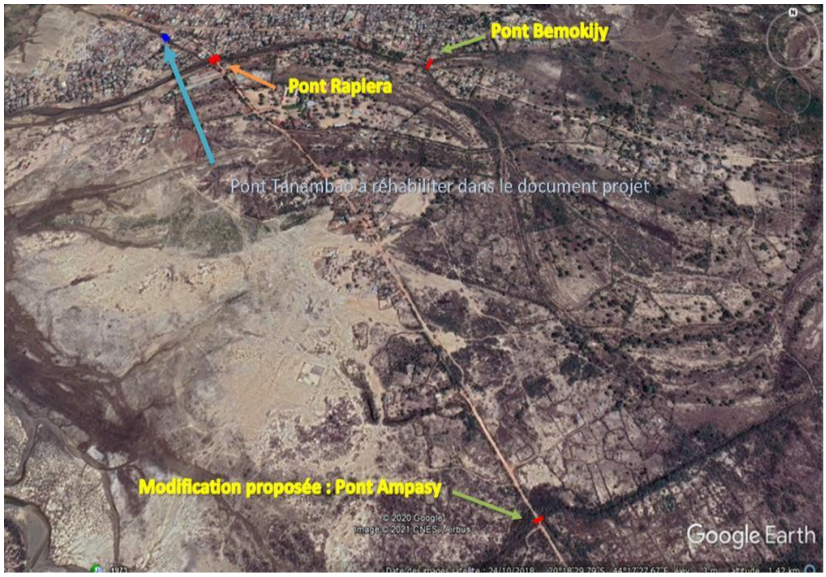


*Figure 5: Location of the third bridge proposed by Morondava under sub-project 5.1.6.*

*Sub-project 5.1.7 Improvement of drainage capacity in the city centre*

The drainage system is very important for the city to mitigate the impact of flooding and erosion. *Sub-project 5.1.7 Improvement of drainage capacity in the city centre* is still necessary according to the needs and priorities of the communities and the municipality, as confirmed by the Mayor and the person in charge of sanitation during interviews. This sub-project aims to improve drainage capacity in Morondava Centre and the adjacent areas in the districts of Andabatoara, Andakabe and Sansfil by cleaning/rehabilitating most of the existing drainage network and building a new drainage channel connecting the city centre in Sansfil which currently has no drainage system in place.

The historic city centre is where most services and infrastructure are found while the surrounding areas are home to bustling markets and shops which populate the streets with locals from all parts of the city. The existing drainage network in the targeted areas is largely non-operational due to a lack of maintenance and cleaning. It is also not properly connected to surrounding areas. The poor sanitation conditions pose a high risk to health and property, especially during flooding. The total length of the channels to be cleaned and rehabilitated

is 4,389 m (comprising 3,584 m of covered channels and 805 m of open channels). For this intervention, concrete, steel and waterproof plaster will be the main materials needed.

A new drainage channel (length 305 m; section 0.50 m x 0.60 m) can be built in Sansfil at a reasonable cost and connected to the existing drainage system, thus considerably improving the drainage of rainwater/flooding in this poor/vulnerable neighbourhood.

*Sub-project 5.1.8 Improving solid waste management*

It is estimated that in Morondava, the daily production of waste is around 35 tonnes of household waste and nearly 5 tonnes of ordinary organic waste, plus 6 to 7 tonnes of waste from commercial activities and markets. Most household waste is either scattered outside, buried in the courtyard or alleyway of each household, or thrown away with the recycling. In the peripheral *fokontany*, residents pile their waste in pits and incinerate it to prevent the spread of disease on the orders of the local authorities.

The Urban Municipality of Morondava has a landfill site for solid household waste in d'Ampasy *fokontany* managed by the NGO Manao Manga but due to a lack of adequate equipment the site is not currently being used to its full potential. It is necessary, therefore, to strengthen its capacity by providing appropriate equipment and a sustainable strategy to properly manage solid waste. It is clear that the municipality needs to establish a sanitation plan as well as a cooperative association and a system of pre-collection, collection, recycling and disposal of waste. (Urban Resilience Action Plan, 2017–2027).

