UNION OF THE COMOROS

Unity - Solidarity - Development

MINISTRY OF AGRICULTURE, FISHERIES AND THE ENVIRONMENT

GENERAL DIRECTORATE OF ENVIRONMENT AND FORESTRY

(DGEF)

GREEN CLIMATE FUND (GCF)

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

STUDY OF WATER SUPPLY SYSTEMS FOR DOMESTIC PURPOSES IN ANJOUAN

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

June 2022

Contents

LIST OF ABBREVIATIONS

AEP	: Drinking water supply
PDP	: Preliminary detailed project
PDS	: Preliminary draft summary
FDA	: French Development Agency
GAC	: General Administrative Conditions
SCC	: Special Conditions of Contract
ICE	: Inter-ministerial Committee for the Environment
TD	: Tender documents
OD	: Outside diameter
DGEF	: General Directorate for the Environment and Forests
ND	: Nominal diameter
ESIA	: Environmental and Social Impact Assessment
ER2C	: Ensuring a climate-resilient water supply
GCF	: Green Climate Fund
HSE	: Health, Safety and Environment
MY	: Suspended Matter
GRM	: Grievance Redress Mechanism
MAFELU	: 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 Program
DWSS	: Drinking water supply system
PCC	: Provincial Canal Company
UC	: Union of the Comoros
GBV	: Gender-Based Violence
ESMF	Environmental and Social Management Framework
SES	Environmental and social safeguards
DGEF	Directorate General for Environment and Forests

1 EXECUTIVE SUMMARY

Comoros has received funding from the Green Climate Fund (GCF) over 41.9 million USD for project "**Ensuring climate resilient water supply in the Comoros Islands**". The main goal of the project is to strengthen the resilience of drinking and irrigation water to climate change risks for 15 of the most vulnerable zones in the Union of Comoros.

Specifically, the project focuses on: creating a paradigm shift in water governance by mainstreaming climate risk reduction into water sector legislation, institutional arrangements, planning and budgeting; understanding and adapting to the climate risks to the nation's fragile water resources and weak water management systems using watershed protection and rehabilitation coupled with hydrological monitoring and forecasting; integration of climate risk reduction into water supply scheme design; put in place drinking water supply and irrigation infrastructure to ensure access to drinking water for 450,000 inhabitants (60% of the Comorian population by 2042) and the operation and management including multiple water sources exploitation.

Fifteen target zones on the three islands, comprising 103 villages, have been chosen due to their vulnerability to climate change, their good hydrogeological and hydraulic potential for water storage and capture distributed as follow: **6 zones** in Gd Comoros; **7 zones** in Anjouan; and **2 zones** in Moheli island.

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

This Environmental and Social Management Plan (ESMP) is a corollary of the Environmental and Social Management Framework (ESMF) that was developed during the preparatory phase of the project.

In accordance with good practice and in compliance with the UNDP SES, the Anjouan ESMP attempted to identify additional risks and/or impacts that had not been initially identified in the ESMF during project design and confirm those initially identified

Also, the ESMF stipulates in its executive summary that environmental and social management plans (ESMP) could be prepared if this seems relevant.

In addition, the development of the ESMPs makes it possible to satisfy the conditions of the FAA in its clause 10.2 (j), which stipulates that: "Before starting any work or construction activity for the implementation of the project, the accredited entity must submit the detailed environmental and social management plan relating to the relevant construction works or construction activities to be carried out, in a form and substance satisfactory to the GCF Secretariat".

This ESMP focuses solely on the establishment of drinking water supply systems in 7 areas in Anjouan (from activity 3.2. construction of water intakes on rivers, construction of reservoirs, installation of disinfection and water filtration systems, installation of pipe networks, improvement of groundwater extraction systems, and installation of meters (Component 3 of the Project).

In its impact identification methodology, the ESMP highlighted the impact-generating activity and the impact receptors (natural and human) during the different phases of the project (pre-construction, construction and operation). This, with the aim of having all possible management measures to allow the proper implementation of activities.

The tables referenced below illustrate how the dimensions and impacts identified in the ESMF, their performance criteria, their management measures as well as the environmental and social indicators are taken into account in this ESMP.

• Table 8 highlights the activities that are sources of impacts and the potential impacts during the different phases.

Table 9 Management measures identified in the ESMF integrated in table 10

• Tables 10 for impact assessment and management measures.

• Table 11 Monitoring measures identified in the ESMF to be observed during the different phases, included in Table

12.

• Table 13 Works monitoring and supervision measures during the different phases

As so the objective of this ESMP is to integrate into the planning of the developments and activities planned by the project for the **seven zones selected in the Island of Anjouan,** the specific considerations of the natural and human environment taking into account the risks and impacts already identified in the ESMF, so as to allow the proper implementation of the planned activities while ensuring the protection of the sensitive components of the latter.

On this island, the project plans to ensure a sustainable supply of water for drinking and irrigation to 23 villages with a total population of 95,790 inhabitants (in 2020). This population is expected to grow to 139,198 in 2032.

The main actions planned under the project can be summarized as follows refer to 2.1.1

Construction of new water catchments on natural flows or springs ;

- Rehabilitation of existing catchments ;
- Construction of water treatment plant (decantation, filtration and chlorination);
- 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, transportation, 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.

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 outdated and suffer from high 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 during low water periods and especially for washing clothes;
- 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 in this study shows that the water supply project for domestic and agricultural purposes in the seven selected areas of the island Anjouan, particularly the technical component of reinforcing and constructing the water supply systems in these areas, complies with the country's environmental laws and regulations 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 the 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 positive and negative impacts of the project on the natural and human environment was done by means of an impact matrix that correlates the project components with the different components of the natural and social environment of the area.

For the site installation phase and the period of execution of the works, the main negative impacts identified are:

- During the site installation and preparation phase : Noise and air pollution related to the installation of the living base and the circulation of the construction machinery, risk of accidental fuel leakage from the construction machinery, social conflicts that may emerge following the choice of the construction sites, possible temporary restriction to access lands and resources, non-payment of compensation after damages, or the non-valuation of local labor and migration flows in search of work, risk of work accidents, risk of STI contamination, risk of child exploitation and GBV, risk of increasing the contamination rate by the COVID-19 virus, especially among site workers. During the implementation of the works undertaken in zones 7,9,10 and 12 in Anjouan (before the suspension), the project did not record any environmental impact. Due to the nature (capacity of less than 50m3) and the dispersion of the works to be built (catchment, reservoir, treatment unit, breakwater), the delivery of construction materials did not impact the site and the dwellings bordering. In the social context, there was the risk linked to Covid19 contamination, of which around 10 confirmed cases of company staff were recorded. This led to the work being stopped by the company. In addition to the GRM (Grievance Redress Mechanism), the implementation of the stakeholder engagement plan has made it possible to adopt a participatory and concerted approach for the selection of sites for the installation of water supply infrastructure in areas 7,9,10 and 12. Regarding economic displacement and restriction, the project did not trigger this policy; The rights-of-way identified and agreed with the communities during the design of the works were not modified during the execution of the works. To this end, there is no temporary or permanent economic displacement or restriction of access to resources.
- During the execution phase : pollution and congestion by construction site waste, noise and air pollution due to the traffic of construction site machinery, risk of water and soil pollution by the effluents from the base camp and by the fuel from the construction site machinery, loss of property, in particular for crops grown in the fields bordering the construction sites, risk of work accidents, risk of damage to the existing infrastructure, risk of inconvenience for the population living near the work sites, risk of social conflicts related to the acquisition of land for the project (Construction of reservoirs), risk of STI contamination, risk of child exploitation and GBV, etc.

In the operation phase, the positive impacts of the project are dominant 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 attend 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. However, there are also negative impacts, including the risk of contamination of the water collected, possibly due to human activities upstream of the reservoir, the risk of wastage in the use of water and an increase in wastewater discharges.

To avoid or minimize potential negative impacts, several depositions are to be applied by the concerned organizations during the installation phase, execution phase as well as during the operation of the project. These measures are set out in an Environmental and Social Management Plan (ESMP). These measures are, in most cases, part of the duties of the construction companies in the application of good practices and are included in their general expenses.

We note that the types of actions planned by the project are almost the same for the 9 zones and that no specificity has been identified for any of these zones. Moreover, all the zones are similar, particularly with regard to environmental and social aspects. As a result, only one ESMP is proposed, which is applicable to all the target zones.

The proposed ESMP includes (i) the awareness program for project beneficiaries and capacity building for future network managers (technical support, training and awareness), (ii) the mitigation program for negative impacts, specifying the

responsibilities, costs and financing of the different actions, and (iii) the monitoring and follow-up program. For each program, the ESMP specifies the impact at risk, the mitigation or improvement measure, the different actors involved, the monitoring indicators, the places of intervention and the timetable for the execution of the different tasks. The environmental aspect of the project is taken into account right from the bidding preparation phase. The latter includes environmental and social clauses that are an integral part of the contract.

For the construction site installation phase and the execution phase, the identified impacts are moderate to low and require, for the most part, only the implementation of good work management practices to be followed by the contractor and the work monitoring authorities during the construction site.

Thus, for the work already carried out, the following measures have been applied:

• Compulsory wearing of personal protective equipment by site personnel

• Availability of a first aid kit on each site

• Supply of sand to the sites is done through bags in order to avoid dust pollution.

• Signaling of sites with fluorescent strips to ensure the safety of the movement of goods and people.

• Little waste is generated by the work at the various sites and most of it is recycled (bags of cement, formwork materials, stripping waste, etc.)

• Non-reusable waste is sent directly to a public landfill.

• The works are carried out in the rights-of-way identified during the studies

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 the quality of the water supplied to the population. To this end, the environmental measures proposed are

- The organization of sensitization and popularization missions for the population of the project beneficiary area on (i) the necessity of paying for water consumption for the continuity of the service and the durability of the infrastructure to be installed, (ii) the proper use of water by avoiding waste, (iii) the necessity of constructing septic tanks to avoid discharging domestic wastewater into the natural environment in order to avoid stagnation of water which favors the creation of environments conducive to the development of vectors of parasitic or infectious diseases (malaria,), and others.
- The respect of the protection perimeters on the sites of surface water resources catchments is also one of the main concerns. It would thus be necessary to (i) organize awareness-raising and negotiation missions with the owners of the land included in these perimeters in order to avoid and completely prohibit all anthropic activities in these zones, prohibit the dumping of waste (ii) provide garbage dumps for the populations of the upstream zone of the catchments (iii) program reforestation campaigns in the catchment area upstream of the catchments in order to reduce the load of suspended solids 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 supply and distribution pipes.

The implementation of this ESMP at 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 recruits a Control Office to which the permanent monitoring of the works will be assigned. In the event of non-compliance or non-application of environmental measures, this control office (through its environmental and social expert) will initiate the formal notice process that will be sent to

the company. The supervision of the control office's work during this phase will be ensured by the DGEF and the ER2C Project's environment specialist, through periodic verifications either of the site minutes and environmental monitoring reports drawn up by the control office's environmentalist, or through field missions during the execution of the project as well as at the time of acceptance of the work.

At the end of the hydro-agricultural development work on the perimeter, an audit of the project's environmental and social achievements will be carried out by an independent consultant to be recruited by the DGEF.

The proposed capacity building program provides for the realization of two technical training sessions to add to 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 project stakeholders. 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 different measures indicated in the ESMP, (ii) The members of the future management committee of the network who will take charge of the management of the water system to be installed. Training will be provided by the ER2C project.

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

The implementation of the project activities could generate impacts on people who will feel aggrieved and could react by formulating various types of complaints (verbal, by phone...) with a view to seeking redress from the project or the actors associated with its implementation. These complaints can be formulated by direct beneficiaries of the project (farmers, concessionaires, village consultation committees, etc.), but also by communities or any other person or structure indirectly affected by the project. It is with this in mind that a Grievance Redress Mechanism (GRM) is proposed in the last chapter of this study, with the aim of managing risks and possible conflicts, disseminating information, providing advance notification and increasing the accountability of the various stakeholders and project beneficiaries. Through this GRM, local communities and other interested stakeholders can file a complaint or grievance with the DGEF at any time. Furthermore, the affected local communities must be informed of this GRM and the procedure for filing complaints.

The project implementer shall establish a complaint register to record concerns raised by the community during the implementation of project activities. Any complaint will be reported to UNDP and DGEF within 24 hours of receipt. The complaint will be reviewed. After the review, complaints regarding corrupt practices will be forwarded to UNDP for comments and/or advice as well as to DGEF.

A summary list of complaints received and the action taken must be published in a report produced every six months.

2 INTRODUCTION

2.1. GENERAL CONTEXT OF THE PROJECT AND THE STUDY

The technical studies of water supply systems for domestic purposes for 103 localities (352,000 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 capture and storage, the limited investments for water supply in these localities to date, and the potential collaboration envisaged with development partners who are carrying out complementary interventions there.

The target areas on the island of Anjouan are presented in Table 1 below.

Table 1: Target areas for project interventions

Islands	Zone
Anjouan	Zone 7: Marahare, Hassimpao, Chitsangachele Mromouhouli and Mutsamudu Zone 8: Bandrani, Dar Salama, Vouani and Marontroni Zone 9: Vassi and Dzindri Zone 10: Ankibani, Chironkomba, Maoueni, Bandrajou and Bandrani Mtsangani Zone 11: Chitrouni-Saadani Zone 12: Mdjamaoue-Sahara Zone 13: Adda Daoueni, Ongdjou, Lingoni and Pomoni

The objectives of the project 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 both 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 way that not only prevents climate- induced derogations but also, to the extent possible, enhances the protection of water resources, including by providing forecasts and alerts on the status of water resources to allow for adaptive management;
- Climate-resilient infrastructure and technologies are being put in place to manage and meet water supply shortages caused by droughts, floods, storm damage, storm surges, bushfires, power outages, and water needs induced by rising temperatures.

The mission granted to the consulting firm HYDRO PLANTE is integrated in the component 3 of the project and has for specific objective the elaboration of the complete studies of the works of the drinking water supply and irrigation systems resilient to the climatic changes of the seven zones retained at the level of the island of Anjouan.

The implementation of the studies is planned in two phases:

- **Phase 1:** Preliminary design studies, the objective of which is to establish the current situation of the drinking water supply and irrigation, estimate the water demand, establish the balance of water resources and needs, and elaborate the solution for the water supply and possible irrigation.
- **Phase 2:** The studies of APD (detailed preliminary design studies), the Environmental and Social Management Plan and the elaboration of the TD (Tender document), whose objective is to establish the detailed studies (APD)

of the selected variant of the DWS and irrigation systems of the selected localities and to elaborate the TD by zone for the recruitment of the companies of work.

2.1.1. Summary of construction work planned at the level of the 7 zones in Anjouan

Table 2: Infrastructures planned for the 7 zones in Anjouan

ISLE	Project area	Number of localities	Target population	Treatment units (filtration + chlorination)	Linear Adduction pipes	Linear Distribution Lines	Catchment (Rehabilitation + Construction)	Reservoirs (Rehabilitation + Construction)	Number of pumping station
		Unity	Number of inhabitants	Unity	(m)	(m)	Unit _	Unity	Unity
Anjouan	Area 7	5	82,893	6	5527	9088	6	5	0
	Area 8	4	10,926	3	5040	8600	4	5	0
	Area 9	2	6,679	2	1576	5559	4	3	0
	Area 10	5	18,426	2	11590	20564	6	9	0
	Area 11	2	5,921	2	2238	2311	2	3	0
	Area 12	2	2,775	1	4304	4944	3	2	0
	Area 13	4	45,419	4	13575	54757	5	12	2
Total		**24**	**173,039**	**20**	**43850**	**105823**	**30**	**39**	**2**

For areas already under contract (areas 7, 9, 10 and 12) the work undertaken concerns:

In area 7:

• 02 tanks of 50 m3;

• 01 settling and filtration station;

• 01 treatment chamber (chlorination);

• Two current works (OS and VE).

In area 10:

• 01 settling and filtration station;

• 01 treatment chamber (chlorination);

• 02 tanks of 25 m3;

• 02 load breaks;

• Three current works (OS3, OS1 and VE).

2.2. OBJECTIVES OF THIS REPORT

The present report constitutes the Environmental and Social Management Plan of the water supply project for domestic and irrigation purposes at the level of all the zones retained on the island of Anjouan. This project, supported by UNDP as an Accredited Entity of the Green Climate Fund (GCF), has been screened under the UNDP Social and Environmental Standards procedure and has been assessed as a 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 the protection of its sensitive components. The scope of this study, as defined in the terms of

reference, covers the analysis of the impacts on the environment, the identification of actions to reduce environmental risks and their implementation methods, as well as the enhancement of the positive impacts of the project.

More specifically, it will involve: (i) describe the location of existing or future structures and the environmental components found there; (ii) identify the environmental and social impacts likely to be generated by project activities; (iii) propose mitigation measures for the potential negative impacts identified and measures to improve the positive impacts by targeting responsibilities; (iv) develop an environmental and social management plan (ESMP) in relation to the identified impacts and proposed measures and estimate the costs of the measures associated with the implementation of the ESMP.

The ESMP was developed to fulfill the requirements of the GCF and the UNDP's SES. The findings from an extensive stakeholder consultations and site visits were the basis to prepare the ESMP including the monitoring plan to address/mitigate the environmental and social impacts that were identified during project design phase.

A Map of the areas of intervention and an Excel table of DWS infrastructure by area are respectively in appendix 2 and appendix 3

2.3. METHODOLOGICAL APPROACH

The approach adopted in the conduct of this ESMP consisted of the exploitation of existing documentation, consultation of structures, resource persons and local populations, observations and field investigations and finally, the analysis of the data collected.

Bibliographic research

The exploitation of existing documentation took place successively at the headquarters, via the Internet, and in the areas concerned by the project in the island of Anjouan. It allowed for the collection and synthesis of:

- data on the legislative and institutional framework ;
- data on the biophysical and human environments ;
- the socio-economic data of the project's area of influence.
- Consultation with resource persons and local populations

For more information and to confirm the literature review, consultations with local resource persons and beneficiaries were also held during the site visits. These consultations were also conducted in order to gather the opinions of the beneficiaries.

Field observations and investigations

The Consultant carried out a field mission in each area to observe and diagnose the current state of the environment, identify sensitive areas and analyze the major environmental issues.

Structure of the ESMP

Once the documentation was analyzed and the field observations were made, the information collected was analyzed in order to adopt the following structure for the ESMP:

- insert the project into the political, legislative and institutional framework ;
- have a description of the project and the environment in its biophysical and human components ;
- identify and evaluate the impacts on the various components,
- propose measures to mitigate negative impacts and improve positive impacts;
- identify monitoring objectives and specify the type of monitoring,
- outline capacity development and training activities to support timely and effective implementation of social

and environmental project components and mitigation measures,

- outline a plan to engage in meaningful, effective and informed consultations with affected stakeholders,
- develop a grievance redress mechanism that describes effective processes for receiving and addressing stakeholder concerns and grievances regarding the project's social and environmental performance, and
- develop an implementation action plan with a timetable for implementing the measures and estimated costs.

3 INSTITUTIONAL AND LEGAL FRAMEWORK

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

3.1. OVERVIEW OF INSTITUTIONAL ARRANGEMENTS FOR ESMP

The Ministry of Agriculture, Fisheries and Environment and UNDP will assess and approve the project's ESMP prior to the start of construction. 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 indicated by 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 Ministry of Health, which can intervene in the missions of sensitization and popularization of the population in social and health matters;
- The Labor and Social Inspectorate will be responsible for (i) ensuring the application of laws, regulations and collective agreements relating to working conditions and the protection of workers in the exercise of their occupations, in particular those relating to working hours, wages, safety, health and welfare, the employment of children and young people, and other related matters; and (ii) providing information, recommendations and advice to employers and workers on ways of complying with legal provisions... Within the framework of the project, the Labor Inspectorate will be able to carry out inspections throughout the construction period and will intervene in the event of any 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, ordinances) and international and regional conventions ratified by the Union of the Comoros.

This ESMP for Anjouan 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 policy of environmental protection and conservation, which was defined by the Constitution of 23 December 2001, revised in 2009 and in 2013. The legal foundations of the environmental policy are 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 requires 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 State's tasks 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, 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 lays down 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 guarantee an ecologically sound and balanced living environment for all citizens.

In order to achieve these objectives, the Framework Law requires that any public or private investment project that may affect the environment be subject to an environmental and social impact assessment (ESIA) (section 3, articles 11 to 14):

Articles 31-36 of the Framework Law aim to protect the marine environment. Thus, the removal of materials from the seashore is prohibited, as is any discharge into maritime waters of any substance likely to affect the quality of the water, destroy the fauna and flora of the marine environment, and the aesthetic and tourist value of the sea and the coastline.

As the areas to be supplied with water under the project are located very close to the coastline, the project will have to take precautions (in terms of waste management and storage of materials in particular) to avoid any negative impact on the marine environment.

- Law N°20-036/AU of 28 December 2020, on the Water and Sanitation Code in the Union of Comoros
- Decree No. 01/52/CE on the content of the ESIA: this Decree, taken in application of article 14 of the above-mentioned framework law No. 94-018 of 22 June 1994, as amended, on the environment, is intended to regulate the methods of carrying out and presenting impact studies, as well as the methods of their examination by the administration and of informing the public.
- Forestry Legislations
  - Law n°88-006 of 12 July 1988 on the legal regime of reforestation, reforestation and forestry development. Date of the text: 12 July 1988
  - Decree No. 55-582 concerning the protection of forests in the African territories under the authority of the Minister for Overseas France.
  - 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.
  - Order of 21 October 1931 regulating the exploitation of sandalwood.
- On the whole, this forestry legislation lays down 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 operations required at the work sites (reservoirs, catchment works) and along the routes of the supply and distribution pipes must comply with forestry legislation.
- Act No. 95-O13/A/F, on the Public Health and Social Action Code: this Act lays down, among other things, provisions relating to 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.

  The project will have to comply with the provisions of this law with regard to construction site nuisances (water and air pollution, noise levels, etc.).
- 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).

- Law No. 14-034/AU, of 22 December 2014, on combating child labor and trafficking completes the provisions of the Labor Code.

  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° 14-036/AU 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.

- Order No. 01/31/MPE/CB of 14 May 2001 on the protection of species of wild fauna and flora in the Comoros: This order 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 because of their endemism, their rarity or the threats of extinction that they face.

  The provisions of this decree have been considered in the development of this ESMP to assess the impact of the project on wildlife. They will apply to the project whenever the implementation of its activities is likely to affect wild fauna and flora species.

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)

UNDP Guidance Note on Social and Environmental Assessment and Management defines ESMP as key output of the assessment process and consist of avoidance, mitigation, monitoring and institutional measures – as well as actions needed 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 align itself with its general principles when programming and designing the projects it supports. These standards constitute guidelines that must be taken into account during 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 the full and effective participation of stakeholders, including through a mechanism for responding to complaints from those affected by a project.

The SES require that all UNDP programs and projects promote environmental and social opportunities and benefits and ensure that risks and negative environmental and social impacts are avoided, minimized, mitigated and managed. They represent a commitment by UNDP to integrate environmental and social sustainability into its projects and programs in order to promote sustainable development.

