UNION OF THE COMOROS

Unity - Solidarity - Development

MINISTRY OF AGRICULTURE, FISHERIES AND ENVIRONENT

DIRECTORATE GENERAL FOR ENVIRONMENT AND FORESTRY (DGEF)

GREEN CLIMATE FUND (GCF)

PROJECT "ENSURING A CLIMATE CHANGE RESILIENT WATER SUPPLY IN THE COMOROS

STUDY OF DRINKING WATER SUPPLY SYSTEMS IN MOHELI

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (EMSP)

June 2022

LIST OF ABBREVIATIONS

AEP	Drinking water supply
APD	Detailed Preliminary Project
APS	Preliminary draft summary
AFD	Agence Française de Développement
CCAG	Cahier des Clauses Administratives Générales
CCP	Special Conditions of Contract
CIE	Inter-ministerial Committee for the Environment
DAO	Tender documents
DE	Outside diameter
DGEF	General Directorate for the Environment and Forests
DN	Nominal diameter
EIES	Environmental and Social Impact Assessment
ER2C	Ensuring a climate-resilient water supply
FVC	Green Climate Fund
HSE	Health, Safety and Environment
MES	Suspended Matter
MRG	Grievance Redress Mechanism
MAPEAU	Ministry of Agriculture, Fisheries, Environment, Land Management and Urban Planning
NGO	Non-governmental organization
PAP	Population affected by the project
HDPE	High density polyethylene
ESMP	Environmental and Social Management Plan
QHSE	Quality, Health, Safety and Environment
UNDP	United Nations Development Programme
SAEP	Drinking water supply system
UC	Union of the Comoros
VBG	Gender-Based Violence
AEP	Drinking Water Supply

1 EXECUTIVE SUMMARY

Comoros has received Green Climate Fund (GCF) funding of over US$41.9 million for the project "Ensuring Climate Resilient Water Supply in the Comoros Islands". The main objective of the project is to strengthen the resilience of drinking and irrigation water to climate change risks for 15 of the most vulnerable areas in the Union of Comoros. Specifically, the project focuses on: creating a paradigm shift in water governance by integrating climate risk reduction into water sector legislation, institutional arrangements, planning and budgeting; understanding and adapting to climate risks to the country's fragile water resources and weak water management systems using watershed protection and rehabilitation coupled with hydrological monitoring and forecasting ; integrating climate risk reduction into the design of water supply systems; developing drinking water supply and irrigation infrastructure to ensure access to drinking water for 450,000 people (60% of the Comorian population by 2042) and including the operation and management of multiple water sources.

Fifteen target areas on the three islands, comprising 103 villages, were selected because of their vulnerability to climate change and their good hydrogeological and hydraulic potential for water storage and catchment, as follows: 6 areas on Grande-Comores; 7 areas on Anjouan; and 2 areas on Moheli.

The project was reviewed under the UNDP Social and Environmental Standards procedure and was classified as a moderate risk project with 10 risks identified, of which seven were rated moderate and three were rated low.

Since during the project design phase, the sites for the installation of the infrastructure were not yet identified, an Environmental and Social Management Framework (ESMF) was prepared in an attempt to outline the possible impacts and the types of mitigation measures that might be required during project implementation.

Also, the ESMF states in its executive summary that environmental and social management plans (ESMPs) could be prepared if deemed appropriate.

Furthermore, the development of this ESMP makes it possible to meet the requirements of the FAA in its clause 10.2 (j), which stipulates that: "Before commencing any construction work or activity for the implementation of the project, the accredited entity shall submit the detailed environmental and social management plan relating to the relevant construction work or activity to be carried out, in a form and substance satisfactory to the GCF Secretariat.

To this end, this ESMP is a corollary of the ESMF. It deals with aspects related to the establishment of drinking water supply systems (WSS), relating to sub-activities 3.2 of component 3 of the project, on the autonomous island of Moheli.

Along the same lines, other ESMPs have been developed to cover the other islands (Ngazidja and Anjouan).

In accordance with good practice and in line with the UNDP SES, the ESMP attempts to identify additional risks and impacts that were not initially identified in the ESMF at the time of project design and to confirm those initially identified.

In order to ensure correlation between the ESMF and the ESMP, the impacts identified in the ESMF in relation to the installation of drinking water supply systems (AEP) in the two zones (zones 14 and 15) in Moheli, as well as the management measures and environmental and social monitoring and follow-up, have been integrated into this ESMP development process.

In addition, this ESMP is aligned with the project documents including: the stakeholder engagement plan and the gender action plan.

In its impact identification methodology, the ESMP highlighted the impact-causing activity and the impact receptors (natural and human) during the different phases of the project (pre-construction, construction and operation). This was done in order to have all possible management measures to allow the proper implementation of the activities.

In Moheli, the project plans to provide drinking water and irrigation to 8 localities with a total population of 31,932 (in 2020), which is expected to grow to 51,541 in 2032. The main actions planned under the project can be summarized as follows:

- Construction of new water catchments on natural flows or springs
- Rehabilitation of existing catchments
- Construction of a water treatment station (decantation, filtration and chlorination; 10.4m x 2.4m, total size of 24.96m^2)
- Construction of pumping stations
- Construction of storage tanks: reinforced concrete tanks of the semi-underground type
- Construction of surge tanks
- Rehabilitation of the existing reservoirs which will be maintained for the future situation of the project
- Supply, transport, earthworks and laying of new HDPE water supply and distribution pipes and construction of management and protection works
- Excavation and laying of existing pipes currently laid on the ground.

Tables 1 and 2 present respectively the characteristics of the infrastructures to be built and those to be rehabilitated and their geographical position

Under current conditions, the population of the study area is partially served with drinking water through small, antiquated networks. The main failures of the existing water supply systems are as follows

- The various components of the network (pipes, reservoirs, catchments) are out-dated and suffer from a lot of water losses
- Undersized, permanently leaking distribution and supply lines laid at natural ground level (not buried) and without protection
- Existence of several points of illicit exploitation of water (from conveyances and works)
- Water distributed without treatment (high turbidity in rainy periods)
- The connections are poorly designed
- The management committees are not functional, and water is distributed free of charge
- Households also use the rivers in periods of low water and especially for washing
- Water irregularities do not facilitate the installation of toilets in new constructions, although the population is interested in them because they constitute an element of change in the living environment.

The environmental and social analysis carried out by this study shows that the domestic and agricultural water supply project in the two selected areas of Moheli Island is in compliance with the environmental laws and regulations in the country and with the UNDP standards. This compliance will be achieved through the establishment of a participatory approach of the beneficiary communities and the effective use of the

grievance mechanism and stakeholder engagement plan. It meets the objectives of improving the quality of life of the beneficiary population and reducing the economic, health and technical vulnerability of the towns and villages concerned.

During this analysis, the identification and evaluation of the negative impacts of the project on the natural and human environment was carried out using an impact matrix that correlates the project components with the various components of the natural and social environment during the different phases of the project.

For the pre-construction phase and the construction phase, the main negative impacts identified are:

- ***During the pre-construction phase:*** non-valuation of the local workforce, non-valuation of migration flows in search of work.

- ***During the execution phase :*** noise and atmospheric pollution linked to the traffic of the construction site machinery, risk of accidental fuel leakage from the construction site machinery, clutter from construction site waste, risk of soil pollution from the fuel used by the construction site machinery, risk of silting up of the crops in the fields bordering the construction sites, risk of work accidents, risk of introducing invasive plant species, Risk of accidents to site personnel and local residents, risk of temporary inconvenience to traffic and to the population living near the work sites, risk of MST (Sexually Transmitted Diseases) contamination, risk of increasing the rate of contamination by the COVID-19 virus, particularly among site workers, disturbance of wildlife, risk of exploitation of children and GBV, etc.

- ***During the operation phase:*** Risk of contamination of the water collected, possibly linked to human activities upstream of the catchment, risk of wastage in the use of water and increase in wastewater discharges, risk of infrastructure maintenance, poor water quality for consumption, etc.

It should be noted that during this phase, the positive impacts of the project prevail and include: (i) Satisfaction of vital needs and improvement of the quality of life of the beneficiary population and reduction of water-borne diseases through access to purified drinking water in sufficient quantity, (ii) Reduction of water drudgery for women and girls, allowing them to have time available to engage in income-generating activities for women and to go to school for girls On the other hand, and in particular, the creation of storage reservoirs will constitute a resilient solution to the effects of climate change by ensuring a stock of water to serve the population during periods of low river and spring flow.

In order to avoid and/or minimize potential negative impacts, several measures are to be applied by those responsible during the different phases of the project. These measures are the subject of this Environmental and Social Management Plan (ESMP). Generally, these measures are integrated in the attributions of the work companies, in the application of the good practices in the rules of the art and are included in their general expenses. These include:

- **For the construction site installation phase and the execution phase**, the impacts identified are moderate to weak. For the most part, these impacts require the implementation of good

work management practice measures to be followed by the contractor and work monitoring authorities such as: (i) Ensuring periodic disposal of waste from the works to avoid soil pollution; (ii) ensuring categorical and immediate restoration of the site installation areas; (iii) Equipping workers with Personal Protective Equipment; (v) Ensuring the implementation of a signaling system to allow the movement of goods and people, (vi) protection of property and crops...etc.

- **For the operation phase of the project**, the negative impacts identified are mainly related to the management, maintenance and control of the systems to be installed and to the quality of the water supplied to the population. To this end, the environmental measures proposed are as follows:

- The organization of sensitization and popularization missions to the beneficiary
- populations of the project on (i) the need to pay for water consumption for the continuity of the service, the sustainability and durability of the infrastructure to be installed, (ii) the proper use of water by avoiding waste, (iii) the management of domestic wastewater to avoid its stagnation on the surface, which can promote the creation of environments conducive to the development of vectors of parasitic or infectious diseases (malaria), and others.
- Respecting the safety perimeters established by the water code in the catchment areas. It would be necessary to (i) organize awareness-raising missions on the need and importance of respecting the safety perimeters of the catchments defined in the water code in order to avoid and totally prohibit any anthropic activity in these zones[1], and to prohibit the dumping of waste (ii) program reforestation campaigns in the watersheds upstream of the catchments in order to reduce the load of suspended matter in the water
- Continuous monitoring of the quality of the water collected by means of periodic physico-chemical and bacteriological analyses
- Carry out periodic maintenance of the various network structures (catchment structures, reservoirs, treatment plants, management structures, etc.) and continuous monitoring of the condition of water supply and distribution pipes.

The proposed ESMP includes (i) identification of positive and negative impacts arising from the project activities, (ii) impact analysis, (iii) impact assessment and mitigation measures, (iv) follow-up and monitoring measures to be observed during the different phases, (v) an awareness and capacity building program for the project beneficiaries and the water resources management committees to be established and future system managers.

The environmental aspect of the project is taken into account from the preparation phase of the tender. The latter includes environmental and social clauses which are an integral part of the contract, and which must be respected by the companies.

The implementation of this ESMP on each intervention site requires the serious and responsible commitment of all stakeholders in order to guarantee the sustainability of the project and its success from an environmental and social standpoint. For greater efficiency, it is suggested that the DGEF recruit a Control Office to which the permanent monitoring and surveillance of the works will be entrusted.

[1] This is a preventive measure that concerns the protection of water catchments against pollution. The rivers are used for bathing and washing, but also for waste disposal. To date, in these protection areas and even beyond, no economic activity is conducted in the catchment areas and thus there is no possible risk of economic displacement.

In case of non-compliance or non-application of environmental measures, this control office (through its environmental and social expert) will initiate the process of formal notice that will be sent to the company. Supervision of the works during the various phases and at the time of acceptance of the works will be carried out by the DGEF and the ER2C project's environmental expert.

The proposed capacity building program foresees the realization of two technical training sessions to complete the technical skills of the various stakeholders in the exercise of their profession, management tools and good environmental and social practices so that the reflex of environmental protection is a reality at the level of all the stakeholders of the project. The people concerned by this program are (i) the technical managers of the DGEF who will be in charge of the control and monitoring of the implementation of the various measures indicated in the ESMP, (ii) the members of the IWRM committee who will be in charge of the management and protection of water resources, (iii) the staff of the DGME as a technical department of the ministry in charge of water, (iv) the various operators and (v) the water management committees at community level. Training will be provided by the ER2C project.

The awareness program for project beneficiaries will be established throughout the project implementation period. For greater effectiveness, it should also continue during the first year of project operation. Awareness raising will cover various areas, mainly maintenance of the infrastructure to be installed, management and preservation of water resources, adoption of hygiene and sanitation rules, empowerment of project beneficiaries to respect the infrastructure to be installed under the project and avoid illegal exploitation of water and promotion of gender equality and equity.

The implementation of the project activities could generate impacts on the direct beneficiaries of the project (farmers, concessionaires, village consultation committees, etc.), but also on the communities or any other person or structure, directly or indirectly. A grievance mechanism is established within the project to manage potential risks and conflicts, disseminate information, provide prior notification and increase accountability of the different stakeholders and beneficiaries of the project.

This mechanism was made known to the beneficiaries and stakeholders of the project implementation.

A register of complaints is established at the level of the local authorities (town hall, village chiefs). During the works, a register of complaints will be established at the level of the construction site and will be regularly monitored by the control office.

All complaints will be reported to UNDP and the project within 24 hours of receipt. After review, complaints of corrupt practices will be forwarded to UNDP for comment and/or guidance and to the DGEF.

Resolved and unresolved complaints and their reasons will be published in a report produced every six months.

Within the framework of the project, the environmental and social management framework and the environmental and social management plans have been validated by the stakeholders and by the technical committee for the validation of impact studies at the national level.

2 INTRODUCTION

2.1 GENERAL CONTEXT OF THE PROJECT AND THE STUDY

The technical studies of the water supply systems for domestic purposes for 103 localities (450,000 inhabitants) and for agricultural purposes for the irrigation of 1100 ha located in 15 target areas in the Comoros Islands - Grande Comore, Anjouan and Moheli - are part of the project entitled "Ensuring Climate Resilient Water Supply in Comoros". The project is designed to address the vulnerability of the country's water supply to extreme weather events due to the fragility of its water resources and the lack of human and financial resources due to its small population and isolated islands.

The fifteen target areas on the three islands were selected because of their vulnerability to climate change, their good hydrogeological and hydraulic potential for water catchment and storage, the limited donor support for water supply in these localities to date, and the potential collaboration envisaged with donors conducting complementary interventions there.

The project objectives will be achieved through the following three components:

- A national approach to water planning that integrates climate change resilience into

public policies, plans, legislation, budgeting and institutional arrangements, including regulators and service providers, to ensure that sufficient human and financial resources are available to support climate change resilience

- Ensure that adequate water resources are available during periods of drought and flooding and actively manage river basins in a manner that not only prevents climate-induced overrides but also, to the extent possible, enhances the protection of water resources, including the provision of forecasts and alerts on the status of water resources to enable adaptive management
- The development of climate-resilient infrastructure and technologies to manage and respond to water shortages caused by droughts, floods, storm damage, storm surges, bushfires, power outages, and water needs induced by rising temperatures.

It is within the framework of the implementation of Component 3 that the project plans to set up drinking water supply systems in Zones 14 and 15 in Moheli, the subject of this ESMP.

2.2 OBJECTIVES OF THIS REPORT

This report constitutes the Environmental and Social Management Plan for the project to supply water for domestic and irrigation purposes in the two project intervention zones on the island of Moheli. This project, supported by UNDP as an Accredited Entity of the Green Climate Fund (GCF), has been screened according to the UNDP Environmental and Social Standards procedure and has been classified as a category B moderate risk project.

The main purpose of this ESMP is to integrate during this phase of Project implementation, in addition to the impacts identified in the ESMF, the specific considerations of the natural and human environment so as to allow the realization of the project while ensuring their protection.

The scope of this study as defined in the terms of reference covers the identification and analysis of impacts on the natural and human environment, the identification of measures/actions to eliminate, reduce or mitigate environmental and social risks, the establishment of follow-up/monitoring measures to be observed, as well as the enhancement of the positive impacts of the project

2.3 METHODOLOGICAL APPROACH

The ESMP was developed to meet the requirements of the CVF and the UNDP SES.
The findings of the consultations with the beneficiary communities, site visits, and the analysis of the literature have been used as the basis for the preparation of this ESMP.

Data processing and analysis
The exploitation and analysis of data was based on the review of project documents (ESMF, SESP, stakeholder engagement plan, gender action plan) and via the Internet. It allowed the collection and synthesis of:

- Data on the legislative and institutional framework
- Data on the biophysical and human environments
- Socio-economic data for the project's area of influence
- Data on the socio-economic impacts of the project

Organization of meetings
Meetings were held with the communes covering the project's intervention zones in Moheli to gather their opinions on the project.

Field observations and investigations:
Field missions to each infrastructure site were organized to observe and diagnose the current state of the environment, identify sensitive areas and analyze the main socio-environmental issues.
No sensitive areas were identified as a result of the field work. The project is not located in or near a protected area, nor in or near a sensitive area.

Analysis of the data collected:
Once the documentation had been analyzed and the field observations made, the information collected was analyzed in order to:

- Insert the project in the political, legislative and institutional framework
- Have a description of the project and the environment in its biophysical and human components
- Describe the sites and activities to be carried out
- Identify the environmental and social impacts likely to be generated by the project activities
- Propose measures for the elimination, reduction or mitigation of the potential negative impacts identified and measures to improve the impacts
- Develop a follow-up and monitoring plan for the relevant impacts identified.

3 INSTITUTIONAL AND LEGAL FRAMEWORK

This chapter describes the institutional and legal framework applicable to the Comoros in the context of the water supply project for domestic and irrigation purposes in Moheli.