Implementation of *Sub-project 5.1.8 Improving solid waste management* is still recommended to respond to the needs and priorities of communities and local authorities. The sub-project aims to put mechanisms in place for the sustainable management of solid waste with the cooperation of both municipal staff and local communities, especially women, as well as by providing the necessary equipment to ensure effective and sustainable implementation.

## Identification and justification of changes

*Sub-projects with no modifications or implementation constraints*

*Sub-project 5.1.4 Construction of a resilient and multi-purpose safe haven* corresponds to the implementation strategy and activities detailed in the project document, i.e. there are no modification or implementation constraints. The first validation carried out before the site visit was to check whether the location of the resilient and multi-purpose safe haven identified in the project document was still appropriate. See figure 6.

This was confirmed at a meeting with the Mayor of Morondava and the Governor of Menabe region on 11 December 2020, the latter clarified that there is no other possible location than the one already identified in the project document.

During the discussion a representative of the 930 project for a digital early warning system (a project in the Menabe region and likely to be a stakeholder in the implementation of this sub-project) confirmed that the 930 project does not need to use the resilient and multi-purpose safe haven for its operations or monitoring centre because their project is going to renew the old existing centre in Morondava. The location of sub-project 5.1.4 as identified in the project document is therefore validated and retained.

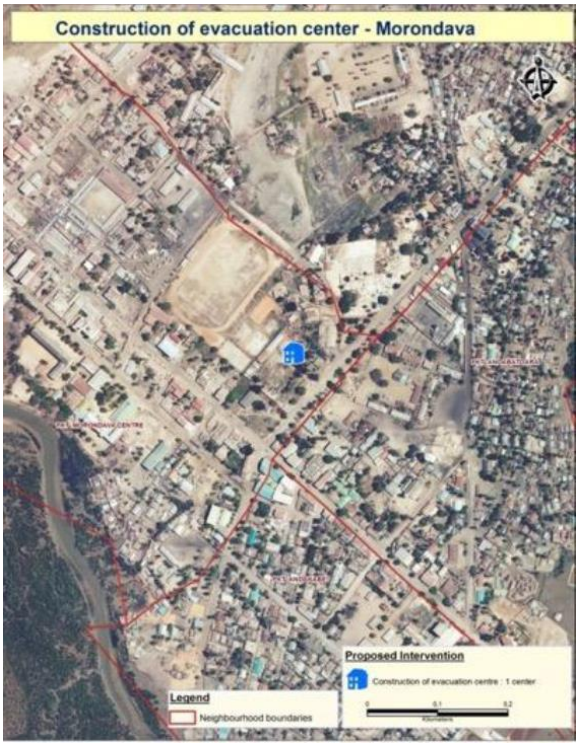


*Figure 6: Sub-project site 5.1.4.*

The site visit also checked whether the space identified in the project document was sufficient for the resilient and multi-purpose safe haven (the estimated footprint of the building is approximately 30 m in diameter) and confirmed that it was.

Existing buildings could be also be demolished or moved and this option has already been approved by the Mayor of Morondava. Qualified personnel will determine the best technical solutions for the construction of the building following the architectural design.

*Sub-projects with implementation constraints*

One of the constraints in implementing the proposed sub-projects is the land situation in Morondava. Residents on state land consolidate their properties through the city's domains service in order to obtain a Title Deed. There are now dense areas of titled properties in the urbanized and urbanizable areas of the city which means land available for the local authorities to carry out development projects is somewhat restricted.

Buildings on land classified as ‘flood-prone’ and ‘non-building zone’ have been publicly denounced by *fokontany* chiefs as illegal construction in their areas of administration. The department responsible for sanitation in the city has also identified that some of these buildings are aggravating the floods since they obstruct drainage channels and weaken protective dikes. This problem is now a major challenge with regards to urban planning in Morondava, and particularly in the implementation of sustainable development projects.

Sub-projects 5.1.1 Rehabilitation of 180 ha of mangroves, 5.1.2 Development of urban green spaces in high-risk areas and 5.1.7 Improvement of drainage capacity in the city centre are the most affected by these constraints.