The following UNDP's SES 2015 principles and standards were applied to screen the project:

- Principle 1: Human Rights.
- Principle 2: Gender Equality and Women's Empowerment.
- Principle 3: Environmental Sustainability.

The following UNDP SES apply to the project:

- Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management
- Standard 2: Climate Change and Disaster Risks
- Standard 3: Community Health, Safety and Working Conditions
- Standard 4: Cultural Heritage
- Standard 5: Displacement and Resettlement
- Standard 7: Pollution Prevention and Resource Efficiency

Standard 6 is not applicable because there are no peoples in the country that fall within the broad definition of SES.

4 DESCRIPTION OF THE PROJECT

The project's beneficiary localities are currently served with drinking water from very old networks, sometimes with a few 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 7

4.2. Reference situation

Zone 7 belongs to the island of Anjouan and includes four neighbouring localities: Mromouhouli, Maraharé, Hassimpao and Chitsangachel are part of the Vouani commune in the north-west of the island of Anjouan. Zone 7 also includes an action to improve water production for the town of Mutsamudu.

The four localities are located in the coastal zone and along the road to Sima Pomoni. As for the town of Mutsamudu, the capital of the island, it is located on the northern coast of the island.

The localities in the area are partially supplied with drinking water through networks consisting of:

- **DWSS of Mromouhouli**
  - A catchment called Maboungouni catchment.
  - A HDPE DE63 PN10 pipeline from the Maboungouni catchment, 1333 m long.
  - A semi-underground tank with a capacity of 13 m3
  - A distribution network of HDPE 32 and 50 mm pipes, laid on the surface, with a total length of 184 m
- **DWSS of Chitsangachel**
  - The Bouejou catchment
  - A Galvanized water supply pipe with a total length of 228 m.
  - A 53 m3 capacity tank
  - A distribution network of Chitsangashel, consisting of HDPE PN10 pipes from 25 to 50 mm and total length 256 m.
  - A HDPE DE50 PN10 pipe, total length of 532 m to serve the Hassimpao locality connected to the Chitsangashel reservoir. Currently this network is not operational.
- **DWSS of Mutsamudu**

  The town of Mutsamudu is integrated with zone 7 with the aim of improving its DWSS since the quality of water distributed to the population of this town is rather poor, particularly during rainy periods. The water collection, supply and treatment system of this city is composed of:
  - Two catchments (Houngouni and Moina Oupetro)
  - A galvanized steel pipe for the Houngouni water supply system, diameter 150.
  - A Sangani tank.
  - The water treatment units from the two catchments Houngouni and Moiana Oupetro

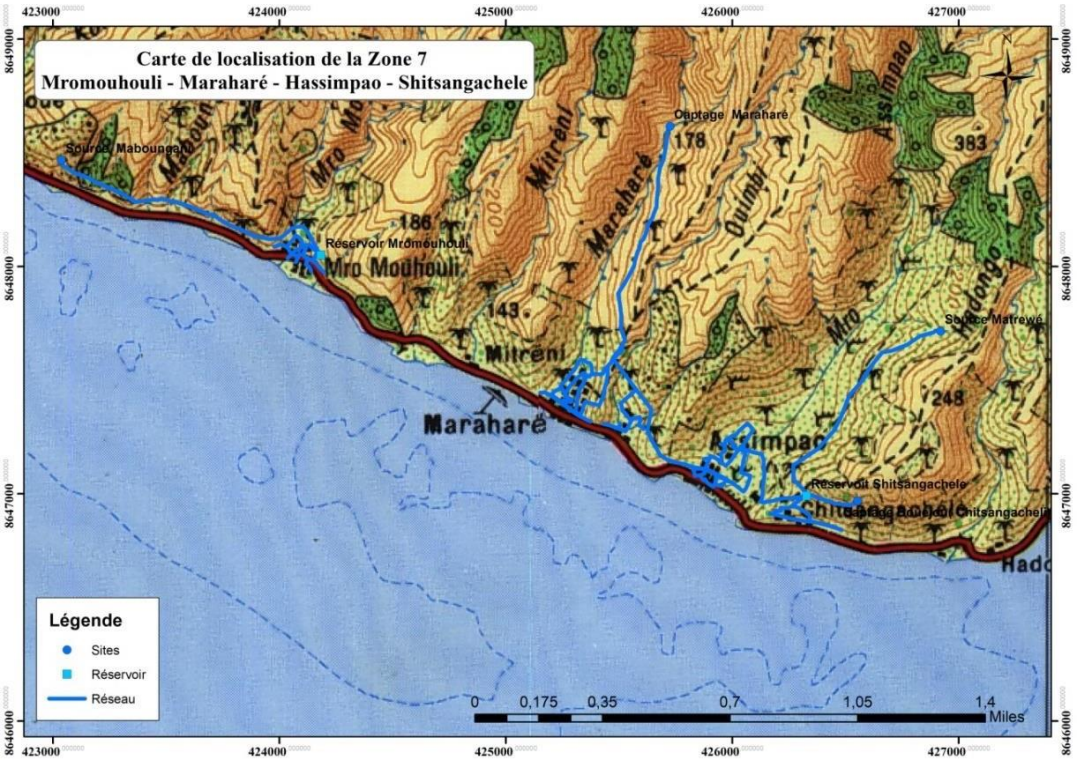


Figure 1: Location map of the localities concerned by the project - zone 7

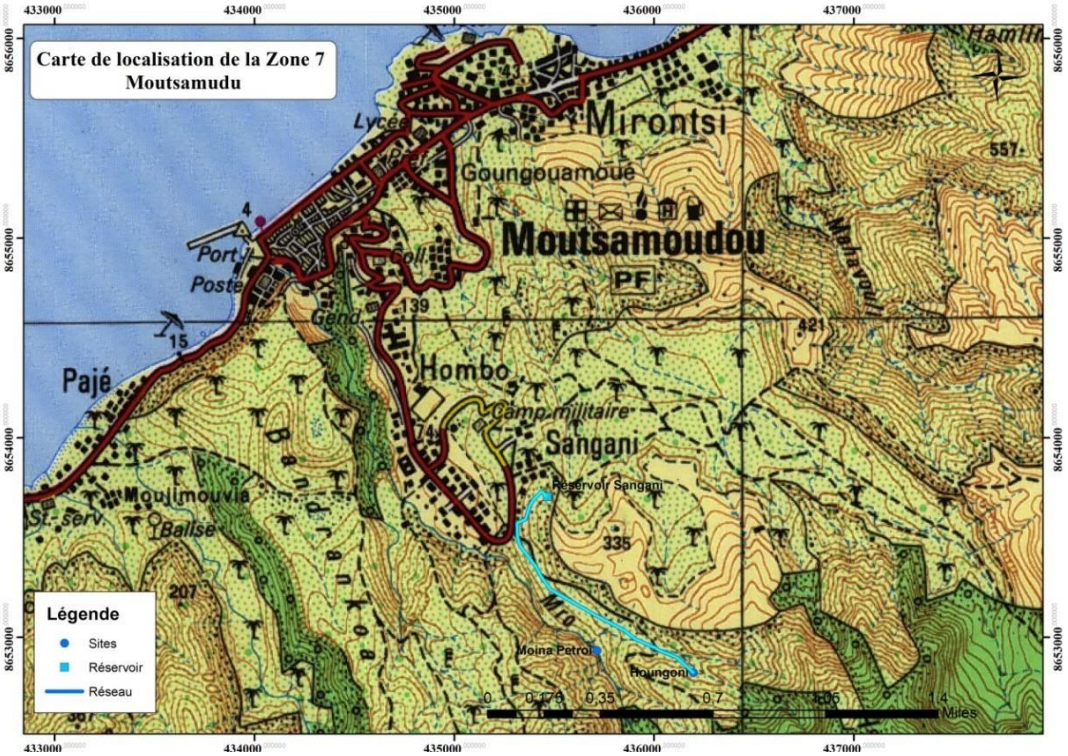


Figure 2: Location map of Mutsamudu

4.2.1. Project Description - Zone 7

The projected rehabilitation actions for the Zone 7 DWSS are as follows:

- **Locality Mromouhouli**
  - Creation of a new catchment
  - Creation of a new 25 m^3 capacity reservoir
  - Installation of a water treatment plant
  - Intensification and reinforcement of the distribution network through the installation of new HDPE pipes with a total length of 968 m (OD90 to OD32 mm) and the laying of 1145 m of HDPE supply pipe OD63 PN10
  - Construction and equipment of management and protection works on the new pipes (1 sectioning, 4 suction cups and 2 draining).
- **Marahare, Hassimpao and Chitsangachele:**
  - Creation of 2 new catchments (Maraharé and Matrawé) Rehabilitation of the existing Bouejou catchment Rehabilitation of the existing 53 m^3 Shitsangachele reservoir Creation of two new reservoirs with a capacity of 50 m3 Installation of two water treatment plants
  - Installation of a chlorination station
  - Reinforcement of the distribution and supply network by the installation of 7807 m of HDPE pipes (DE110 to DE32mm) and 290 m of cast iron pipes (DE80 to 60mm) and management and protection works (2 sectioning works, 9 suction cup works and 7 draining works)
- **DWSS of Mutsamudu**
  - Rehabilitation of existing catchments (Houngouni and Moina Oupetro)

- Extension and rehabilitation of two water treatment plants
- Installation of three fire hydrants
- Construction of a 50 m^3 capacity reservoir and a reservoir/breezeway and construction and equipment of chlorination chambers upstream of the reservoirs
- Installation of management and protection works (6 drains, 7 suction cups, 3 sectioning) Brushing and painting of the Moina Oupetro water supply pipe
- Reinforcement of the distribution and supply network by installing new HDPE pipes (from 160 to 40mm) and cast iron pipes (ND150-NN60mm)

4.3. ZONE 8

4.3.1. Reference situation

Zone 8, belonging to the island of Anjouan, comprises four neighboring localities: Marontroni, Vouani, Bandrani-Vouani and Darsalama, which are part of the commune of Moya in the North-West of the island of Anjouan. The localities are located in the coastal zone towards Pomoni, with the exception of Bandrani-Vouani which is slightly higher up but adjoins Darsalama. The DWSS currently serving these localities are composed of:

- **Marontroni DWSS:**
  - Three catchments: Habaisalam, Dagalojou low and Dagalojou high
  - HDPE DE40 supply lines (581 m) from the catchments
  - A stone masonry tank with a capacity of 11 m^3
  - A distribution network in HDPE DE40 PN 10 pipe with a total length of 400 m, laid on the surface.
- **The Vouani DWSS**
  - The Vouani catchment
  - A HDPE water supply pipe with a total length of 1864 m
  - Two load breakers (currently abandoned)
  - A 62 m^3 capacity tank
  - A distribution network consisting of HDPE PN16 pipes.
- **The DWSS of Bandrani Vouani and Dar Salama**
  - Bandrani Vouani dam built in 2003
  - A HDPE DE75 PN10 supply pipe from the catchment to a loading chamber. From this chamber, two supply pipes leave:
    - a first pipe (Galva 80/90, length 238 m, Galva 50/60, length 412 m, HDPE DE 63, length 790 m) leads to a load breaker. From the load breaker, two HDPE DE63 pipes go to the Dar Salama reservoir and one to the Bandrani/Vouani reservoir.
    - A second HDPE pipe to Bandrani/Vouani laid mainly on the surface and protected from sunlight by the vegetation cover.
  - Two reservoirs (Bandrani/Vouani with a capacity of 19 m^3, and Dar Salama with a capacity of 13 m^3). Each reservoir supplies a distribution network within the supplied locality.

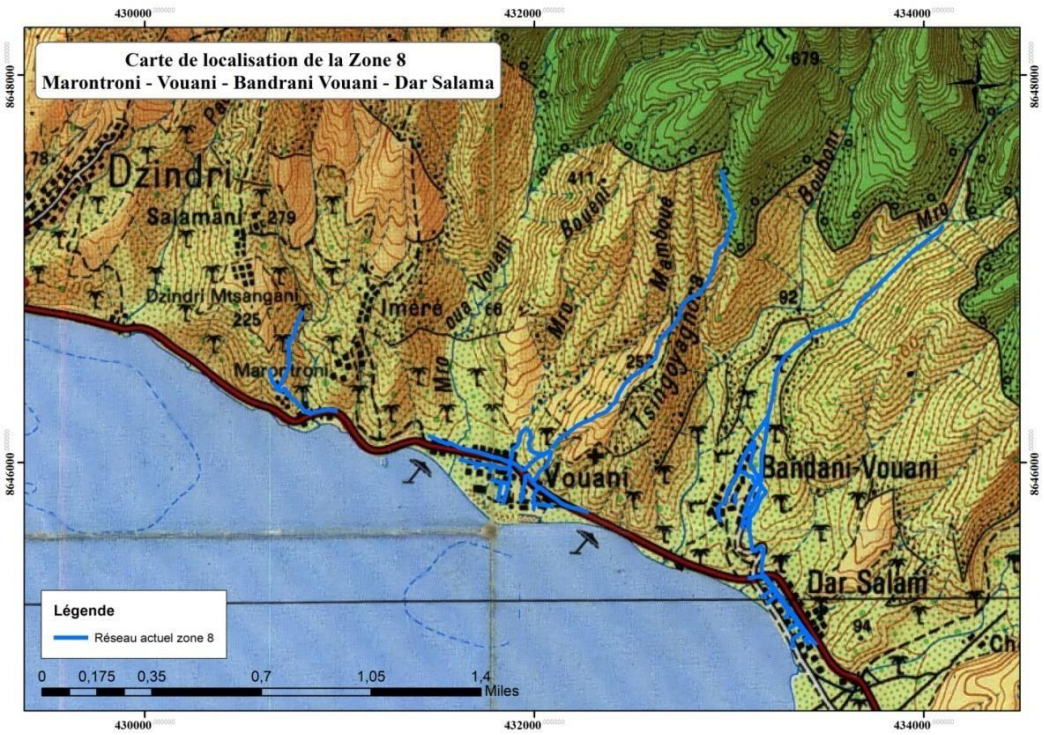


Figure 3: Location map of localities affected by the project - zone 8

4.3.2. Project Description - Zone 8

- **DWSS of Marontroni**
  - Reinforcement and rehabilitation of the two existing catchments,
  - Installation of a decantation, filtration and disinfection system
  - Construction of a new reservoir at a higher elevation than the existing one in order to dominate a neighborhood that is higher than the existing reservoir
  - Supply and installation of HDPE supply and distribution pipes (DE32 to DE63mm) and ND50 cast iron pipes.
  - Construction and equipping of 4 current and protection structures on the new supply and distribution pipes (2 draining structures and 2 suction structures).
  - The route of the planned pipes will involve 10 m of roadway crossing and 40 m of river crossing.
- **DWSS of Vouani**
  - Rehabilitate and strengthen the existing water catchment,
  - Construction and equipping of two load-breaking structures,
  - Installation of a water treatment plant.
  - Rehabilitation of the existing 62 m^3 tank.
  - Construction and equipment of a 50 m^3 tank.
  - Supply and installation of HDPE pipes DE90 and 75 mm with a total length of 1997
  - Laying of the existing HDPE pipe from DE160 to DE63 PN10 with a total length of 2172 m and cast iron pipe ND150 mm with a length of 38 m.
  - Construction and equipping of 11 current and protection structures on the new supply and distribution lines (3 blocking structures, 4 draining structures and 4 suction structures).

- Supply and installation of HDP distribution pipe DE32 to 160 mm with a total length of 4224 m to serve the dwellings from the existing reservoir to be rehabilitated and the planned reservoir.
- The proposed pipeline route involves 20 m of roadway crossing and 40 m of river crossing.

- **DWSS of Bandrani Vouani and Dar Salama**
  - Rehabilitate and reinforce the existing water catchment,
  - Installation of a water treatment plant.
  - Supply and installation of new HDPE pipes DE90 and 75 mm with a total length of 1997 m
  - Construction and equipment of two 50 m3 tanks
  - Supply and installation of HDPE distribution pipe DE32 to 110 mm with a total length of 3741 m.
  - Construction and equipping of 9 current and protection works on the new water supply and distribution pipes (3 sectioning works, 3 draining works and 3 suction works
  - Laying of existing HDPE 32 mm distribution pipes with a length of 173 m.
  - The proposed pipeline route involves 50 m of roadway crossing and 70 m of river crossing.

4.4. ZONE 9

4.4.1. Reference situation

Zone 9 belongs to the island of Anjouan. It includes two neighbouring localities: Vassi and Dzindri which are part of the commune of Vouani in the North-West of the island of Anjouan.

- **DWSS of Vassi**

  The Vassi DWSS consists of a catchment that supplies a reservoir with a capacity of 80 m^3 through a 517 m long HDPE 90 PN10 pipe. From this reservoir, a distribution network of HDPE pipes starts to serve the village of Vassi.

- **DWSS of Dzindri**

  The Mbatsé DWSS is supplied from two catchments: Ciresse and Padzanni. The first catchment is connected to the second catchment by an HDPE supply pipe. The water supply network installed on these two catchments is composed of a supply pipe that feeds a 100 m^3 capacity reservoir, located at 328 m. From this reservoir, a distribution network of HDPE and Galva pipes starts up to supply the village.

4.4.2. Project Description - Zone 9

The projected rehabilitation actions for the Zone 9 DWSS are as follows:

- **Locality Vassi**
  - Reinforcement and rehabilitation of the existing catchment Installation of a decantation, filtration and disinfection system
  - Construction of a new reservoir at a higher elevation than the existing one Rehabilitation of the existing tank
  - Intensification and reinforcement of the distribution network by installing new HDPE pipes with a total length of 2766 m (OD40 to OD110 mm)
  - Construction and equipment of management and protection works on the new pipelines (3 sectioning, 6 suction cups and 4 draining).

- **Locality Dzindri:**

- Rehabilitate and strengthen the two existing water catchments
- Creation of a new catchment Zikelen
- Construction and equipping of a connecting structure
- Construction and equipment of a load breaker with a capacity of 1.2 m^3
- Installation of a water treatment plant Rehabilitation of the existing tank
- Installation of 3 load breakers on the distribution network
- Reinforcement of the distribution network by laying 137 m of HDPE DE50 supply pipe, installing 4,313 m of HDPE distribution pipe (DE125 to DE32mm) and 48 m of cast iron pipe (DE80 to 60mm) and installing management and protection structures (5 sectioning structures, 3 suction cup structures and 2 drainage structures)

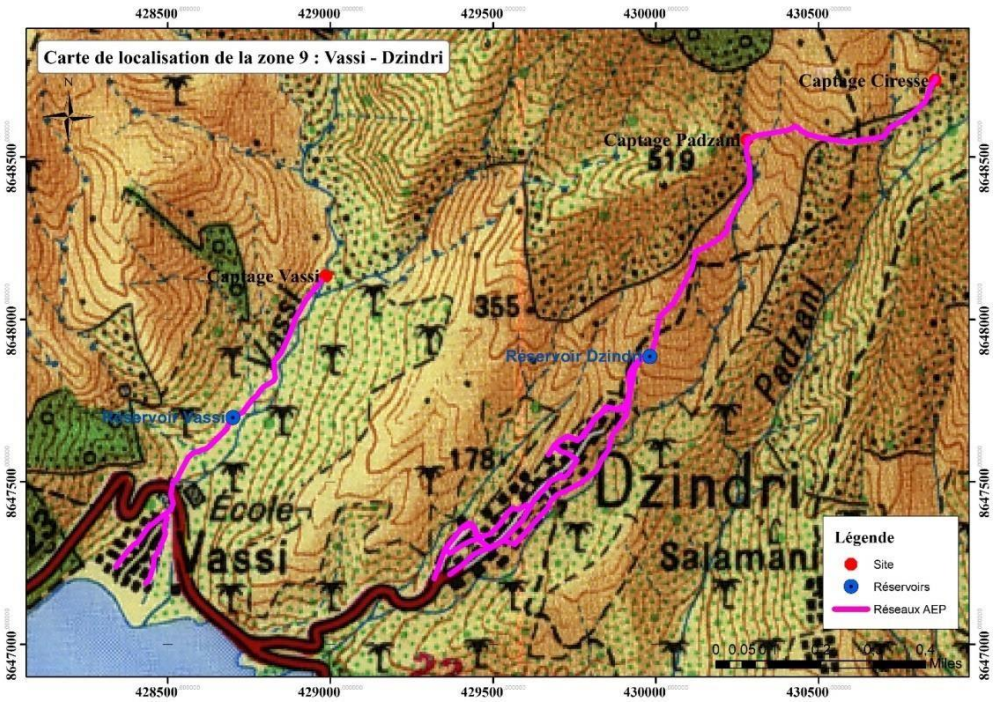


Figure 4: Location map of localities affected by the project - zone 9

4.5. ZONE 10

4.5.1. Reference situation

Zone 10 belongs to the island of Anjouan. It is located between Mutsamudu and Sima and is part of the Bandrani region. It includes 5 localities: Ankibani, Chironkamba, Bandraoupépo, Bandrani/Yamtsagani, Maoueni. These localities are supplied with water through two completely independent drinking water supply systems (DWSS):

- **The DWSS of the Ankibani locality:**

  This system is supplied from two catchments: Ankibani and Trondroni. The Ankibani catchment supplies the Ankibani reservoir with a capacity of 94 m^3 through a 50/60 steel pipe 452 m long.

  The Trondroni catchment is connected to the Ankibani reservoir by a HDPE pipe, DE 90 PN 16 laid on the ground and 1890 m long. From the Ankibani reservoir starts a distribution network of galvanized steel and HDPE pipes with a total length of 1.9 km to serve the homes in the locality.

  This system has a lot of water leaks at the level of the Ankibani intake pipe as well as at the level of the reservoir whose civil engineering is in very bad condition. In addition, the reservoir does not dominate the whole village,

as several houses are located on higher ground.

The distribution pipes are undersized and cannot carry the peak hourly flow. This confirms the reason why the population resorts to load shedding to alleviate the problems of the flow rate of the distribution pipes and the storage of water at home.