3.1 OVERVIEW OF INSTITUTIONAL ARRANGEMENTS FOR ESMP

This ESMP is technically validated by the project implementation stakeholders and by the Technical Committee for the Evaluation of Environmental and Social Impact Studies at the national level. The Directorate General of Environment and Forestry (DGEF) will be responsible for overseeing the implementation of the ESMP. UNDP will obtain the endorsement of the DGEF and ensure that the ESMP is properly implemented. In the event of non-compliance with the measures identified in this ESMP, the Project Implementation Team (PIT) will ensure that timely corrective action is taken by the contractor.

Other stakeholders that may play an important role in the implementation of the ESMP include:

- **The Directorate General for Energy, Mines and Water (DGEME):** DGEME is the main national institution responsible for sovereign missions in the water sector. In this sense, the project must ensure that it has the necessary information for better project implementation and that environmental protection requirements coincide with project activities.
- **The communes:** Under the law on the Water Code in the Union of the Comoros, the project management of the public drinking water supply and sanitation service is delegated to the communes (local authorities). In this case, the municipalities are responsible for the direct or indirect management of their assets and services. They are also in charge of environmental preservation and sanitation and monitor projects in their constituency.

- The ministry in charge of health, which can intervene in the missions of sensitization and popularization of the population in social and health matters

- The Labor and Social Laws Inspectorate will be responsible for (i) ensuring the enforcement of laws, regulations and collective agreements relating to working conditions and the protection of workers in the exercise of their profession, in particular those relating to working hours, wages, safety, health and welfare, employment of children and youth, and other related matters; and (ii) providing information, recommendations and advice to employers and workers on how to comply with the legal provisions... Under the project, the Labor and Law Inspectorate will be able to carry out inspections throughout the construction period and will intervene in case of disputes.

3.2 LEGAL AND LEGISLATIVE FRAMEWORK OF THE PROJECT

The legal framework of the Union of the Comoros is made up of national legislation (the Constitution, laws, decrees, orders, and ordinances) and international and regional conventions ratified by the Union of the Comoros.

This ESMP for the Moheli domestic and agricultural water supply project has been prepared in accordance with the legislation in force. The following paragraphs present the main legal and regulatory texts applicable to the project.

3.2.1 National legislation

- **The Constitution of the Union of the Comoros:** The Comorian State has embarked on a new environmental protection and conservation policy, defined by the Constitution of 23 December 2001, revised in 2009 and 2013. The legal foundations of the environmental policy is found in this Constitution, which proclaims in its preamble the right of the Comorian people to a healthy environment and the duty of all to safeguard it. It also required the State to respect the international agreements ratified by the country, including those relating to the rights of the child and of women. Under the Constitution, the tasks of the State include "improving the quality of life of the Comorian people and protecting the landscape, nature, natural resources and the environment, as well as the historical, cultural and artistic heritage of the Nation" (art. 8).

- **The Framework Law on the Environment:** Law No. 94-018 of 22 June 1994, as amended by Law No. 95-007 of 19 June 1995, governs all activities relating to the sustainable management and conservation of biological diversity resources in terrestrial, coastal and marine environments. It sets out the general principles that must inspire and guide the regulation of activities likely to affect the environment and has three main objectives:
  - Preserve the diversity and integrity of the environment of the Comoros, which is particularly vulnerable due to its insularity,
  - To create the conditions for the sustainable use of natural resources, in terms of quality and quantity, for present and future generations,
  - To ensure an environmentally sound and balanced living environment for all citizens.

In order to achieve these objectives, the framework law requires that an environmental and social impact assessment (ESIA) be carried out for any public or private investment project that may affect the environment (section 3, articles 11-14). Under the project, an Environmental and Social Management Framework (ESMF) is developed at the project design stage, as the infrastructure installation sites have not yet been identified. In this phase of project implementation, the identification and validation of all infrastructure installation sites has enabled the development of this environmental and social management plan, a corollary of the ESMF. The ESMF, like the ESMPs, have been technically validated by the project implementation stakeholders, and by the national committee for the validation of environmental and social impact studies.

This framework law, which is currently being revised, is an opportunity to integrate other environmental and social assessment and monitoring tools.

Sections 3 to 36 of the framework law are designed to protect the marine environment. Thus, the removal of material from the coastline is prohibited, as is any discharge into marine waters of any substance likely to affect water quality, destroy the fauna and flora of the marine environment, and the aesthetic and tourist value of the sea and coastline.

- **Law N°20-036/UA of 28 December 2020**, on the Water and Sanitation Code in the Union of Comoros. It defines the principles, rules, procedures and institutions for the planning, use, protection and development of water resources and the environment.
  The management of water resources must comply with the provisions of this law. **Decree n° 01/52/CE** relating to Environmental Impact Assessment. This Decree, taken in application of Article 14 of the above-mentioned Framework Law n°94-018 of 22 June 1994 modified relating to the environment, aims at regulating the methods for carrying out and presenting impact studies as well as the methods for their examination by the administration and for informing the public.

- **Forestry legislation**
  - Law n°88-006 of 12 July 1988 on the legal regime of reforestation, reforestation and forest management.
  - Order No. 66-617 regulating user rights dated 11 May 1966.
  - Order No. 66-398/PROD implementing deliberation No. 65-19 of 14 December 1965 regulating land clearing and vegetation fires.
  - Order of 5 August 1932 regulating the exploitation of mangrove stands.

Overall, this forestry legislation establishes rules for the protection, management and exploitation of all forests subject to the forestry regime, namely

  - Natural forests such as integral nature reserves, special reserves, national parks, classified forests, state forests and forest reserves,
  - Woods, forests and woodlands owned by a forestry group set up with the aim of carrying out a land policy in coastal regions to safeguard the coastal area, respect natural sites and the ecological balance.

Any clearing required at construction sites (reservoirs, watersheds) and along supply and distribution pipeline routes must comply with forestry legislation.
Before carrying out any work, the company must have in its possession all the necessary permits.

- **Act No. 95-O13/A/F**, on the Public Health and Social Action Code: this Act makes provision, inter alia, for any other form of deterioration in the quality of the living environment due to factors such as air or water pollution, industrial waste and noise.

This ESMP is developed to put in place management measures for the mitigation of impacts on the natural and human environment in order to allow the proper implementation of the project and ensure its success.

- **Law n°84-108 on the Labor Code**

The law establishes the right to work, training and professional development for all and prohibits forced or compulsory labor (Art. 2). It is applicable to workers and employers carrying out their professional activity in Comoros. Law No. 84-108 was amended by the Law of 28 June 2012 repealing, amending and supplementing certain provisions of Law No. 84-108/PR on the Labor Code.
The law specifies the rights and obligations of employers and employees with regard to: the employment contract (Title III), wages (Title IV), working conditions (Title V), working conditions of foreign workers (Title VI), health, safety and medical services (Title VII),

enforcement bodies and means (Title VIII), labor disputes (Title IX), penalties (Title X) and transitional provisions (Title XI).

Throughout the implementation of the activities, the project must comply with the labor code.

- **Law No. 14-034/UA of 22 December** 2014 on combating child labor and trafficking supplements the provisions of the Labor Code.

- **Law -N° 14-036/UA of 22 December 2014**, on the prevention and repression of violence against women: The purpose of this law is to combat all forms of violence against women and girls in the Union of Comoros.

The project will have to comply with the provisions of this law, in particular by combating all forms of gender-based violence in its activities and those of its suppliers and providers.

- **Law n° 31/01/MPE/CB of 14 May 2001** on the protection of species of wild fauna and flora in Comoros. This decree lists the provisions to be respected to ensure the protection of wild fauna and flora and provides a list of category 1 species, which are fully protected, and category 2 species, which are partially protected due to their endemism, rarity or the threats of extinction they face.

In this regard, the sites where the water supply works will be carried out do not harbor endemic flora or fauna species that are fully or partially protected. These sites are located in areas that have already been transformed for agricultural use.

3.2.2 International agreements, conventions and treaties

The Union of Comoros has ratified various international conventions and treaties on environmental protection and social issues, which demonstrates its willingness to integrate the environment into development. The most relevant to the present project are

- The RAMSAR Convention on Wetlands of International Importance of 1971. Ratification by decree n°94 -007/AF of 6 June 1994
- The Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora of 1972). Ratification by Decree No. 94-005/AF of 6 June 1994
- United Nations Framework Convention on Climate Change (1992). Ratification by decree n°94 -010/AF of 6 June 1994
- Convention on Biological Diversity (5 June 1992), Rio Earth Summit, ratified on 30 August 1994.

3.2.3 UNDP Social and Environmental Standards (2015)

The UNDP Guidance Note on Social and Environmental Assessment and Management defines the ESMP as a key outcome of the assessment process and consists of avoidance, mitigation, monitoring and institutional measures as well as the measures required to

implement these measures to achieve the desired social and environmental sustainability outcomes. UNDP's support for the project covered by this study means that the project must comply with the social and environmental standards (SES) of this international institution and must be aligned with its general principles when programming and designing the projects it supports. These standards are guidelines that must be taken into account in the environmental and social assessment of the activities to be undertaken by the project. Through these standards and principles, UNDP aims to:

- Strengthen the environmental and social benefits of programs and projects
- Avoiding negative impact on people and the environment
- Minimize, mitigate and manage their negative impact where it cannot be avoided
- To strengthen the capacity of UNDP and its partners to manage environmental and social risks
- Ensure full and effective stakeholder participation, including through a mechanism for responding to complaints from those affected by a project.

The GES requires that all UNDP programs and projects promote environmental and social opportunities and benefits and ensure that negative environmental and social risks and impacts are avoided, minimized, mitigated and managed.

The following UNDP 2015 GES principles are applicable to the project:

- **Principle 1: Human rights.**

In the area of human rights, UNDP will support the Government in meeting its human rights obligations and in empowering individuals and groups, particularly the most marginalized, to realize their rights.

- **Principle 2: Gender equality and women's empowerment.**

Regarding Principle 2, this ESMP has made provisions to ensure women's participation in all stages of project implementation including in the training program and in the monitoring and surveillance plan for risk and impact management and mitigation measures.

- **Principle 3: Environmental sustainability.**

For principle 3, UNDP is committed to integrating environmental sustainability throughout the project cycle. Thus, environmental sustainability issues are considered and integrated into the concept, design of a project and this ESMP. UNDP's commitment to integrating environmental Sustainability in this project has focused on compliance with standards 1, 2 and 7 to promote sustainable development.

The following UNDP SES 2015 standards are applicable to the project:

- **Standard 1: Biodiversity conservation and sustainable natural resource management**

The applicability of this standard is established during the review and categorization process of the environmental and social dimensions. In areas with modified habitat, UNDP will ensure that measures in this ESMP are implemented to minimize impacts on natural resources, including avoiding the introduction of invasive plant species.

- **Standard 2: Climate change mitigation and adaptation**

With regard to standard 2, UNDP will assist the Government in integrating the objectives of reducing emissions and resisting climate shocks in the implementation of this project. Thus, this ESMP will identify the mitigation and adaptation measures to be implemented.

- **Standard 3: Health, Safety and Working Conditions in the Community**

The community health and safety standard recognize that project activities, equipment and infrastructure may increase community exposure to risks and impacts. Therefore, UNDP will support the Government in implementing measures to avoid or minimize risks and impacts on community health and safety that may arise from project activities. These measures are incorporated into this ESMP. The present project is likely to improve the supply of drinking water to the population. It is therefore directly aimed at improving the health, safety and working conditions of communities.

- **Standard 4: Cultural Heritage**

Based on the field investigations, the project does not fall within any of the scope of this standard:

- The project will not cause a negative impact on cultural heritage
- It is not located on or near a cultural heritage site
- There are no major excavations, demolitions, earth movements, flooding or other environmental changes[2]
- It will not use tangible or intangible forms of cultural heritage for commercial or other purposes.

- **Standard 5: Displacement and resettlement**

UNDP projects will seek to avoid physical and economic displacement and mitigate the impact of displacement and its inherent risks where it cannot be avoided.

Within the framework of the project, all the sites for the installation of the infrastructures were donated by the various communes. Indeed, in the Comorian context, land is either privately owned (inheritance/purchase) or, for the most part, owned by the communes. In the latter case, the land is used for village or community development projects. It is in this context that the communes have made available to the project all the sites for the installation of the planned infrastructures.

The use of these lands has not resulted in any temporary or permanent economic displacement or restriction of access to resources.

- **Standard 6: Indigenous Peoples**

Standard 6 was not triggered because the project will not affect Indigenous peoples.

[2] The project will bury pipes at 0.80m from the ground surface and some of the tanks at 0.50cm from the surface. Taking into account the context of the environment and its history, it is not possible to have chance findings.

- **Standard 7: Pollution Prevention and Resource Efficiency**

Regarding standard 7, UNDP will ensure that projects avoid the release of pollutants, and if they cannot be avoided, minimize and/or limit the intensity and mass flow of releases. This applies to the release of pollutants to air, ensuring that pollution prevention and control technologies and practices consistent with international good practice are applied during the project life cycle.

4 PROJECT DESCRIPTION

The project's beneficiary localities are currently served with drinking water from very old networks, sometimes with renewed components. These networks are generally in average to poor condition and the population currently suffers from water quantity and quality problems to varying degrees.

For all existing water systems, management committees are not functional, and water is provided free of charge.

The components of the existing networks in each area and the planned development and/or rehabilitation actions are detailed in the following.

4.1 ZONE 14

4.1.1 Current situation

Zone 14 has a single SAEP. The localities of Fomboni, Bangoma, Bandar Salam and Djoézi have a single catchment, two reservoirs and two distribution networks.

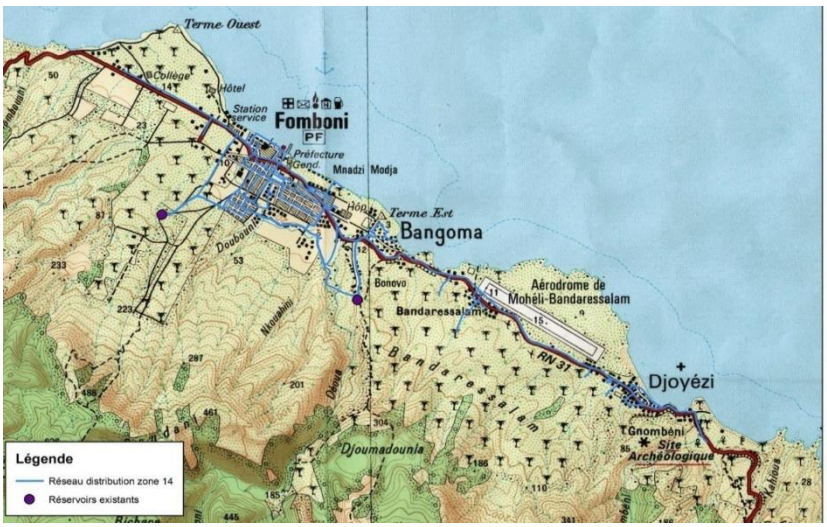


Figure n° 1: Location map of the localities affected by the project - zone 14

The existing SAEP consists of:

- A catchment on the MroOualembini River.
- A DN 250 ductile iron supply pipe, 3,282 m long, linking the catchment to a reservoir with a capacity of 1,250 m^3, passing through a load-breaking structure and 3 decanters.
- A chlorination chamber
- A tank with a volume of 1,250 m^3.
- A HDPE pipe with a diameter of 200 is 2,650 m long.

- A reservoir with a capacity of 500 m^3, normally designed to supply the localities of Bangoma, Bandar Salam and Djoézi.
- A distribution network with a total length of 20 km in pipes of different diameters and different types: Cast iron from DN 80 to 250, HDPE from DE 200 to 40.

4.1.2 Project Description - Area 14

The projected rehabilitation actions for the Zone 14 SAEP are as follows:

- Rehabilitation of the existing MroOualembini catchment
- Creation of a new catchment for Djoièzi
- Construction and equipment of a filtration and disinfection station for Djoézi
- Extension and rehabilitation of the Fomboni treatment plant
- Rehabilitation of existing tanks
- Construction and equipment of three reservoirs (250 m^3, 50 m^3 and 25 m^3)
- Construction and equipment of two load breakers with a capacity of 3.5 m^3
- Intensification and reinforcement of the distribution network by installing new HDPE and cast-iron pipes
- Construction and equipment of management and protection works on the newpipelines (23 sectioning, 8 suction cups and 11 draining).

4.2 ZONE 15

4.2.1 Current situation

Zone 15 is located between Fomboni and Domoni and includes 3 localities: Hoani, Mbatsé and Mtakoudja.
It should be noted that Mbasté and Mtakoudja are merged geographically (there is almost no land boundary because the two villages are mixed).

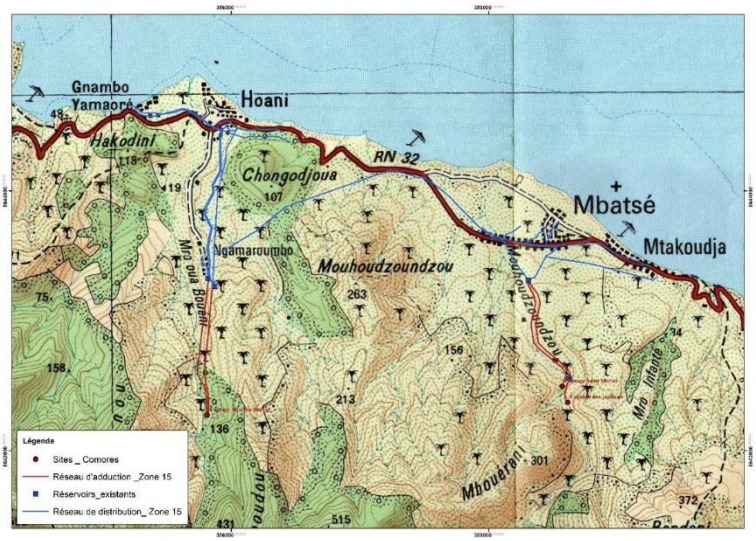


Figure n° 2 Location map of the localities affected by the project - zone 15

SAEP of Hoani

The Hoani SAEP is composed of an old network built in 1986 by the Association Française des Volontaires du Progrès (A.F.V.P) financed by the FAC (Fonds d'Aide et de Coopération française). This network is fed from a natural flow (Mro Wa Boueni 1). This catchment is connected to an elevated decanter which in turn feeds the Ngamarumbo reservoir with a capacity of 50 m^3 through a supply pipe with a total length of 1,064 m (120 ml in 80/90 galvanized steel and 944 ml in 90 HDPE). From this reservoir, a distribution network of HDPE and galvanized steel pipes starts to serve the villages of Ngamarumbo, Nyambo and Houani centre.