Andakabe, Avaradrova, Nosikely and Tanambao *fokontany*, DREDD Menabe and several NGOs were consulted to confirm whether the sites selected in the project document are still appropriate for sub-project 5.1.1. During the discussion it became clear that only 44 per cent of the original 180 ha would be available because of the challenges of urbanization and land issues – much of the land has now become private property.

Restoration of mangrove areas, as one method of ecological compensation, also brings land issues back into the spotlight and the issues become the *sine qua non* for its implementation. Ecological compensation is used to mitigate the impact of development on biodiversity and ecosystems, and finding land for compensatory measures is often needed in order to obtain the administrative authorization required to start the work.

To compensate for the 44 per cent reduction of the 180 ha of land to be rehabilitated, additional areas – 30 ha in the Andabatoara districts, 10 ha in Sanfily and 40 ha in Ampasy – were proposed by stakeholders during the quarterly meeting of the municipal project committee (CPT) in March 2021. These areas will be surveyed for their suitability by a consultant specializing in mangroves.

Implementation of *Sub-project 5.1.2 Development of urban green spaces in high risk areas* could be achieved without hindrance if the law and town planning regulations had been observed. According to articles (176–177–178) of Law 2015–052 of 3 February 2016 relating to town planning and housing, land alongside main and access roads, and drainage channels is to be kept clear as reserve areas for road extensions or public utility projects, if needed. The alignment is measured from the edge of the road to the first edge of the construction facing it. Table 1 shows the town planning regulations of the relevant measurements.

*Table 1: Town planning regulations on the alignment of channels.*
*Source: Law No. 2015–052 relating to town planning and housing, 2016.*

| Channel type | Grip (m) | Observation |
|---|---|---|
| Highway | 50 | Ministerial competence |
| National road | 25 | Ministerial competence |
| Provincial road | 15 | Regional competence |
| Foot dike / river / lake | 10 | Municipal jurisdiction |
| Public channel | 02 | Municipal jurisdiction |
| Lane or public road | 02 | Municipal jurisdiction |
| Coastal strip | 25 | Ministerial jurisdiction |
| Two-way municipal road | 10 | Municipal jurisdiction |
| One-way municipal road | 05 | Municipal jurisdiction |

Sub-project 5.1.2 proposes revegetation along RN35 which according to the regulations should have a 25 m right-of-way clear for a project such as the development of urban green spaces. However, this alignment has not been generally respected by the properties bordering RN35 and therefore this is an issue with regards to implementation. A working group has been created, composed mainly of members of the CPT, to discuss it further with the aim to finding an inclusive solution.

Some of the water channels proposed for rehabilitation by *Sub-project 5.1.7 Improvement of drainage capacity in the city centre* also face the problem of illegal construction and occupation of public space. Not only do some inhabitants settle in flood-prone and high-risk areas but they also build their houses on rights-of-way and sewerage networks, in particular blocking open channels. See figure 7. Because of these blocks it takes several days or even a week for water levels to drop. Residents in these areas are actually causing the problem they'd like to be resolved.

*Figure 7: Illegal construction over sewerage channels.*

Ideally, all illegal construction should be demolished and cleared in order for the drainage channels to be rehabilitated. However, this would have a social impact since the illegal occupation is not only by poor households, but the promoters of the illegal construction come from highly diverse social categories. Working groups have been formed in each sector facing this quandary made up of the head of the *fokontany* concerned, the head of the sanitation department of Morondava, a representative of the group of consultants recruited, the inhabitants concerned and others who can contribute to a lasting resolution of the issue.