- **The DWSS of the localities of Chironkamba, Bandrajou/Oupépo, BandraniMtsangani and Maoueni**

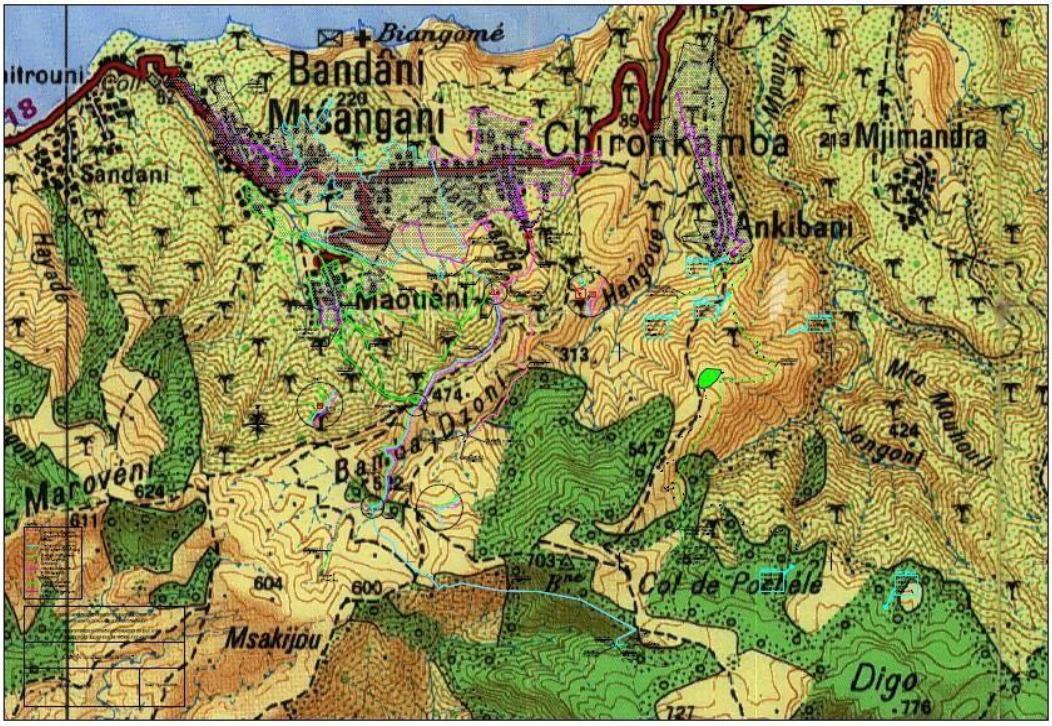
The localities of Chironkamba, Bandrajou/Oupépo, Bandrani Mtsangani and Maoueni are grouped on 4 water catchments:

- A first catchment called Chitsotsoni 1 connected to the Chitsotsoni 1 distribution centre by a HDPE 50 PN 16 pipe 1074 m long
- A second catchment called Chtsotsoni 2 connected directly to the Chironkomba reservoir (100 m3) by a HDPE 50 PN 16 pipe 2 148 m long
- A third catchment called Hakoujou which groups together 3 sources. This catchment is connected to the Magouni load breaker by a HDP pipe of 75 PN 16 with a length of 3100 m
- A fourth catchment called Tsongohori which feeds the central tank R1 (200 m^3) through a galvanized steel pipe 102/114 of 1000 m length

The various components of the drinking water supply network starting from these catchments is composed of :

- A load breaker dating back to 1964
- 5 tanks: A central tank called R1 tank, R2 tank called Chironkomba tank, R3 tank called Bandrajou tank, R4 tank called Bandrani Mtsangani tank and R5 tank called Maoueni tank. These tanks are in poor condition and have leaks on all sides.
- The R4 tank is built on the side of the road, without any fence or protection.
- Each reservoir feeds a distribution network within the supplied locality. Only the Bandrajou network is in the process of being built; it is in good condition and has pipes of sufficient diameter. As for the other networks, the diameters are fairly to very small and are not sufficient to carry the hourly peak flows.

Figure 5: Location map of localities affected by the project - zone 10



4.5.2. Project Description - Zone 10

- **DWSS of Ankibani :**
    - Construction of 3 new catchment structures (weirs): Ziara, Hakomo and a new Trondoni catchment. The catchment structure will be a weir to collect the water leaving the spring.
    - Abandonment of the existing Trondoni catchment and rehabilitation of the existing Ankibani catchment.
    - Construction of two tanks of 25 m^3 capacity each (R3 and R4)
    - Rehabilitation of the existing Ankibani tank (R2) with a capacity of 50m^3
    - Construction of three 2m^3 load breakers(BC1 - BC2 and BC3)
    - Installation of a decantation, filtration and disinfection system
    - Supply and laying of new HDPE pipes from 90 to 125 mm with a total length of 2.34 km to connect the new catchments to the decanting structure to be built
    - Supply and installation of a new HDPE 50 mm pipe, length 366 m, to serve the existing perimeter from the load breaker n°2.
    - Supply and installation of a new HDPE pipeline of 125 mm in total length of 1.53 km to connect the Chironkomba reservoir to the decantation structure to be built.
    - Supply and laying of HDPE pipe DE32 to 125 mm with a total length of 3913 m to serve the houses of Ankibani locality from the two planned tanks R3 and R4 and from the R2 tank to be rehabilitated and the locality of Chirokomba from the Chironkomba tank which will be rehabilitated within the framework of the project. It should be noted that the village of Chirokomba (100 m^3) is currently supplied from the existing.
    - Chistsotsoni 2 catchment (part of the DWSS of the localities of Chironkamba, Bandrajou/Oupépo, BandraniMtsangani and Maoueni). Under the project, this village will be served from the Ankibani DWSS.
    - Construction and equipping of 12 current and protection structures on the new supply and distribution lines (7 blocking structures, 3 draining structures and 2 suction structures).

  The route of the proposed pipelines involves 50 m of river crossing and 96 ml of roadway crossing.

- **DWSS of Chironkamba, Bandrajou/Oupépo, Bandrani, Mtsangani and Maoueni**
    - Construction of a new catchment (weirs): The catchment structure will be a weir to collect the water leaving the spring.
    - Rehabilitation of civil engineering and equipment of existing reservoirs: central reservoir (200 m^3), Bandrani Mtsangani reservoir (130 m^3), Bandrajou reservoir (28 m^3) and Maoueni reservoir (70 m^3)
    - Construction of a 25 m^3 capacity tank
    - Rehabilitation of all the infrastructures of the Hakoujou and Ntsongohari catchments and abandonment of the Chitsotsoni 1 and 2 catchments.
    - Installation of a water treatment plant.
    - Construction of two 2m^3 load breakers
    - Supply and installation of new HDPE pipes DE90 and 110 mm with a total length of 5.2 km to connect the new catchment to the system, to replace the existing pipes in poor condition and to connect the tanks and / or load breakers.

- Construction and equipping of 12 standard and protection structures on the new water supply and distribution lines (27 blocking structures, 9 draining structures and 13 suction structures).
- Construction of three 3.5 m^3 capacity load breakers on the distribution network.
- Supply and laying of HDPE distribution pipe DE32 to 110 mm with a total length of 16.7 km m to serve the dwellings of Maoueni, Bandrani, Mtsangani, Bandrajou and Oupépo from the existing reservoirs to be rehabilitated and the planned reservoir.

The route of the planned pipelines involves 146 ml of roadway.

4.6. ZONE 11

4.7. Reference situation

Zone 11 belongs to the island of Anjouan. Located between Mutsamudu and Sima, it is part of the Bandrani region. It includes 2 localities: Chitrouni and Saadani. The components and the general scheme of operation of these networks are as follows

- A first network comprising: A series of catchments at Mtsangoni. These catchments supply a 6 m^3 reservoir called the fountain reservoir and a 29 m^3 reservoir called the Chitrouni low reservoir, crossing the locality of Sandaani. Each reservoir is fed by a HDPE pipe of 50, 40 and 32 PN 10.
- A second network comprising: A catchment called Dzitsoni, an adduction feeding the Sandaani reservoir via an 18 m^3 reservoir/distributor that diverted part of the water to the Bandrani/Mtsangani locality. This diversion is currently non-functional. From the Sandaani reservoir, a fairly basic distribution network covers part of the locality.
- A third network comprising: a catchment called Kondroni supplying a Ntrahani reservoir with a capacity of 22 m^3 which supplies an upper part of the Chitrouni locality and the upper Chitrouni reservoir with a capacity of 60 m^3, then a distribution network.

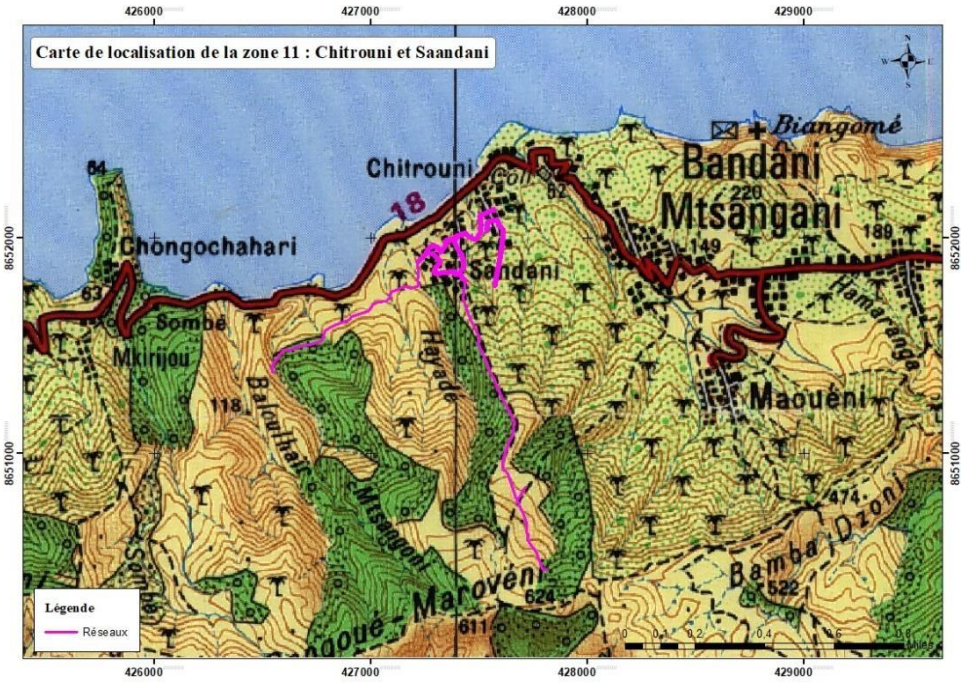


Figure 6: Location map of the localities concerned by the project - zone 11

4.7.1. Project Description - Area 11

The projected rehabilitation actions for the Zone 11 DWSS are as follows:

- Rehabilitation of existing catchments (Dzitsoni and Mtsangani)
- Installation of two filtration works
- Construction and equipment of a chlorination chamber
- Construction of a 50 m^3 capacity tank with a chlorination chamber
- Rehabilitation of the existing Saandani and Borne Fontaine reservoirs
- Construction of 3 surge tanks
- Supply and laying of new HDPE supply pipes (DE90 to DE32) with a total length of 3548 m and laying of existing HDPE pipes (DE50 to DE32) with a total length of 1001 m.
- Construction and equipping of the current and protection works on the new supply and distribution pipes (5 sectioning works, 3 draining works and 4 suction works).

4.8. ZONE 12

4.9. Reference situation

Zone 12, belonging to the island of Anjouan and located between Mutsamudu and Sima, is part of the Bandrani region. It includes 2 localities: Mjamaoué and Msahara. These localities are partially supplied with drinking water through two completely independent DWSS.

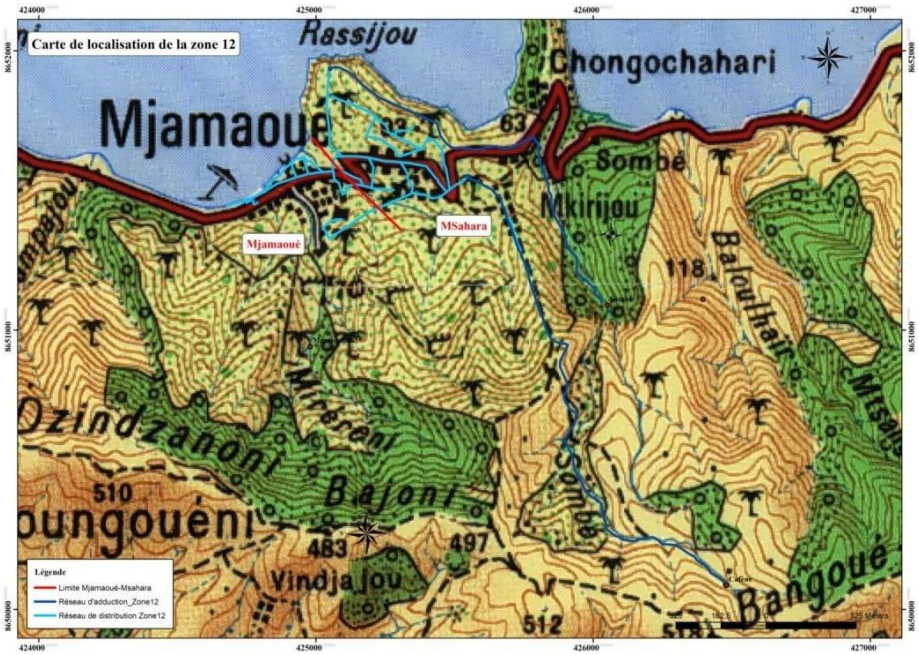


Figure 7: Location map of the localities concerned by the project - zone 12

The components and the general scheme of operation of these networks are as follows:

- A first network starting from the Cafène catchment. Dating back to 1980, this catchment feeds the Mkirijou reservoir (39 m3) by gravity through a steel pipe (66/76, 50/60 and 40/49) with a total length of 1.7 km. This reservoir in turn feeds a second reservoir called Mjamaoué (70 m3) by means of a steel pipe (50/60, 40/50 and polyethylene DE40 PN16) with a total length of 398 ml. Each reservoir feeds a distribution network made up of galvanized steel pipes (ND50/60, 40/49, 33/42 and 20/27 mm) and HDPE pipes (DE32 and DE40 mm) with a total length of approximately 2.3 km.
- A second network served from the Sombé catchment. This catchment feeds a ground reservoir called Msassa (49 m3) by means of a HDPE pipe (DE 110, 75 and 63 PN 16) laid on the ground and 660 ml long. This reservoir is

connected to a distribution network in HDPE pipe DE75 which is currently not functional.

4.9.1. Project Description - Area 12

The projected rehabilitation actions for the Zone 12 DWSS are as follows:

- Rehabilitation of existing water catchments (Sombé and Haitsozi): cleaning, protection and rehabilitation of civil engineering as well as supply and replacement of hydro-mechanical equipment are planned.
- Construction of 4 load breakers along the water supply line from the Cafène catchment
- Construction of two treatment plants: each treatment plant consists of decantation, filtration and disinfection. The treatment system exists on the two catchments Sombé and Caffeine. It is composed of a tranquilizer, a decantation basin, a filtration basin and a chlorination chamber. The filters are equipped with a backwash system that injects water under the filter. This water comes from the intake pipe of the catchment.
- Rehabilitation of the Mjamaoué reservoir: Rehabilitation of civil works, construction of a valve chamber and supply and installation of hydro-mechanical equipment.
- Construction of a 50 m3 semi-underground reservoir
- Construction of a new catchment: The catchment work will be a weir to collect water coming from a natural spring. It will be equipped with two outlets: one outlet to serve an irrigated area and one outlet to supply a BC1 load breaker to be built within the framework of the present project.

The general scheme of operation of the proposed DWSS will be as follows:

- **DWSS n°1**

  From the Cafène catchment, a new HDPE pipe of 75-63 mm PN10 and of a total length of about 1,5 km will be installed along which 3 load breakers (BC1 -BC2 and BC3) will be installed. This pipe will lead to a treatment basin to be built (filtration and chlorination basin). This conveyance pipe will also convey the flow captured at the new Haitsozi catchment which will be connected to the BC1 breakwater by means of a new 350 m long HDPE 50 mm conveyance pipe.

  From the treatment basin, a HDPE pipe of 75 mm PN10 with a total length of about 440 m starts and ends in the Mjamaoué reservoir to be rehabilitated. A group located along this supply line will be served by means of a load breaker (BC4) and a 40 mm HDPE pipe 105 m long.

  From the Mjamaoué reservoir, a distribution network of buried HDPE pipes (DE32 to 75 mm) starts to serve the homes of the Msahara village and the upper area of the Mjamaoué locality.

- **DWSS n°2**

  From the Sombé catchment, a new supply pipe with a total length of 1.52 km (120 m in ductile cast iron and 1.4 km in HDPE 125 mm) will lead to a treatment basin to be built (filtration and chlorination basin). This basin will feed a 50 m3 semi - buried reservoir to be built nearby. From this reservoir, a distribution network of HDPE pipes (DE125 mm to 40 mm) will start to serve the lower area of the Mjamaoué locality.

4.10. ZONE 13

Zone 13 belongs to the island of Anjouan. It comprises 4 localities: Lingoni, Pomoni, Adda Daoueni and Ongoujou.

4.10.1. Reference situation

- **DWSS Adda Daoueni**

  The Adda Daouena drinking water supply system is composed of:

  - A catchment called Hamcoco, which was rehabilitated in 1984, a Hapessi catchment built around 2017 and a Pappani catchment built in 2000,

- A Galva 102/114 pipeline from Hamcoco to the Hacoumou reservoir, laid in 1983 by the Chinese cooperation.
- A Pappani pipeline, laid in the early 2000s by ID, from the Pappani catchment to the Hachimbwi reservoir.
- A Hapessi conveyance pipeline, laid around 2015 by the community, from the Hapessi catchment to the Hapessi reservoir.
-
- Hacouma reservoir built in 1985 by the Chinese cooperation, with a capacity of 58m3. It is a distributing reservoir between Adda Daoueni and the Mramani region.
- Hachimbwi tank with a capacity of 144m3, it is newly constructed, in 2014, by the community. This tank overlooks the dedicated area.
- Mpapani tank built in 2017-2019, capacity 23 m3. It is a community built reservoir on the roadside without generating traffic disruption.
- Hapessi tank, built in 2017, with a capacity of 49m3.
- A distribution network composed of HDPE pipes with a small diameter of less than 50 mm.

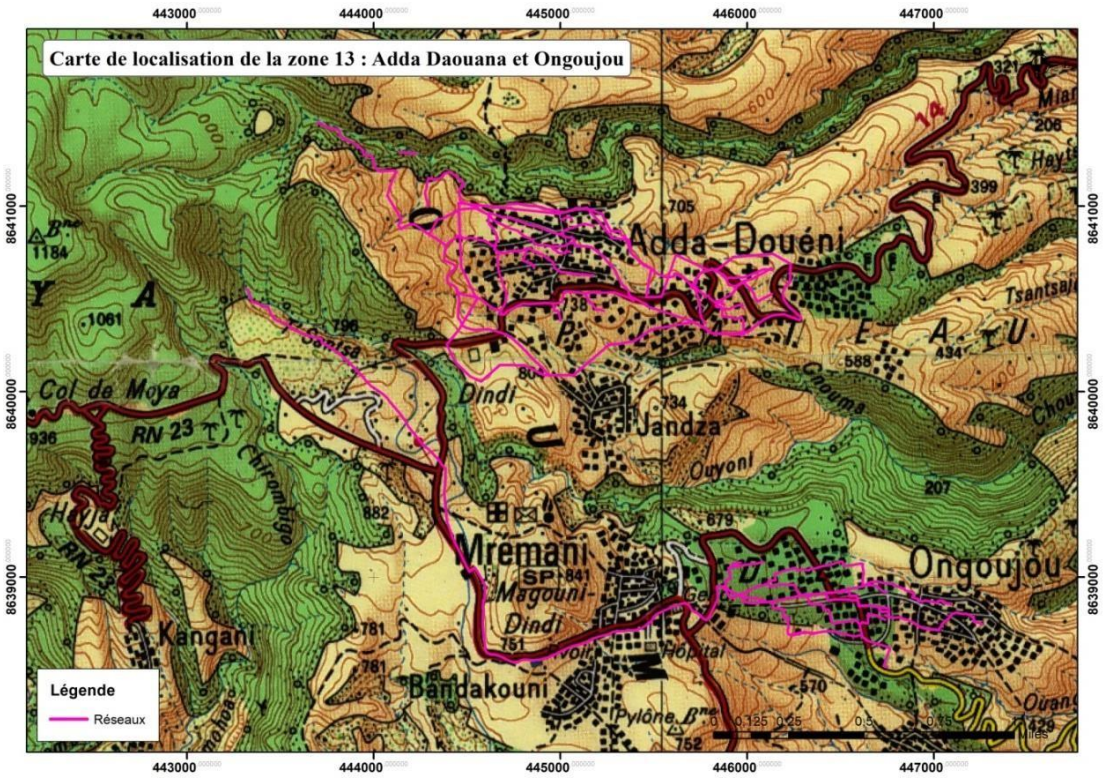


Figure 8: Location map of the localities concerned by the project - zone 13

- **DWSS Ongoujou**

The Ongoujou drinking water supply system is composed of:

- A catchment called Mrémahoja II, built in 1983, from where the supply pipe starts, laid in 1983, in Galvanized Steel G102/114 from the catchment to the Ongoujou spigot in poor condition. Then in HDPE DE 63 and DE 50 PN 16 from the spigot to the Ongoujou reservoir.
- Two Ongoujou tanks, built in 2001, with a total capacity of 90m3. Both tanks are of the semi-underground type.
- An old reservoir, built in 1960 with a capacity of 36m3, it has never been rehabilitated. This reservoir is

fed by the overflow of the main Ongoujou reservoirs or by the opening of the drains. This structure is connected to the distribution network which sends water to the Trindrini reservoir or to reinforce the distribution of Ongoujou.

- Trindrini reservoir, built in 1964, with a capacity of 54m3. This reservoir overlooks the current housing estate of Trindrini.
- A distribution network composed of HDPE pipes of various diameters. The distribution network has quite high pressures reaching 107 m at the level of the BF. Also a part of the population is located at higher levels than the first reservoir.

- **DWSS Lingoni and Pomoni**

The Lingoni and Pomoni drinking water supply system is composed of :

- A catchment called Mavatrijou, which was newly built in 2020 and rests on unsound bedrock. This catchment is made up of two compartments: a collector and a small load-bearing tank. It contains leaks and calcifications are present on both sides of the structure.
- A HDPE pipe of 160 PN16 and 110 PN16, the pipe at the start of the catchment was dug up during the earthworks for the opening of the Lingoni-Dindri road. In general, the pipe is in good condition, even if it is laid on the surface or at a shallow depth, and it is not equipped with suction cups and drains.
- A filter built in 2014/2015 with funding from UNDP, it consists of five compartments. The filtering materials no longer play a role as the water is clear throughout the year. The filter is clogged during the road opening works, the materials are not removed and the compartment N°1 is out of order.
- A cylindrical tank Lingoni, newly built by a UNDP funding in 2014/2015, with a capacity of 250 m3. This tank dominates the two localities: Lingoni and Pomoni.
- A distribution network is made up of HDPE pipes of 180 PN10, DE110 PN16, DE90 PN16, DE75 PN75, DE63 PN16, DE50 PN16, DE40 PN16 and DE32 PN16.

4.10.2. Project Description - Zone 13

The projected rehabilitation actions for the Zone 13 DWSS are as follows:

- **DWSS Adda Daoueni :**
  - Rehabilitation of the Hapessi, Hamcoco, and Papani catchments, Rehabilitation of the Daji spring,
  - Connection of Yeyani and Daji springs,
  - Construction and equipping of a pumping station to pump the water from the two springs to the filtration plant,
  - Installation of three treatment and filtration plants,
  - Construction of a reservoir (civil engineering and equipment) of 50 m^3 capacity, Construction and equipment of a chlorination chamber
  - Rehabilitation of the 5 existing tanks with capacities of 144m^3, 23m^3, 49m^3, 30m^3 and 58m^3. Construction and equipment of 2 load breakers with a capacity of 3,5 m^3,
  - Construction and equipment of management and protection works on the new pipelines (13 sectioning, 10 suction cups and 11 draining).
- **DWSS Ongoujou :**
  - Rehabilitation of the Mrémahoja II catchment Construction of a new catchment on the Kangani River,
  - Construction and equipment of a pumping station at the level of the catchment on the Kangani river to

deliver the water from this catchment to the filtration plant via a recovery station.