In 2016, a UNDP-funded ACCE project intervened to rehabilitate the catchment and the water supply and distribution network in the two localities Hoani and Mbatsé. Under this project, a new network was installed, consisting of:

- A new cast iron and HDPE pipeline between the catchment and the decanter
- A UNDP tank with a capacity of 400 m^3 just near the decanter
- A distribution network made of HDPE pipes of 75 and 110 mm with a total length of 3.31 km starting from the new reservoir in parallel with the old distribution network serving the villages of Ngamarumbo, Nyambo and Houani centre.
- A PEHD DE110 pipe, PN 10, from the PNUD reservoir to the Japanese donation, reservoir to supply the northern districts of Mbatsé

SAEP of Mbatsé

The drinking water supply system of Mbatsé is supplied from two catchments: Michel catchment and Don Japonais catchment. The AEP network installed on these two catchments is composed of:

- The Michel catchment supplies a reservoir named Michel with a capacity of 50 m^3 by means of an adduction pipe in galvanized steel DN80 and in HDPE DE90 with a total length of 920 m. along this pipe we note the presence of a load shedder (BC).
- The Don Japonais catchment feeds a buffer reservoir with a capacity of 25 m^3 which in turn feeds the Don Japonais reservoir with a capacity of 100 m^3 located near the Michel reservoir. The two reservoirs are connected.
- From these two reservoirs, a distribution network of HDPE pipes with a total length of about 4 km starts and supplies the villages of Mbatsé and Ntakoudja.

4.2.2 Project Description - Area 15

The projected rehabilitation actions for the Zone 15 SAEP are as follows:

Locality Hoani:

- Rehabilitation of the Mro Wa Boueni catchment1
- Rehabilitation of the PNUD reservoir with a capacity of 400 m^3
- Construction and equipment of a load breaker on the distribution pipe of the PNUD network
- Replacement of the HDPE supply pipe between the catchment and the decanting and filtration station by a new ductile iron pipe of 150 mm
- Intensification and reinforcement of the distribution network by installing new HDPE pipes with a total length of 5.7 km (OD40 to OD90 mm)

- Rehabilitation of the water treatment plant.
- Construction and equipment of management and protection works on the new pipelines (7 sectioning, 7 suction cups and 4 draining) .

The old pipeline and reservoir of the ADFC project will be abandoned

<u>Localities Mbatsé/Ntakoudja:</u>

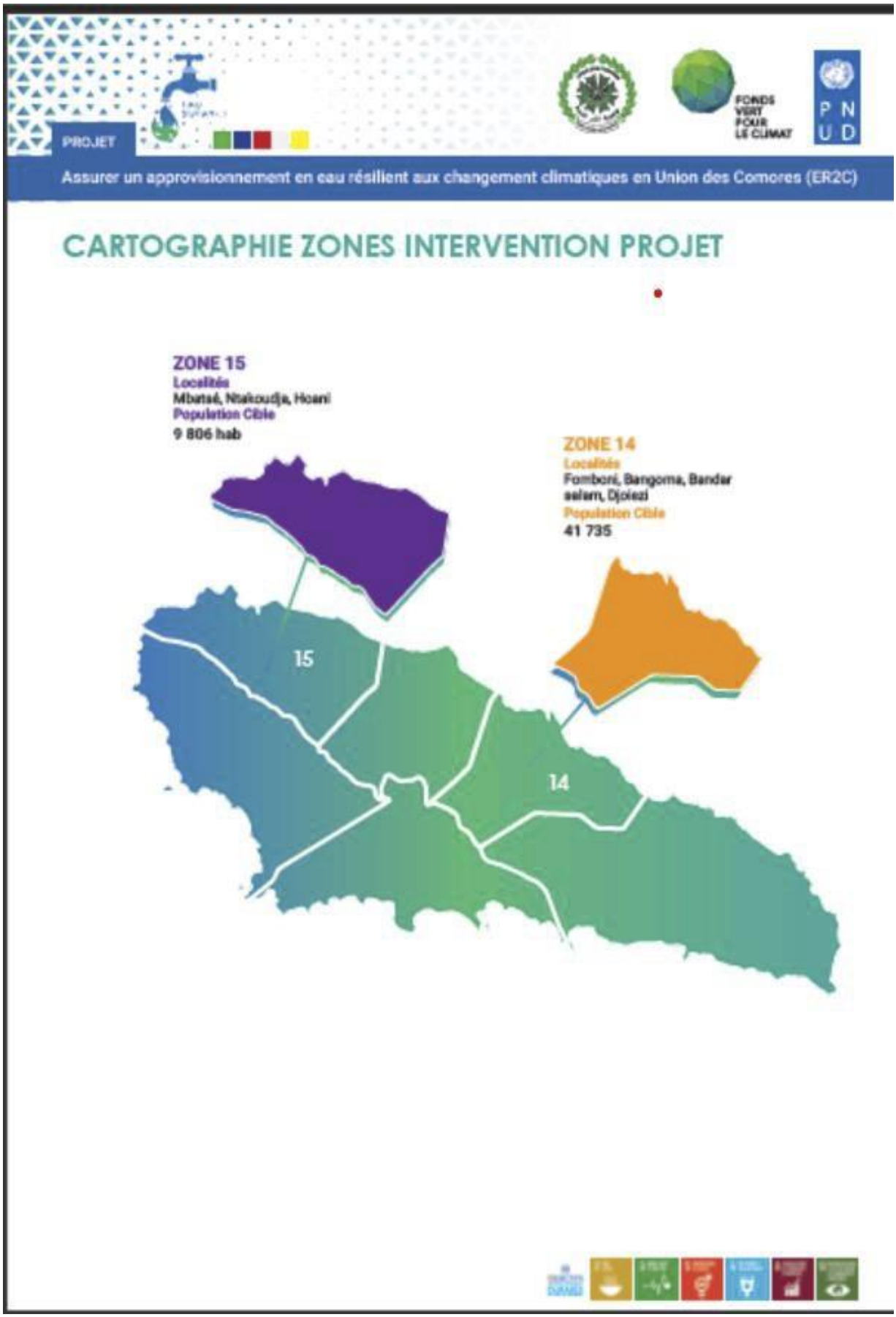
A new catchment "Mroni Hakanga" will be constructed on a natural flow. This tapping will be connected to a treatment plant (to be built within the framework of the project) by means of a new 1.5 km long HDPE 160 mm supply pipe. From this station, two supply lines will be laid:

- A new 66 m long pipe (HDPE 160 mm) which will feed a new 50 m capacity reservoir^3 to be built within the framework of the project to serve the topographically high area of the village Ntakoudja.
- A new HDPE DE90 pipe (640 m long) to supply the existing Don Japonais reservoir.
- This reservoir will serve most of the area (Mbatsé locality and the lower part of Ntakoudja village) after the necessary rehabilitation work has been carried out.

The Michel reservoir and the Michel catchment will be abandoned. The Japanese Don catchment and the buffer reservoir will be used for irrigation after the necessary rehabilitation work has been carried out.

The distribution network will be reinforced by laying 10.6 km of HDPE pipes from 40 to 125 mm, on which management and protection structures will be installed (6 suction cup structures, 2 draining structures and 7 blocking structures). Figure 3 shows the two intervention zones of the project in Moheli.

Figure N°3: Map of the project intervention areas in Moheli



Tables 1 and 2 show the infrastructure to be built and rehabilitated in the two zones in Moheli

Table N°1: Presentation of the infrastructures to be built in the two zones

Village	**Type of work**	**Site coordinates**	**Dimensions of the required plots**		**Surface area of the structure (m^2)**	**Area required (m^2)**
			Length	**Width**		
Zone 14						
Djoièzi	Catchment	UTM X=366445.86 Y=8637402.18, ALT: 117.51	19	14	150	266
	Filtration and disinfection station	UTM X=366358.17 Y=8638722.62 ALT:97.60	20	9	82	180
	Catchment reservoir 250 m^3	UTM, X= 366436.7 Y=8638744.78	31	24	132	744
	Load breaker 50m^3	UTM, X=362358 Y=8641374	25	15 ,6	130	390
Bandar-Salam	R5 tank 25m^3	UTM, X=365050 Y=8639835	18	11	112	198
Zone 15						
Mbatsé	MroniHakanga catchment	ALT: 109.87	10,25	6,55	16	67,13
	Filtration plant	ALT:89.24	23 ,40	8	77,6	187,2
	Projected tank 50m3	ALT= 86m	25	15 ,6	130	390
Hoani	Charge breeze	ALT= 58	11,8	8,5	35,1	100,3

Table N°2: Presentation of existing infrastructures to be rehabilitated

Site	Work	Coordinates (decimal degree)	Date of installation
Zone 14			
Fomboni	Mro Oualembini tank 1250 m3		2008
	Kanaleni tank 1250 m3	X=12.288747°S Y=43.732178°E	2008
	Bonovo tank 500 m3	X 12.295639°S Y 43.749703°E	2015
Zone 15			
Hoani	Ngamarombo catchment	X 12.278694°S Y 43.674191°E Altitude 124 m	2003
	Ngamaroumbo, FADC project tank	X 12.269261°S Y 43.674359°E Altitude 72 m	2001
	Ngamaroumbo, Uper decanter	X 12.270016°S Y 43.674598°E Altitude 86m	2016
	PNUD tank 400 m3	X 12.269779°S Y 43.674624°E Altitude 81m	2016
Localities Mbatsé/Ntakoudja	Catchment (Japanese donation)	X 43.699928 degree Y 43.699928 degree Altitude 81 m	2013
	Mroni Boyer Buffer tank (A) 25 m3	X 12.277056°S Y 43.689802°E Altitude 58 m	2013
	Mroni ha Boyer old breez loads	X 12.276013°S Y 43.699895°E Altitude 64 m	1980
	New Japanese donation tank 100m3	12.269553°S Y 43.697189°E Altitude 37m	2013
	New Japanese donation tank 100m3	12.269553°S Y 43.697189°E Altitude 37m	2013

5 REFERENCE DATA

5.1 PROJECT AREAS OF INTERVENTION

In Moheli Island, the project intervention will cover zones 14 and 15. These intervention zones include a total number of inhabitants of 37512 inhabitants in 2020 who are supposed to benefit directly from the projected development. This number of inhabitants is expected to reach 41,461 inhabitants in 2032 and 51,541 inhabitants in 2042 (Table 3)

Table 3: Number of inhabitants benefiting from the project

Zone	Villages concerned	Number of inhabitants 2020	Number of inhabitants 2032	Number of inhabitants 2042
Zone 14	Fomboni, Bangoma, Bandar Salam and Djoézi	25857	33573	41735
Zone 15	Hoani, Mbatsé and Ntakoudja	6 075	7888	9806
Total		**31 932**	**41 461**	**51 541**

Far from the geographical limits of the project intervention areas, the potentially affected population (PAP) extends to all persons using the traffic routes (roads and lanes) along which work will be carried out as part of the project.

5.2 PHYSICAL AND NATURAL ENVIRONMENT

Because of its insularity and small size, the characteristics of the physical and natural environment vary very little across the island. These will be described in a general way.

5.2.1 Geomorphology of the project area

The island of Moheli, which includes zones 14 and 15, is characterized by a rugged relief with sharp ridges, resulting from the dissection of the ancient volcano (West). This relief attenuates towards the East and down to the coastal plains. The island is also marked by the cutting of its coasts and the presence of small bays with mangroves and a fringing coral reef surrounding the whole island perimeter.

5.2.2 Climate

5.2.2.1 Climate change

The Union of the Comoros is experiencing the adverse effects of climate change, which significantly affects various sectors, including water resources, health, energy, agriculture and forestry.
In Moheli, the Djandro region, which is more arid and hot during the dry season, is particularly affected by the scarcity of water due to the premature drying up of water points.

5.2.3 General overview of water resources

Moheli has more than 50 rivers collected by a moderately dense hydrographic network. These rivers are distributed in 25 river basins. However, it is reported that a phenomenon of decreasing low water flows and drying up of the water tables in the dry season has been occurring for the last 10 to 20 years, probably as a result of deforestation, which leads to increased runoff. On this island, the supply of fresh water depends mainly on surface water with a supplement of springs and wells in the eastern part and on the Djandro plateau.
As far as lakes are concerned, they are not very present, but some of them are of environmental importance: the case of Lake Boudouni, which covers 30 hectares, is a highly ecological wetland of the Comoros, located on the island of Moheli and classified on the Ramsar list (which came into force on 09/06/1995) of wetlands of international importance. However, Lake Boudouni is not located in the project intervention areas. Lake Boudouni is located in the South-East of the island whereas the project areas are located in the North and North-West of the island.

5.2.4 Surface water quality

The quality of river water is altered by the products of erosion, the discharge of faecal matter, household waste and other waste.

5.2.5 Biological environment

The Comoros Islands are part of the Madagascar Biodiversity Hotspot, which includes other islands in the western Indian Ocean. This area is considered one of the five most sensitive 'hotspots' in the world because of the extremely high number of endemic species found there. The animals and plants that reached the islands were subsequently isolated from the rest of their species and many evolved independently into entirely new species. Although Moheli has a high rate of endemism (see Table 4), the activities to be carried out by the project will not affect biodiversity.

Indeed, due to the small size of the infrastructures to be installed and their scattering in space, the sites of installation of the infrastructures are all already converted into agricultural zones or zones of socio-economic development.

To determine the presence or absence of these species at the level of the intervention sites for the water supply works in Moheli, questions were asked to the local users (farmers). This was based on the lists of endemic species that are fully and partially protected.

Table 4: Endemicity of fauna in Moheli (ECDD, BCSF & Durrell 2014)

	Endemic to the island	Endemic to Comoros	No endemic	Total
Birds	13	6	12	31
Reptiles	1	0	3	4
Butterflies	1	5	10	16

5.3 CHARACTERISTICS OF THE SOCIO-ECONOMIC ENVIRONMENT

The island of Moheli is the least populated of the 3 islands that form the Union of the Comoros. In 2020, the population was estimated at 56,526 inhabitants of which 48% are women with 9,193 households. This population represents nearly 7% of the total population.

The population density is the lowest in the country, at around 177 inhabitants per km2.

The prefecture of Fomboni (which includes the communes of Moilimdjini, Fomboni and Mombassa) accounts for 56.5% of the total population of Moheli. Almost half of Moheli's population is rural with 49.1%. In Moheli, the average number of persons in a household is identical to that of Grande-Comore. It is estimated at 6 persons in both urban and rural areas.

The island of Moheli is characterized by a fairly high sex ratio, which is explained by strong internal migration to this island, especially by men, and return migration to Anjouan.

According to the final report (2017) of SCA2D and based on the results of the 1, 2, 3 survey conducted by INSEED in 2014, poor individuals are unevenly distributed among the islands and by area of residence. The island of Mwali (Mohéli) is the most affected with an incidence of 50.3% of the poor.

5.3.1 Demography, urban planning and socio-economic activities

- **Zone 14**

Fomboni

Fomboni is the capital of the island with an essentially urban population. The main activity is administrative and commercial.

The town of Fomboni is home to the basic infrastructure of the island of Moheli (high school, hospital, market),

Post Office and Banks...etc) and concentrates several activities. It is essentially fishing, tourism, agriculture and trade.

Bangoma

The village of Bangoma has a population that is mainly rural. The main activities carried out by the inhabitants are agriculture, fishing and trade. The inhabitants of Bangoma belong to the category of poor households according to the average income classification at Moheli.

Bandar Salam

The village of Bandar-Salam is mainly rural and lives on agriculture, fishing and livestock. Its inhabitants are poor, with little income to support them properly.

Djoièzi

The village of Djoièzi is characterized by a semi-urban population. The main activities of the village are agriculture, fishing and breeding. The agriculture is of the extensive type using rudimentary means of production. Three types of crops are grown: food crops (banana, manioc, taro), market gardening (tomato, onion, lettuce, cabbage, carrot and brèdes (felkmafana) and cash crops (vanilla, clove, coffee). Bananas and cassava, the main staple foods, are grown by almost all households. Production is mainly for own consumption. A small amount (less than 20%) is sold at the market in Fomboni and even in Moroni (Grande Comore).

- **Zone 15**

The localities concerned by the planned development in zone 15 are Hoani, Mbatsé and Ntakoudja. They have a total of 6075 inhabitants in 2020. Agriculture, livestock and fishing are the main economic activities of the population in these areas.

Hoani

The village of Hoani is characterized by an essentially rural population and lives mainly from fishing and agriculture, mainly food and cash crops in the south near the forest.

Mbatsé and Ntakoudja

In Mbatsé, agriculture is dominated by food crops in the south along the edge of the forest and market gardening in the north near the sea. Market gardening is practiced in Mbébani and Ziarani. In these localities, handicraft activities are less practiced, being limited to small works related in particular to the making of mats, hats, baskets, decorative objects, bags for girls, in particular the pupils. They also make sheets and traditional ornamental buttons as well as pottery.

5.3.2 Socio-economic infrastructure

The socio-economic infrastructures in the two areas are presented in Table 5 below.