*Sub-projects having synergy and coordination with other key actors*

Sub-project 5.1.3 Setting up an early warning system in response to flooding in the city requires synergy and coordination with other key players. The NGO Medair has already started training and revitalizing the (local and municipal) Disaster Risk Management and Disaster Risk Reduction committees in Morondava as part of the implementation of the Early Warning System (SAP) 930 project. Also involved are the local committee at *fokontany* level, the municipal committee at city level, the regional representative of BNGRC and the Directorate General of Meteorology (DGM) which has already carried out a hydrological survey and digital mapping of areas at risk of flooding. According to the Morondava District Evacuation Plan of June 2021, DGM generates a flood warning following meteorological data from the Earth network and Morondava via a telephone call and/or an automatic flood warning station which will be installed by Medair. Implementation of sub-project 5.1.3 therefore requires collaboration with the key partners listed to avoid duplication of activities and promote coordination in the SEA Building Urban Climate Resilience project and that of SAP 930. Three points were discussed during bilateral meetings between Oxfam and Medair: 1. Working together to specify the details of the two early warning system projects; 2. The possibility of working together with Morondava for sustainable management of the proposed multipurpose safe haven of sub-project 5.1.4; and 3. Continued involvement of local and municipal committees since the SAP 930 project will be completed in 2022 and the SEA Building Urban Climate Resilience project will probably be completed in 2024.

Synergy and coordination with the NGO Manao Manga, and the Communal Youth Council (CCJ) and Mère Model associations will also be beneficial in implementing *Sub-project 5.1.8 Improved solid waste management*. Manao Manga has experience in Morondava since it supported the Urban Municipality in the management of the landfill site in the *fokontany* of Ampasy. In addition, the two associations collaborate with Morondava for the pre-collection of household waste: CCJ covers the surroundings of the Andakabe *fokontany* and Mère Model ensures the proximity area of RN35 and Andabatoara *fokontany*. Residents pay a monthly fee for their services. See table 2.

*Table 2: Household waste collection service fees.*
*Source: Master Planning Plan of the City of Morondava, 2020.*

| **Customer type** | **Service price (monthly)** |
|---|---|
| Hotels and department stores | MGA 10,000 |
| Shops/small businesses | MGA 5,000 |
| Households | MGA 1,000 |

CCJ and Mère Model are members of CPT so they are already considered stakeholders of sub-project 5.1.8 and know the implementation process of the SEA Building Urban Climate Resilience project. Oxfam and Manao Manga discussed four points in order to consider the

type of partnership to be established for the disposal of household waste in Morondava: 1. Waste collection; 2. Waste delivery; 2. Waste recovery centre; and 4. Awareness activities.

*Sub-projects with modifications*

For the *Sub-project 5.1.5 Rehabilitation of urban roads* (raised roads protected against flooding with improved drainage capacity), the Urban Municipality of Morondava is proposing the rehabilitation of the road from Tanambao to Ampasy because the section previously identified in the project document has already been repaired by the Menabe Region as part of the Presidential Project.

As the target neighbourhoods listed in the project document were the residents of Ankisirasira North, Ankisirasira South and Tanambao, this modification only affects the residents of Ankisirasira North replacing them with residents in Ampasy. This new proposal will link the southern districts to the main road and to other essential services meaning that the positive impact of the intervention is still expanding. Rehabilitation of 920 m of the road with heightening of 40 cm will still apply, as will all technical specifications proposed previously by the project.

Implementation has not yet started. This modification was identified during the preparation phase of detailed studies and designs of structures, so the change has no impact on strategy and planned activities in relation to the sub-project sheet. However, delay in validation of the modification could influence the timeframe for implementation. There is no budgetary impact since the modification is considered minor and has no consequence on the general objective of the project.

The Oxfam technical team and experts from the Urban Municipality of Morondava carried out a site visit to assess if there were any major constraints to be considered on the proposed new site, particularly where the roads converge – an area of about 870 m. See figures 8 and 9.