- Installation of a treatment/filtration plant
- Construction of tanks (civil engineering and equipment) of 50 m^3 and 100 m^3 capacity,
- Rehabilitation of the 2 existing tanks of 90 m^3 and 54 m^3 capacity.
- Construction and equipment of management and protection works on the new pipelines (7 sectioning, 13 suction cups and 9 draining).

5 BASELINE DATA

5.1. PROJECT INTERVENTION AREAS

The project intervention will cover seven zones including zones 7, 8, 9, 10, 11, 12 and 13 which are part of the island of Anjouan. These overall intervention zones comprise a total population of 107,206 inhabitants in 2020 who are expected to benefit directly from the planned development. This number of inhabitants is expected to reach 139,198 in 2032 and 173,040 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 7	Mromouhouli, Maraharé, Hassimpao,Chitsangacheli and Mutsamudu and itssurroundings	**51357**	**66682**	**82894**
Zone 8	Marontroni, Vouani,Daresalam and Bandrani-Vouani	**6769**	**8789**	**10926**
Zone 9	Dzindri Vassi	**4138**	**5373**	**6679**
Zone 10	Ankibani, Chironkamba, Bandrajou/Oupépo, BandraniMtsangani andMaoueni	**11416**	**14823**	**18426**
Zone 11	Chitrouni and Sandani	**3668**	**4763**	**5921**
Zone 12	Mjamaoué/Msahara	**1 719**	**2232**	**2775**
Zone 13	Pomoni, Lingoni, AddaDaoueni and Ongoujou	**28139**	**36536**	**45419**
Total		**107,206**	**139,198**	**173,040**

Far from the geographical limits of the project intervention area, the population likely to be affected by the project (PAP) extends to include all persons using the traffic routes (roads and tracks) along which there will be works to be carried out under the project.

5.2. PHYSICAL AND NATURAL ENVIRONMENT

5.2.1. Geomorphology of the project area

The Union of the Comoros is made up of four islands of volcanic origin, including Grande Comore, Moheli, Anjouan and Mayotte, the latter under French administration. Despite their common characteristics due to their volcanic origin, their morphology presents a great variability due to their different stages of evolution. The areas concerned by the project are located on the island of Anjouan.

Anjouan shows a dissected pattern and a very rugged relief with sharp ridges and steep flanks. The central part corresponding to the shield volcano is deeply cut by large cirques. These remains of craters are the place of stagnation of superficial waters which constitute the only accumulations of surface water, like the lakes of Dzialandée and Dzialaoutsounga. Others are simply the seat of wetlands, as is the case of some volcanic cones near Bambao. At the three extremities of the island, there are cliffs dominating the coastline and a fringing reef which in some places is detached from the coast, possibly indicating the beginning of a subsidence phenomenon.

5.2.2. Climate

The Comoros have a humid tropical climate with an oceanic influence, characterized by two main seasons: a hot and humid season (southern summer) and a dry and cool season (southern winter). This climate is characterized by great local variations in relation to the exposure to the prevailing winds and the altitude. The examination of the climatic

characteristics of the region from the rainfall and temperature data of the stations of Ouani and Mutsamudu shows the presence of two seasons:

- The hot season (or rainy season), from mid-November to mid-April, is characterized by humid heat, frequent thunderstorms and, especially in January and February. In the coastal zone, the average temperature is around 27°C, the maximums vary between 31 and 35°Cand the minimums are around 23°C. The average annual rainfall exceeds 1000 mm on all the islands. In Grande Comore, it varies from 1398 mm to 5888 mm, in Anjouan between 1371 mm and 3000 mm, and in Moheli between 1187 mm and 3063 mm
- The cool season is from early June to late September. At low altitudes, temperatures average 23 to 24°C. Maximum temperatures remain high; around 28°C, but minimum temperatures are 4 to 5°Clower than in the warm season. The average wind speed is significantly higher than in the warm season, with a large predominance of the trade winds blowing from the south to southwest. On the other hand, in the absence of cyclonic circulation, there is no risk of strong winds. The average monthly rainfall is about 194 mm.

The Comoros can be crossed by cyclones, mobile air masses, strongly rotating, accompanied by very violent winds and rains. There are three types of cyclones that can strike the Comoros. These three types are linked to the site of formation: in the vicinity of the archipelago, to the north of Madagascar and to the east between 55 and 65° East longitude.

It should be noted, however, that the global climatic disturbances have resulted in a significant decrease in precipitation, a shift in the season and an increase in the average temperature of about 0.5°C.

5.2.3. 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.

Generally speaking, the North and North-East of Grande Comore as well as the regions of Anjouan and Moheli (Djandro, Nioumakélé and Sima), which are more arid and hotter during the dry season, are the areas most affected by the scarcity of water due to the premature drying up of water points.

5.2.4. Overview of water resources

In Anjouan, the permanent hydrographic network is dense. This island is characterized by networks of more or less permanent watercourses originating in the highlands. However, an increasing drying up of these rivers is observed.

On this island , the partially impermeable soil makes it possible, with heavy rainfall, to feed numerous perennial streams with a marked torrential character, as well as springs. The main resource in these two islands is therefore surface water, even if wells and springs provide a complementary resource in certain areas.

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.

Anjouan is mainly fed by river water. Climate change and deforestation have resulted in a drastic reduction of the hydrographic network. Indeed, if there were about forty rivers in Anjouan in the 1950s, there are now only about ten

The more or less impermeable alteration facies particularly at the end of the first and second phases of volcanism, allowed the development of a very dense hydrographic network.

The valleys are narrow and deep and the alluvium is significant. A study on the inventory of resources in Anjouan showed that, despite the drying up of most rivers, surface water resources should be sufficient for the present and future needs of the population, provided that reforestation and environmental awareness campaigns continue. However, the flow of many rivers or streams and springs has decreased significantly over the past three decades.

5.2.5. Surface water quality

The quality of river water is altered by the products of erosion, faecal discharges, household waste and others. Studies report faecal contamination of most surface water resources in the Anjouan Region.

5.2.6. Biological environment

The Comoros do not harbor a large number of different species. From a geological point of view, they are small volcanic islands formed very recently and do not harbor native mammals or amphibians, as these are less easily dispersed in isolated islands.

Anjouan island is home to a number of endemic species, the number of which is summarized in the following table. Overall, the mammal diversity of the Comoros, like most other volcanic islands, is limited to marine mammals and bats. (Table 4)

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

	Endemic to the island	Endemic to Comoros	No endemic	Total
Birds	9	7	16	32
Reptiles	1	3	9	13
Butterflies	9	5	20	34

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 to become entirely new species. However, their isolated evolution makes them extremely vulnerable to environmental change and new threats.

The rich volcanic soils of the islands favor the growth of abundant vegetation. Generally speaking, the Comoros are characterized by dense, generally green and very diverse vegetation, which varies according to the type of soil and microclimate, which are numerous on the islands. Beyond the coastal areas are coconut, mango and banana trees, and above them is a forest zone with many varieties of tropical hardwoods. Tree frog wood, lichens and heather grow on the highest peaks.

Sixteen endemic bird species are found on the three islands of the Union of the Comoros, some of which are found on only one of the islands. A striking example is the Scops-Owl - a different species has evolved on each island, namely the Karthala Scops-Owl, the Moheli Scops-Owl and the Anjouan Scops-Owl, now classified as Critically Endangered on the UICN Red List of Threatened Species.

There is a wide variety of bat species in the Indian Ocean islands, but the largest is the Livingstone's bat (Petrous Livingstone), which evolved in Comoros and is found only in Anjouan and Moheli. With a wingspan of up to 1.4 meters, it is one of the largest bats in the world and a flagship species for conservation in Comoros. The Livingstone's bat is considered essential in the regeneration of forests6.

Reptiles (snakes and lizards) have been less studied. However, according to Cole's study (1992), there are at least 11 endemics (5 geckos, 2 chameleons, one skink and 3 snakes) among the 25 native species recorded. The day gecko Pheisuma is sought after for export. The rate of endemism would be 45%.

Knowledge on insects is rather fragmentary. References are mostly related to research done in Madagascar. According to some studies, there are about 1200 species present in Comoros, some of which appear to be threatened. Some species, such as the big-tailed butterfly, are endangered.

One of the most important elements of the marine fauna is the coelacanth, Latimeria chalumnae, a relict and poorly known taxon, discovered in 1938, of worldwide scientific interest. Its worldwide distribution is limited to the area of the sea trench between Grande Comore and Anjouan.

The catches, most often accidental, would be of the order of 5 to 6 per year. In 1991, 8 were caught.

The species is internationally protected (art.2 of the CITES Convention) and the captured specimens are in principle kept by the government.

Besides these endangered species, we can note the presence of whales, orcas and dolphins (in very large numbers for the latter).

The species associated with coral reefs are very numerous (fish, crustaceans, molluscs, etc.). It is estimated that there are nearly 820 species of marine fishes in the Comoros (coastal and pelagic combined). Only one marine mollusk is recognized as endemic to the Comoros: Clithon comorensis.

5.3. CHARACTERISTICS OF THE SOCIO-ECONOMIC ENVIRONMENT

5.3.1. Demography, urban planning and socio-economic activities

Located on the same island, all of these areas have almost the same characteristics in terms of housing, income and population growth.

On the whole, the region is undergoing a transformation in terms of housing construction. All the houses are equipped with dry latrines, 30 to 55% of which are covered, depending on the locality.

The field observation revealed that there is no waste management system in all the localities. Household waste is dumped in nature or in streams and rivers.

As far as sources of income are concerned, agriculture is the main activity of the population.

Clove is the main crop in the region, and it seems to be well suited to the region given the uneven terrain. Food crops dominated by banana, cassava and sweet potato are also strongly practiced in the Bandrani region and are mostly for self-consumption.

Livestock farming is always associated with agriculture, with 30-60% of farmers practicing it.

Trade is limited to small grocery stores, dominated by basic necessities such as rice, flour, kerosene etc.... In addition, part of the community of the region trades in various products related to import-export in the capital of the island: Mutsamudu.

The craft industry is not very developed; we can distinguish a few craftsmen, hat weavers, carpenters, bakeries, stills for the distillation of YLANG, brick factories.

The marketing of food crops is strongly practiced by farmer-producers and resellers.

5.3.2. Health

In zones 7, 8, 9, 10, 11, 12 and 13, it was not possible to assess the prevalence of water- related diseases despite the presence of health posts in each zone. There are no specific statistics for each intervention zone. However, it is certain that typhoid and diarrheal diseases (parasites and others...) are rampant in the region given the quality of the water. The population is aware of this situation and most households report that they always boil their drinking water before consumption.

6 STAKEHOLDER ENGAGEMENT

Consultations were undertaken in the design phase of the project with various stakeholders such as government agencies, community organizations, NGOs and community groups. Also, as part of the technical studies (pre-project studies, detailed project studies and the development of the ESMP), consultation were organized with beneficiaries to present the project and its activities, and collect their opinions and concerns, which were later used to inform the design of the project.

During these meetings, beneficiaries from Zones 7, 8, 9, 10, 12 and 13 expressed their support for the Project and highlighted the pressing need for the completion of the work to enable the supply of safe drinking water in the communities.

However, there were some pushbacks from the community of Zone 11 (Chitroni and Sandani). The population of the Chitroni refused to give the Project Consultants access to their water supply infrastructure for order the diagnosis to take place. A series of stakeholder meetings were organized afterwards in Zone 11 to further present the project's objectives and reassure the communities of the great benefits of the project will bring to the area.

Two key stakeholder meetings were held in the village of Sandani on 23rd November 2019 and on 27th June 2020. They key point of disagreement was related to the governance of the water supply system. Some community members (mainly youth and women) preferred that the water supply system be managed by the local commune instead of SONEDE (The National Water Utility). They were afraid that under SONEDE management, the price of water will be unaffordable to community members. After multiple other consultations, a final meeting was held on 8th January 2022, where all parties, including representatives of youth and women, agreed to the project and expressed their full support for its implementation.

During the implementation of the project, these consultations will continue through meetings and workshops with the stakeholders. A publicized telephone number will be maintained throughout the construction of all projects to serve as a point of contact for enquiries, concerns and complaints. All enquiries, concerns and complaints will be recorded on a register and the appropriate manager will be informed.

This ESMP will be disclosed to local authorities and project stakeholders in preliminary and final form. Periodic progress reports will be shared with communities, outlining progress in implementing the ESMP and issues that the consultation process or grievance mechanism has identified as of concern. Sharing of reports will be done every four months.

As part of the project implementation, the public must be well informed about the different steps of the project implementation (construction activities), as well as the mechanism, rules and procedures for handling complaints and avenues of redress. This information must be disseminated to all actors and at all levels to enable all stakeholders to be familiar with it.

A project-level stakeholder engagement plan has been developed and operational. Through this plan, consultations with the various stakeholders were conducted to share information on the progress of the work and discuss the concerns of the various stakeholders. This plan will be updated to incorporate other potential stakeholders for project implementation and will also include a description of effective processes for receiving and responding to stakeholder concerns and grievances regarding the social and environmental performance of the project.

7 ANALYSIS OF ALTERNATIVES

The analysis of possible alternatives capable of achieving the objectives of the Project with less impact on the environment and the Project was a key part of the project design. Several alternatives were considered in the pre-feasibility study phase. The retained alternatives were then studied in detail during the feasibility phase and a more accurate cost of the Project was determined.

The most relevant alternatives of the proposed Project are:

- The "No Project" alternative;
- Design alternatives
- Flow alternatives
- Alternatives for the distribution system (piping)
- Storage tanks alternatives

7.1. "NO PROJECT" ALTERNATIVE

The "No Project" alternative is the option not to run the proposed Project. This solution would imply that the proposed development is not carried out and that the situation remains as it is now. This would avoid any environmental, social, economic and cultural impact. Under current conditions, the population of the Project area is partially provided with drinking water through very old small networks. Assuming that the water supply systems would not be developed on the island of Anjouan, the site would remain in its current state, as no specific development is currently planned on the area. There would be no improvement of quality of life, no reduction of poverty, no improvement in access to safe and clean water, no improvement in the overall health of beneficiaries, etc. The direct benefits associated with the construction activities, such as increased employment opportunities and associated economic benefits, would also not occur if project did not materialize.

7.2. DESIGN ALTERNATIVES

After a technical diagnosis of the existing drinking water supply infrastructure, two alternatives were considered during the design phase: upgrading the existing water supply network or building and entirely new network. It was identified that upgrading the network would not cover the water needs of the community by the end of the year. With the existing network:

- the quantities of water that can be mobilized and the water needs estimated at the project horizon;
- some sections of the of the towns would not get adequate water supply;
- current infrastructures are poorly constructed;
- water storage structures are insufficient and dilapidated;
- distribution networks are non-compliant in terms of water quality
- network pipes are undersized.

The existing network could not improve sustainably the living conditions on the island.

So the choice went for the second alternative (building new water supply infrastructure). This new system will be designed taking into account the demographic evolution, the social and economic situation of each area of intervention, and the needs of the beneficiaries.

7.3. FLOW ALTERNATIVES

The geo-morphological conditions of Anjouan led the Project to choose Gravity flow water distribution systems over pumping systems. Gravity flow water distribution systems are reliable and cost effective over pumping systems as no external power is required to maintain the flow. This option uses less energy and is relatively easier to maintain.

7.4. ALTERNATIVES FOR THE DISTRIBUTION SYSTEM (PIPING)

High-density Polyethylene (HDPE) was chosen over PVC and cast-iron as the material for the distribution systems. PEHD is easy to install, the price is affordable, and it is resistance to soil chemistry. Moreover, the material is largely used in Comoros, therefore there is local knowledge when it comes to installation and repair.

7.5. STORAGE TANK ALTERNATIVES

The storage tank could have been either metallic or concrete. Based on the comparative analysis of the existing situation, it appears that metallic 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 salt and is not appreciated by many beneficiaries. Concrete tanks, on the other hand, require more time, materials, labor and money to install, but they are very strong, resilient and can last for a long time (several generations). Their maintenance is very easy and manageable by the population. Hence, this alternative was adopted for the project.

8 IDENTIFICATION AND ASSESSMENT OF THE ENVIRONMENTAL AND SOCIAL IMPACTS OF AREAS 7,8,9,10, 11,12 and 13

8.1. METHODOLOGY FOR IDENTIFYING AND ASSESSING IMPACTS

The identification of impacts was based on documentary analysis, mainly the ESMF developed in the project design phase and the analysis of data collected in the field by relating the project components (impact-generating activities), both in the pre- construction, execution and operation phases, to the components of the receiving environment (physical, natural and human environments). This comparison of project elements and environmental components (physical, social, natural) makes it possible to assess the probable impact and thus to have all possible mitigation measures allow the proper implementation of activities. To this end, an impact identification matrix was adopted, which is a summary of the impacts identified during the study (mainly the impacts identified in the ESMF) and field surveys that may affect the various components of the physical, natural and human environment. It lists all the probable impacts of each of the project activities on each environmental component (see Table 8). Subsequently, the determination of significance and assessment of impact risks was carried out in accordance with the methodology adopted in the project's ESMF (see Tables 5, 6 and 7 below).

As part of the ongoing water supply works (areas 7,9,10 and 12), a site ESMP covering the said areas has been prepared and is being revised. However, the resumption of works cannot be effective before the validation and disclosure of the site ESMP by the parties concerned (company, project and UNDP).

Table 5: Rating the 'Impact' of a Risk

Score	Rating	Social and environmental impacts
5	Extreme	Significant adverse impacts on human populations and/or environment. Adverse impacts of large-scale magnitude and/or spatial extent (e.g. large geographic area, large number of people, transboundary impacts, cumulative impacts) and duration (e.g. long-term, permanent and/or irreversible); areas adversely impacted include areas of high value and sensitivity (e.g. valuable ecosystems, critical habitats); adverse impacts to rights, lands, resources and territories of indigenous peoples; involve significant levels of displacement or resettlement; generates significant quantities of greenhouse gas emissions; impacts may give rise to significant social conflict.
4	Extensive	Adverse impacts on people and/or environment of considerable magnitude, spatial extent and duration, but more limited than Extreme (e.g. more predictable, mostly temporary, reversible). Impacts of projects that may affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples are to be considered at a minimum potentially Extensive
3	Intermediate	Impacts of medium magnitude, limited in scale (site-specific) and duration (temporary), can be avoided, managed and/or mitigated with relatively uncomplicated accepted measures.
2	Minor	Very minor impacts in terms of severity and magnitude (e.g. small affected area, very low number of people affected) and duration (short), may be easily avoided, managed, mitigated
1	Negligible	Negligible or no adverse impacts on communities, individuals, and/or environment

Table 6. Rating the 'Likelihood' of a Risk

Score	*Rating*
5	Expected
4	Very likely
3	Moderately likely
2	Low likelihood
1	Not likely

Table 7. Determination of 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 MAIN CAUSES OF NUISANCE

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-related activities (or sources of impact).

The implementation of the proposed developments could lead to certain negative impacts on the human and natural environment. For the most part, these impacts are usually temporary and controllable.

The main sources of impacts and the most significant impact receptors are summarized below:

8.2.1. Pre-work phase

- Reservation of land for the installation of the site (base camp, storage areas for equipment and materials...)
- Recruitment of site workers
- Request for authorizations
- Communication of the work schedule

8.2.2. Execution phase

- Development of storage areas for equipment and materials
- Installation of the life base
- Clearing, stripping, earthworks sites (new catchments, new reservoirs, pipelines)
- Transport and circulation of machinery and equipment
- Recruitment of site workers

- Vehicle maintenance
- Construction of catchments
- Construction of reservoirs
- Construction of water treatment stations
- Installation of HDPE pipelines for water supply
- Site restoration
- Site withdrawal

8.2.3. Operation phase

- Water resource development
- Access to catchments and reservoirs
- Water treatment and disinfection
- Upkeep and maintenance of infrastructures
- Individual connection to the various networks

NB: the infrastructures to be put in place are not of high capacity and are scattered in the different areas. Their impacts are therefore very limited in their installation sites.

None of the work to be carried out will require: the installation of temporary base camp, the opening of tracks and the storage of fuels, oils, chemicals or other dangerous liquids.
Water supply activities do not take place in protected areas or near protected areas.

8.3. IDENTIFICATION OF IMPACTS AND ACTIVITIES SOURCE OF IMPACTS DURING THE DIFFERENT PHASES

In this revision of the ESMP, impacts are determined based on the analysis of the ESMF and field surveys. This analysis made it possible to determine:
- The risks and impacts identified in the ESMF which are applicable to the establishment of DWS systems in Anjouan
- The risks and impacts identified in the ESMF which are not applicable to the establishment of DWS systems in Anjouan
- And to identify other risks and impacts that have not been identified in the ESMF and which complement the latter.

a) Risks and impacts identified in the ESMF which are linked to the establishment of DWS systems in Anjouan
- Pollution of the terrestrial environment
- Alteration of river water (sedimentation in surface water systems
- Risk of soil erosion
- Air pollution
- Production of solid / liquid / hydrocarbon waste
- Noise pollution
- Accident to personal site and the population
- Impact on women and children (gender risk)
- Risk of spillage and/or physical damage from liquid chlorine
- Non-inclusion of women in training
- Damage to infrastructure by floods, landslides, etc.
- Social risk
- Temporary disruption of the way of life of animals
- Introduction of invasive plant species

These impacts are linked to the activities of setting up DWS systems in the areas of Anjouan.

b) Risks and impacts identified in the ESMF, which are not related to the establishment of DWS systems in Anjouan

- Habitat loss,

The activities to be carried out in the 7 zones in Anjouan are not likely to cause an impact on the habitat.
The project operates in areas already converted for agriculture and social development.
In addition, the infrastructures are small and scattered in the different areas.

- Extraction and/or groundwater contamination

There is no underground water in Anjouan. The latter is characteristic of Ngazidja.

- Potential impacts on endangered 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 infrastructure installation sites by the project.
Particles solids and others contaminants in suspended in water systems of surface

- Changes land use

There will be no risk that will be linked to changes in land use.

As part of the project, all sites for the installation of infrastructure have been given by the various municipalities. Indeed, in the Comorian context, the land belongs either to private individuals (inheritance/purchase), or to the communes for the vast majority. In the latter case, the land is used for village or community development projects. It is within this framework that the municipalities have made available to the project all the sites for the installation of the planned infrastructures.
Use of these lands has not resulted in temporary or permanent economic displacement or restriction of access to resources.

- Excessive use of resources

The infrastructures to be put in place are small in size and do not require the excessive use of resources.