Table N°5 : Socio-economic infrastructures in the two areas

Village /infrastructures		School infrastructures	Hotels/Motels	Market	Bank	Mosque	Bakery

	Sanitary infrastructures	Primary	Middle school	High school					
Zone 14									
Fomboni	5	15	11	5	13	1	12	32	8
Bangoma	0	1	0	0	0	0	0	7	1
Bandar-Salama	0	1	0	0	1	0	0	4	0
Djoièzi	0	4	2	1	3	1	3	7	2
Zone 15									
Hoani	1	3	2	1	1	0	1	10	1
Mbatse	0	2	1	1	2	0	1	6	0
Ntakoudja	0	0	0	0	0	1	0	4	0

5.3.3 Health

In zones 14 and 15, according to the surveillance activity report of the health department of Moheli, out of a total of 9,227 patients consulted from January to June 2020 at the ospital in Fomboni, 0.16% are cases of bloody diarrhoea and 6.39% of typhoid. No deaths have yet been recorded due to water-borne diseases.

6 COMMITMENT OF THE BENEFICIARY COMMUNITIES

During the design of the project, consultations were conducted with various stakeholders including the beneficiary communities, in accordance with the stakeholder engagement plan. Based on this plan, the beneficiary communities were involved in the different phases of the project from design to implementation. A consultation meeting was held involving all parties: local authorities, NGOs and beneficiary communities including women's associations, opinion leaders and youth representatives. Beyond the presentation of the activities to be carried out, the objective of these consultations was to raise awareness among the various parties and to gather the opinions of all of them. The involvement of the stakeholders, and in particular that of the beneficiary communities, is essential for the ownership and progress of the project. No protest against the project was expressed. The parties present at these meetings expressed their willingness to accompany and support the project so that it achieves its objectives and that the supply of drinking water and irrigation in the beneficiary localities becomes a reality. The main points raised, the responses provided and the lists of participants are consolidated in the consultation report (see Annex 1).

7 ANALYSIS OF ALTERNATIVES

The analysis of possible alternatives on the implementation of the drinking water supply systems (WSS) with less impact on the environment was a key element during the design of the latter. Several alternatives were considered during the pre-feasibility study phase (preliminary design). The selected alternatives were then studied in detail during the feasibility

phase (detailed design) and a more precise cost for the implementation of the water systems in the two areas in Moheli was determined.

The most relevant proposed project alternatives are:

- The "No Project" alternative (no implementation of AEP systems in the two zones in Moheli)
- Design alternatives
- Flow alternatives
- Alternatives for the distribution network (piping)
- Alternatives to storage tanks

7.1 NO PROJECT" ALTERNATIVE

The "No Project" alternative is the option of not implementing the proposed project (provision of water supply in both zones in Moheli). This alternative would imply that the proposed development would not be carried out and the situation would remain as it is now. This would avoid any environmental, social and economic impact. Under current conditions, the population in the two target areas is partially served through very old, small networks. Assuming that the water supply systems would not be developed on Moheli Island, the site would remain in its current state, as no specific development is currently planned in the target areas. There would be no improvement in the quality of life, no reduction in poverty, no improvement in access to clean water, no improvement in the overall health of the beneficiaries, etc. The direct benefits associated with construction activities, such as increased employment opportunities and associated economic benefits, would also not occur if the project did not proceed.

7.2 DESIGN ALTERNATIVES

After a technical diagnosis of the existing water supply infrastructure, two alternatives were considered during the design phase: upgrading the existing water supply network or building a completely new network. It was identified that upgrading the existing network would not meet the community's water needs:

- The quantities of water that could be mobilized and the estimated water requirements for the project horizon would not be met
- Some parts of the localities would not have sufficient water supply
- The current infrastructure is poorly constructed
- Water storage structures are inadequate and dilapidated
- Distribution networks are not compliant in terms of water quality
- The network pipes are undersized.

The existing network has not been able to sustainably improve living conditions on the island. The choice therefore fell on the construction of new water supply infrastructure while improving the existing one. This new system will be designed taking into account the demographic evolution, the social and economic situation of each intervention area and the needs of the beneficiaries.

7.3 ALTERNATIVES FOR THE DISTRIBUTION NETWORK (PIPING)

High-density polyethylene (HDPE) was chosen over PVC and cast iron as the material for the distribution systems. HDPE is easy to install, affordable and resistant to soil chemistry. In addition, the material is widely used in Comoros, so there is local knowledge of installation and repair.

7.4 STORAGE TANK ALTERNATIVES

The storage tank could have been metallic or concrete. Based on the comparative analysis of the existing situation, it appears that metal tanks require less time and labor to install. They are more economical. However, being an island country with a very narrow continental shelf, this type of infrastructure is very corrosive to the salt and is not appreciated by many beneficiaries.
Concrete tanks, on the other hand, require more time, materials, labour and money to install, but they are very strong, resilient and can last a long time (several generations). Their maintenance is very easy and manageable by the population. Therefore, this alternative was adopted for the project.

7.5 ALTERNATIVE TARGET AREAS AND SITES FOR THE INSTALLATION OF STRUCTURES

The project could have intervened in areas where water systems are functioning well and improve the conditions of supply and maintenance of infrastructure. The most vulnerable areas would remain on the same conditions:

- Partial water supply in some localities
- The current infrastructure is poorly constructed
- Water storage structures are inadequate and dilapidated
- Distribution networks are not compliant in terms of water quality
- The network pipes are undersized.

The existing network could not sustainably improve living conditions on the island.
This alternative was abandoned. The fifteen target areas on the three islands were selected because of their vulnerability to climate change, their good hydrogeological and hydraulic potential for water catchment and storage, the limited donor support for water supply in these localities to date, and the potential collaboration envisaged with donors conducting complementary interventions there.
As for the choice of sites for the installation of the infrastructures, they were chosen according to the **altitude** and the **proximity** to the service area (the agglomeration), while avoiding as much as possible to damage the natural and social environment.

- **Searching for the elevated area (altitude):**

Sufficiently elevated area to ensure gravity distribution (material and energy savings)

- **Proximity:**

The proximity of the water reservoir to the service areas is an important criterion in determining the location.

Other criteria also contributed to the choice of sites, such as the nature of the soil for the foundation, the accessibility of the sites and the absence of protected areas, or areas where the project activities could have more impacts (additional impacts) than in other areas (e.g. areas at risk of erosion (slopes), sites at risk of flooding, landslides, etc.

8 IDENTIFICATION, ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL IMPACTS OF PROJECT AREAS 14 and 15 AT MOHELI LEVEL

8.1 METHODOLOGY FOR IDENTIFYING AND ASSESSING IMPACTS

The identification of impacts was based on documentary analysis, mainly the ESMF, and analysis of data collected in the field, highlighting the project components (impact-causing activities) and the components of the receiving environment (physical, natural and human environment) during the various phases (pre-construction, construction and operation).

This comparison of the project elements and environmental components (physical, social, natural) makes it possible to evaluate the probable impact and thus to have all the possible mitigation measures for the proper implementation of the activities. To this end, a matrix for highlighting the probable impacts on each of the activities to be carried out during the different phases was adopted (see Table 9). Subsequently, the determination of significance and assessment of impact risks were carried out in accordance with the methodology adopted in the project's ESMF (see Tables 6, 7 and 8 below).

Table 6: Risk Impact Assessment

Score	Rating	Social and environmental impacts
5	Extreme	Significant adverse impacts on human populations and/or the environment. Adverse impacts of large magnitude and/or spatial extent (e.g., large geographic area, large number of people, trans-boundary impacts, cumulative impacts) and duration (e.g., long-term, permanent and/or irreversible); adversely affected areas include areas of high value and sensitivity (e.g., valuable ecosystems, critical habitats); adverse impacts on Aboriginal peoples' rights, lands, resources, and territories; involve significant levels of displacement or relocation; and involve a high degree of risk to the environment. Negatively impacted areas include areas of high value and sensitivity (e.g., valuable ecosystems, critical habitats); negative impacts on Aboriginal peoples' rights, lands, resources, and territories; involve significant levels of displacement or relocation; generate significant amounts of greenhouse gas emissions; impacts may result in significant social conflict.

4	Extended	Negative impacts on people and/or the environment of considerable magnitude, spatial extent and duration, but more limited than extreme (e.g., more predictable, mostly temporary, reversible). Project impacts that may affect the human rights, lands, natural resources, territories and traditional livelihoods of indigenous peoples should be considered at a minimum.
3	Intermediate	Impacts of medium magnitude, limited in magnitude (site-specific) and duration (temporary), can be avoided, managed and/or mitigated through relatively simple accepted measures.
2	Minor	Very minor impacts in terms of severity and magnitude (e.g. small area affected, very few people affected) and duration (short), can be easily avoided, managed, mitigated
1	Negligible	Negligible or no negative impacts on communities, individuals and/or the Environment

Table 7. Assessing the "probability" of a risk

Score	Rating
5	Expected
4	Very Likely
3	Moderately Likely
2	Low Likelihood
1	Not Likely

Table 8. Determining the "significance" of Risk

Impact	**5**	High	High	High	High	High
	4	Moderate	Moderate	High	High	High
	3	Low	Moderate	Moderate	Moderate	Moderate
	2	Low	Low	Moderate	Moderate	Moderate
	1	Low	Low	Low	Low	Low
		1	**2**	**3**	**4**	**5**
		Likelihood				

8.2 THE ACTIVITIES SOURCE OF IMPACTS

The sources of potential impacts are defined as all the activities planned under the project. The impact receptors (or environmental components likely to be affected by the project), correspond to the sensitive elements of the study area, i.e. those likely to be significantly modified by the project activities (or sources of impact).

The implementation of the proposed developments could have some negative impacts on the human and natural environment. For the most part, these impacts are generally temporary and controllable. The main sources of impacts are summarized below:

8.2.1 Pre-work phase

- Application for authorizations
- Reservation of the sites by the company for the installation of the building sites
- Communication of the work schedule
- Recruitment of site personnel

8.2.2 Throughout the work

- Site clearing[3] and earthworks
- Vehicle traffic
- Vehicle maintenance
- Site installation
- Construction of catchments
- Tank construction
- Construction of water treatment plants
- Water withdrawal for the work
- Installation of HDPE pipelines for water supply
- Site restoration
- Withdrawal from the site

8.2.3 "Operational phase".

- Operation of water supply infrastructure
- Water treatment and disinfection
- Infrastructure maintenance and upkeep
- Individual connection to different networks

NB: the infrastructures to be put in place are not of great capacity and are scattered throughout the various localities. Their impact is therefore very limited at the installation site and is temporary.

None of the work to be done will require: the establishment of a temporary base camp, the opening of roads, and the storage of fuels, oils, chemicals or other hazardous liquids. Water supply activities do not take place in or near protected areas

[3] The site clearing will not involve the removal of existing infrastructure.

8.3 IDENTIFICATION OF IMPACTS ACCORDING TO THE ACTIVITIES THAT CAUSE IMPACTS DURING THE DIFFERENT PHASES

The analysis of the ESMF and the field surveys determined:

- The risks and impacts identified in the ESMF, linked to the establishment of water systems in Moheli;
- The risks and impacts identified in the ESMF, which are not related to the establishment of water systems in Moheli;
- And to identify other risks and impacts that were not identified in the ESMF and that complement it.

Regarding cumulative impact, there were no cumulative impacts identified. The existing networks are over 20 years old and other activities are not undertaken in these areas.

a) Risks and impacts identified in the ESMF, linked to the establishment of water systems in Moheli;

- Disruption of the animals' way of life (livestock)
- Pollution of the terrestrial environment
- Alteration of river water
- Risk of soil erosion
- Air pollution
- Solid / liquid / hydrocarbon waste generation
- Noise pollution
- Accident on site personnel and the population
- Impact on women and children
- Risk of spillage and/or physical damage from liquid chlorine
- Non-inclusion of women in training
- Damage to infrastructure by flooding, landslides, etc.
- Social risk
- Introduction of weeds
- Decrease in vegetation cover
- Fire and emergency management and prevention strategies implemented
- Non-inclusion of women in training

b) Risks and impacts identified in the ESMF, which are not related to the establishment of water supply systems in Moheli

- Habitat loss,

The activities to be carried out in the two zones in Moheli are not likely to have an impact on the habitat.

The project operates in areas already converted to agriculture and social development. In addition, the infrastructure is small and scattered in the different areas.

- Extraction and/or contamination of groundwater

There is no groundwater in Moheli. The latter is characteristic of Ngazidja.

- Potential impacts on threatened species.

The project does not intervene in protected areas.
Although there are fully and partially protected endemic species on the island, these have not been identified in the project's infrastructure installation sites (which are residential/agricultural areas).

- Land use change

There will be no risk associated with land use changes.

- Excessive use of resources

The infrastructure to be put in place is small and does not require an excessive use of resources.

- Vibration due to construction work

This impact is almost non-existent. Given the small size of each infrastructure, the supply of construction materials does not require the use of heavy machinery.

- Increase dust levels in sensitive receptors

No sensitive receptors have been identified in the project sites.
However, the impact of dust on crops and the atmosphere has been noted.

- Excessive extraction and/or contamination of groundwater

In Moheli, as in Anjouan, no groundwater source is known. Only the island of Ngazidja has known groundwater. This impact does not therefore concern the sites in Moheli.

c) Risks and impacts identified in the ESMP development process

- Temporary traffic disruption
- Choice of equipment
- Impacts on flow
- Risk of disease and increase in communicable diseases including STIs and Covid-19
- Non-consideration of the local workforce
- Poor quality of drinking water
- Failure to maintain and service infrastructure
- Waste of water
- Liquid waste generation and increase in disease vectors
- Changing the landscape
- Silting and crop destruction
- Pollution of water catchments by agricultural activities
- Temporary traffic disruption

The negative impacts identified in the ESMF, which are related to the implementation of the water supply systems in Moheli, and those identified by the ESMP, constitute the exhaustive list of impacts that may occur throughout the water supply works and during the operation of the infrastructures to be put in place. Based on the impacts presented in Table 9 below, the sections on impact analysis, impact assessment and application of management and mitigation measures, as well as the implementation of impact monitoring and follow-up during the various phases, will be addressed.

Table 9: Highlighting of impacts and impact-causing activities during the various project phases

X : *Indicate the presence*

Type of impact :

Likely negative impact :

	Negative socio-environmental impacts																										
	Temporary traffic disruption	Choice of equipment	Disruption of the animals' way of life (livestock)	Pollution of the terrestrial environment	Alteration of river water	Impacts on flow	Risk of soil erosion	Air pollution	Solid / liquid / hydrocarbon waste generation	Noise pollution	Accident on site personnel and the population	Risk of disease and increase in communicable diseases including STIs	impact on women and children	No consideration of local labor	Poor quality of drinking water	Risk of spillage and/or physical damage from liquid chlorine	Damage to infrastructure by flooding, landslides, etc.	Failure to maintain and service infrastructure	Waste of water	Liquid waste generation and increase in disease vectors	Changing the landscape	Silting and crop destruction	Pollution of water catchments by agricultural activities	Social risk	Decrease in vegetation cover	Fire and emergency management and prevention strategies	Non-inclusion of women in training
Pre-construction phase																											
Application for authorizations Reservation of the sites by the company for the installation of the building sites and the base camp																											
Communication of the work schedule																											
Application for authorizations Reservation of the sites by the company for the installation																											

X : *Indicate the presence*

Type of impact :

Likely negative impact :

	Negative socio-environmental impacts																										
	Temporary traffic disruption	Choice of equipment	Disruption of the animals' way of life (livestock)	Pollution of the terrestrial environment	Alteration of river water	Impacts on flow	Risk of soil erosion	Air pollution	Solid / liquid / hydrocarbon waste generation	Noise pollution	Accident on site personnel and the population	Risk of disease and increase in communicable diseases including STIs	impact on women and children	No consideration of local labor	Poor quality of drinking water	Risk of spillage and/or physical damage from liquid chlorine	Damage to infrastructure by flooding, landslides, etc.	Failure to maintain and service infrastructure	Waste of water	Liquid waste generation and increase in disease vectors	Changing the landscape	Silting and crop destruction	Pollution of water catchments by agricultural activities	Social risk	Decrease in vegetation cover	Fire and emergency management and prevention strategies	Non-inclusion of women in training
of the building sites and the base camp																											
Recruitment of site staff														X													
Storage of materials and hydrocarbons				X																							
Execution phase																											
	X		X							X	X	X	X	X							X						
Circulation des véhicules	X			X			X	X	X		X		X														
Vehicle traffic				X					X		X		X														
Vehicle maintenance	X		X						X		X	X	X	X							X	X			X	X	
Site installation			X		X				X		X	X	X	X							X	X			X	X	
Construction of tanks			X				X		X		X	X	X	X			X			X	X	X			X	X	

X : *Indicate the presence*

Type of impact :

Likely negative impact :

	Negative socio-environmental impacts																								
	Temporary traffic disruption	Choice of equipment	Disruption of the animals' way of life (livestock)	Pollution of the terrestrial environment	Alteration of river water	Impacts on flow	Risk of soil erosion	Air pollution	Solid / liquid / hydrocarbon waste generation	Noise pollution	Accident on site personnel and the population	Risk of disease and increase in communicable diseases including STIs	impact on women and children	No consideration of local labor	Poor quality of drinking water	Risk of spillage and/or physical damage from liquid chlorine	Damage to infrastructure by flooding, landslides, etc.	Failure to maintain and service infrastructure	Waste of water	Liquid waste generation and increase in disease vectors	Changing the landscape	Silting and crop destruction	Pollution of water catchments by agricultural activities	Social risk	Decrease in vegetation cover	Fire and emergency management and prevention strategies	Non-inclusion of women in training
Construction of water treatment plants			X						X		X	X	XX	X			X			X	X	X			X	X	
Watre withdrawal for the work									X		X		X														
Installation of HDPE pipelines for water supply	X	X	X				X		X		X	X	X	X			X				X	X					
Site restauration																								X			
Withdrawal from the site infrastructure																								X			
Operating phase																											
Operation of water supply infrastrucrure						X		X											X				X				X

X : *Indicate the presence*

Type of impact :

Likely negative impact :

	Negative socio-environmental impacts																												
	Temporary traffic disruption	Choice of equipment	Disruption of the animals' way of life (livestock)	Pollution of the terrestrial environment	Alteration of river water	Impacts on flow	Risk of soil erosion	Air pollution	Solid / liquid / hydrocarbon waste generation	Noise pollution	Accident on site personnel and the population	Risk of disease and increase in communicable diseases including STIs	impact on women and children	No consideration of local labor	Poor quality of drinking water	Risk of spillage and/or physical damage from liquid chlorine	Damage to infrastructure by flooding, landslides, etc.	Failure to maintain and service infrastructure	Waste of water	Liquid waste generation and increase in disease vectors	Changing the landscape	Silting and crop destruction	Pollution of water catchments by agricultural activities	Social risk	Decrease in vegetation cover	Fire and emergency management and prevention strategies	Non-inclusion of women in training
Water treatment and disinfection																X												
Infrastructure maintenance and upkeep	X													X	X		X	X										
Individual connection to different netxorks																			X	X								

8.4 ANALYSIS AND EVALUATION OF THE PROJECT'S IMPACT ON THE NATURAL AND HUMAN ENVIRONMENT

The environmental impacts of the project are analyzed, and their evaluation is presented in Table 11 (evaluation of negative impacts before and after management measures).
Furthermore, the environmental assessment of a project on the environment should not be limited to the description of negative impacts but should also highlight positive impacts. This will help to better judge and evaluate the project from an environmental point of view and in particular to show that the non-implementation of the project itself poses problems for the natural and human environment. The main positive impacts of the project are presented in section 10. The impacts of the ESMP were identified on the basis of the ESMF analysis and field surveys.