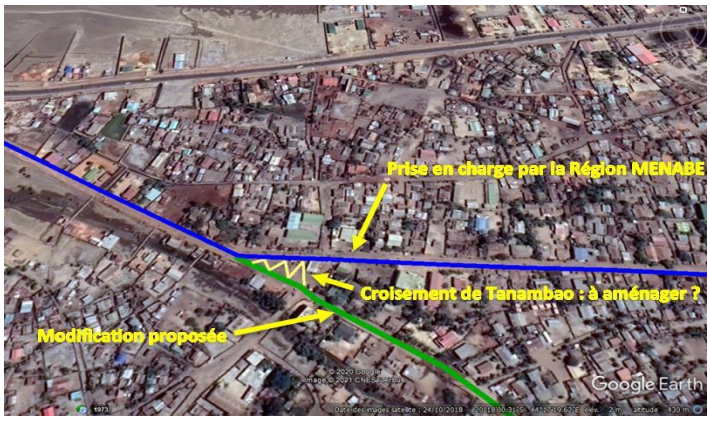


*Figure 8: Map showing converging roads.*

*Figure 9: Open area where roads converge.*

A meeting held on 20 January 2021 with the Mayor concluded that the converging area is private property. However, the Urban Municipality of Morondava will make a request to the owner so that the street vendors along the Tanambao-Ampasy road can trade there temporarily during the rehabilitation works. The proposed road modification therefore has no major constraints.

With regard to the socio-economic and environmental impacts of this sub-project, it is estimated that 17,814 people (more than 50 per cent women) will benefit from better access to urban infrastructure and services, good evacuation conditions and access to higher land in the event of flooding. Approximately 9,685 people will benefit from better drainage conditions including patients and staff at Betela Hospital. This sub-project will be particularly beneficial for people with disabilities and the elderly living in the target neighbourhoods (residents of Ampasy, Ankisirasira South and Tanambao).

In short, the proposed modification of sub-project 5.1.5 consists of geographically modifying only the site of the said sub-project, the dimensions of the road as previously stated will be retained.

For *Sub-project 5.1.6 Rehabilitation of the three bridges,* the Urban Municipality of Morondava proposes the rehabilitation of Ampasy bridge (length 15 m) instead of Tanambao bridge (length 16 m) as originally suggested in the project document because the latter has already been rehabilitated by FID.

The target neighbourhoods detailed in the project document were residents of Ankisirasira South, Bemokijy and Tanambao, and this proposed modification will also benefit the residents of Ampasy. The number of direct beneficiaries will increase from 10,943 to 13,028 people meaning that the positive impact of this intervention has increased. The proposed rehabilitation of Bemokijy and Rapiera bridges does not need to be modified.

Implementation of the activities planned for the bridges has not yet started. The proposed modification was identified in the preparation phase of detailed studies and design of the works so this modification has no impact on the implementation strategy and planned activities in relation to the sub-project sheet. A delay in validation of the modification could influence the timeframe for implementation of the sub-project.

The quantity of the structural elements needed (bridge, slabs, etc.) is an important factor for determining the cost of the structure, however, the estimated budget allocated to sub-project 5.1.6 is not affected by the modification because Tanambao Bridge (16 m) is almost the same length as that of Ampasy (15 m).

There are no major constraints to consider for the rehabilitation of Ampasy bridge. A field visit confirmed that the rehabilitation of this bridge would not only improve the evacuation of the southern districts (Ampasy and residents south of the Kabatomena River) in the

event of natural disasters but also access for supplies to the city of agricultural products. See figure 10.

*Figure 10: Supplying Morondava with agricultural products using Ampasy Bridge.*

Nearly 13,000 people will benefit from a better connection between the districts of Ampasy, Ankisirasira South, Bemokijy and Tanambao in addition to the residents to the south of the Kabatomena River. This will facilitate movement, access to infrastructure and basic services and, consequently, improve livelihoods (supplying the city with agricultural products). The communities of Ampasy and Tanambao are among the poorest of Morondava with the highest poverty rate in the city (85 to 88 per cent). An estimated population of 10,550 people will benefit from improved access to the city centre and an increased response/evacuation capacity in the event of floods and cyclones, especially for elderly and disabled people living in the urban area target neighbourhoods.

Regarding sustainability of the proposed modifications under sub-projects 5.1.5 and 5.1.6, Morondava reiterates its commitment to reserve annual funds for the maintenance of all infrastructures built under the SEA Building Urban Climate Resilience Project. In addition, the communities will always be involved in the rehabilitation works under the high labour intensive (HIMO) public works programme as much as possible. Training will be provided and information disseminated to the local population on basic maintenance practices.

### Mapping of the main existing and future initiatives in Morondava

As the capital of the administrative region of Menabe, Morondava acts as the headquarters of all projects proposed for the district including projects that are generated in Morondava which are not necessarily carried out in the city itself but in other districts, towns, municipalities or villages across the region. Certain projects/initiatives exist on a one-off or short-term basis and others take the scale of personal or individual initiatives, for example beach sanitation work.