- Vibration due to works of construction

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 levels of dust in the receivers sensitive

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

c) Risks and impacts identified in the ESMP development process

- Risk of disease and increase in communicable diseases, including STIs and Covid-19
- Poor quality of drinking water
- Lack of upkeep and maintenance of the infrastructure
- Waste of water
- Increase in disease vectors
- Changing the landscape
- Siltation and destruction of crops
- Choice of equipment
- Disregard local labor
- Pollution of water catchments by agricultural activities

These impacts are identified on the analysis of field visits and data on the infrastructures to be put in place.

The impacts identified in the ESMF, which are applicable to the establishment of DWS systems in Anjouan, and those identified by the ESMP, constitute the exhaustive list of impacts that may occur during the establishment of DWS systems in Anjouan.

Table 8 below highlights the activities that generate impacts and the impacts that are linked to each activity during the different phases of the project.

It is on the basis of the impacts presented in Table 8 that the sections on impact analysis, impact assessment and application of management measures will be discussed, as well as the implementation of monitoring and impact monitoring during the different phases

Table N°8: Highlighting the impacts and the activities that are sources of the impacts during the different phases of the project

X : *Indicates the presence of impact*

Type

: *Likely negative impact*

	Negative socio-environmental impacts																								
	Temporary traffic disruption	Choice of equipment	Temporary disruption of animal lifestyle	Pollution of the terrestrial environment	Alteration of river water	Impacts on flow	Risk of soil erosion	Air pollution	Production of solid / liquid / hydrocarbon waste	Noise pollution	Accident on site staff and the population	Risk of disease and increase in communicable diseases including STIs and Covid-19	Impact on women and children	Failure to consider the local workforce	Poor quality of drinking water	Risk of spillage and/or physical damage from liquid chlorine	Damage to infrastructure through 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 destruction of crops	Pollution of water catchments by agricultural activities	Social risk	Risk of introduction of invasive species
Pre-construction phase																									
Application for authorizations																									
Reservation of sites by the company for the installation of construction sites and base camp																									
Communication of the work schedule																									
Recruitment of site personnel																									
Storage of materials and hydrocarbons																									
Site clearing and terracing																									

X : *Indicates the presence of impact*

Type

: *Likely negative impact*

	Negative socio-environmental impacts																								
	Temporary traffic disruption	Choice of equipment	Temporary disruption of animal lifestyle	Pollution of the terrestrial environment	Alteration of river water	Impacts on flow	Risk of soil erosion	Air pollution	Production of solid / liquid / hydrocarbon waste	Noise pollution	Accident on site staff and the population	Risk of disease and increase in communicable diseases including STIs and Covid-19	Impact on women and children	Failure to consider the local workforce	Poor quality of drinking water	Risk of spillage and/or physical damage from liquid chlorine	Damage to infrastructure through 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 destruction of crops	Pollution of water catchments by agricultural activities	Social risk	Risk of introduction of invasive species
Movement of vehicles	■			■			■	■	■	■	■		■												
Vehicle maintenance				■					■		■		■	■											
Site installation	■		■						■		■	■	■	■							■	■			
Construction of catchment			■		■				■		■	■	■	■							■	■			
Construction of reservoirs			■				■		■		■	■	■	■			■			■	■	■			
Construction of water treatment plants			■						■		■	■	■	■			■			■	■	■			
Installation of HDPE pipelines for water supply	■	■	■				■		■		■	■	■	■			■				■	■			

X : *Indicates the presence of impact*

Type

: *Likely negative impact*

	Negative socio-environmental impacts																								
	Temporary traffic disruption	Choice of equipment	Temporary disruption of animal lifestyle	Pollution of the terrestrial environment	Alteration of river water	Impacts on flow	Risk of soil erosion	Air pollution	Production of solid / liquid / hydrocarbon waste	Noise pollution	Accident on site staff and the population	Risk of disease and increase in communicable diseases including STIs and Covid-19	Impact on women and children	Failure to consider the local workforce	Poor quality of drinking water	Risk of spillage and/or physical damage from liquid chlorine	Damage to infrastructure through 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 destruction of crops	Pollution of water catchments by agricultural activities	Social risk	Risk of introduction of invasive species
Restoration of site																									
Worksite withdrawal																									
Operation of water supply infrastructure																									
Water treatment and disinfection																									
Infrastructure upkeep and maintenance																									
Individual connection to different networks																									

It is on the basis of the impacts presented in Table 9 below that the sections on the analysis of the impacts, their evaluation, the management measures and the monitoring and surveillance measures have been addressed.

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

Impact analysis is very important. It makes it possible to have an appreciation of the consequence of the impact in relation to the activity which will be undertaken on the various sites.

8.4.1. Risk and impact analysis

8.3.1.1. Negative impacts of the pre-construction, execution phases and operating

The implementation of the proposed developments could have certain negative impacts on the human and natural environment. For the most part, these impacts are temporary and controllable (they will be occasional and very localized in time and space). Tables 10 assess the risks and impacts and present the mitigation measures.

Here is a summary of the main risks identified for the pre-construction and construction phases.

- **Noise**
  The activities related to the construction of the installations and the operations necessary for the works are likely to be a source of noise pollution (movement of machinery, soil preparation operations, etc.), which will only be occasional and very localized in the time and in space.
  The risks of noise pollution are mainly encountered during construction work. On the reservoir sites and along the watershed supply routes, these impacts will be very low, or even non-existent, in particular due to the dispersed nature and the very low density of the habitat. This impact will be felt mainly in cities during the laying of distribution pipes.
  Among the main sources of noise pollution, we can note on such a construction site:
    - Layout of site facilities
    - The use of substandard construction equipment
    - Use of concrete mixers
    - The machinery emergency horn.

  Whatever the project site, measures must be taken to limit the nuisance caused by machine noise.
- **Atmospheric pollution**
  The execution of the works may occasionally generate temporary dust or gas emissions during the construction and operation phase. Air pollution by dust will generally come from automobile traffic on the construction site.
  The second atmospheric pollution will come from the exhaust gases of cars and generators (use of generators for pumping water).
  Due to the dispersion of the infrastructures and their small size, these emissions will be temporary and will not change the overall level of current air quality. However, in order to limit the nuisance caused by dust and exhaust gases, measures will be taken to manage this impact.
- **Impacts on surface waters**

In general, the risk of surface water pollution will be linked to the construction work of the catchments (risk of depositing solid materials in the water) and the risk of anthropogenic pollution. The impacts related to these risks will not have significant effects that could alter the quality and quantity of surface water.

- **Vegetation**
  The main activities affecting vegetation are related to the installation of construction sites (clearing and clearing of rights-of-way. Most of the work consists of laying pipelines along tracks and roads,

which does not require much clearing. the sites (treatment stations, catchments and reservoirs) are not grouped together in one place, so their footprint is relatively small, not occupying a very large area.
Also, there is a risk of introducing invasive species

- **Soil impacts (erosion/ constituent material ground)**
The impact on the ground will come from the excavations for the foundation of the infrastructures (reservoirs, catchment, treatment stations, load breaks, laying of pipes, etc.). Given the size of these infrastructures and their dispersion, this impact will not have a significant effect on the ground.
The laying of the pipes will be carried out in such a way as to avoid laying in the direction of steep slopes as much as possible. The backfill placed on the pipe will be well compacted.
This impact is almost nil.

- **Impacts on the movement of goods and automobiles**
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:
    - Traffic disruptions and inconveniences
    - Risk of occupational accidents for workers and users of these routes/roads
    - Soil contamination from fuel and oil from machinery
    - Release of dust, which can be a nuisance to residents and passengers along the tracks.

Steps should therefore be taken to avoid damage and minimize any problems that may arise.

- **Social impacts**

The implementation of the proposed developments could have certain negative impacts on the human environment, in particular:

- Risk of spreading the Covid.19 pandemic due to the mixing of populations with employees of construction companies and sexually transmitted diseases.
- Dust generated by earthworks on construction sites can affect the health (respiratory diseases) of workers and the surrounding population, especially sensitive people (infants and the elderly).
- Disruption of traffic during the replacement and installation of pipes along the roads.
- Temporary interruption of water supply during replacement of water mains and rehabilitation /construction of watersheds and reservoirs.
- Risk of pollution of crop destruction fields in the area where the pipes are laid (silting and plant debris).

Taken together, these risks could lead to social conflict. Measures must be taken to avoid or minimize damage. In any event, all land acquisition procedures by companies for the installation of construction sites and all authorizations from the competent authorities must be completed before work can begin on the site.

- **Wildlife impacts**

The execution of works on the sites and the presence of human beings can cause the temporary disturbance of certain animals. However, in the process of developing the ESMP, which is being carried out in parallel with the development of the detailed preliminary design study, no fully or partially protected endemic species has been identified on the intervention sites in Anjouan. .

As ESMF Table 6 (Measures to Prevent and Mitigate Potential Impacts on Threatened Species) indicates, infrastructure is small and generally located in areas already impacted by development and agriculture.
For this, the ESMF recommended to assess the sites before the start of construction works in order to detect the presence of endangered species. In the process of carrying out the studies, this evaluation consisted in asking questions to the users of the sites (based on the lists of fully and partially protected endemic species, in Appendices 4 and 5) to determine the presence or not of these species. .

8.4.1. Negative impacts of the operational phase

The main sources of negative impacts during the operation phase of the project are as follows:

- **The increase in the volume of wastewater.**

Improving the conditions of access to water and its availability at all times could lead to an increase in wastewater discharges and their stagnation near homes and around network structures, thus promoting the creation of environments conducive to the development of vectors of parasitic or infectious diseases (malaria, etc.);

- The risk of contamination of water resources and destruction of structures due to the absence of a protective perimeter upstream of the watersheds 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 the repair of infrastructure, lack of maintenance of reservoirs and other network components.

8.4.2. **NB** : After the bibliographical analysis and the realization of the mission on the ground, no sensitive zone was identified in the sites of intervention of the project on the level of the island of Anjouan.
To this end, this parameter will not be taken into account in the impact assessment.

8.5.MEASURES FOR MANAGING NEGATIVE IMPACTS

8.5.1. MEASURES SPECIFIC TO THE STUDY PHASE AND THE PREPARATION OF BDs

At the end of November 2021, an official ceremony was organized for the launch of the drinking water supply works resilient to climate change. The expected works consist of the laying of 60 km of network, the construction of 19 storage reservoirs and 11 water treatment units which will reach 110,773 inhabitants or 14% of the population of the island of Anjouan, spread over 7 zones covering 14 localities administered by 4 communes.
In order to ensure compliance with the PGSE, environmental and social clauses are included in the tender documents and form an integral part of the contracts with the companies carrying out the works. These clauses will ensure compliance with environmental and social safeguard measures by the contractors throughout the execution of the works.

Note: The contractors' specifications and the contract awarded must include all the specific provisions and obligations to be implemented in terms of the environment. Failure to comply with any of these environmental requirements will constitute a serious violation for which a fine must be imposed on the company.
In addition, other measures must also be considered in the final design of the proposed drinking water supply system. These are measures that have already been taken into account by the technical study of the project. Indeed, during the different phases of the study, different alternatives were studied with a view to minimizing the constraints and choosing the alternative best suited to 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 more waterproof and resistant to breakage and cracking.
- All the works (suction cup, drain, sectioning, etc.) will be protected in reinforced concrete chambers equipped with tamper-proof closing systems, which allows the protection of these works and the elimination of the illicit use of these works at d other purposes.
- The tanks will be covered to prevent the intrusion of various contaminants into the water.

8.5.2. SPECIFIC MEASURES FOR THE PRE-CONSTRUCTION PHASE

Before the start of the work, the company that will be responsible for carrying out the various tasks of the project is required to undertake the following actions:

8.5.2.1. Appointment of a QHSE manager

Within his team (previously approved by the project manager), the contractor must present a Quality, Health, Safety and Environment (QHSE) manager who will be responsible for the implementation of the ESMP throughout the contract. execution of the work contract.

8.5.2.2. Identification and selection of a suitable site and an installation plan by the companies

To comply with UNDP ESS (including Biodiversity and MNR Standard 1, Displacement and Resettlement Standard 5) and linked national laws, the Contractor must obtain the necessary agreements/permits for this temporary occupation of the premises. lands. Specifically, the Contractor must ensure that the full and prior agreement of the affected communities is obtained in cases where restrictions of access to certain areas, for any period of time, are caused by the implementation of the project, and that such restrictions do not result in temporary or permanent economic displacement of communities. Before installing the site:

- this plan must be approved by the project manager and UNDP;
- When the site is in the domain of the State, the company must have a legal document (temporary occupation permit) issued by the competent authorities;
- When the site is located on private land, the company must draw up a legal document with the owner(s), defining the rights and obligations of each party.

In any case, the legal document to be presented by the company regarding the temporary land occupation agreement must define precisely:

- The area and limits of the land required for the installation of the site;
- Dates and duration of occupation;
- The state, occupation and current use of the land (agricultural activities, existing buildings, presence of trees, structures, etc.);
- Obligations and conditions for the restoration of the premises (repair of damage, removal of waste, elimination of the consequences of the work, etc.)
- The compensation (in kind and/or in monetary terms) agreed between the company and the owners, as well as the terms and conditions of its application.

In addition, the site installation plan proposed by the contractor must take into account, as far as possible, the following installations and protective measures:

- Areas for storing or handling dangerous, toxic, flammable or polluting products must be designed in such a way as to ensure effective protection of the physical and biological environment;
- At the end of the work, the contractor must restore all used areas, including the removal of remaining materials, disposal of waste, leveling of sites, dismantling and evacuation of facilities.

-

8.5.2.3.Preparation of E&S management documents

- The project has developed a grievance mechanism (GRM) to receive and respond to concerns about its impact on community and external stakeholders.
- The contractor(s) responsible for the construction of a drinking water supply system covering one or more areas will be required to submit an environmental and social construction management plan (ESMP) before commencing construction activities. This ESMP will describe how construction activities will avoid, minimize and mitigate potential effects on the environment, communities and workers. The commitments made under the ESMP-Site (ESMP-C) will be aligned with this ESMP, the UNDP social and environmental standards and the relevant social and environmental requirements of the Union of the Comoros. As part of the ongoing water supply works (areas 7, 9, 10 and 12), a site ESMP-C covering the said areas has been prepared and is under review. However, the resumption of works cannot be effective before the validation and disclosure of the ESMP-C by the parties concerned.

8.5.2.4.Preparing a traffic plan

In this plan, the company is required to define and prepare, according to the needs/requirements, a traffic diversion plan (cars, pedestrians, etc.) to ensure the fluidity of traffic, to minimize restrictions on the population's access to their properties and public services, and to mitigate the impacts of the works on the daily life of the population and economic activities. The diversion of traffic must be designed in such a way as to ensure the safety of users (signalling, lighting, safety barriers, protection of pedestrians).

This traffic plan must be approved by the competent authorities (municipalities, traffic police, etc.). The public must be informed in advance of this diversion (notice in the press, posting near the site) and their agreement must be obtained before the implementation of the traffic plan.

In addition, the company must carry out regular maintenance of the detours until the work is completed and normal traffic resumes.

8.5.2.5.Stakeholder information and awareness

Information should be provided to the public on the nature of the work to be carried out. The information relating to the works must specify the routes and places likely to be affected by the works as well as their duration. Details of the nuisances caused by the works and the behavior that users must adopt to avoid any risk of accident.

The company is also required to define working hours and inform the public of this timetable in advance in order to avoid possible disruptions to the movement of construction machinery and to avoid noise emissions outside the working hours.

8.5.2.6.Measures concerning staff recruitment

Local recruitment:

In order to stimulate local economic development, it is recommended to give priority to hiring local (unskilled) labour. The choice of local suppliers must also be favored. In the recruitment of staff, women should not be omitted as they can perform certain tasks.

Contribution of women and young people to the project in compliance with the law

Women must be involved in all stages of the organization, from the selection of priorities to implementation and subsequent maintenance. The following integration initiatives are recommended:

- Involve women in the selection of project implementation priorities.

- Motivation to hire women for maintenance work.

In addition, compliance with Comorian regulations on youth employment is essential. To this end, the Employer will not accept workers under the minimum age for youth employment (18 years) on its sites.

8.5.3. SPECIFIC MEASURES FOR THE EXECUTION PHASE

8.5.3.1.Specific measures for site installations

Physical environment

Here are some of the measures to be taken specifically at the site facilities:

- Measures to be implemented to preserve air quality
  In order to minimize impacts on air and climate, certain measures should be considered:
  - Routing routes for materials and structures on site should be as direct as possible
  - Construction equipment and trucks must be well maintained and up to current standards. They must be chosen in such a way as to reduce odors, fumes and dust as much as possible;
  - Dust reduction measures will be applied on unpaved roads crossing inhabited areas and on internal traffic routes : regular spraying of water or other non-hazardous dust-absorbing products on the roadway, and reduction of speeds in and around target areas.
  - The use of covered trucks will be preferred.
  - The regulations in force concerning the fight against atmospheric pollution and the standards relating to the evacuation of exhaust gases from vehicles will be respected.

- **Management measure for hazardous products (pollutants, toxic or flammable)**
  - The contractor will have to ensure the specific management of each category of products in accordance with the guidelines for the protection of the environment.
  - The contractor must establish a procedure for dealing with leaks or spills of pollutants before work begins.
  - Limit the use and storage of hazardous substances, in particular for the maintenance of construction vehicles and machinery and the products necessary for the work. No major storage will be done.
  - Hydrocarbons will be stored in appropriate drums equipped with containment areas with a volume of at least 1.5 of the stored volume.
  - In the event of pollution, the soiled area must be immediately covered with highly absorbent materials (sawdust). The area will then be stripped and evacuated to an appropriate landfill after agreement with the project manager on site.
  - The establishment of an intervention team capable of acting quickly in the event of fire or accidental spillage of hazardous materials.
  - The use of personal protective equipment specific to the nature of the products to be handled.
  - Communication of incidents and accidents to the nearest health and safety services.
  - Toxic and/or flammable products must be transported in specific vehicles, adapted to the nature of the product (tank). These products must be stored and protected from any source of heat, sufficiently far from all infrastructures and transport or storage equipment which may themselves contain flammable materials (gas and oil pipelines, petrol pumps, etc.).
  - Engine shutdown in unloading and loading areas, especially in hydrocarbon supply areas.
  - All vehicles circulating or parked on the site will comply with the standards in force and will be properly maintained.
  - The site must be equipped with fire extinguishers and absorbent products in case of spillage

or leakage of these products.
- Training of staff in the handling of toxic and flammable products, as well as the use of personal protective equipment (safety shoes, earplugs, helmets, safety glasses, gloves, as well as face masks with filters for certain substances, or flame-retardant clothing).

- **Measures to be taken for vehicle maintenance**
  - Maintenance (oil changes, repairs) of construction equipment and any vehicles related to site activities should be prohibited on site. Maintenance and cleaning operations should preferably be carried out at the nearest service stations ;
  - A preliminary overhaul of the machines at the beginning of the worksite activities is desirable, it will reduce the risk of technical failure and possible accident;
  - Heavy and light vehicles must be subject to regular technical inspection;

- **Measures to be taken for the management of site waste**

  Appropriate and rigorous management of the waste produced during the construction phase must be put in place. He will understand :
  - The development of a waste management plan for each of the sites concerned by the work, before the start of field operations
  - Strict application of the "reduce - reuse - recycle" principle in order to minimize the volume of waste to be disposed of in landfill sites (none or few such sites are currently available).
  - Preliminary identification of treatment channels for each type of waste
  - Implementation of waste sorting by type and according to pre-identified channels
  - Preferably, the following measures should be applied depending on the type of waste:
    - Inert waste (rubble produced by the factory, wood, metal): local reuse as backfill or construction material.
    - Household waste: reduction at source, raising awareness among workers on how to reduce waste on a daily basis, avoidance of single-use disposable products, composting of organic waste, reuse of glass and plastic containers whenever possible, recycling of cardboard waste, compaction of plastic waste,
    - Hazardous waste: collection and storage in containers suitable for their nature and in safe conditions, before being evacuated to a recycling facility (used oils) or the nearest transfer centre. In its absence, to an area previously identified in consultation with the local authorities and secured to avoid any risk of environmental pollution.
  - Collection in work areas as work progresses.
  - Landfill disposal should be considered the ultimate solution. Waste disposal sites should be identified prior to the start of operations, in consultation with local authorities.
  - Any abandonment, fire or uncontrolled burial (without prior authorization from the client and the environmental authorities) is strictly prohibited.
  - The contractor's C-ESMP will contain a waste management plan, which will include aspects related to the proper maintenance of their construction sites, warehouses and rest areas, as well as regular inspections.

- **Liquid waste management**

  Proper management of liquid discharges will prevent or reduce the risk of soil and groundwater pollution. The following measures should be applied :
  - Adequate sewage disposal system (black and domestic) for site personnel should be

provided.

- **Surface water pollution prevention measures**
  The following measures are recommended to reduce the impact on the water resource:
  - Locate the storage areas for polluting substances and other facilities likely to generate pollution outside the gully areas
  - Avoid any risk of overexploitation of water resources in the areas of intervention
  - Assessment of river flows as part of the design of project water supply systems.
  - Respect the measures provided for the protection of the soil against accidental and chronic pollution
- **Measures to be taken to protect natural flow conditions**
  - The location of equipment and material storage areas should avoid: gullies and areas marked by past runoff, areas located less than 50 m from the coast
  - The machines and other equipment mobilized will be secured in the event of a weather warning concerning heavy rain.
  - For all backfilling, cutting and access works, the rainwater drainage system must be installed as soon as possible in order to avoid stagnation of water on the site.

- **Soil and subsoil erosion prevention measures**
  In order to reduce the impact of construction activity on the subsoil and the ground, it will be necessary to:
  - Limit the right-of-way on construction sites to a strict minimum,
  - Use vehicles with low ground pressure,
  - The materials resulting from any excavation will be used as backfill as soon as their geotechnical characteristics allow it.
  - Excavated materials and backfill will be stabilized, drained and replanted as needed and to the extent possible. The soils will be stabilized immediately after the end of the environmental interventions.
  - In anticipation of the restoration of construction sites (areas for the supply of materials and equipment) and vegetation , before any earthworks and soil compaction, it is recommended to recover the topsoil (the first 20 centimeters of soil). It must then be stored at a depth of less than 2 m in a place protected from runoff.

- **Measures to reduce the destruction of vegetation**
  In order to reduce the impact on the natural environment, the project will focus on:
  - Locate the work base and all ancillary sites (material borrow areas) outside natural areas
  - Delimit the work areas and respect the delimited rights of way in order to avoid any intrusion outside the limits of the project site
  - Limit clearing operations to the strict minimum. The following clearing methods are prohibited:
    - Cleaning by chemical methods,
    - Clearing by fire, except for the burning of forest waste on the premises, and according to a method and schedule, previously approved by the project manager.
  - The contractor shall physically delineate the boundaries of each area to be cleared on the land in a manner approved by the employer.
  - Clearing operations will be carried out without damaging adjacent uncleared areas: topsoil

is stored in the cleared area and at the edge of the cleared area; trees are felled towards the interior of the zone.
    - Sites will be cleaned from side to side, or center out, to avoid the risk of animal entrapment.
    - The project will avoid the introduction of invasive alien species (weeds) by using local machinery and equipment as much as possible.