This allowed us to determine:

- The risks and impacts identified in the ESMF that are applicable to the implementation of DWS systems in Moheli.
- Risks and impacts identified in the ESMF that are not applicable to the implementation of drinking water supply systems in Moheli
- Identification of other risks and impacts that were not identified in the ESMF and that complement it.

To identify impacts, the ESMP highlighted activities that cause impacts at different phases of the project (pre-construction, construction, and operation/use). This made it possible to identify the impacts according to the impact receptors (natural and human level). To this end, the dimensions and impacts identified in the ESMC are well integrated into the ESMP.

In addition, the scope of the activities covered by this ESMP is limited to the sub-activities of construction of the drinking water supply system in the two zones of Moheli, which are part of project activity 3.2 as described in Table 2 of the ESMF.

8.4.1 Analysis of the impacts related to the implementation of water systems during all the different phases

The analysis of an impact makes it possible to situate it and measure its consequence in relation to its receptor. This will enable the impact to be properly assessed and appropriate management measures to be proposed to ensure the proper implementation of activities.

- **Noise pollution**

Activities related to infrastructure construction, machine traffic and pipe laying are likely to be a source of noise pollution. This nuisance will be very occasional or even non-existent and very localized in time and space, due to the dispersed nature and very low density of the habitat. This impact will be felt mainly in the cities when the distribution pipes are laid. Among the main sources of noise pollution, we can note on such a construction site:

  - Layout of the site facilities
  - The use of inferior construction equipment
  - The use of concrete mixers
  - The horn of the vehicles.

Regardless of the project site, measures must be taken to limit the nuisance caused by construction-related noise.

- **Air pollution**

The execution of the work may occasionally generate temporary emissions of dust or gaseous pollutants during the work phase. In fact, the main air pollution caused by the movement of construction equipment required for the work is dust. It is mainly generated by the movement of machinery on the construction sites and by the transport of equipment to the construction areas.

The second source of air pollution is exhaust from construction equipment, including sulfur dioxide (SO2) and nitrogen oxides (NOx). In all cases, these emissions will be temporary and will not affect the overall level of air quality on the site. However, in order to limit the nuisance caused by dust and exhaust gases, measures must be taken.

- **Impacts on surface water**

Potential impacts on surface water will be related to the construction of the catchments.
In general, almost all of the installation sites for structures (reservoirs, breakwaters, treatment plants) are outside the riverbeds.

- **Poor quality of drinking water**

This impact would be linked to the pollution of water catchments and the lack of maintenance of infrastructures

- **Poor management of water resources**

The availability of water at all times could lead to waste and depletion of the resource.

- **Risk on the maintenance and upkeep of infrastructures**

This risk would be linked to a lack of financial means following the non-payment of bills.

- **Wooded areas**

The main activities affecting vegetation are:

  - Site preparation (clearing brush and cleaning up rights of way).

Most of the work consists of laying pipelines along tracks and roads, which does not require a lot of brush clearing. In addition, the infrastructure to be installed (treatment plant, catchments and reservoirs) is not clustered in one location, so the footprint is relatively small, not occupying a very large area.

  - Introduction of invasive plant species

During site restoration and as part of the reforestation of watersheds, there is a risk that invasive plant species may be introduced to the sites.

- **Impacts on soil**

The impact on the soil could be related to the risk of accidental hydrocarbon pollution from construction equipment, construction materials and construction waste.

- Waste generation (solid, liquid and hydrocarbon waste)

Waste generation would be related to the construction of infrastructure and the laying of pipes along the lines.

- **Impacts on traffic**

The implementation of the project will not require the removal or modification of public roads and the existing network of access roads. However, disruptions may be caused during the execution of the work:

  - Temporary traffic disruptions during the replacement and installation of pipes along roads.
  - Risk of occupational accidents for site personnel and road users

- **Social impacts**

Implementation of the proposed developments could result in certain adverse impacts on the human environment, including:

  - Risk of spread of the Covid.19 pandemic and transmission of STIs (HIV/AIDS) due to mixing of populations with employees of construction companies.
  - Dust generated by earthworks on construction sites can affect the health (respiratory diseases) of workers and the surrounding population, in particular sensitive persons (infants and elderly).
  - Traffic disruption during replacement and installation of pipes along roads.
  - Accident on site for site personnel and users
  - Risk of silting and destruction of field crops in the area where the pipes are laid and during clearing for infrastructure construction.
  - Impact on women and children
  - Risk of employment of children on the sites. If female workers are present, risk of abuse and non-integration. Few women, if any, are engaged in such activities

- Non-consideration of the local workforce

There is a risk that during the recruitment of site personnel, the company does not favour local labour, especially unskilled labour. In particular, there could be a risk of marginalization of women during the recruitment of site personnel

- Risk of spillage and/or physical harm associated with liquid chlorine This risk could have an impact on the health of the beneficiary population

- **Impacts on wildlife**

Work on the sites and the presence of humans can cause disturbance to the lifestyle of certain animals.

8.4.2 Negative impacts of the operational phase

The primary sources of adverse impacts during the operational phase of the project are as follows:

- The increase in the volume of wastewater as a result of improved access to water.

This could lead to the presence of stagnant wastewater in the vicinity of houses and around network structures, thus favoring the creation of an environment conducive to the development of vectors of parasitic or infectious diseases (malaria, etc.);

- The risk of contamination of water resources and destruction of infrastructure due to the absence of a protection perimeter and the presence of human activities in these areas
- Disruption of water service and risk of social problems between the population and the network operator due to possible delays or non-payment of water consumption by the population, delays in repairing leaks, lack of maintenance of tanks and other network components.
- Health and safety impact of employees and users related to equipment operation and maintenance work

8.5 ASSESSMENT OF NEGATIVE IMPACTS AND MANAGEMENT ANDMITIGATION MEASURES

The impact management measures include the measures identified in the ESMF (presented in Table 10 below), in addition to other measures identified in the ESMP. This forms the measures for managing the negative impacts associated with the development of the water supply systems in Moheli, during the different phases.

Table N°10: Management measures identified in the ESMF

Component	Performance criteria	Management measures
SURFACE WATERS	No significant decrease in water quality as a result of construction and operation activities Water quality will have to comply with the conditions of approval	Conduct regular monitoring of surface water quality

	stipulated by UNDP, DGEF and/or other government agencies, or in the absence of such conditions, the "no worsening" method will be pursued	
ECOLOGY	- No clearing beyond the established limits - No introduction of new weed species as a result of construction activities	- Limit clearing activities and reduce habitat disturbance through protection and proper management of vegetation - Restore vegetation in disturbed areas using native and local endemic species that have strong habitat value.
EROSION CONTROL	- No accumulation of sediment in aquatic environments and/or waters as a result of construction and operation activities	- Plan/organize the work to limit the areas to be cleared and the soils exposed at all times. - Plan/structure the proposed work to ensure that major vegetation disturbances and earthworks are carried out during periods of low rainfall and wind speed. - Remove and store topsoil for use in vegetation restoration and/or return removed soil to agricultural land - Plan/organize the work to reduce the storage time of topsoil materials - Design storm water management measures to reduce flow velocities and avoid concentration of runoff. - Avoid importing fill that could result in site contamination and is not accompanied by certification/documentation. - When backfill is not available on site, it must be tested
SOCIAL MANAGEMENT	- Avoid negative impacts on the local community throughout construction and operations and, to the extent possible, reduce, restore for these impacts - The health and safety of communities is protected and the project has an overall positive impact on well-being - Complaint and grievance mechanisms are in place and proactively managed - Consultation with stakeholders will continue. It will help to ensure	- Conduct community consultation on the purpose and benefits of the infrastructure to be put in place - Ensure compliance with the grievance mechanism process - Women will need to be trained in the maintenance of local water management systems, including monitoring of small waterworks and water treatment systems to indicate when they need repair and to prevent inefficiencies in resource use (e.g., leaks) (ensuring that some of the trainers are female).

	that stakeholders continue to be informed about the project, its progress and any changes that are made. It will also help to identify potential problems.	- Design, standardize and implement socially sensitive water tariffs in each target area that promote climate-sensitive water management.
WASTE MANAGEMENT	- Application of the waste hierarchy (avoid, reduce, reuse, recycle) - No littering in the project area or surrounding area due to site staff activities - No complaints received regarding waste generation and management - Used oil will be collected and sent for recycling	- Give preference to materials that reduce waste - The disposal of waste shall be in accordance with the requirements of the competent authorities. - Fuel and lubricant leaks from vehicles and facilities must be repaired immediately. - Major maintenance and repair work should be carried out off-site whenever possible.
NOISE AND VIBRATION	- Noise from construction and operation - Activities shall not cause an environmental nuisance in a noise sensitive area - Take measures at all times to help Reduce noise associated with construction activities - No damage to off-site properties caused by vibrations from construction and operation activities;	Reduce the need for emissions and limit them as much as possible if noise-generating construction work is to be carried out outside working hours: 7:00 a.m. - 5:30 p.m. - Consultation with local residents prior to construction activities, especially if noise-generating activities are to be carried out outside the "hours of the day", i.e. 7:00 a.m. - 5:30 p.m. - The contractor shall provide training to employees and operators to increase awareness of the need to reduce excessive noise
AIR QUALITY	- The release of dust/particles must not be harmful to the environment - Take measures at all times that help Reduce air quality impacts associated with construction and operation activities construction and exploitation	- Limit speeds on roads and access roads - Ensure that vehicles/equipment are stopped when not in use. - Ensure that all vehicles, facilities and construction equipment are maintained
EMERGENCY MANAGEMENT	- No impact of fire - No failure of water retention	- Containment/storage areas for flammable liquids and fuels shall be designed in

MEASURES	structures - No major chemical or fuel spills - No unavoidable industrial or occupational accidents - Provide an immediate and effective response to incidents that pose a risk to health, safety or the environment; and - Reduce damage to the environment due to unforeseen incidents.	accordance with appropriate international standards - Fire extinguishers should be available on site - Open fires are not permitted in the project area - Communication equipment and emergency protocols will need to be in place prior to the start of construction activities - Train all staff in emergency preparedness and response (covering workplace health and safety). Work in coordination with the national disaster management office.

8.5.1 MEASURES SPECIFIC TO THE STUDY PHASE AND THE PREPARATION OF DAO

In order to ensure compliance with the ESMP, environmental and social clauses are included in the tender documents and form an integral part of the contracts with the companies carrying out the work. These clauses will ensure that the environmental and social safeguards are respected by the companies throughout the execution of the works. In addition, prior to the start of the work, the company must submit its construction ESMP, which will be aligned with the management, monitoring and surveillance measures established in this ESMP.

Note: All specific environmental provisions and obligations to be implemented must be included in the companies' specifications. Failure to comply with any of these environmental requirements will constitute a serious infringement for which a fine should be imposed on the company.

Thus, other measures have also been taken into account in the final design of the proposed drinking water supply systems. In fact, during the different phases of the study, different alternatives were studied with a view to minimizing the constraints and choosing the most suitable alternative for the conditions of the area, the acceptability of the project by the population, etc. Among these measures, the following can be mentioned.

- To minimize leaks and pipe breaks, the new pipes to be installed will be buried and made of HDPE, which is tighter and more resistant to breakage and cracking.
- All the works (suction cups, drains, sectioning, etc.) will be protected in reinforced concrete chambers equipped with tamper-proof closing systems, which will allow the protection of these works and the elimination of the illicit use of these works for other purposes.
- The tanks will be capped to prevent the intrusion of various contaminants into the water.

8.5.2 IMPACT MANAGEMENT AND MITIGATION MEASURES DURING CONSTRUCTION AND OPERATION OF DWS SYSTEMS

During construction and operation of the water systems, measures will be put in place to manage and mitigate impacts.

In Table 11 below, all the risks and negative impacts that could occur during the construction and operation of the water systems are assessed, managed and mitigated.

This assessment addresses the magnitude of the risk and impact before and after the implementation of management and mitigation measures.

The assessment made shows that the magnitude of risks and impacts related to the activities of the AEP works in Moheli is "low" with only one impact considered "moderate".

The impact considered moderate is related to natural conditions that are not necessarily related to the works and the operation of the water systems in the two zones in Moheli. This is the impact of climate change, in particular the variations in rainfall.

The mitigation measures that will be put in place will be beneficial in creating a microclimate.

Table 11: Risk and impact assessment before mitigation, and risk and impact assessment after mitigation.

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
Pre-construction phase							
No consideration of local labor	3	3	Moderate	In order to stimulate local economic development, it is recommended that priority in hiring be given to local people for unskilled labor. The choice of local suppliers should also be encouraged.	1	2	Low
				Encourage women to join the workforce.			
Construction phase							
Temporary traffic disruption	1	3	Moderate	A site traffic plan will be drawn up, particularly for the movement of machinery at the edge of the work area	1	2	Low
				Road signs in accordance with the regulations will be put in place to warn all users of the presence of the work site. The works should be signposted (at 150 m, then reminders every 50 m).			
				No storage or warehousing of materials or equipment will be permitted within the existing roadway right-of-way			
				The maximum speed for lorries transporting materials through built-up areas is limited to 30 km/h.			
Choice of equipment	2	1	Low	All equipment must be checked by the control office and submitted for validation by the project coordinator. The company must respect the technical prescription of the equipment included in the tender document (DAO)	1	1	Low

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
Temporary disturbance to wildlife (in the work areas, wildlife and livestock could be disturbed by human presence)	1	2	Moderate	Limiting noise and dust emissions Avoid night work	1	1	Low
Pollution of the terrestrial environment	2	1	Low	In case of soil pollution by hydrocarbons, the soiled area must be immediately covered with highly absorbent materials (sawdust). The area will then be stripped and evacuated to a suitable landfill after agreement with the project manager on site.	1	1	Low
Alteration of river water	1	3	Low	Maintenance (oil changes, repairs) of construction equipment and any vehicle related to the site activities will be prohibited on site. Maintenance and cleaning operations must be carried out off-site. Conduct regular monitoring of surface water quality	1	1	Low
Risk of soil Erosion	2	1	Low	Limit construction site rights-of-way to a strict minimum and do not clear sloping areas Plan/organize the work to limit the number of sites to be cleared. Plan/structure the proposed work to ensure that major vegetation disturbances and earthworks are carried out during periods of low rainfall and wind speed. Use low ground pressure vehicles,	1	1	Low

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
Air pollution	4	2	Low	The routes for bringing materials and structures to the site should be as direct as possible	2	1	Low
				Limit speeds on roads and access roads			
				Ensure that vehicles/equipment is stopped when not in use.			
				Ensure that all vehicles, facilities and construction equipment are maintained			
				Construction equipment and trucks must be well maintained and comply with current standards. They must be chosen in such a way as to reduce odors, fumes and dust as much as possible			
				Dust abatement measures will be applied on unpaved tracks crossing inhabited areas and on internal traffic routes			
				The use of tarpaulin-covered trucks will be preferred for supplying the sites.			
				The regulations in force concerning the fight against atmospheric pollution and the standards for the discharge of exhaust gases from the operation's machinery will be respected.			
Production of Solid / liquid / hydrocarbon waste	4	2	Moderate	Strict application of the "reduce - reuse - recycle" principle in order to minimize the volume of waste to be disposed of in landfills	3	1	Low
				Disposal by landfill should be considered as the ultimate solution. Waste disposal sites will need to be identified prior to the commencement of operations, in consultation with local authorities			

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
				Ensure the maintenance of the machines and daily verification of their condition			
				Fuel and lubricant leaks from vehicles and facilities must be repaired immediately.			
				Hydrocarbon wastes will be collected in watertight drums for disposal in appropriate sites.			
				Major maintenance and repair work should be carried out off-site whenever possible.			
				Give preference to materials that reduce waste			
Noise pollution	3	3	Low	The work schedule of the site is organized to coincide with the activities of local residents (7 a.m. to 5 p.m.).	2	1	Low
				Consultation with local residents prior to construction activities, especially if noise-generating activities are to be carried out outside the "hours of the day", i.e. 7:00 a.m. - 5:30 p.m.			
				The contractor shall provide training to employees and operators to increase awareness of the need to reduce excessive noise			
				The machines to be used on site must be in very good condition to avoid noise emission			
Accident on site personnel and the population	3	3	Moderate	Before the start of the work, an information campaign should be carried out under the authority of the Administration to involve the local population in the work and also to warn of the dangers and risks involved	2	2	Low
				Prohibition of the work site to the public: Thus, the work site will be the object of a defense by the installation of a fence and the			