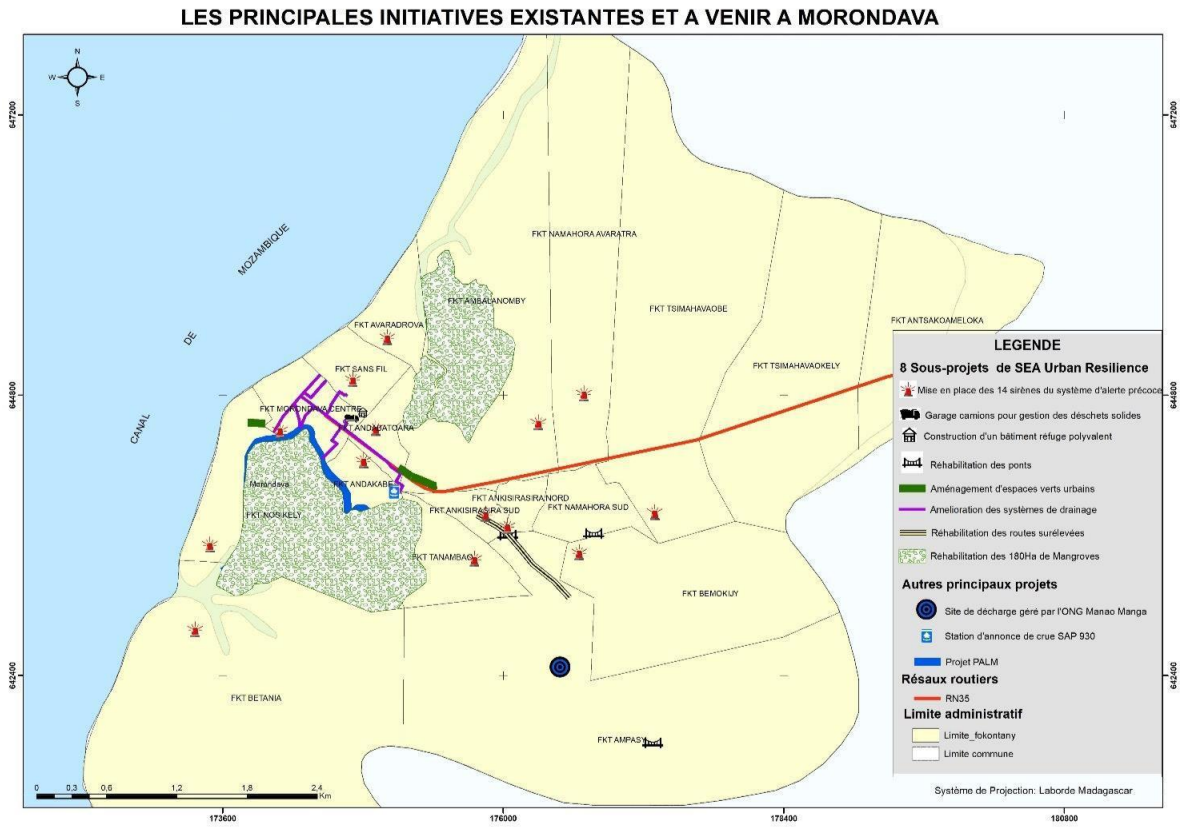


*Figure 11: Current and future initiatives in Morondava.*

Figure 11 shows the main current and future initiatives planned at the time of the baseline review. It should be noted that development projects in Madagascar, particularly in urban areas, are dynamic. According to the Interim Mayor, Morondava is in great need of sustainable urban development programmes. The main initiatives to date are the eight sub-projects of SEA Building Urban Climate Resilience; the Protection and Planning of the Morondava Coast project; the SAP 930 project and the micro-projects managed by Manao Manga.