- **Measures to reduce nuisance to wildlife**
    - Limit noise and dust emissions
    - Avoid night work

Human environment

- Recruitment of workers: The project (or relevant contractors) will recruit entirely unskilled labor from the communities where the intervention is carried out. Semi-skilled and skilled labor will be recruited, whenever possible, from the communities where the intervention is carried out.
- The project will also develop labor management procedures to appropriately address labor issues. The project will ensure that all workers employed by the project and/or a contractor are provided with appropriate contracts with the terms and conditions of employment clearly set out therein. This must comply with linked labor laws, rules and regulations.
- The project and/or contractors will allow workers to form a union (if linked) and establish and disclose an employee grievance mechanism.
- Measures to be applied to reduce the nuisance of the works
    - Before the start of the work, an information campaign should be carried out under the direction of the Administration to involve the local population in the work and also to warn of the dangers and risks involved.
    - The work schedule on site is organized to coincide with the activities of local residents (7:30 a.m. to 5:00 p.m.).
    - Speed limits will be observed.
    - Dust removal measures will be respected.
    - Access to properties and businesses will be maintained during the construction phase.
    - Alternate access will be provided if required.

- **Safety of people (workers and residents)**
  The organization of the site will comply with the regulations in force. Informing residents will limit the impact of the work on safety. In addition, in order to ensure the safety of personnel and residents on the site, various measures can be put in place:
    - Prohibition of the site to the public: Thus, the site will be protected by the installation of a fence, and the establishment of a public information system (signs of danger).
    - Information of the public and appropriate signage: Explanatory signs will inform the public about the work in progress: duration, surface, prohibited access, etc.
    - Installation of signage in work areas with clear information on the obligations to wear personal protective equipment and risk areas.
    - Traffic plan implemented during the construction phase: In order to limit the partial sealing of the site necessary for construction, truck turning areas will be preferred to the widening of access roads. The site may also be subject to a traffic plan indicating the turning zones, one-way and two-way lanes, and the speed of movement on the site.
    - Provision of personal protective equipment to each worker.
    - Project infrastructure could collapse or break during construction or after completion. Such

failures could cause safety issues for workers and communities and/or cause pollution that could threaten the integrity of the environment, ecosystem and ecosystem services. The project will also hire control engineers who will control the design and monitor the construction to ensure that the infrastructure is built according to specifications and that occupational health and safety problems are avoided.

- The project will specifically ensure that all excavation pits are appropriately barricaded during construction and will close them after construction, to ensure that these sites pose no risk to communities, wildlife or the environment. .

- **Road safety and traffic**

The risk of accidents on the routes taken will be reduced by organizational measures.

- Road signs in accordance with the regulations will be put in place to warn all users of the presence of the construction site. Work should be signaled (150 m away, then reminder every 50 m).
- If necessary, the flow of traffic will be managed by officers with red and green flags. They should be clearly visible, wearing a fluorescent bib. The construction sites would also be delimited by barriers or fluorescent or luminous tapes.
- When crossing built-up areas, the maximum speed for trucks transporting materials is limited to 30 km/h.
- No storage or warehousing of materials or machinery will be authorized in the right-of-way of the existing road network

- **Disease prevention and epidemiological risks**

Preventive and curative measures must be taken by the company in charge of carrying out the work, namely:

- A medical surveillance plan for the workforce must be put in place by the company;
- An awareness and information program for site personnel must be implemented by the company, in particular on the means of protection against COVID-19, sexually transmitted diseases and AIDS and the hygiene rules to be observed during the period of execution of the works.

The training is also accompanied by other measures such as the free provision of personal protective equipment (disinfectant gel, mask, gloves, special clothing, etc.) for all workers on site.

- The contractor will implement the following additional measures:
  - Development of a work management procedure and a code of conduct to be applied by all project workers. Acts such as sexual harassment and gender-based violence should be expressly prohibited in the Code of Conduct.
  - Insertion of the code of conduct in worker contracts and clear explanation of the content
  - Educate workers on the prevention of sexual harassment and gender-based violence. In addition, the establishment of a complaints mechanism that is accessible to communities and allows anonymous complaints.
  - Awareness training on STDs, HIV/AIDS and Covid-19, to minimize the risk of infection for workers and communities.

The company will be required to comply with the procedures indicated in the HSE plan in the context of COVID-19, which must be inserted in the DAO project.

- **Landscape integration of construction areas**

Specific measures must be applied to reduce temporary visual nuisance caused by the construction site:

- Cleanliness and structure of the site (orderly storage of materials and equipment),
- Cleaning the roads bordering the site in the event of dirt,
- Waste management (installation of closed skips),
- Appropriate use of parking areas,
- Restoration of intervention sites after removal from the site, using non-invasive local spaces.

- **Prevention of gender-based violence (GBV)**

  Gender-based violence will be addressed through the following preventive measures:
  - Development of a communication and education plan for the company's ongoing awareness of site personnel.
  - Implementation of awareness-raising activities on gender-based violence (type of behaviors concerned, sanctions foreseen) and importance of taking this into account in the project, including access to local health resources for treatment and support.
  - Development and signature by all site stakeholders of a code of conduct that includes a statement of zero tolerance for gender-based violence and all forms of mistreatment, abuse and exploitation of children. The code will also include the mention of other prohibited situations and behaviors such as : the prohibition of drug addiction, respect for the habits and customs of populations and human relations in general.
  - The code will define the following elements: definitions, rules, training standards for workers, content and modalities of implementation of the action plan against gender-based violence, as well as the consequences and sanctions in case of non-compliance with the rules set out .
  - Integrate gender concepts into the grievance mechanism with avenues for filing a complaint and informing workers and populations.
  - Provide separate toilets for women and men in all activity areas and post signs against GBV around the site.

  In the event of GBV incidents, the following management measures will be implemented:
  - Anonymous support for victims in the formulation, filing and throughout the processing of the complaint.
  - Creation, in collaboration with the local medical services, of a medical and psychological support unit for the victims
  - Apply the sanctions provided for in the code of conduct to those involved in acts of violence, namely summary dismissal with immediate effect (gross misconduct).
- Compensation

  The company will provide appropriate compensation where community assets are damaged by works outside the footprint areas agreed in the specifications.

8.5.3.2.Restoration of the site at the end of the works

The Contractor shall, under the supervision of the Project Manager, clean up and eliminate at its own expense any form of pollution caused by its activities, and compensate those who have suffered the effects of such impacts, in accordance with UNDP standards and procedures for safeguards. environmental and social, in particular: standard 1 on the conservation of biodiversity and the sustainable management of natural resources, standard 7 on the prevention of pollution and the rational use of resources.

8.5.4. MEASURES SPECIFIC TO THE OPERATIONAL PHASE

During operation, certain measures – including compliance with the UNDP SES – must be applied to achieve sustainable management of the infrastructure to be installed under the project. Law No. 20-036/UA of December 28, 2020 on the Water and Sanitation Code in the Union of the Comoros stipulates that all sources of water intended for human consumption must be protected from contamination. possible. Security perimeters (immediate, near and distant) will be set up.

These measures include:

- Need to respect catchment protection perimeters to avoid contamination of the water to be exploited: To this end, awareness-raising and negotiation missions with the owners of the land included in these perimeters with a view to avoiding and totally prohibiting any activity anthropogenic in these areas, to prohibit the dumping of waste...
- Information/sensitization of project beneficiaries on the need to pay for water consumption for the continuity of service and the sustainability of the infrastructure to be installed;
- Sensitization of the beneficiary population of the project to the proper use of water, in particular avoiding waste;
- Encourage beneficiaries to build septic tanks to avoid the discharge of domestic wastewater into nature in order to avoid water stagnation which favors the creation of environments conducive to the development of vectors of parasitic or infectious diseases (malaria, etc.). .)
- Anti-erosion and reforestation campaign in the catchment area upstream of the catchments in order to reduce the load of solid particles in suspension in the water;
- Public awareness of good environmental practices for the protection and conservation of watersheds
- 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 (watersheds, reservoirs, treatment plants, management structures, etc.) and continuous monitoring of the condition of the supply and distribution pipes to be installed (checking for leaks, ruptures, illegal connections, etc.).

8.5.5. Management measures established in the ESMF

In the process of identifying negative impact management measures, the measures to be put in place, identified by the ESMF that reflect the reality of the situation on the sites are well integrated into this ESMP.
These measures mainly concern measures to manage impacts on surface water, geology, erosion control, social, waste, noise and vibration and air quality.
These measures are included in Table 10 below.

Table N°9: Management measures identified in the ESMF

Component	Impact	Management measures
SURFACE WATER	Alteration of river water	Regularly monitor surface water quality
ECOLOGY	Land clearance	- Limit clearing activities and reduce habitat disturbance through adequate protection and management of vegetation - Restore the vegetation of the areas disturbed by using species native and local endemics that have a strong for habitat.
EROSION CONTROL	Soil erosion	- Plan/organize the work in such a way as to limit the areas to be cleared and soils exposed at all times. - Plan/organize the planned works in such a way as to ensure that major vegetation disturbances and earthworks are carried out during periods of low rainfall and low wind speed. - Remove and store topsoil to be used when restoration of the vegetation and/or putting back the earth removed on the farming lands - Plan/organize the work in such a way as to reduce the duration of storage of topsoil materials - Design stormwater management measures to reduce flow velocities and avoid water concentration runoff. - Avoid importing fill that could lead to contamination of the site and are not accompanied by certification/documentation. - When backfill is not available on site, they must be tested
SOCIAL MANAGEMENT	Risk of spillage and/or physical harm associated with liquid chlorine	- Carry out a community consultation on the purpose and benefits of changing land use - Ensure compliance with the dispute resolution mechanism process grievances - Women should be trained in maintenance local water management systems, covering in particular the

Component	Impact	Management measures
		monitoring of small hydraulic works and water supply systems water treatment, to indicate when they need to be repaired and prevent inefficiencies in the use of the resource (leakage through example) (ensuring that some of the trainers be of sex feminine). - Design, standardize and implement in each target area socially sensitive water tariffs that promote water management water taking into account the climate.
WASTE MANAGEMENT	Production of waste (solid, liquid and hydrocarbon waste),	- Preferably use materials that reduce waste - Waste disposal must be done in accordance with the requirements of competent authorities. - Fuel and lubricant leaks from vehicles and installations must be repaired immediately. - Major maintenance and repair work should be performed off-site whenever possible.
NOISE AND VIBRATION	Increase in noise level	Reduce the need to resort to emissions and limit them as far as possible if construction work generating noise must be performed outside s hours working hours: 7 a.m. - 5:30 p.m. - Consultation with residents before the activities of construction, particularly if those that generate noise need to be carried out outside the "hours of the day", namely: 7 a.m. - 5:30 p.m. - The contractor shall provide training to employees and operators in order to raise their awareness of the need to reduce the excessive noise
AIR QUALITY	Increased emissions from vehicles/machines Generation of dust	- Limit speeds on roads and driveways - Ensure that vehicles/machines are stopped when they are not used. - Ensure that all vehicles, installations and machinery construction are maintained

Table 10 below present all the impacts identified (ESMF/ESMP), their assessment and the management measures throughout the different phases of the project.

This ESMP focuses solely on the establishment of drinking water supply systems in 7 areas in Anjouan (from activity 3.2. construction of water intakes on rivers, construction of reservoirs, installation of disinfection and water filtration systems, installation of pipe networks, improvement of groundwater extraction systems, and installation of meters (Component 3 of the Project).

Table 10: Impact assessment table, before and after management measures

Unmitigated Impacts	Assessment before impact mitigation			Prevention and mitigation measures	Assessment after mitigation		
	P	C	A		P	C	A
Pre-construction phase							
No consideration of local labor	3	3	Modarate	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 suppliers local will have to hearth too privileged	1	2	Low
				Encourage women to integrate maintenance work.			
Construction phase							
Temporary traffic disruption	1	3	Modarate	Alternating traffic may be introduced when the work requires the use of heavy-duty machinery and during periods of heavy transport by transport trucks (for entry and exit of site machinery).	1	2	Low
				A site traffic plan will be drawn up, in particular for the movement of machinery at the edge of the work area.			
				Road signs in accordance with the regulations will be put in place to warn all users of the presence of the construction site. Work should be signaled (150 m away, then reminder every 50 m).			
				If necessary, the flow of traffic will be managed by officers with red and green flags. They should be clearly visible, wearing a fluorescent bib. The construction sites would also be delimited by barriers or fluorescent or luminous tapes.			
				No storage or warehousing of materials or machinery will be authorized in the right-of-way of the existing road network			
				When crossing built-up areas, the maximum speed for trucks transporting materials is limited to 30 km/h.			
Choice of equipment	2	1	Modarete	All equipment must be checked by the control office, and submitted for validation by the project coordinator. The company must respect the technical specification of the equipment appearing in the tender document (DAO)	1	1	Low
Temporary disruption of animal lifestyle	1	2	Low	In the work areas, wildlife and livestock could be disturbed by human presence	1	1	Low
				Limit noise and dust emissions			
				Avoid night work			

Unmitigated Impacts	Assessment before impact mitigation			Prevention and mitigation measures	Assessment after mitigation		
	P	C	A		P	C	A
Pollution of the terrestrial environment	2	1	Low	In the event of soil pollution by hydrocarbons, the soiled area must 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 the site.	1	1	Low
River water alteration	1	3	Low	Regularly monitor surface water quality Assessment of river flows as part of the design of project water supply systems.	1	1	Low
Soil erosion risk	2	1	Low	Limit site footprints to a strict minimum and do not clear slope areas Plan/organize the work in such a way as to limit the areas to be cleared and soils exposed at all times. Plan/organize the work envisaged in such a way as to ensure that major vegetation disturbances and earthworks are carried out during periods of low rainfall and low wind speed. Remove and store topsoil to be used when restoration of the vegetation and/or putting back the earth removed on the farming lands Plan/organize the work in such a way as to reduce the duration of storage of topsoil materials Design stormwater management measures to reduce flow velocities and avoid water concentration runoff. Avoid importing fill that could lead to contamination of the site and are not accompanied by certification/documentation. When backfill is not available on site, they must be tested Use construction vehicles with low ground pressure, Materials from any cuttings will be used as backfill materials as soon as their geotechnical characteristics allow it. The soils will be stabilized immediately after the end of the interventions on the environment.	1	1	Low
Air pollution	4	2	Low	Routes for transporting materials and structures to the site must take the most direct route possible Limit speeds on roads and driveways	2	1	Low

Unmitigated Impacts	Assessment before impact mitigation			Prevention and mitigation measures	Assessment after mitigation		
	P	C	A		P	C	A
				Ensure that vehicles/machines are stationary when not are not used.			
				Ensure that all vehicles, installations and machinery construction are maintained			
				Construction machines and trucks must be well maintained and comply with the standards in force. They must be chosen in such a way as to reduce odors, fumes and dust as much as possible.			
				Measures to reduce the dust raised by the passage of vehicles or machinery will be applied on unpaved tracks crossing inhabited areas and on internal traffic lanes.			
				The use of covered trucks will be favored for supplying the sites.			
				The regulations in force with regard to the fight against atmospheric pollution and the standards for the discharge of exhaust gases from operating machinery will be respected.			
Production of solid / liquid / hydrocarbon waste	4	2	Low	The preparation of a waste management plan for each of the sites concerned by the work, before the start of field operations	3	1	Low
				Strict application of the "reduce - reuse - recycle" instruction in order to minimize the volumes of waste to be disposed of in landfill			
				Hazardous waste: collection and storage in containers adapted to their nature and under safe conditions, before being evacuated to a buyer (used oils)			
				Disposal by landfill should be considered as the ultimate solution. The waste disposal sites must be identified prior to the start of activities, in consultation with the local authorities.			
				Locate storage areas for polluting substances and other facilities likely to generate pollution outside the gully areas			
				Before work, check the condition of the machinery to be used			
				Ensure the maintenance of the machines and daily check of their condition			
				Fuel and lubricant leaks from vehicles and installations must be repaired immediately.			
				Hydrocarbon waste will be collected in sealed drums for disposal at appropriate sites.			
				Major maintenance and repair work should be performed off-site whenever possible.			

Unmitigated Impacts	Assessment before impact mitigation			Prevention and mitigation measures	Assessment after mitigation		
	P	C	A		P	C	A
				The machines should not be repaired on site			
				For all embankment, excavation and access road works, the runoff drainage system should be put in place as soon as possible to avoid stagnation of water on the site.			
				Waste disposal must be done in accordance with the requirements of competent authorities.			
				A gree _ a preference for materials which enable reduce waste			
				Raising public awareness to integrate an adequate evacuation system for domestic wastewater			
Noise pollution	2	1	Low	The work schedule on the site is organized so that it coincides with the activities of local residents (7 : 30 a.m. to 5 p.m.).	2	1	Low
				Consultation with local residents before the activities of construction, particularly if those that generate noise need to be carried out outside the "hours of the day", namely: 7 : 30 a.m. to 5 p.m.			
				The contractor shall provide training to employees and operators in order to raise their awareness of the need to reduce the excessive noise			
				The machines to be used on sites must be in very good condition to avoid the emission of noise.			
Accident on the site personnel and the population	3	3	Moderate	Before the start of the works, an information campaign under the supervision of the Administration should be carried out to involve the local population in the works and also to warn of the dangers and risks they entail.	3	2	Modarate
				Prohibition of the construction site to the public: Thus, the construction site will be the subject of a defense by the installation of a fence (palisades), and the establishment of a public information system (danger signs) .			
				Put up public information displays on the construction site in progress: duration, area, prohibited access, etc.			
				Installation of signage within construction areas with clear information on the obligations to wear personal protective equipment and risk areas.			
				Provision of personal protective equipment to each worker			
				Observe traffic measures.			

Unmitigated Impacts	Assessment before impact mitigation			Prevention and mitigation measures	Assessment after mitigation		
	P	C	A		P	C	A
Risk of diseases and increase in communicable diseases, in particular STIs and Covid-19	3	3	Moderate	Prioritize the recruitment of local labor to reduce the risk of disease proliferation	2	2	Low
				A medical surveillance plan for the workforce must be put in place by the company			
				An awareness and information program for site personnel must be implemented by the company, in particular, on the means of protection against COVID-19, sexually transmitted diseases and AIDS and the hygiene rules to be observed. during the period of execution of the works.			
				The company is required to provide free means of personal protection (disinfectant gel, mask, gloves, special clothing, etc.) for all site workers.			
				The company will be asked to respect the procedures indicated in the HSE plan under COVID-19 inserted in the project's DAO			
				The company must provide workers with hydroalcoholic gels and masks free of charge. Respect the barrier measures			
Impact on women and children	2	3	Moderate	Implementation of awareness-raising actions on gender-based violence (type of behavior concerned, penalties provided for) on construction sites	1	3	Low
				Adoption of a code of conduct on the sites and zero tolerance for Gender-Based Violence and all forms of ill-treatment, abuse and exploitation of children.			
				Strict ban on the employment of children			
				If incidents of gender-based violence occur, - Anonymous support for 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 culprit			
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 locals with regard to (unskilled) labour. The choice of suppliers local will have to hearth too privileged	2	2	Low
				Encourage women to integrate maintenance work.			
Damage to infrastructure by	1	3	Low	Avoid installing structures in risk areas (floods, earthquakes and landslides, etc.) and bury water pipes	1	1	Low

Unmitigated Impacts	Assessment before impact mitigation			Prevention and mitigation measures	Assessment after mitigation		
	P	C	A		P	C	A
flood, landslide, landslide...							
Production of liquid waste and increase in disease vectors	1	3	Low	Encourage beneficiaries to build septic tanks to avoid the discharge of domestic wastewater into nature to avoid water stagnation which promotes the creation of environments conducive to the development of vectors of parasitic or infectious diseases (malaria, etc.)	1	1	Low
Change of landscape	2	1	Low	Ensure the cleanliness and structure of the site (storage of materials and equipment in an orderly manner), Cleaning of roads bordering the construction site in the event of contamination, Waste management (installation of closed bins), Correct use of parking areas, Restoration of intervention sites after site setbacks, etc.	1	1	Low
Siltation and destruction of crops	2	3	Moderate	Locate the base of the works and any ancillary sites (borrowing areas for materials) outside natural areas, with a stake for biodiversity The Contractor physically demarcates on the ground, using a method approved by the Project Manager, the limits of each area to be cleared. Clearing operations will be carried out without damage to adjacent uncleared areas: the topsoil is stored in the cleared perimeter and at the edge of the clearing area, the trees are cut down 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 construction areas and respect the delimited rights-of-way in order to avoid any intrusion outside the limits of the project site	2	2	Low
Risk of introduction of invasive species	1	3	Low	Restore vegetation to disturbed areas using species native and local endemics that have a strong for habitat.	1	1	Low
Decreased vegetation cover	3	3	Moderate	Limit clearing to the area necessary for installation of infrastructure. As much as possible, avoid cutting large trees. Restore vegetation to areas disturbed by using species native and local endemics that have a strong for habitat.	2	1	Low

Unmitigated Impacts	Assessment before impact mitigation			Prevention and mitigation measures	Assessment after mitigation		
	P	C	A		P	C	A
				- Limit clearing activities and reduce habitat disturbance through adequate protection and management of vegetation			
Social risk	1	3	Low	It will be necessary to design, standardize and implement in each target area socially sensitive water tariffs that promote water management water taking into account the climate.	1	2	Low
				Women should receive maintenance training local water management systems, covering in particular the monitoring of small hydraulic works and water supply systems water treatment, to indicate when they need to be repaired and prevent inefficiencies in the use of the resource (leakage through example) (ensuring that some of the trainers be of sex feminine).			
				Before the start of the work, communicates the schedule for the execution of the work and the sites concerned			
				Conduct community consultation prior to undertaking activities			
				Ensure compliance with the Grievance Redress Mechanism process grievances, in particular ensuring that the public is aware of and has access to the MRG.			
				Restore worksite and base camp settlement sites using cash native and local endemics . Agree with the owners on the species to be put in place.			
				Update stakeholders on project status and any changes that occur during the implementation process			
Fire and Emergency management and prevention strategies implemented	3	3	Modarate	No open fires are permitted within the project area	2	2	Low
				Communication equipment and emergency protocols to be established prior to commencement of construction activities.			
				Train all staff in emergency preparedness and response (cover health and safety at the work site). Work in coordination with the national management office disaster.			
				Check and replenish First Aid Kits			
				Use of Personal Protection Equipment			
Operation phase							
Throughput impacts	1	2	Low	The supply of drinking water could lead to a consequent use of water resources. Sensitize the beneficiary populations on the rational use of water.	1	1	Low
				Install flow meters for resource monitoring.			