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
				installation of a system of information of the public (signs of danger).			
				Put up posters informing the public about the work in progress: duration, surface area, prohibited access, etc.			
				Installation of signage in the work areas with clear information on the obligation to wear personal protective equipment and the risk areas.			
				Provision of personal protective equipment to each worker			
Risk of disease and increase in communicable diseases including STIs and HIV/AIDS	3	3	Moderate	Favor the recruitment of local labor to reduce the risk of disease proliferation	2	2	Low
				A program of awareness and information of the personnel of the building site must be implemented by the company, in particular, on the means of protection of the COVID-19, the sexually transmissible diseases and AIDS and the rules of hygiene to be respected during the period of execution of the works.			
				The company is obliged to provide free of charge individual protection means (disinfectant gel, mask, gloves, special clothing...) for all the workers on the site.			
				The company must provide workers with free hydro alcoholic gels and masks. Respect the barrier measures			
Impact on women and Children	2	3	Low	Implementation of awareness-raising actions on gender-based violence (type of behavior concerned, planned sanctions) on the work sites	1	2	Low

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
				Adoption of a code of conduct on the sites and zero tolerance to Gender Based Violence and any form of mistreatment, abuse and exploitation of children.			
				Strict prohibition on the use of children			
				In the event of incidents of gender-based violence, - encourage victims to file a complaint, - Anonymous accompaniment of victims in the formulation, filing and throughout the processing of the complaint. - Establishment, in collaboration with local medical services, of a medical and psychological support unit for victims - Dismissal without notice with immediate effect of the offender			
No consideration of local labor	3	3	Moderate	In order to stimulate local economic development, it is recommended that priority be given to hiring local (unskilled) labor. The choice of local suppliers should also be privileged	2	2	Low
				Encourage women to join the workforce			
Damage to infrastructure by flooding, landslides, etc.	1	3	Low	Avoid installing structures in areas at risk (flooding, earthquake and landslides...) and bury water pipes	1	1	Low
Changing the Landscape	2	1	Low	Ensure the cleanliness and structure of the site (orderly storage of materials and equipment),	1	1	Low
				Cleaning of the roadways bordering the site in case of soiling,			
				Waste management (installation of closed bins),			
				Proper use of parking areas,			
				Restoration of intervention sites after the work site has been			

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
				withdrawn, etc.			
Silting and crop destruction	2	3	Moderate	Water sites as necessary to limit crop silting	2	2	Low
				Limit clearing to the area required for the installation of the infrastructure.			
				Clearing operations will be carried out without damaging adjacent un-cleared areas: topsoil is stored within the cleared area and at the edge of the clearing area, trees are felled towards the interior of the area.			
				Sites will be cleared from side to side, or from the center outwards, to avoid the risk of animal entrapment			
				Mark out the work areas and respect the defined rights-of-way to avoid any intrusion outside the project site boundaries			
Introduction of Weeds	1	3	Low	Restore vegetation in disturbed areas using native and local endemic species that are well adapted to the environment. Prior to restoration, it would be preferable for the company to give the landowner the choice of which species to put on the site.	1	1	Low
Decrease in vegetation cover	3	3	Moderate	Limit clearing to the area necessary for the installation of the infrastructure. As much as possible, avoid cutting down large trees.	2	1	Low
				Restore vegetation in cleared areas using native and local endemic species that adapt to the environment. Agree with the owners on the species to be put in place.			

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
Social risk	1	3	Low	Women will need to be trained in the maintenance of local water management systems, including monitoring of small waterworks and water treatment systems to indicate when they need repair and to prevent inefficiencies in resource use (e.g., leaks) (ensuring that some of the trainers are female).	1	2	Low
				Ensure compliance with the grievance mechanism process, in particular that the public is aware of and has access to the GRM.			
				Restore work sites using native and local endemic species. Agree with the owners on the species to be put in place.			
				Inform stakeholders on the status of the project and any changes during the implementation process			
Fire and emergency management and prevention strategies	3	3	Moderate	No open fires are permitted in the project area	2	2	Low
				Communication equipment and emergency protocols should be established prior to the start of construction activities.			
				Train all staff in emergency preparedness and response (cover health and safety on site). Work in coordination with the national disaster management office.			
				Check and restock first aid kits			
				Use of personal protective equipment			
Hygiene, health and safety impact on workers and the local population	3	2	Moderate	Make workers aware of the risks associated with the trade Require cleanliness of the site Require the wearing of PPE Ensure that PPE is renewed Prohibit the presence of children on the site	2	1	Low

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
				Prohibit public access to the site and protect it with markers and signs Maintain all electrical equipment, machinery, vehicles and dangerous machines in good working order and prohibit their use without prior training, competence and authorization			
Operating phase							
Impacts on flow	1	2	Low	The supply of drinking water could lead to a consequent use of water resources. Raise awareness among the beneficiary populations on the rational use of water. Erosion control and reforestation campaign in the catchment area upstream of the catchments in order to reduce the load of suspended solids in the water;	1	1	Low
Poor quality of drinking water	3	1	Low	To ensure continuous monitoring of the quality of the water collected by means of periodic physic-chemical and bacteriological analyses; Carry out periodic maintenance of the various network structures (Tank structures, reservoirs, treatment plants, management structures, etc.) and continuous monitoring of the condition of the supply and distribution pipes to be installed (check for leaks, breakages, illegal connections, etc.).	1	1	Low
Pollution of Water catchments by agricultural Activities	3	1	Low	Carry out awareness-raising missions for local users and negotiate with the owners of the land included in these areas to avoid and completely prohibit all human activities in these zones, prohibit the dumping of waste, etc.	2	2	Low

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
Risk of spillage and/or physical damage from liquid chlorine	1	3	Low	Equip the technicians in charge of water treatment and mobilization with adequate equipment for their protection and with tools to properly dose chlorine	1	2	Low
Non-inclusion of women in training	2	3	Moderate	Encourage women to integrate maintenance work and to prioritize it in the training. According to the gender action plan, 30 to 50% of the participants will be women (see annex XIII-c of the project document: Gender assessment and action plan).	1	2	Low
Failure to Maintain infrastructure	1	3	Low	Information/sensitization of project beneficiaries to the need to pay for water consumption for the continuity of service and the sustainability of the infrastructure to be installed Installation of meters for each connection	1	1	Low
Waste of water	3	3	Moderate	Sensitization of the population benefiting from the project for the proper use of water by avoiding waste;	1	1	Low
Generation of liquid waste and increase in disease vectors	3	3	Moderate	Encourage the beneficiaries to build septic tanks to avoid the discharge of domestic wastewater into the environment in order to avoid the stagnation of water which favors the creation of environments conducive to the development of vectors of parasitic or infectious diseases (malaria, etc.)	1	1	Low
Health and safety impact of employees and users related to equipment	1	2	Low	Equip employees with protective tools (personal protective equipment (PPE), gauge for the use of liquid chlorine, etc.) Inform the local population of the works to be carried out in the event of maintenance of the equipment and infrastructures in place	1	1	Low

Unmitigated Impacts	Evaluation before mitigation of impacts			**Prevention and mitigation measures**	Post-mitigation evaluation		
	P	**C**	**A**		**P**	**C**	**A**
operation and maintenance work				Maintain a diversion if necessary (indicated by road signs) and inform the population			
Impacts of climate change, particularly variations in precipitation	3	3	Moderate	Reforesting watersheds, particularly upstream of water catchments, to allow for river recharge.	3	2	Moderate

Reference:

P=Probability

C= Consequence

A= Magnitude of the consequence of the risk and/or impact

In order to maintain this low level of risk and impact on the water system works, the above-mentioned mitigation measures will be monitored and followed up throughout the duration of the works and during operation (see Table 12).

9 FOLLOW-UP AND MONITORING OF MANAGEMENT AND MITIGATION MEASURES

9.1 Overview of the monitoring program

The objective of the monitoring and follow-up program is to ensure that improvement and mitigation measures are implemented and that they produce the desired results. It also assesses compliance with national environmental and social policies and standards. This program will be implemented during the construction phase and will also continue during the operation phase. It covers the following principles:

- Control and supervision of the work,
- Monitoring and follow-up during the operational phase,
- And the inspection.

The objective of environmental monitoring is to ensure compliance with: (i) the measures proposed in this ESMP, including mitigation measures; (ii) commitments to local communities and departmental authorities; and (iii) the requirements of other laws and regulations related to public health and safety, management of the living environment of the population, and protection of the environment and natural resources. Environmental monitoring will cover all phases of the project.

A control office will be recruited to ensure the permanent monitoring of the works. In the same way as the water supply works, the control office will ensure the environmental and social control, follow-up and monitoring.

In case of non-compliance or non-application of environmental and social measures, the control office initiates the process of formal notice, through the owner, which will be sent to the company a copy to UNDP.

9.2 Performance criteria for site monitoring and surveillance

The performance criteria indicate the success of and compliance with the implementation of the management measures. In this case for the water supply works in Moheli, the performance criteria can be summarized as follows:

- No clearing beyond established limits
- No new weed species introduced as a result of site remediation activities
- The community was consulted, and the project components were designed with their informed consultation and participation throughout the process
- All stakeholders are appropriately represented
- Avoid negative impacts on the local community during construction and, to the extent possible, reduce or mitigate such impacts
- Community health and safety are protected, and the project has an overall positive impact on well-being
- Complaint and grievance mechanisms are in place and proactively managed
- Long-term benefits are assured.
- Application of the waste hierarchy (avoid, reduce, reuse, recycle)
- No littering in the project area or surrounding area due to site personnel activities
- No complaints received regarding waste generation and management
- Used oil will be collected and sent for recycling
- Noise from construction and operation activities shall not cause an environmental nuisance in a noise sensitive location
- Take measures at all times that help reduce noise associated with construction activities
- No damage to off-site properties caused by vibrations from construction and operation activities
- The release of dust/particles must not harm the environment
- Take measures at all times that help reduce air quality impacts associated with construction and operation activities
- No Fire Impact
- No major chemical or fuel spills
- No unavoidable work or occupational injury

- Provide an immediate and effective response to incidents that pose a risk to health, safety or the environment; and
- Hygiene and sanitation in the temporary bases are ensured
- The level of maintenance of construction equipment (maintenance sheet)
- The use of personal protective equipment for workers (helmets, bibs, boots, uniforms, gloves, masks, goggles, hydro alcoholic gel, etc.)

The analysis of these indicators is the main input for monitoring and surveillance reports. It forms the basis for suggestions to reverse or replace ineffective measures.

9.3 Budget for follow-up and monitoring of the measures put in place

During the construction period, the follow-up and monitoring of management measures for the mitigation of risks and impacts are the responsibility of the company. The related budget is included in the company's offer.

In fact, in the preparation of the DAO, the measures for environmental and social management were integrated into the latter, to be part of the offer of the companies.

During the operation phase, the follow-up and monitoring of management measures for risk and impact mitigation will be the responsibility of the competent authorities (DGEF, DGEME, GIRE committees and SONEDE), with the support of the project during its implementation period. This budget is included in the operating budget of each institution.

The budget for the implementation of this ESMP, which commits the project, will be charged to the budget (training and awareness, and the budget for the implementation of ESMC activities).

Measures that do not require a budget are indicated by N/A (not applicable).

Table 12 below presents the follow-up and monitoring measures, indicators, frequency, persons responsible for follow-up, and timetable for follow-up and monitoring of management measures to achieve the performance criteria.

Table 12: Follow-up and monitoring of risk and impact management and mitigation measures during the different phases

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
Pre-construction phase						
No consideration for local labor	In order to stimulate local economic development, it is recommended that priority in hiring be given to local unskilled labor. The choice of local suppliers should also be encouraged.	Number (Nb) of local workers and technicians hired	Quarterly	Control Office (CO), General Directorate of Environment and Forests (DGEF), Project backup expert (ESP)	Pre-construction phase	Included in the company's offer
	Encourage women to join the work force.	No. of women among the site personnel				
	The company must have a Quality, Health, Safety and Environment (QHSE) manager on its team who will be responsible for the implementation of this ESMP throughout the execution of the works contract.	An operational QHSE manager				
Construction phase						
Temporary traffic disruption	A traffic plan for the site will be drawn up, in particular for the movement of machinery at the edge of the work area	Number of traffic plans developed	1 time	BC, DGEF, ESP	Before the installation of the site	Included in the company's offer

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	Road signs in accordance with the regulations will be put in place to warn all users of the presence of the work site. The work should be signaled (at 150 m, then reminder every 50 m).	Number of signs installed	1 time	BC, DGEF, ESP	Before the installation of the site	Included in the company's offer
	No storage or warehousing of materials or equipment will be permitted within the existing roadway right-of-way	Presentation of the situation of the environment	Weekly	BC, DGEF, ESP	Throughout the work	N/A
	The maximum speed for trucks transporting materials in built-up areas is limited to 30 km/h.					
Choice of equipment	All equipment must be checked by the control office and submitted for validation by the project coordinator. The company must respect the technical prescription of the equipment included in the tender document (DAO)	Quality of the equipment to be installed	Once	BC, Project Coordinator (PC)	At the beginning of the work	Included in the company's offer
Temporary disturbance of wildlife	In the work areas, wildlife and livestock could be disturbed by human presence	Respect of the schedule (7am to 7:30am)	Daily	BC, ESP	Throughout the work	N/A

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	Limit noise and dust emissions Avoid night work					
Pollution of the terrestrial environment	In case of soil pollution by hydrocarbons, the soiled area will have to be immediately covered with materials with a very high absorption rate (sawdust). The area will then be stripped and evacuated to a suitable landfill after agreement with the project manager on site.	Nb of soil treatments performed	Quarterly	BC, ESP, DGEF, PND	Throughout the work	Included in the company's offer
Alteration of river water	Maintenance (oil changes, repairs) of construction equipment and any vehicle related to the site activities will be prohibited on site. Maintenance and cleaning operations must be carried out off-site. Conduct regular monitoring of surface water quality	No. of water analyses performed	Weekly	BC, DGEF, ESP	Throughout the work	Included in the company's offer
Risk of soil erosion	Limit construction site rights-of-way to a strict minimum and do not clear Plan/organize the work to limit the sites to be cleared.	Respecting the right-of-way for the work	Daily	BC, DGEF, ESP	Throughout the work	Included in the company's offer

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	Plan/organize the proposed work to ensure that major vegetation disturbances and earthworks are conducted during periods of low rainfall and wind speed.	Quality of the sites	Quarterly	BC, DGEF, ESP	Throughout the work	Included in the company's offer
	Use low ground pressure construction vehicles,	Quality of vehicles on site	Weekly	BC, DGEF, ESP	Throughout the work	N/A
Air pollution	The routes for bringing materials and structures to the site should be as direct as possible	Site Report	Daily	BC, ESP, DGEF	Throughout the work	Included in the company's offer
	Limit speeds on roads and access roads					
	Ensure vehicles/equipment are stopped when not in use.					
	Ensure that all vehicles, facilities and construction equipment are maintained					
	Construction equipment and trucks must be well maintained and meet current standards. They should be selected to minimize odors, fumes and dust					

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	Dust abatement measures will be applied on unpaved tracks crossing inhabited areas and on internal traffic routes					
	The use of tarpaulin-covered trucks will be preferred for site supply.					
	The regulations in force concerning the fight against atmospheric pollution and the standards of exhaust gas discharge from the operation's machinery will be respected.					
Production of solid / liquid / hydrocarbon waste	Strict application of the "reduce - reuse - recycle" principle in order to minimize the volume of waste going to landfill	Volume of waste on site	Weekly	BC, ESP, DGEF	Throughout the work	Included in the company's offer
	Disposal by landfill should be considered the ultimate solution. Waste disposal sites will have to be identified prior to the start of activities, in consultation with the local authorities.					
	Maintain equipment and check its condition daily	Site report	Daily	BC, ESP, DGEF	Throughout the work	

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	Fuel and lubricant leaks from vehicles and facilities will be repaired immediately.					Included in the company's offer
	Hydrocarbon waste will be collected in leak-proof drums for disposal at appropriate sites.	Number of drums filled	Weekly	BC, ESP, DGEF	Throughout the work	Included in the company's offer
	Major maintenance and repair work shall be performed off-site whenever possible.					
	Prioritize materials that reduce waste	Type of materials used	Weekly	BC, ESP, DGEF	Throughout the work	Included in the company's offer
Noise pollution	The work schedule of the construction site is organized to coincide with the activities of the local residents (7:00 a.m. to 5:30 p.m.).	Site Report Complaint filed	Weekly	BC, ESP, DGEF	Throughout the work	N/A
	Consultation with local residents prior to construction activities, especially if noise-generating activities are to be carried out outside the "hours of the day", i.e 7:00 a.m. - 5:30 p.m.					
	The contractor shall provide training to employees and operators to increase awareness of the need to reduce excessive noise	Number of training sessions conducted	1 time and as needed	BC, ESP, DGEF	Throughout the work	Included in the company's offer

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	The equipment to be used on site must be in very good condition to avoid the emission of noise					
Accident on site personnel and population	Before the beginning of the works, an information campaign under the control of the Administration should be carried out to involve the local population in the works and also to warn of the dangers and risks that they involve	Awareness report	1 time and as needed	EP, BC	Before the work and if necessary	Included in the company's offer
	Prohibition of the work site to the public: Thus, the work site will be the object of a defense by the installation of a fence and the installation of a system of information of the public (signs of danger).	Number. of sites marked with visual markers at night and during the day.	1 time	BC, ESP	Throughout the work	Included in the company's offer
	Putting up public information posters on the current work site: duration, surface area, prohibited access, etc.	Number of signs put in place and visual	1 time	BC ESP, DGEF	Throughout the work	Included in the company's offer
	Putting in place signage within the work areas with clear information on the obligations to wear personal protective equipment and the risk areas.					