## Status of indicators

### *Effect indicators*

*Number of people with access to basic services and resilient infrastructure*

There is no data directly related to the total number of people who have access to basic services and resilient infrastructure. The only data that is available from the technical services is broken down by service and existing infrastructure. According to the Master Plan of Morondava, the rate of access to drinking water in Morondava was 65 per cent in 2017. Jiro and Rano Malagasy, the supplier of electricity and public lighting, supplied on average

756,553 KwH of energy to 18 *fokontany* of the city – Betania *fokontany* does not have access to electricity.

The agglomeration of Morondava currently has 75.28 km of road (12.76 km asphalted and 62.52 km in sandy soil). Three types of domestic housing coexist in Morondava according to architecture and footprint: 87 per cent live in less than 100 $m^2$; 12.19 per cent between 100 to 400 $m^2$ and 0.80 per cent over 400 $m^2$.

*Number of people with access to ecosystem improvement*

There is no base indicator yet for this in Morondava and it is difficult to provide any substitute data.

*Number of people who have participated in improving basic services, resilient infrastructure and ecosystems in accordance with Adaptation Fund indicators (3.1, 4.2 and 5)*

Focus group discussions carried out with participants of 11 *fokontany* (a total of 39,015 inhabitants) showed that it is associations and community groups that are often active in citizen participation such as improvement of the environment and community infrastructure. There are about 85 associations and groups of communities in the 11 *fokontany* with about 10 to 15 members in each. Therefore, the total number of people who have participated in improving basic services, resilient infrastructure and ecosystems is approximately 1,000 people.

*Number of municipal departments and employees with increased capacity to minimize exploitation of risks related to climate variability in accordance with Adaptation Fund indicators 2.1*

Two technical service providers in the Urban Municipality of Morondava have the capacity to minimize the risks linked to climate change – the Town Planning and Heritage Department and the Water, Sanitation and Hygiene Department. These two services have a total of five employees. Combined with the three employees of Morondava who participated in the design of the SEA Building Urban Climate Resilience project, there are eight municipal employees with a capacity for climate resilience interventions.

*Percentage of women in Morondava who actively participated in the implementation of sub-projects*

The number of women who actively participated at the start of the implementation of sub-projects was zero or 0 per cent. This data will continue to be monitored from the training participation register and project implementation reports.

*Increase in the percentage of women who are actively engaged in the socio-economic development of Morondava*

There are currently about 40 women's associations made up of 10 to 15 people on average, giving an estimated number of 500 people. With the 33 women employees of the Urban Municipality of Morondava, that total increases to 533 people. There are 30,420 women in Morondava (50.7 per cent of the population) but it is estimated that only 1.75 per cent women are actively involved in the socio-economic development of the city.

### *Output indicators*

| | | | |
|---|---|---|---|
| **Output 1**<br><br>Implementation plans for sub-projects developed with the community and the municipality including detailed technical studies. Gender perceptions, capacities and skills are taken into account and gender needs are addressed in the sub-project implementation plan. | Number of sub-project implementation plans developed. | 0 at the start of the implementation of sub-projects. | Monitoring will be carried out from the project implementation report. |
| | Number of sub-project implementation plans with a gender approach that clearly define the role of women. | 0 at the start of the implementation of sub-projects. | Follow-up will be done based on the examination and feedback of the women on the implementation plans of the sub-projects. |
| | Percentage of women satisfied with the sub-project implementation plan as meeting their needs and strengthening their role. | 0 per cent at the start of the implementation of sub-projects. | Follow-up will be done based on the examination and feedback of the women on the implementation plans of the sub-projects. |
| | Number of detailed technical studies prepared to assess environmental and social risks in accordance with national and Adaptation Fund requirements. | 0 at the start of the implementation of sub-projects. | Follow-up will be done from the evaluation of the environmental and social review reports. |
| **Output 2**<br><br>The priority sub-projects are implemented in Morondava mainly thanks to the participation of the community in works under HIMO. Women are actively involved and engaged in the implementation of sub-projects and ensure that gender needs and perspectives are solidly taken into account. | Number of municipal employees and members of the community mobilized/trained to ensure good management of the priority sub-projects carried out (in accordance with indicators 2.1.1 and 3.1.1 of the Adaptation Fund). | 0 at the start of the implementation of sub-projects. | Follow-up will be made from the training report and photos of activities taken. |
| | Number of women who occupy a leadership position in the implementation of the | 0 at the start of the implementation of sub-projects. | Follow-up will be done from the survey on the contribution of women in |