Unmitigated Impacts	Assessment before impact mitigation			Prevention and mitigation measures	Assessment after mitigation		
	P	C	A		P	C	A
				Reforestation of watersheds			
				The design of DWS systems must take into account the flow of rivers			
Air pollution	4	2	Low	Routes for transporting materials and structures to the site must take the most direct route possible	2	1	Low
				Construction machines and trucks must be well maintained and comply with the standards in force. They must be chosen in such a way as to reduce odors, smoke and dust as much as possible.			
				Measures to reduce the dust raised by the passage of vehicles or machinery will be applied on unpaved tracks crossing inhabited areas and on internal traffic lanes.			
				The use of covered trucks will be favored for supplying the sites.			
				The regulations in force with regard to the fight against atmospheric pollution and the standards for the discharge of exhaust gases from operating machinery will be respected.			
No consideration of local labor	3	3	Moderate	Prioritize the recruitment of local technicians for infrastructure maintenance.	2	2	Low
				Encourage women to integrate maintenance work.			
Poor quality of drinking water	1	3	Low	Fight against erosion and reforestation campaign of the watershed upstream of the catchments in order to reduce the load of suspended solids in the waters;	1	3	Low
				Ensure 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 structures in the network (catchment structures, reservoirs, treatment stations, management structures, etc.) and continuous monitoring of the condition of the supply and distribution pipes to be installed (check the absence of leaks , breakage, illicit connections, etc.).			
Risk of spillage and/or physical damage associated with liquid chlorine	1	3	Low	Provide technicians responsible for water treatment and potabilization with adequate equipment for their protection and equipped with tools to properly gauge chlorine	1	3	Low

Unmitigated Impacts	Assessment before impact mitigation			Prevention and mitigation measures	Assessment after mitigation		
	P	C	A		P	C	A
Non-inclusion of women in training	2	3	Moderate	Encourage women to integrate maintenance work and prioritize it in training sessions	1	2	Low
Failure in infrastructure maintenance	1	3	Low	Information/awareness of project beneficiaries of 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 good valorization of water by avoiding waste;	1	1	Low
Production of liquid waste and increase in disease vectors	3	3	Modarate	Encourage beneficiaries to build septic tanks to avoid the discharge of domestic wastewater into nature to avoid water stagnation which promotes the creation of environments conducive to the development of vectors of parasitic or infectious diseases (malaria, etc.)	1	1	Low
Pollution of catchments by agricultural activities	1	3	Low	Conduct missions to raise awareness of site users and negotiate with the owners of the land included in these perimeters with a view to avoiding and completely prohibiting all anthropogenic activities in these areas, prohibiting the dumping of waste, etc.	1	2	Low
Impacts of climate change, in particular variations in rainfall	3	3	Modarate	Reforest watersheds, particularly upstream of catchments to allow watercourses to recharge.	3	2	Modarate

Reference:

C= Consequence

P = Probability

A = Magnitude

8.6. Positive impacts of the project

The environmental assessment of a project on the environment should not be limited to the description of the negative impacts. It must also highlight the positive impacts. This will make it possible to better judge and evaluate the project from an environmental point of view and to show in particular that failure to carry out the project itself could pose problems for the natural and human environment. The main positive impacts of the project are presented below.

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

During the execution 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 companies responsible for the work, or through opportunities for income- generating activities (snack bar, small business). For the worksite, the companies should favor the recruitment of local labor, especially unskilled labor.

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

- Satisfaction of the vital needs and improvement of the quality of life of the beneficiary population and reduction of diseases through access to purified drinking water in sufficient quantity;
- Access to drinking water and the reduction in the use of water storage tanks and direct water withdrawals from rivers and springs will lead to a reduction in water- borne diseases (diarrhea, malaria, etc.)
- Reduction of water collection for women and girls, allowing them to have time to engage in income-generating activities for women and to go to school for girls...

In particular, the replacement of the existing distribution network (with frequent water breaks and leaks) with a new HDPE pipe network will certainly have purely positive impacts throughout the operation phase of the project, including:

- Avoiding water loss and leakage
- To ensure continuity of water supply to the beneficiary population
- Minimize water service interruptions...

On the other hand, 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.

8.6.1. MEASURES TO ENHANCE THE POSITIVE IMPACTS OF THE PROJECT

The bonus program will consist mainly of:

- Recruitment of unskilled labor for the needs of the site in the project areas
- Informing and sensitizing the beneficiary population of the need to pay the fees in order to maintain the network in good condition and to ensure permanent water quality;
- Periodic analysis of the quality of the distributed water ;
- Accompanying the drinking water supply project with a sanitation component to guarantee hygiene and quality of life;
- Involve women in water management and/or public awareness activities...
- The Project will continue ensuring local people are provided with regular feedback on how their input is taken into consideration and to address any additional concerns that may be identified as the project moves forward. This engagement process will include disclosure of information in appropriate format that is

understandable and relevant to local women and men and consultation in a culturally appropriate manner.

The measures to enhance positive impacts are presented in Table 11.

Impact Receiver	Impact	bonus measure	Calendar	Monitoring indicators	Monitoring Manager	Cost in USD
Social	Job creation	Promote local labor, especially unskilled labor	All phases	NB of local worker on the sites	DGEF	-
		- Continuous monitoring of the quality of the water collected by means of periodic physico-chemical and bacteriological analyzes	Operation phase (monthly)	Number of scans performed	DGEME	55 USD Per catch and per month
		- Continuous monitoring of water quality downstream of treatment plants by means of periodic physico-chemical and bacteriological analyzes				55 USD Per catch and per month
	Reduced hardship and time for water collection for women and girls	- Involve women in water management and/or public awareness activities	Operation phase	Number of women attending sensitization meetings Number of women on the management committee	DGEF and project	N / A

Impact Receiver	Impact	bonus measure	Calendar	Monitoring indicators	Monitoring Manager	Cost in USD
	Reduction of waterborne diseases in the region	- Supervision and monitoring of project beneficiaries for efficient management of distributed water while avoiding waste, water loss, discharge of waste water into the open air...	Operation phase	Number of people affected by water-related diseases	Committee	N / A
Infrastructure operation	Availability of water at all times	– Sensitization of the beneficiary population for the payment of invoices to allow the upkeep and maintenance of the infrastructures	Once and as needed during the operation phase	Number of missions carried out Number of days of water stoppage Awareness mission report	Integrated Water Resources Management (IWRM) Committees Operator	Integrated in awareness-raising missions by the IWRM committee (see table 20)

9. MONITORING AND SURVEILLANCE PROGRAM FOR PROJECT ACTIVITIES AND IMPACT MANAGEMENT MEASURES DURING THE DIFFERENT PHASES

The purpose of the monitoring and follow-up program is to ensure that enhancement and mitigation measures will be implemented, that they will produce the expected results, or that they will be abandoned or modified if they do not produce successful results. It also assesses compliance with national environmental and social policies and standards.

This program will be implemented during the execution of the different actions of the project (construction phase) and will also continue during the exploitation phase.

Les mesures de suivi/surveillance à observer tout au long des différentes phases du projet portent essentiellement sur :

- control and supervision of the work,
- monitoring and follow-up during the operational phase,
- and inspection.

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

Throughout the construction phase, the contractor will be responsible for implementing the project's ESMP.

For greater efficiency, it is suggested that the DGEF recruit a Control Office to which the permanent monitoring of the works will be assigned. This office, on the basis of its contractual obligations, will have to have a person in charge with an environmental and social sensitivity and who could also have another attribution in the control. This person will be responsible for:

- The daily control of the level of compliance of the Contractor with the regulatory and legal provisions relating to environmental protection, simultaneously with its mission of technical control of the works
- Monitoring the effective implementation of the various natural and social environmental protection measures specified in this study (ESMP).
- The implementation of a management plan for solid and water waste (collection, removal) generated by the works and by the living base. The contractor must specify in this plan the receiving environment for each type of waste and ensure that the plan is approved by the project manager before work begins.
- Reclamation monitoring for each intervention site;
- Informing local authorities, NGOs, communities and the population of the work schedule and the nature of the project and ensuring that the necessary authorizations are obtained for the start of the work and that the required contractual documents are produced on time.

In addition, it must ensure that the results of the environmental follow-up program are acceptable and that the mitigation measures are effective.

During the works, the environmental and social manager of the control office must record in writing (compliance or non-compliance sheets) the orders for environmental services, their progress and their execution according to the standards. A monthly report on the monitoring of the site will be drawn up by the control office and sent to the DGEF in which the results of the environmental monitoring of the works will also be integrated.

The Ministry of Agriculture, Fisheries, Environment, Land Management and Urban Development (MAPEATU), through the DGEF, supervises the mission of the control office, particularly with regards to monitoring the procedures and regulations in force.

The DGEF will evaluate the environmental and social performance of the company in charge of the execution of the works and to guarantee the conformity with the ESMP of the project and this through the verification of the results of the daily inspections of the control office which must be consigned in a register available at the level of the building site at any time, of the monthly reports of the follow-up of the building site to be elaborated by the control office and the results of the environmental and social audit to be carried out at the end of the works of each zone of the project.

The contractor will maintain and retain all administrative and environmental records, which would include a record of complaints, as well as records of all actions taken to mitigate the cause of the complaints.

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

The monitoring/surveillance measures for the negative impacts identified by the ESMF, to be respected during the different phases of the project as well as the performance criteria are listed in Table 12 below. These measures mainly concern monitoring/surveillance of impacts on surface water, geology, erosion control, social, waste, noise and vibration and air quality.

Table No. 12: Monitoring measures identified in the ESMF to be observed during the different phases

Component	Impact	Performance criteria	Follow-up measures
SURFACE WATER	Alteration of river water	No significant decrease in water quality as a result of construction activities and operating Water quality shall be in accordance with the conditions of approval stipulated by the UNDP, the DGEF and/or other public administrations, or in the absence of such conditions, the method "without aggravation" will be continued	Regularly monitor surface water quality
ECOLOGY	land clearance	- No clearing beyond established limits; - No introduction of new weed species as a result of construction activities	- Restore the vegetation of the areas disturbed by using species native and local endemics that have a strong for habitat.
EROSION CONTROL	Soil erosion	- No accumulation of sediments in aquatic environments and/or waters as a result of construction and operation activities	- Plan/organize the work in such a way as to limit the areas to be cleared and soils exposed at all times. - Plan/organize the planned works in such a way as to ensure that major vegetation disturbances and earthworks are carried out during periods of low rainfall and low wind speed.
SOCIAL MANAGEMENT	Risk of spillage and/or physical harm associated with liquid chlorine	- Avoid negative impacts on the local community during construction works and operations and, where possible, reduce, restore or offset these impacts; - The health and safety of communities is protected and the project has a positive impact general well-being; - Complaint and grievance mechanisms are in place and proactively managed - Consultation with stakeholders will continue. It will help ensure that the stakeholders continue to be informed of the project, its evolution and	- Ensure compliance with the dispute resolution mechanism process grievances - Women should be trained in maintenance local water management systems, covering in particular the monitoring of small hydraulic works and water supply systems water treatment, to indicate when they need to be repaired and prevent inefficiencies in the use of the resource (leakage through example) (ensuring that some of the trainers be of sex feminine). - Design, standardize and implement in each target area socially sensitive water tariffs that promote

Component	Impact	Performance criteria	Follow-up measures
		any changes that is brought there. This will also help identify any problems.	water management water taking into account the climate.
WASTE MANAGEMENT	Production of waste (solid, liquid and hydrocarbon waste),	- Application of the waste hierarchy (avoid, reduce, reuse, recycle); - No garbage dumped in or around the project area as a result of the activities of project staff. site ; - No complaint received concerning the production and management of waste; - W aste oils will be collected and sent for recycling	- Preferably use materials that reduce waste - Fuel and lubricant leaks from vehicles and installations must be repaired immediately. - Major maintenance and repair work should be performed off-site whenever possible.
NOISE AND VIBRATION	Increase in noise level	- Noise from construction and operation activities must not cause a nuisance environmental in a location sensitive to noise; - Take measures at all times that contribute to reducing the noise associated with the activities of construction ; - No damage to properties off site caused by vibrations from activities construction and operation;	- Consultation with local residents before the activities of construction, particularly if those that generate noise need to be carried out outside the "hours of the day", namely: 7 a.m. - 5:30 p.m. - The contractor shall provide training to employees and operators in order to raise their awareness of the need to reduce the excessive noise
AIR QUALITY	Increased emissions from vehicles/machines Generation of dust	- Emissions of dust/particles must not harm the environment; - Take measures at all times that help reduce the associated air quality impacts construction and operating activities	- Ensure that all vehicles, installations and machinery construction are maintained
Emergency Management Measures	Fire and Emergency management and prevention strategies implemented	No incident of fire outbreak; No failure of water retaining structures; No major chemical or fuel spills; No preventable industrial or work related accidents;	No open fires are permitted within the project area Communication equipment and emergency protocols to be established prior to commencement of construction activities. Train all staff in emergency preparedness and

Component	Impact	Performance criteria	Follow-up measures
		Provide an immediate and effective response to incidents that represent a risk to public health, safety or the environment; and Minimise environmental harm due to unforeseen incidents.	response (cover health and safety at the work site). Work in coordination with the national management office disaster. Check and replenish First Aid Kits Use of Personal Protection Equipment

Throughout the establishment of the drinking water supply systems (AEP) in the 7 zones in Anjouan, the environmental monitoring and surveillance measures, the monitoring indicators and the persons responsible for the monitoring and surveillance are presented in the table 16 below.

This table incorporates the measures indicated in Table 13 above.

Table No. 13: Works monitoring and supervision measures during the different phases

Impact	Mitigation measure	Follow-up indicator	Frequency	Monitoring manager	Calendar
Pre-works phase					
Pollution of the terrestrial environment	The places for storing polluting substances must be waterproofed to avoid any pollution of the terrestrial environment.	Number of places for permeabilized storage	Once at the start of work	Control office (BC) General Directorate of Environment and Forests (DGEF) Project backup expert (ESP)	Pre-works phase and works phase
No consideration of local labor	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 suppliers local will have to hearth too privileged	Number (Nb) of local workers and technicians hired Number of women among site personnel	Quarterly	BC, DGEF, ESP	Pre-works phase
Temporary traffic disruption	A site traffic plan will be drawn up, in particular for the movement of machinery at the edge of the work area.	Number of traffic plans drawn up	1 time	BC, DGEF, ESP	Before site installation
	Road signs in accordance with the regulations will be put in place to warn all users of the presence of the construction site. Work should be signaled (150 m away, then reminder every 50 m).	Number of traffic signs put in place	1 time	BC, DGEF, ESP	Before site installation

Impact	Mitigation measure	Follow-up indicator	Frequency	Monitoring manager	Calendar
	No storage or warehousing of materials or machinery will be authorized in the right-of-way of the existing road network	Presentation of the situation of the environment	Weekly	BC, DGEF, ESP	Throughout the work
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 specification of the equipment appearing in the tender document (DAO)	Quality of equipment to be installed	Once	BC, project coordinator (CP)	At the start of the works
Disturbance/displacement of wildlife	Avoid night work	Work schedule	Daily	BC, DGEF, ESP	Throughout the work
	No significant decrease in water quality as a result of construction activities and operating	Water quality	Daily	BC, DGEF, ESP	Throughout the work
Surface water pollution	Regularly monitor surface water quality	Nb of water analysis carried out	Weekly	BC, DGEF, ESP	Throughout the work
Soil erosion risk	Limit site footprints to a strict minimum,	Respect of rights-of-way for works	Daily	BC, DGEF, ESP	Throughout the work
	Use construction vehicles with low ground pressure,	Quality of vehicles on site	Weekly	BC, DGEF, ESP	Throughout the work
	Plan/organize the work envisaged in such a way as to ensure that major vegetation disturbances and earthworks are carried out during periods of low rainfall and low wind speed	Site quality	Quarterly	BC, DGEF, ESP	During the construction phase
Production of solid / liquid / hydrocarbon waste	The preparation of a waste management plan for each of the sites concerned by the work, before the start of field operations	No. of waste management plans prepared	Quarterly	BC, DGEF, ESP	Throughout the work
	A gree _ a preference for materials which enable reduce waste	Quality of materials used	Weekly	BC, DGEF, ESP	Throughout the work
	Strict application of the "reduce - reuse - recycle" instruction in order to minimize the volumes of waste to be disposed of in landfill	Volume of waste to be evacuated	Weekly	BC, DGEF, ESP	Throughout the works
	Hazardous waste: collection and storage in containers adapted to their nature and under	Number of barrels filled	Semester	BC, DGEF, ESP	Throughout the work

Impact	Mitigation measure	Follow-up indicator	Frequency	Monitoring manager	Calendar
	safe conditions, before being evacuated to a buyer (used oils)				
	Major maintenance and repair work should be performed off-site whenever possible.	Soil quality	Weekly	BC, DGEF, ESP	Throughout the work
	Ensure the maintenance of the machines and daily check of their condition. Fuel and lubricant leaks from vehicles and installations must be repaired immediately.	State of machines on the sites	Daily	BC, DGEF, ESP	Throughout the work
Noise pollution	The work schedule on the site is organized so that it coincides with the activities of local residents (7 a.m. to 5 p.m.).	Work schedule	Daily	BC, DGEF, ESP	Throughout the works
	The contractor shall provide training to employees and operators in order to raise their awareness of the need to reduce the excessive noise	Number of training	Semester	BC, DGEF, ESP	During the works
Accident on the site personnel and the population	Before the start of the works, an information campaign under the supervision of the Administration should be carried out to involve the local population in the works and also to warn of the dangers and risks they entail.	Attendance list	Once	DGEF, project team	Before starting work
	Prohibition of the construction site to the public: Thus, the construction site will be the subject of a defense by the installation of a fence (palisades), and the establishment of a public information system (danger signs) .	Delimitation of the construction site	Monthly	BC, DGEF, ESP	Throughout the work
	Put up public information displays on the construction site in progress: duration, area, prohibited access, etc.	Nb of display	Monthly	BC, DGEF, ESP	Throughout the works
	Installation of signage within construction areas with clear information on the obligations to wear personal protective equipment and risk areas.	Number of traffic signs	One time	BC, DGEF, ESP	During site installation
	Provision of personal protective equipment to each worker	Number of staff equipped	Daily	BC, DGEF, ESP	Throughout the work

Impact	Mitigation measure	Follow-up indicator	Frequency	Monitoring manager	Calendar
Risk of diseases and increase in communicable diseases, in particular STIs and Covid-19	Prioritize the recruitment of local labor to reduce the risk of disease proliferation	Percentage of local staff on site	Quarterly	BC, DGEF, ESP	Throughout the work
	A medical surveillance plan for the workforce must be put in place by the company	A plan in place	Semester	BC, DGEF, ESP	Throughout the works
	An awareness and information program for site personnel must be adopted by the company, in particular on the means of protection against COVID-19, sexually transmitted diseases and AIDS and the hygiene rules to be observed during construction. period of execution of the work.	Number of sensitizations carried out	Quarterly	BC, DGEF, ESP	Throughout the work
	The company is required to provide free means of personal protection (disinfectant gel, mask, gloves, special clothing, etc.) for all site workers.	Number of gels and masks distributed	Quarterly	BC, DGEF, ESP	Throughout the work
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, DGEF, ESP	Throughout the work
	Adoption of a code of conduct on the sites and zero tolerance for Gender-Based Violence and all forms of ill-treatment, abuse and exploitation of children.	Number of GBV cases	Daily	BC, DGEF, ESP	Throughout the work
	Strict ban on the employment of children	Presence of children on site	Daily	BC, DGEF, ESP	Throughout the work
Damage to infrastructure by flood, landslide, landslide...	Avoid installing structures in risk areas (floods, earthquakes and landslides, etc.) and bury water pipes	Site identification criteria	Once	Technical project team (ETP)	Before the final validation of the feasibility studies
Change of landscape	Ensure the cleanliness and structure of the site (storage of materials and equipment in an orderly manner),	Presentation of site status	Daily	BC, DGEF, ESP	Throughout the work
	Cleaning of roads bordering the construction site in the event of contamination,				

Impact	Mitigation measure	Follow-up indicator	Frequency	Monitoring manager	Calendar
	Waste management (installation of closed bins),				
	Correct use of parking areas,				
	Restoration of intervention sites after site setbacks, etc.				
	Set up a complaints register on each site	Number of complaints registered	Daily	BC, DGEF, ESP	Throughout the work
Social risk	It will be necessary to design, standardize and implement in each target area socially sensitive water tariffs that promote water management water taking into account the climate.	Number of Study carried out	Once	AND P	During operation
	Before the start of the work, communicate the schedule for the execution of the work and the sites concerned	Number of meetings organized	Once	AND P	Before starting work
	Conduct community consultation prior to undertaking activities	Number of consultations carried out	Once	AND P	Before starting work
	Design , standardize and implement in each target area socially sensitive water tariffs that promote water management water taking into account the climate.		Once	General Directorate of Water, Mines and Energy (DGEME)	During operation
	Ensure compliance with the Grievance Redress Mechanism process grievances, in particular ensuring that the public is aware of and has access to the MRG.	Number of complaints recorded and resolved	Weekly	BC, DGEF, ESP	Throughout the work
	Restore worksite and base camp settlement sites using cash native and local endemics . Agree with the owners on the species to be put in place.	Agreement in principle of landowners and type of species for restoration	Once	BC, DGEF, ESP	Before the site withdrawal
	Update stakeholders on project status and any changes that occur during the implementation process	Number of meetings organized	Quarterly	AND P	Throughout the work
Operation phase					

Impact	Mitigation measure	Follow-up indicator	Frequency	Monitoring manager	Calendar
Throughput impacts	The supply of drinking water could lead to a consequent use of water resources. Sensitize the beneficiary populations on the rational use of water.	Establishment of integrated resource management committees (GIRE)	Once	UNDP, CP, DGEF	All along the project
	Ensure that all vehicles, installations and machinery construction are maintained	Quality of exhaust gas produced	Monthly		
	Minimize the use of generators. As much as possible, favor renewable energies	Type of energy used for water supply	Once	CP	During the operation phase
Poor quality of drinking water	Fight against erosion and reforestation campaign of the watershed upstream of the catchments in order to reduce the load of suspended solids in the waters;	Number of reforestation campaigns carried out	Annual	AND P	All along the project
	Ensure continuous monitoring of the quality of the water collected by means of periodic physico-chemical and bacteriological analyses;	Number of analyzes carried out	Monthly	Operator	Operation phase
	Carry out periodic maintenance of the various structures in the network (catchment structures, reservoirs, treatment stations, management structures, etc.) and continuous monitoring of the condition of the supply and distribution pipes to be installed (check the absence of leaks , breakage, illicit connections, etc.).	Number of checks carried out	Semester	Operator	
Risk of spillage and/or physical damage associated with liquid chlorine	Provide technicians responsible for water treatment and potabilization with adequate equipment for their protection and equipped with tools to properly gauge chlorine	Tap water quality Number of accidents that have occurred	Not planned	Operator	
Non-inclusion of women in training	Encourage women to integrate maintenance work and prioritize it in training sessions	% of women having benefited from the training Number of female technicians	Once	CP	During operation

Impact	Mitigation measure	Follow-up indicator	Frequency	Monitoring manager	Calendar
Failure in infrastructure maintenance	Information/awareness of project beneficiaries of the need to pay for water consumption for the continuity of service and the sustainability of the infrastructure to be installed	Pricing study Number of sensitizations carried out	Once and as needed	Operator, project	During operation
Waste of water	Design , standardize and implement in each target area socially sensitive water tariffs that promote water management climate aware water				
	Sensitization of the population benefiting from the project for the good valorization of water by avoiding waste;	Number of sensitization	Once and as needed	Operator, IWRM committee members	
Production of liquid waste and increase in disease vectors	Encourage beneficiaries to build septic tanks to avoid the discharge of domestic wastewater into nature to avoid water stagnation which promotes the creation of environments conducive to the development of vectors of parasitic or infectious diseases (malaria, etc.)	Number of sensitizations carried out	Semester	Project technical team	Operation phase
Pollution of catchments by agricultural activities	Conduct missions to raise awareness of site users and negotiate with the owners of the land included in these perimeters with a view to avoiding and completely prohibiting all anthropogenic activities in these areas, prohibiting the dumping of waste, etc.	Number of sensitizations carried out	Once and as needed	Project, operator, IWRM committee members	Operation phase

9.1. Site Inspections

During the various phases of the project, inspection will be carried out by the DGEF and UNDP. It will make it possible to assess compliance with the effective application of environmental mitigation measures. More specifically, it will determine, with reference to the regulations applied, whether these measures are adequate and effectively enable the environmental and social protection objectives set to be achieved. It can be triggered at any time by the person responsible for regulatory application or following the receipt of complaints from the population of the intervention area and/or motivated by control and monitoring reports.