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	Provision of each worker with personal protective equipment	Number of equipment issued and number of workers wearing protective equipment	1 time and as needed	BC, ESP	Throughout the work	Included in the company's offer
	Put a first aid kit on each site to be renewed as needed.	Number of first aid kits to be renewed	1 time and as needed	BC, ESP	Throughout the work	Included in the company's offer
Risk of disease and increase in communicable diseases including STIs, HIV/AIDS and Covid-19	Give priority to recruiting local labor to reduce the risk of disease proliferation	Number of local workers recruited	Once a year	BC, ESP	At the beginning of the work	Included in the company's offer
	A program of sensitization and information of the personnel of the building site must be implemented by the company, in particular, on the means of protection of the COVID-19, the sexually transmissible diseases and the AIDS and the rules of hygiene to be respected during the period of execution of the works.	No. of awareness raising sessions carried out	Quarterly	BC, ESP	Throughout the work	Included in the company's offer

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	The company is required to provide free of charge means of individual protection (disinfectant gel, mask, gloves, special clothing ...) for all workers on site.	No. of materials given to workers, No. of cases of illness on site.	Quarterly	BC, ESP	Throughout the work	Included in the company's offer
	The company must provide workers with free hydroalcoholic gels and masks.					
Impact on women and children	Implementation of awareness-raising actions on gender-based violence (type of behavior concerned, penalties provided for) on construction sites	Number of sensitizations carried out	Quarterly	BC, ESP	Throughout the work	Included in the company's offer
	Adoption of a code of conduct on the sites and zero tolerance to Gender Based Violence and any form of mistreatment, abuse and exploitation of children.	Number of cases of violence observed on site	Daily	BC, ESP, UNDP	Throughout the work	Included in the company's offer
	Strict prohibition on the use of children	Number of complaints about GBV filed	Daily	BC, ESP, DGEF, PNUD	Throughout the work	Included in the company's offer
	In the event that incidents of gender-based violence occur - Encourage victims to file a complaint,					

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	- Anonymous accompaniment of victims in the formulation, filing and throughout the processing of the complaint. - Setting up, in collaboration with local medical services, a medical and psychological support unit for victims - Dismissal without notice with immediate effect of the offender					
No consideration of the local workforce	In order to stimulate local economic development, it is recommended that priority in hiring be given to locals with regard to (unskilled) labour. The choice of local suppliers should also be given priority	Number (Nb) of local workers and technicians hired	Quarterly	Office of Control (OC) Directorate General of Environment and Forestry (DGEF) Expert project (ESP)	Throughout the work	Included in the company's offer
	Encourage women to join the construction staff	No. of women among site personnel				
Damage to infrastructure by flooding, landslides, etc.	Avoid installing structures in areas at risk (flooding, earthquakes, landslides, etc.) and bury water pipes	Site identification criteria	1 time	Technical project team (ETP)	Before the final validation of the feasibility studies	Included in the company's offer

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
Landscape changes	Ensure the cleanliness and structure of the site (orderly storage of materials and equipment),	Presentation of the state of the sites	Daily	BC, DGEF, ESP	Throughout the work	Included in the company's offer
	Cleaning of the roadways bordering the site of construction in case of soiling,					
	Waste management (installation of closed garbage cans),					
	Correct use of parking areas,					
	Restoration of intervention sites after the work site has been withdrawn, etc.					
Silting and destruction of crops	Water sites as necessary to limit silting of crops	Cleared area Number of complaints filed	1 time	BC, ESP, DGEF	Throughout the work	Included in the company's offer
	Limit clearing to the area required for the infrastructure installation.					
	Clearing operations will be conducted without damage to adjacent uncleared areas: topsoil is stockpiled within the cleared perimeter and at the edge of the clearing area, trees are felled towards the interior of the area.					
	Sites will be cleared from side to side, or from the center outwards, to avoid the risk of animal entrapment					

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	Mark the work areas and respect the demarcated rights-of-way to prevent trespassing outside the boundaries of the project site					
Introduction of weeds	Restore vegetation in disturbed areas using native and local endemic species that are well adapted to the environment. Prior to restoration, it would be preferable for the company to give the landowner the choice to validate the species to be placed on the site.	Plant species to be afforested	1 time	BC, ESP, City Hall	During site withdrawal	Included in the company's offer
Decrease in vegetation cover	Limit clearing to the area needed for infrastructure installation.	Cleared area	1 time	BC, ESP, DGEF	During the work	Included in the company's offer
	Restore vegetation in cleared areas using native and local endemic species that adapt to the environment. Agree with the owners on the species to be planted.	Plant species to be afforested	1 time	BC, ESP, Town hall, owner	During site withdrawal	Included in the company's offer
Social risk	Women will need to be trained in the maintenance of local water management systems, including monitoring of small waterworks and water treatment systems to indicate	Number of women trained in water management	1 time	BC, ESP, DGEF	Throughout the project	Planned in the project

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	when they need repair and to prevent inefficiencies in the use of the resource (e.g., leaks) (ensuring that some of the trainers are female).					
	Ensure compliance with the Grievance Mechanism process, in particular ensuring that the public is aware of and has access to the GRM.	Number of municipalities mastering MRG	Weekly	BC, ESP, DGEF	Throughout the project	Planned in the project
	Restore site installations using native and local endemic species. Agree with landowners on which species to put in place.	Number of sites restored	1 time	BC, ESP, Town hall, owner	During site withdrawal	Included in the company's offer
	Inform stakeholders about the status of the project and any changes during the implementation process.	Number of stakeholders informed of project progress	Quarterly	Technical project team (ETP)	Throughout the project	Planned in the project
Fire and Emergency Prevention and Management Strategies	No open fires are permitted in the project area	Number of fire extinguishers on site Nb of people trained in risk management	1 time	BC, ESP	During site withdrawal	Included in the company's offer
	Communication equipment and emergency protocols must be established prior to the start of construction activities.					
	Train all personnel in emergency preparedness and response (cover site health and safety). Work in					

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	coordination with the national disaster management office. Check and restock first aid kits. Use of personal protective equipment					
Hygiene, health and safety impact on workers and the local population	Make workers aware of the risks associated with the trade Require cleanliness of the site Require the wearing of PPE Ensure that PPE is renewed Prohibit the presence of children on the site Prohibit public access to the site and protect it with markers and signs Maintain all electrical equipment, machinery, vehicles and dangerous machines in good working order and prohibit their use without prior training, competence and authorization	Number of accidents on site State of cleanliness of the premises	Weekly	BC, ESP	Throughout the work	Included in the company's offer
Operation phase						

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
Impacts on flow	The supply of drinking water could lead to a consequent use of water resources. Raise awareness among the beneficiary populations on the rational use of water.	Integrated Resource Management (IRM) committees established	Once	UNDP, CP, DGEF	Throughout the project	Operator financing of the network in its operating budget
Poor water quality for consumption	To ensure a continuous follow-up of the quality of the water collected by means of periodic physico-chemical and bacteriological analyses;	Number of analyses carried out	Monthly	Operator	Operation phase	Operator financing of the network in its operating budget
	Carry out periodic maintenance of the various works of the network (catchment works, reservoirs, treatment plants, management works...) and a continuous control of the state of the supply and distribution pipes to be installed (check for leaks, breakages, illicit connections...).	Number of controls carried out	Semester	Operator	Operation phase	Network operator financing in its operating budget
Pollution of water catchments by	To carry out missions of sensitization of the users of the places and negotiation with the owners of the grounds included in these perimeters	Number of awareness campaigns carried out	Once and as needed	Project, operator, IWRM committee members	Operation phase	Network operator financing in its

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
agricultural activities	in order to avoid and prohibit completely all anthropic activities in these zones, to prohibit the discharge of waste...					operating budget
Risk of spills and/or physical damage associated with liquid chlorine	Provide the technicians in charge of water treatment and potabilization with adequate equipment for their protection and equip them with tools to properly dose chlorine	Tap water quality Number of accidents that occurred	Not planned	Operator	Operation phase	Network operator financing in its operating budget
Failure to include women in training	Encourage women to integrate maintenance work and prioritize it in training. In accordance with the gender action plan, 30 to 50% of the participants will be women.	No. of women trained (%) No. of women technicians No. of awareness-raising activities carried out	1 time and as needed	Project	During operation	Included in the project budget for the duration of the project
Failure to maintain infrastructure	Information/sensitization of the beneficiaries of the project to the necessity of paying the water consumption for the continuity of service and the durability of the infrastructures to be installed	Tariff study (co-financed by the government) Number of sensitizations carried out	Once and as needed	Operator, project	During operation	Government co-funding

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
Waste of water	Sensitization of the beneficiary population of the project for the good valorization of water by avoiding waste	Number of sensitizations carried out	Once and as needed	Operator, IWRM committee members	Operation phase	Government co-funding
	Installation of meters for each connection (co-financed by the government)	Number of meters installed	Quarterly			
Production of liquid waste and increase in disease vectors	Encourage beneficiaries to build septic tanks to avoid the discharge of domestic wastewater into the environment and to avoid the stagnation of water, which favors the creation of environments conducive to the development of vectors of parasitic or infectious diseases (malaria, etc.)	Number of sensitizations carried out	Semester	Technical team of the project	Operation phase	N/A
Health and safety impact of employees and users related to equipment operation and maintenance work	Equip employees with protective tools (personal protective equipment (PPE), gauge for the use of liquid chlorine, etc.) Inform the local population of the works to be carried out in the event of maintenance of the equipment and infrastructures in place	Nombre des techniciens portant du matériel de sécurité	Monthly	SONEDE, DGEME	Operation phase	Included in the SONEDE/DGEME operating budget

Unmitigated impacts	**Prevention and mitigation measures**	**Monitoring indicator**	Frequency	Person in charge of follow-up	Calendar	**Budget**
	Maintain a diversion if necessary (indicated by road signs) and inform the population					
Impacts of climate change, particularly variations in precipitation	Reforesting watersheds, especially upstream of water catchments, to allow for stream recharge.	Number of plants reforested	1 time	Project	4th Quarter 2022	Included in the project budget

10 MAIN SOCIO-ECONOMIC BENEFITS OF THE PROJECT

The expected positive health and socio-economic impacts of the project are numerous and represent the very objectives of the project.

During the construction phase, it will improve the income of the local population by creating jobs. These will be temporary jobs for young people through local contracts with the contracting companies, or through income-generating opportunities (snack bar, small business). Companies should give preference to hiring local labor, especially unskilled labor.

During the operational phase, the following effects are identified in particular:

- Satisfaction of vital needs and improvement of the quality of life of the beneficiary population and reduction of diseases thanks to the access to purified drinking water in sufficient quantity
- Access to safe drinking water and the reduction of the use of rainwater storage tanks and direct water withdrawals from rivers and springs will lead to a reduction in waterborne diseases (diarrhea, malaria, etc.).
- Reduced drudgery and time for water collection by women and girls, allowing them time to engage in income-generating activities for women and to attend school for girls in particular, the replacement of the existing distribution network (with frequent water losses and leaks) with a new HDPE pipe network will certainly have purely positive impacts throughout the project operation phase, including:
- Avoiding water loss and leakage
- Ensure the continuity of water supply to the beneficiary population
- Minimize water service interruptions...

On the other hand, the creation of storage reservoirs will provide a resilient solution to the effects of climate change by ensuring a stock of water to serve the population during periods of low river and spring flows.

10.1 MEASURES TO ENHANCE THE POSITIVE IMPACTS OF THE PROJECT

The bonus program will consist primarily of:

- Recruitment of unskilled labor for site requirements in the project areas
- To inform and sensitize the beneficiary population of the need to pay the fees in order to maintain the network in good condition and to ensure a permanent water quality
- Periodic analysis of the quality of the distributed water
- To accompany the drinking water supply project with a sanitary component to guarantee hygiene and quality of life
- Involve women in water management and/or public awareness activities
- The project will continue to ensure that local people receive regular feedback on how their input is being considered and to address any

additional concerns that may be identified as the project proceeds. This engagement process will include providing information in a format that is appropriate, understandable and relevant to local women and men, as well as consulting in a culturally appropriate manner.

Measures to increase positive impacts are presented in Table 13.

Table N° 13: Presentation of positive impacts

Impact receiver	Positive impact	Bonus measure	Monitoring indicators	Frequency	Responsible for Follow-up	Calendar	Cost in USD
Social	Job creation	Favor local labor, especially unskilled labor	NB of local workers on the sites	1 time at the beginning of the work and as needed	DGEF, CP	All phases	Included in the company's offer
		Continuous monitoring of the quality of the distributed water by means of analysis	Number of analyses performed	Monthly	DGEME, SONEDE	Operation phase	SONEDE funding in their operating budget
	Reduced drudgery and time for water collection for women and girls	Involve women (30% of women in IWRM committees) in water management and/or public awareness activities	Number of women attending outreach meetings Number of women on the management committee	Quarterly	DGEF, DGEME and project	Operation phase	Project funding during its implementation period and to be determine d after the project
	Reduction of waterborne diseases in the region	Supervision and monitoring of the project beneficiaries for an efficient management of the distributed water while avoiding waste,	Number of people affected by water-related diseases	Quarterly	IWRM Committee	Operation phase	Project funding during its implementation period and to be determined after the project

Impact receiver	Positive impact	Bonus measure	Monitoring indicators	Frequency	Responsible for Follow-up	Calendar	Cost in USD
		water losses, wastewater discharge in the open air...					
peration of the infrastructure	Availability of water at all times	Water availability at all times	Sensitization of the beneficiary population for the payment of bills to allow the maintenance of the infrastructures	Number of missions carried out Number of days of water shut-off Outreach Mission Report	Once and as needed	IWRM Committee Operator	During the operation phase

11 Site Inspections

During the different phases of the project, the inspection will be carried out by the DGEF and the UNDP. It will assess compliance with the effective application of environmental mitigation measures. More specifically, it will determine, based on the regulations applied, whether these measures are adequate and effectively achieve the environmental and social protection objectives set.
In addition, the inspection will determine the deviation of the application of the measures from the commitments made in the C-ESMP and will specify the specific recommendations and/or sanctions with respect to the deviations observed, the extent of the impact and the environmental and social risks generated by these deviations and the urgency of the intervention to be carried out in order to regularize the situation.

11.1 ENVIRONMENTAL AND SOCIAL COMPLIANCE REPORTS

Table 14 below shows the process for reporting

Table 14: Reporting Framework

Report prepared by	Submitted to	Frequency
Contractor, environmental officer and site Engineer	Project Manager, PMU	Monthly
Project Manager, PMU	Project Council	Semi-annually
Project Manager, PMU	UNDP CO	Quarterly

In addition to regular reporting, the Contractor will be required to report any major incident within 36 hours to UNDP. This includes details of any incident or accident related to the implementation of the project, with respect to any incident of an environmental or social nature; and/or the nature of occupational health and safety; and/or the nature of public health and safety.
When a significant incident occurs, UNDP shall implement a stop work order until an investigation is conducted and all corrective measures are put in place to prevent further damage.
Contractors should minimize the impact that may result from construction activities and implement mitigation measures to prevent damage and nuisance to local communities and the environment. Remedial measures should also be implemented effectively during the construction phase.

11.2 Contractual relationships

The contractor should ensure minimal negative impact on the natural and social environment and implement the mitigation measures and management plans detailed in the ESMP. Contractor shall comply with (but not limited to) the following:

 Comply with relevant legislation governing social and environmental safeguards and SES, including impact on human health.

- Undertake work within contractual requirements and other conditions.
- Assign one or more qualified and competent representatives to the site and participate in joint site inspections undertaken by the UMP, UNDP CO and responsible parties.
- If the ESMP is amended, the UMP should immediately review the changes and, as a result, incorporate and update the ESMP to ensure compliance.
- Comply with the recommendations of UN and local government officials made during their visit.
- Ensure regular monitoring of environmental and social compliance.
- Maintain a record of all instructions, incidents and actions taken.
- Provide a compliance report to the PMU and the UNDP CO when requirements arise.
- Document grievances and recommend corrective action.

Failure to comply with the above would be treated seriously in accordance with the laws of the country and the contractual terms.

11.3 Legal reports

The following measures will be implemented:

- All environmental licenses and permits are complied with in accordance with legislative requirements.
- All instructions to contractors shall be in writing with the time frame for compliance and the consequences if deferred.
- Construction activities must comply with environmental and social requirements.

12 CAPACITY BUILDING AND TRAINING

12.1 TRAINING FOR NETWORK MANAGERS AND OPERATORS

The effectiveness of the consideration of environmental and social issues in the implementation of activities will be achieved through the training of key technical staff involved in the validation, follow-up and monitoring of the implementation of identified mitigation measures. This training will benefit the following beneficiaries:

- The DGEF's technical agents who will be responsible for monitoring the implementation of the various measures indicated in the ESMP within the framework of this study, particularly for the execution phase of the project activities

- The members of the future management committee of the network who will take charge of the management of the water system to be installed.

12.2 AWARENESS PROGRAM FOR PROJECT BENEFICIARIES

The outreach program for project beneficiaries will be established throughout the project implementation period.
This program will be carried out by the IWRM committees, in association with local associations and NGOs, and co-supervised by the DGEF and DGEME.
The main theme of this mission will be the drinking water supply sector and the natural and social environment.
The sensitizations will touch various fields, mainly the care and maintenance of the infrastructures to be installed, the management and preservation of water resources, the adoption of hygiene and sanitation rules, the empowerment of the beneficiaries of the project for the respect of the infrastructures to be installed within the framework of the project and to avoid the illicit exploitation of water and the promotion of gender equality/equity, the payment of the invoices to ensure the maintenance and the perpetuation of the infrastructures to be installed. In order to comply with the gender action plan, all training sessions will be targeted at 30 to 50% women.