| | | | |
|---|---|---|---|
| | sub-project execution plan. | | the implementation of the sub-projects. |
| | Percentage of women who agree that women's needs are considered. | 0 per cent at the start of the implementation of sub-projects. | Monitoring will be done based on the project implementation report and feedback from women on the implementation of a gender approach in the implementation of sub-projects. |
| **Output 3**<br><br>Municipal staff and community members are mobilized, trained and equipped to ensure the sustainable management/maintenance of the priority sub-projects implemented. The role, capacities and skills of women are strengthened and are included in the sustainability plan of priority sub-projects of the city. | Number of municipal employees and members of the community mobilized/trained to ensure the good management of the priority sub-projects carried out (in accordance with indicators 2.1.1 and 3.1.1 of the Adaptation Fund). | 0 at the start of the implementation of sub-projects. | Follow-up will be made from the training report and photos of activities taken. |
| | At least 50 per cent of women have been trained. | 0 per cent at the start of the implementation of sub-projects. | Follow-up will be made from the training report and photos of activities taken. |
| | Percentage of women whose capacities have been recognized and are taken into account in the sustainability plan. | 0 per cent at the start of the implementation of sub-projects. | Monitoring will be done based on feedback from women on the implementation of a gender approach in the implementation of sub-projects, and the report on the project's sustainability plan. |
| | Percentage of women who have been trained to play an active role in priority sub-projects. | 0 per cent at the start of the implementation of sub-projects. | Monitoring will be done based on feedback from women on the implementation of a gender approach in the implementation of sub-projects, and the training report. |

# Conclusion

It is clear that this baseline review is important so that the project team can begin implementation of the sub-projects being well informed. The SEA Building Urban Climate Resilience project is faced with certain challenges (implementation constraints and modification of certain sub-projects) which it must understand at this stage in order to be

more successful in its project management. However, many opportunities will also have to be exploited by the project team namely the dynamism of CPT, active communication with key players and the commitment of local authorities (Morondava and Menabe regions) for the successful implementation of the projects.

The SEA Building Urban Climate Resilience project will have to take into account all the information provided by the baseline review to improve its implementation strategies, orient its activities, adapt its method of monitoring progress in accordance with the principles of Adaptation Fund, gender strategy and a human rights approach, and assess the final impact of the project.

## Recommendations

These recommendations are made to improve the implementation strategies of the SEA Building Urban Climate Resilience project by taking better account of its environment at the start of the project.

Let us first underline the importance of highlighting the gender aspect given the low involvement of women (1.75 per cent) in the socio-economic development of the city. A gender balance should be reinforced at all stages of project activities. The involvement of women in the implementation of the project represents a crucial step in the adaptation process. According to the United Nations, women are more inclined to share information on the well-being of the community.

The implementation phase of the infrastructure sub-projects should be started quickly (sub-projects 5.1.4, 5.1.5, 5.1.6 and 5.1.7). Local authorities (the mayor and governor) are very sensitive to decision-making with regards to infrastructure projects. The proposed modifications of sub-projects 5.1.5 and 5.1.6 highlight this situation and validate the dynamism of infrastructure investments in Madagascar.

Regarding sub-projects with certain implementation constraints, it is important to create working groups made up of members of CPT, the population concerned and the inhabitants affected by implementation of these projects. Consideration should be given to mitigate the social impacts of the SEA Building Urban Climate Resilience project. In this way, overall strategies could be developed to go beyond the initiatives undertaken by the project which could serve as experiences to be shared at national or regional level.

Synergy and coordination should be developed among the main projects operating in Morondava amongst the key players (community groups, associations, authorities, technical services, etc.). Implementation of sub-projects 5.1.3 and 5.1.8 require this kind of collaboration to include actions in an integrated approach of local development (alignment with participatory approaches, local knowledge and indigenous experiences).

# Annexes

Distribution of the population by *fokontany*

Available at https://oxfam.box.com/s/5qc98vp1lgdp44lys3rcx74s7dlg8mrq