12.3 TRAINING FOR CONTRACT WORKERS

The company is responsible for ensuring that its employees and subcontractors are aware of the contractual environmental and social requirements to be met during the term of the contract.
All site personnel will attend an orientation that covers health, safety, environmental and customary requirements.

13 GRIEVANCE MECHANISM

The implementation of project activities may negatively affect, directly or indirectly, the beneficiary population. In this sense, a grievance mechanism is developed within the framework of the project to allow any person affected by the project activities to file a complaint. It is already in place at the municipal level and will be operational at the village level before the start of works.

The purpose of the proposed mechanism is to:

- Be a legitimate process to build trust between stakeholder groups and reassure them that their concerns will be assessed in a fair and transparent manner
- To be accessible to all affected persons, and to provide adequate assistance to those who may have faced barriers to expressing their concerns in the past
- Provide clear and known procedures at each step of the Grievance Mechanism process and specify the types of outcomes that individuals and groups can expect

- To ensure fair treatment of all individuals and groups involved through a consistent and formal approach that is fair, informed and respectful of complaints and/or concerns
- Provide a transparent process, keeping aggrieved individuals/groups informed of the progress of their complaints, the information used to assess their complaints, and the information about the mechanisms that will be used to address their complaints; and
- To allow for regular learning from experience and improvements to the Grievance Mechanism. Through ongoing evaluation, lessons learned can help reduce potential complaints and grievances.

14 BUDGET FOR THE IMPLEMENTATION OF THE ESMP

The total budget of the ESMP for the project of creation of water supply systems for domestic use in the island of Moheli amounts to **25500 USD**. This budget is part of the implementation of the ESMF activities. This cost is broken down as shown in Table 15 below.

Table 15: Estimated ESMP Costs to be borne by the Project

Designation	Cost (USD)	Observation
Social and administrative approach	1000	Incorporated into the company's budget during the preparation of the tender document
Hazard and risk management	3000	IDEM
Approaches to addressing gender-based Violence	2000	IDEM
Various environmental measures	3000	IDEM
Waste management	5000	IDEM
Rehabilitation of the site	8500	IDEM
Environmental monitoring mission by the Administration	3000	Incorporated into the overall budget for the implementation of ESMF activities
TOTAL	**25500**	

Appendix 1: Minutes of Consultation Meetings

PV AND LISTS OF PRESENCE ZONE 14

PROCÈS VERBAL DE RÉUNION PUBLIQUE

Région de : Fomboni
Commune de Fomboni et Moilimdjini
Projet : Assurer un approvisionnement en eau résilient aux changements climatiques aux Comores (ER2C)

Réunion publique

- *Sujet* : Consultation publique de la mise en œuvre du Projet, des activités prévues et celles que la communauté est bénéficiaire.
- *Date* **12/02/2020**
- *Lieu* **Fomboni**

-Début réunion : à15 h 20mn
- Fin de la réunion 17 h30mn
- Président : Le Directeur Régional de Forêt et de l'environnement

- Secrétaire : Raouia Madi Bamdou
- Participants : Voir la liste de présence

1. Ordre du jour :
   - Information de la population sur le but et objectifs du Projet
   - Information et discussion des activités prévues pour le projet et recueillir leurs opinions sur le projet.

La réunion a été présidée par Anissi Fazul Said, Directeur Régional de Forêt et de l'environnement qui a remercié les participants pour avoir répondu à l'invitation et ouvert le débat et à donner la parole à la RTI du projet.

2. Liste des participants
Ont pris part à cette réunion :
   - L'équipe de Projet représentée par Raouia Madi Bamdou (RTI du Projet),
   - Les autorités locales représentées par le maire, le directeur Régional de l'environnement et de foret, le Directeur régional de la SONEDE, le Directeur régional de la production et les chefs du village
   - La population des villages bénéficiaires représentées par 41.07% des femmes et 58.9% des Hommes

3. Compte rendu

Les points et les résolutions suivantes ont été adoptés pendant la réunion :

Ordre du jour n° 1

- La RTI du projet a présenté brièvement aux participants le contexte du projet qui s'insère dans le cadre d'un ambitieux programme.

- Résumé des débats : 38 personnes dont 15 femmes et 23 hommes ont pris part aux discussions.
- La plupart des intervenants ont montré un soulagement et espèrent que le Projet atteint les objectifs fixés et ils attendent tellement de ce Projet qui va leur permettre d'une part d'alléger leur corvée de l'eau, améliorer leurs conditions sanitaires et d'autre part diminuer le long trajet pour abreuver leurs bétails et l'arrosage de leur plantes.
- Résolutions prises : les participants se sont montrés favorables à s'impliquer et accompagner le projet et surtout fournir leurs contributions qui les seront à leur niveau.

Ordre du jour n° 2

- Résumé des débats : 15 personnes dont 7 femmes et 8 hommes ont pris la parole. Chaque intervenant a pris la parole pour souhaiter une bonne réussite au Projet et les Maires ont remerciés le PNUD, le Gouvernement, les partenaires financiers particulièrement le GCF.
- Résolutions prises : les activités prévues sont en parfaites adéquation avec les attentes des populations villageoises vue les problèmes d'eau de consommation et leurs différentes activités quotidienne qu'elles ont actuellement et l'urgence de protéger les ressources en eau vue la destruction des bassins versants qui s'empirent des jours en jours.

Plus rien n'étant à l'ordre du jour, la réunion s'est terminée à 17h30

La Commune

Fomboni, le 13/02/2020.

COMMUNE DE MWALIMO JINI
LE MAIRE
AHAMADA BEN AHAMADA

Annexe :
- Fiche de présence des participants avec signatures et adresses

GREEN CLIMATE FUND

PNUD

FICHE DE PRESENCE Date : le 12/02/2020 Zone 14

Projet : Assurer un approvisionnement en eau résilient aux changements climatiques aux Comores (ER2C)

Objectif : Consultation publique sur la mise en œuvre du Projet, des activités prévues et celles que la communauté est bénéficiaire

N°	Nom et Prénom	Fonction	Adresse	Téléphone	Signature
1	Chamsidine Abdallah Nolhim	Directeur de l'Agriculture	Hoani	3370180	[signature]
2	Amissi FAZUL	Directeur Environnement Forêts	Fomboni	320 24 10	[signature]
3	Abdoulbastoi Hamidi	Directeur Sonede Mohéli	Fomboni	3380823	[signature]
4	Eusthaxie Rakotoarijaona	Retraitée	Fomboni	3205523	[signature]
5	Sitti Saïd Hadi	Couturière	Hoali-Mdjini	3351083	[signature]
6	Fairaty Chahassane	Enseignante	Bangoma	3370759	[signature]
7	Mariama Mohamed	Femme de ménage	Boingoma	3500979	[signature]

COMMUNE DE MWALI LE MAIRE

AHAMADA BEN AHAMADA

FICHE DE PRESENCE Date : le. 12./02./2020 Zone 1.4

Projet : Assurer un approvisionnement en eau résilient aux changements climatiques aux Comores (ER2C)

Objectif : Consultation publique sur la mise en œuvre du Projet, des activités prévues et celles que la communauté est bénéficiaire

N°	Nom et Prénom	Fonction	Adresse	Téléphone	Signature
8	Dossen Ali Saroumo	Agent sonolee Volet	Bandar salama	00269 3321786	
9	Mahafidhou Ahmed	Enseignant	Bandarsalama	3384817	
10	Mohamed Hassane	Soudeur	Bandar-Salama	340-43-88	
11	Ahamada Ben Ahamada	Maire Mwalimdjini	Bandar-s-Salama	3267740	
12	Nouroun Said Fazul	Secrétaire	Bungoma	3350412	
13	Ali Said	Eleveur	~~3312761~~ Fombani	3312761	
14	Mohamed Madi	Enseignant	Djoezi	3465726	

AHAMADA BEN AHAMADA

COMMUNE DE MWALIMDJINI LE MAIRE

FICHE DE PRESENCE Date : le 12./02./2020 Zone 14

Projet : Assurer un approvisionnement en eau résilient aux changements climatiques aux Comores (ER2C)

Objectif : Consultation publique sur la mise en œuvre du Projet, des activités prévues et celles que la communauté est bénéficiaire

N°	Nom et Prénom	Fonction	Adresse	Téléphone	Signature
15	Mohamed Romli	Police	Djoiezi	3323017	
16	Mohamed Rachid	chef du Village	Midzoueni	3363776	
17	Mariata. B. Ahamada	Retraité	Djoiezi	3448645	
18	Mohamed Hidéré	Cultivateur	Midzoueni		X
19	Mohamed Bélaid Ali Nadir	Ingenieur TP Moheli	Djoiezi	3225750	
20	Nimati Chadhuli	Menagere	Midzoueni	3205309	
21	Ahmed Archimed Bacar	Directeur des infrastructures	Djoiezi	3247515	

COMMUNE DE MWALIMDJINI
LE MAIRE
AHAMADA BEN AHAMADA

PROCÈS VERBAL DE CONSULTATION PUBLIQUEPOR LA MISE EN ŒUVRE DU PROJET

Région de : Fomboni
Commune de Moimbassa

Réunion publique
Le 18 /02/2020 à Mbatsé, s'est tenu dans la place publique de Mbatsé , une réunion d'information, de sensibilisation et d'échanges sur les activités prévues pour le projet « **Assurer un approvisionnement en eau résilient aux changements climatiques aux Comores (ER2C)** »

- *Date* **18/02/2020**
- *Lieu* **Mbatsé**
- Début réunion : 13h30mn
- Fin de la réunion 16h00mn
- Président : Directeur Régional de Forêt et de l'environnement
- Secrétaire : RTI du Projet
- Participants : Voir la liste de présence
-

Ordre du jour :
- Information et sensibilisation de la population sur le but et objectifs du Projet
- Discussion des activités prévues pour le projet et recueillir leurs opinions sur le projet.

La réunion avait pour objectif : d'informer la population locale sur les activités prévues dans le cadre du projet et les objectifs à atteindre. Mais aussi de recueillir leur opinion sur le projet.
La réunion a démarré à 13h300 heures par un mot de bienvenu du Maire de la commune de Moimbassa Ahamadi Aydjo en remerciant les participants de nous avoir honoré de leur présence. Dans son propos, il a montré l'importance du projet pour sa commune qui rencontre des difficultés liées à l'accès à l'eau potable , à l'élevage et à l'agriculture (maraichages). Il appelle toutes les couches sociales à l'appropriation et à la solidarité des actions entreprises par ce projet.
Anissi Fazul Said, Directeur Régional de Forêt et de l'environnement a remercié la commune pour leur implication sur le projet.
La RTI du projet ,Raouia Madi Bamdou a présenté les objectifs et les résultats attendus du projet.

- Les participants représentées par 59.2 % des femmes et 40.8% des Hommes ont réagi suite à l'exposé .La discussion était basé sur :

- Rôle des autorités locales et la population dans l'exécution des travaux
- Collaborations des parties prenantes
- Les localités qui seront approvisionnées en eau potable et l'irrigation
- La question liée au prix de l'eau
- La protection des bassins versants suite à la déforestation
- Des prières de bénédiction pour la réussite du projet

Les interventions des participants :

Le chef du village de Ntakoudja a remercié le représentants du gouvernement comorien et tous les partenaires financiers particulièrement le PNUD et le GCF. Il a montré qu'il compte sur ce projet pour l'atteinte de leurs priorités en matière de développement d'infrastructures et va contribuer au plan de développement local et l'amélioration du cadre de vie sociale et économique . Nos localités sont prêtes à s'impliquer et accompagner le projet pour la bonne réalisation des activités. Pour les mesures d'accompagnement, on s'engage à vous faciliter de votre intégration pour l'intérêt général.

Un Notable de Mbatsé Ali Hamidoune a saisi l'occasion pour montrer son engouement et l'espoir suscité par le projet. Il a insisté sur l'implication des femmes , des comité villageoise et de la jeunesse de la commune sur les différentes phases de réalisations. Toutefois, nous connaissons un fort taux des jeunes chômeurs dans la commune, ainsi, nous demandons de favoriser le recrutement local lors de la réalisation des travaux. On aurait cependant voulu savoir aussi le système de tarification qui sera appliqué après que les ouvrages soient installés.

La représente de l'association féminine pour l'agriculture,Mme Echat Ali Attoumane, a saisi l'occasion pour rappeler aux membres ici présents des difficultés liés à l'accès à l'eau potable et à l'irrigation. Elle insiste sur la rareté des précipitations ces dernières années. Elle a sollicité de continuer à leur impliquer tout au long des activités. Toutefois, nous prions que le projet en question se réalise dans les meilleurs délais et des conditions et que toutes les quartiers seront considérées.

La RTI du projet a répondu aux différentes questions et préoccupations des participants :
Dans cette zone trois villages vont bénéficier l'adduction en eau potable à savoir :Ntakoudja, Mbatsé 1 et 2 et Hoani.
La commune et les bénéficières doivent jouer le rôle de facilitateur tout au long de l'exécution des activités du projet.

Une étude tarifaire de l'eau qui va prendre en compte les enjeux économiques ,sociales et techniques actuel est prévu.
La délimitation et protection des bassins versants est aussi prévu et l'irrigation pour faciliter l'agricultures (maraichage).
Le maire de la commune a remercié le projet car ça va alléger la corvée de l'eau et améliorer leurs conditions sanitaires.

La commune

Mbatsé , 19/02/2020

FICHE DE PRESENCE

Date : le 18./.02./2020 Zone 15

Projet : Assurer un approvisionnement en eau résilient aux changements climatiques aux Comores (ER2C)

Objectif : Consultation publique sur la mise en œuvre du Projet, des activités prévues et celles que la communauté est bénéficiaire

N°	Nom et Prénom	Fonction	Adresse	Téléphone	Signature
1-	Chamsidine Abdallah	Directeur de l'agriculture	Hoani	3370180	
2	Anssi Fazul Said	Dir. de l'Environnement	Fomboni	3202424	
3	Abdoulbastoi Hamidi	Directeur Sonede Tchel.	fomboni	3380823	
4	Madi Laguesa	Président de la Cellule de protect Sociale	Hoani	3323487	
5	Ahamadi Aydjo Madi	Maire de Mbimbara	Hoani-Mohéli	3418945	
6	Toiani Moussa	officier de l'Etat civil	Hoani mohe	324-25-85	
7	Hamada Daou	chef du village Ntakoudja	Ntakoudja		

UNION DES COMORES MAIRIE DE MBIMBARA LE MAIRE COMMUNE AUTONOME DE MWALI

AHAMADI AYDJO MADI RI

GREEN CLIMATE FUND

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FICHE DE PRESENCE

Date : le 18../02./2020 Zone .15

Projet : Assurer un approvisionnement en eau résilient aux changements climatiques aux Comores (ER2C)

Objectif : Consultation publique sur la mise en œuvre du Projet, des activités prévues et celles que la communauté est bénéficiaire

N°	Nom et Prénom	Fonction	Adresse	Téléphone	Signature
8	Souonda mudadi	Agent mairie	Hoani	3257548	
9	Ali Hamidoune	Agent adduction d'eau	M'Batsé	3340286	
10	Faouria Mohamed Madi	Agent d'Etat civil	Hoani Moheli	3498626	
11	Saouda mudadi	Agent cu	Hoani	3567550	
12	Faouzia Saïndou K	~~Agent~~ cultivatrice	M'Batsé		
13	Mohamed ANSOYA	Juriste	Hoani	3459882	
14	Echat Ali Attoumane	Agricultrice	Mbatsé	3340058	

UNION DES COMORES MAIRIE DE MOINBASSA LE MAIRE ILE AUTONOME DE MWALI

AHAMADI AYDJO MAC[illegible]

FICHE DE PRESENCE Date : le 18/02/2020 Zone 15

Projet : Assurer un approvisionnement en eau résilient aux changements climatiques aux Comores (ER2C)

Objectif : Consultation publique sur la mise en œuvre du Projet, des activités prévues et celles que la communauté est bénéficiaire

N°	Nom et Prénom	Fonction	Adresse	Téléphone	Signature
15	Mouroufi Hamada	Ex-Instituteur	M'Batsé - MOHELI	3548448	
16	Fourssiya	Agricultrice	Mbatsé	3289565	
17	Issoufa saïd	Retraité	M'Batsé Moheli	320 1458	
18	AÏTOUMANI-MADI	EX MILITAIRE	MBATSE	3780484	
19	Fandil-Abraihi Lahadji Djambae	Fonctionnaire	Mbatsé	3209779	
20	Fatima Abdallah	Agricultrice	Ntakoudja		
21	Abdel Tarfaili	Chafer	M'Batsé	3883579	

UNION DES COMORES
MAIRIE DE MOIMBASSA
LE MAIRE
AUTONOME DE MWALI
ANAMADI AYDJO MADI

FICHE DE PRESENCE

Date : le 19/02/2024 Zone 15

Projet : Assurer un approvisionnement en eau résilient aux changements climatiques aux Comores (ER2C)

Objectif : Consultation publique sur la mise en œuvre du Projet, des activités prévues et celles que la communauté est bénéficiaire

N°	Nom et Prénom	Fonction	Adresse	Téléphone	Signature
22	Youssoussa Hamidi	Eleveur	Ntakoudja	3382136	
23	Fatima Zakouana	Menagère	Ntakoudja	3382136	
24	Halima Halidi	Menagaire	Ntakoudja		
25	Hidayatié Abdou	Agricultrice	Ntakoudja	3619001	
26	Zahara Mohamed	Agricultrice	Ntakoudja	3802208	
27	Fahitatou Made	Agricultrice	Ntakoudja	3259307	
28	Ayouba Abdou	eleveur	Ntakoudja	3495301	

UNION DES COMORES – MAIRIE DE NDIMBA ASSA – LE MAIRE – AHAMADI AYDJO MADI – COMMUNE DE MWALI