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 regard 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.

9.2. Environmental and Social Audits

The audit is usually carried out on completed works in order to find out whether procedures and standards have been applied and complied with. The audit serves to identify and evaluate those elements of the investment (project) which, by their nature, may have an impact on the natural and human environment and which may contravene the rules set out in the national regulations. Once these elements have been assessed, the audit gives rise to generic or specific recommendations that must be implemented in order to restore the situation to normal. This document may be called a compliance plan.

The audit will be based on direct observations of the field as well as on the site monitoring reports and the reports made by the control office at the end of the works. For more efficiency and objectivity, it is recommended that this audit be carried out by an independent consultant who will be recruited by the project for this purpose.

The overall cost of the environmental audit component is estimated at 5000 USD per zone, i.e. 35000 USD for the 7 zones.

9.3. Environmental and Social Acceptance of the Work

This reception must make it possible to verify whether all the contractual commitments with regard to the environment have been respected, whether the intervention sites are free of residual or other materials and whether complaints, compensation, etc. have been handled in accordance with the requirements of the safeguard policies. This will allow the contractor to be given a release to withdraw the security deposit if necessary. The DGEF is responsible for this reception. It depends on the results of the Environmental Audit described above.

9.4. ENVIRONMENTAL AND SOCIAL COMPLIANCE REPORTING

The reporting requirement is as follow in Table 14.

Table 14: Reporting framework

Report prepared by	Submitted To	Frequency
Contractor, environment officer and Site Engineer	Project Manager, PMU	Monthly
Project Manager, PMU	Project Board	Semi-annually
Project Manager, PMU	UNDP CO	quarterly

In addition to regular reporting, the Contractor will be required to report any major incidents within 36 hours to the UNDP. These include incident or accident in relation to the project execution, regarding details of any incident of an environmental or social nature; and/or occupational health and safety nature; and/or public health and safety nature.

When a Significant Incident occurs, UNDP shall put in place a stop work order until an investigation is conducted and all remedial actions in place to ensure no further harm.

The Contractors shall minimize the impact that may result from the construction activities and implement the mitigation measures to prevent harm and nuisance to the local communities and environment. The remedial actions should also be effectively carried out during the construction phase.

9.4.1. Contractual Reporting

The Contractor should ensure minimum adverse impact to the environment and community and implement the mitigation measures and management plans as detailed in the ESMP.

The Contractor should abide by the following (but not limited to):

- Comply with relevant legislative provisions governing the social and environmental safeguards and SES including the impact on human health.
- Undertake the work within the scope of the contractual requirements and other conditions.
- Depute a qualified and competent representative(s) at the site and participate in joint site inspections undertaken by the PMU, UNDP CO and responsible parties.
- In case of any change to the ESMP, the PMU should review the changes immediately and consequently incorporate and update the ESMP for compliance.
- Comply with the recommendations of UN and Local Government Officials, issued during the monitoring visit.
- Undertake regular monitoring of environmental and social compliance.
- Maintain record of all instructions, incidents and actions taken.
- Furnish compliance report to the PMU and UNDP CO when exigencies arise.
- Record grievances and recommend corrective measures.

Noncompliance to the above would be dealt with seriously in keeping with the laws of the country and contractual terms and conditions.

9.4.2. Legal Reporting

The following measures will be implemented:

- All environmental licensing and permits are complied with as per the legislative requirements.
- Any instruction to the Contractors shall be in writing with deadline of compliance and consequences if deferred.
- The construction activities shall comply with environmental, OHS and social requirements.

10. CAPACITY DEVELOPMENT AND TRAINING

10.1. TRAINING FOR NETWORK MANAGERS AND OPERATORS

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

- technical officers of the DGEF who will be responsible for monitoring and following up the implementation of the various measures indicated in the ESMP under the present study, particularly for the execution phase of the project activities;
- members of the future management committee of the network who will take over the management of the water system to be installed.

A qualified environmental and social assessment consultant-trainer must be recruited by the project to conduct this training.

10.2. AWARENESS AND OUTREACH PROGRAM FOR PROJECT BENEFICIARIES

The awareness and outreach 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.

In this program, local associations and NGOs should be involved in the forefront. The main theme of this mission will be the drinking water supply sector and the natural and social environment. It will be carried out by an NGO with proven expertise in this field, supervised by the DGEF.

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.

10.3. TRAINING OF CONTRACTOR WORKERS

The Contractor has the responsibility for ensuring systems are in place so that relevant employees of contractors and sub-contractors are aware of the environmental and social requirements for construction, including the ESMP. All construction personnel will attend an induction that covers health, safety, environment and community requirements. All staff and contractors engaged in any activity with the potential to cause serious environmental harm (e.g. handling of hazardous materials) will receive task specific environmental training.

Table 15 presents the proposed objectives and costs of the training program.

Table 15: Objectives and costs of the training courses proposed in the framework of the project

N°	Title	Target audience	Educational objective	Duration	Timeline	Actor	Cost (USD)
Capacity Building Program							
1	Training on environmental and social monitoring	– DGEF technical officers in charge of environmental and social monitoring during the project implementation phase: two engineers and two technicians. – The members of the DWSS management committee to be installed: an average of 6 people per zone, i.e. a total of 54 people for the nine zones	- Environmental and social monitoring methodology - Environmental and social monitoring/evaluation indicators ; - Compliance and enforcement of environmental laws and regulations ; - Methodology and main lines of objectives for raising public awareness on environmental protection and management ; - Effectiveness of gender mainstreaming.	1 day/zone, 9days in total	Before starting the work	Private consultant to be recruited by the project	**15,000**
2	Recruitment of a qualified consultant-trainer in environmental and social assessment of water development projects			-	Before starting the work	DGEF	**10,000**
Subtotal 1							**25,000**
Awareness/Education Program							
1	Awareness/outreach	– Project beneficiaries – The members of the DWSS management committee to be installed: on average 6 people per zone, i.e. a total of 54 people for the 9 zones	- Maintenance and upkeep of the infrastructure to be installed, - Management and preservation of water resources, the adoption of hygiene and sanitation rules, - The accountability of the project beneficiaries for the respect of the infrastructures to be installed within the framework	1 day/zone, 9 days in total	During the entire project implementation period and must continue for at least the first year of project operation	Private consultant to be recruited by DGEF	**15,000**

N°	Title	Target audience	Educational objective	Duration	Timeline	Actor	Cost (USD)
			of the project and to avoid the illicit exploitation of water and the promotion of gender equality/equity				
2	Recruitment of a consultant-trainer or NGO specialized in the operation, management and maintenance of drinking water supply systems.			-	Before starting the work	DGEF	**10,000**
Subtotal 2							**25,000**
TOTAL GENERAL							**50,000**

11. GRIEVANCE REDRESS MECHANISM

11.1. ORIGINS OF COMPLAINTS AND RECOMMENDED MECHANISM

The implementation of the project for the creation of a water supply system for domestic and irrigation purposes in Anjouan is subject to several types of complaints and sources of conflicts that may arise during the implementation of the works for various reasons:

- Social impacts during the works: temporary occupation of private land, restriction of access to shops and housing, disruption of socio-economic activities, felling of trees, damage to property, accidents, etc.
- Environmental impacts during construction: dust, noise and odor pollution, vibrations, deterioration of the environment and landscape, accumulation of construction waste, risk of water and soil pollution, traffic diversion and traffic jams,
- Accidental discharges and pollution of water, soil, etc. breakage of pipes, power cuts leading to the discharge of waste water, bad smells,

Should such a situation arise, there must be a mechanism through which affected parties can resolve such issues in a cordial manner with the project personnel in an efficient, unbiased, transparent, timely and cost-effective manner.

The Project will develop a grievance redress mechanism (GRM) to receive and address concerns about its impact on external stakeholders. This gender-sensitive GRM, developed early during the project's implementation phase, will present a set of arrangements that encourages mutually acceptable resolution of issues as they arise. The GRM bears the following characteristics:

- be a legitimate process that allows for trust to be built between stakeholder groups and assures stakeholders that their concerns will be assessed in a fair and transparent manner;
- allow simple and streamlined access to the Complaints Register and Grievance Redress Mechanism for all stakeholders and provide adequate assistance for those that may have faced barriers in the past to be able to raise their concerns;
- provide clear and known procedures for each stage of the Grievance Redress Mechanism process, and provides clarity on the types of outcomes available to individuals and groups;
- ensure equitable treatment to all concerned and aggrieved individuals and groups through a consistent, formal approach that, is fair, informed and respectful to a complaint and/or concern;
- to provide a transparent approach, by keeping any aggrieved individual/group informed of the progress of their complaint, the information that was used when assessing their complaint and information about the mechanisms that will be used to address it; and
- enable continuous learning and improvements to the Grievance Redress Mechanism. Through continued assessment, the learnings may reduce potential complaints and grievances.

Eligibility criteria for the Grievance Redress Mechanism include:

- Perceived negative economic, social or environmental impact on an individual and/or group, or concern about the potential to cause an impact;
- clearly specified kind of impact that has occurred or has the potential to occur; and explanation of how the project caused or may cause such impact; and

individual and/or group filing of a complaint and/or grievance is impacted, or at risk of being impacted; or the individual and/or group filing a complaint and/or grievance demonstrates that it has authority from an individual and or group that have been or may potentially be impacted on to represent their interest.

More importantly, the Project must inform project stakeholders (including communities) of the existence of not only the project-level GRM, but also the UNDP Accountability Mechanism, including the Stakeholder Response Mechanism (SRM) and the Social and Environmental Compliance Unit (SECU), its purpose, and of the procedure they should follow to raise complaints with SRM and/or SECU if they are not satisfied with the GRM's response; but also the use of the Independent Recovery Mechanism (IRM) of the Green Climate Fund (GCF).

The project implementer shall also establish a complaint register to record concerns raised by the community during the implementation of project activities. Any complaint will be reported to UNDP and DGEF within 24 hours of receipt. The complaint will be reviewed. After the review, complaints regarding corrupt practices will be forwarded to UNDP for comments and/or advice as well as to DGEF.

All complaints regarding social and environmental aspects can be received orally (in the field by the company's environmental and social manager), by telephone, in a complaints box or in writing to UNDP, DGEF or the construction contractor. Any grievance related to corruption or any unethical practice should be referred immediately to the Office of Audit and Investigation within the UNDP in New York, by the country office.

All complainants should be treated with respect, courtesy and sensitivity. The project proponent and the construction contractor will make every effort to resolve the issues identified in the complaint. However, some issues may be more complex and may not be able to be resolved through the mechanisms established at the project level. These grievances will be brought to the attention of the Grievance Board. It would be the responsibility of the DGEF to resolve these issues through a rational/efficient process.

A summary list of the complaints received and the action taken should be published in a report produced every six months. It is suggested that this report be prepared by the environmental and social officer of the works control office, who will monitor the complaints recorded in the complaints register on a daily basis and the steps taken by the company to resolve each complaint.

11.2. IMPROVED MONITORING AND PROCESSING OF COMPLAINTS

First of all, the DGEF will improve the system for receiving and following up on claims and complaints in order to avoid a number of problems in advance and improve the acceptability of the project. It will continue the approach currently taken in the development of the various studies related to the project, which consists of always listening to the population of the project area and trying to resolve all differences amicably. In order to achieve this objective, the DGEF will exercise more control over the company during the execution of the work through a control office to be hired for this mission and will make more educational and relational efforts with people who may file complaints. Particular attention will be paid to claims and complaints from the elderly, the disabled, the destitute, the sick, etc.

11.3. LIMITING THE POTENTIAL CAUSES OF COMPLAINTS DURING CONSTRUCTION

The company that will be in charge of the execution of the project will periodically inform and sensitize its staff to the rules of good practice in order to limit the nuisances and disturbances likely to be generated during the works.

It will also be required to display a contact address in a legible manner throughout the performance period. This address must include: first and last name of the person to be contacted, a postal address, a telephone number and an e-mail address.

12. BUDGET FOR THE ESMP IMPLEMENTATION

The total budget for the ESMP of the project for the creation of water supply systems for domestic purposes in the island of Anjouan amounts to 145,000 USD. This budget falls within the framework of the implementation of the activities of the ESMF. This cost is broken down as shown in Table 16 below.

Table 16: Estimated costs of the ESMP to be borne by the project

Action ESMP	**Project funding (USD)**
Information/awareness raising/outreach program or the project's beneficiary population	60,000
Capacity building	50,000
Audit environmental	35,000
Total	145,000

In addition, the present study has identified other additional costs that will be charged to the DGEF throughout the period of operation of the installed DWSS. These are the costs necessary for the continuous monitoring and control of the quality of water supplied to the population. These costs amount to a total of 4,000 USD per month.

APPENDIX 1

Minutes and Attendance Lists of key stakeholder meetings

PROCÈS VERBAL DE RÉUNION PUBLIQUE

Région de : Mutsamudu
Commune de Bandrani Mtsangani

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

Réunion publique

- *Sujet* : sensibilisation de la communauté de la zone 11 sur le but et les objectifs du Projet, les activités prévues et celles que la communauté est bénéficiaire.
- *Date : 23 novembre 2019*
- *Villages concernés : Saandani et Chitrouni*
- *Lieu : Place publique de Saandani*
- *Début réunion : 10h*
- *Fin de la réunion 10h43mn*

1. Ordre du jour :

- Information de la population sur le but et objectifs du Projet, des zones d'intervention et des activités prévues à être mises en place au niveau de la zone 11

La réunion a été présidée par Anzilani Abdou Boina, responsable technique (RTI) d'Anjouan, sous le secrétariat de Mme Zalihat Bacar directrice régionale de l'environnement à Anjouan.
La mairie et les autorités villageois ont facilité l'organisation de la réunion

2. Participants

Ont pris part à cette réunion :

- L'équipe Projet représentée par le RTI et la directrice régionale de l'environnement
- Les autorités locales représentées par des représentants de la mairie et les chefs des villages
- La population des deux villages bénéficiaires.

Voir annexe 1 liste de présence

3. Compte rendu

- Résumé des interventions : 7 personnes dont 2 femmes et 5 hommes ont pris part aux discussions (Nassim Abdou, Djamal Ahmed, Michtadi Mouchta, Anziz Adinane, Bacar MadSidi, Hadidja Houmadi et Nassuria Chabane).

• Un représentant de la mairie a pris la parole pour souhaiter la concrétisation du projet et sa réussite dans les zones d'intervention. Il a relaté la situation qui sévit l'île par rapport au tarissement des rivières et les problèmes de distribution d'eau qui se fait ressentir pendant la période de sécheresse ;

• Un notable de Chitrouni a pris la parole pour faire l'historique sur le réseau en place. Pendant son intervention, il a fait savoir que les deux villages qui constituent la zones 11 vivent dans la précarité et qu'ils sont conscients que l'eau qu'ils utilisent n'est pas traitée car ils doivent la bouillir avant de la consommer, mais que malheureusement leur niveau de vie ne leur permette pas de payer un meilleur servir. Il n'a manqué de rassurer sa compréhension sur les nombreux avantages que le projet va fournir s'il arrive à se concrétiser, et de terminer son récit en embrassant le projet et en disant que sa seule réserve se situe sur le mode de gestion du réseau AEP qui sera mis en place.

• Deux femmes l'une de Saandani et l'autre de Chitrouni ont pris la parole pour montrer leur réserve sur le mode de gestion qui sera adopté.
Elles ont dit qu'elles préfèrent garder leurs réseau AEP actuel (vétuste et pas de traitement) car elles ont peur qu'après la construction des nouvelles infrastructures, le réseau AEP soit remis à la Société Nationale d'Exploitation et de Distribution de l'Eau (SONEDE), et que la population n'arrive pas à payer les factures. Cette situation pourrait porter préjudice aux femmes car elles pourraient les amener à revivre une époque où elles prenaient l'eau directement dans la rivière avec des sceaux (époque qu'elles jugent de calvaire).

• Sur les 7 intervenants, deux cadres se sont appuyés sur la présentation du projet pour d'une part sensibiliser l'assistance sur les retombés que le projet va leur rapporter. D'autre part, l'autre intervenant s'est appuyé sur la vétusté du réseau, le sous dimensionnement des réservoirs existants et la croissance rapide de la population, et a exhorté à l'assistance de ne pas passer à côté d'une telle opportunité au risque de le regretter après, car viendra un temps où le réseau actuel ne pourra pas supporter toute la population. Il a insisté aussi sur le fait que beaucoup de maladies de diarrhée sont causé par une eau non potable, d'où l'importance de faire traiter l'eau et d'assurer la maintenance des infrastructures. Cela a un cout qui devrait être supporté quelque part, que le réseau soit géré par la commune ou par la SONEDE.

• Après ces interventions, les opinions se sont divisées et les participants ont commencé à parler en même temps.
Le chef du village de Saandani a dû intervenir pour apaiser la situation et permettre la continuité de la réunion.

- La résolution

Le RTI du projet a rassuré les participants qu'une loi portant code de l'eau sera élaborée. Cette loi va définir et attribuer les rôles et responsabilités des acteurs du secteur de l'eau, que des comités GIRE seront mis en place pour faire le suivi des ressources et que ces derniers seront composés des communautés villageoises. Une étude socio-économique sera menée au niveau des zones du projet et sera un élément clé dans la détermination du prix tarifaire du m^3 d'eau dans chaque zone.

Annexe 1 :
- Fiche de présence des participants avec signatures et adresses

Anzilani Abdou Boina

RTI Anjouan

Réunion entre le Projet ER2C/GCF/PNUD
et les autorités Locales de Saandani et Chitrouni

Liste de Presence

Date : 23 Novembre 2019

N°	Noms et Prénoms	Villages	téléphone	Signatures
1	Youssouf Salim	Saandani	3423561	[illegible]
2	Dardai Abane	" "	3454211	[illegible]
3	Soumaila Said	" "	3332807	[illegible]
4	Bourhane Abdallah	Chitrouni	3314517	[illegible]
5	Ali Chaharane	" "	3229358	[illegible]
6	Ali Boina	" "		[illegible]
7	Chadhulati Ahmed	Saandani		[illegible]
8	Rohabati Boura	Chitrouni		[illegible]
9	Dhoienla Zoili	Saandani		[illegible]
10	Bourhane Athalithou	" "		[illegible]
11	Youssouf Boina	Chitrouni		[illegible]
12	Mohamed Abdiname	" "		[illegible]
13	Anzilani Abdou BOINA	RTI/ANjouan		[illegible]

MINISTERE DE L'INTERIEUR, DE LA DECENTRALISATION ET DE L'ADMINISTRATION TERRITORIALE
COMMUNE DE BANDRANI YA MTSANGANI
LE MAIRE

Mr LE MAIRE
YOUSSOUF SALIM

I) Liste de présence des villageois

N°	Noms et Prénoms	Villages	titres	Signatures
1)	Habib Soutfi	Saandani	Conseiller M	
2)	Nassim Abdou	" "	Conseiller M	
3)	Bacharati Anlim	" "	" "	
4)	Amiata Bourhali	" "	Notable	
5)	Soumaila Kouchrane	" "	Notable	
6)	M'madela Issa	" "	Notable	
7)	Anrize Adriane	" "	Notable	
8)	Soutfi Mari	" "	Notable	
9)	Hadjim Abdallah	" "	Notable	
10)	Djamal Ahmed	" "	Notable	
11)	Inzou Soutfi	" "	Notable	
12)	Moussa Djandi	" "	Notable	
13)	Chabadi Soutfi	" "	Cadre	
14)	Abdallah Alloui	" "	Notable	
15)	Mohamed Soutfi	" "	Cadre	
16)	Hassan Bère Abdi	" "	Notable	
17)	Fatima Abou	" "	Femme	
18)	Baadirou Houmadi	" "	Femme	
19)	Hadidja Moliadé	" "	Femme	
20)	Hadia Anli	Saandani	Femme	
21)	Hamida Chabane	Saandani	Femme	
22)	Majani Bima	Saandani	Femme	
23)	Chakunia Issa	Saandani	Femme	
24)	Halia Issa	Saandani	Femme	
25)	Anradhati Djandi	Saandani	Femme	
26)	Mariama Hamidane	Saandani	Femme	

LE MAIRE

II)

Nº	Noms et Prénoms	Villages	titres	Signatures
27)	Echati Ahmmadi	Chitrouni	Femme	[illegible]
28)	Fatima Moundi	Saandani	Femme	[illegible]
29)	Houran Ahmed	Chitrouni	Femme	[illegible]
30)	Djoumouenti Djamal	Saandani	Femme	[illegible]
31)	Fatima Djamal	Chitrouni	Femme	Fat
32)	Nadrati Mouhoussoune	Chitrouni	Femme	Nuf
33)	Yasmine Abdallah	Chitrouni	Femme	Fauf
34)	Roziline Allaoui	Chitrouni	Femme	Rouz
35)	Houdidja Hammadi	Chitrouni	Femme	Hamf
36)	Latuba Mouhammadi	Chitrouni	Femme	[illegible]
37)	Anrati Abane	Chitrouni	Femme	Lact
38)	Fatima Achirati	Chitrouni	Femme	Assiati
29)	Mari Dracar	Chitrouni	Femme	[illegible]
30)	Daima Abdou	Chitrouni	Femme	[illegible]
31)	Anzemati Abdou	Chitrouni	Femme	[illegible]
42)	Anrusati Abdallah	Saandani	Femme	[illegible]
43)	Hamnati Toumani	Saandani	Femme	[illegible]
44)	Zoubati Ahmed	Saandani	Femme	[illegible]
45)	Fouzia Ali Achriati	Saandani	Femme	[illegible]
46)	Dehima Mouhoussoun	Saandani	Femme	[illegible]
47)	Soikia Abdou	Saandani	Femme	[illegible]
48)	Zakdati Anthum	Saandani	Femme	[illegible]
49)	Antufia Djantar	Saandani	Femme	[illegible]
50)	Habidja Tolbane	Sandani	Femme	[illegible]
51)	Assibahati Saindou	Saandani	Femme	[illegible]
		Saandani	Femme	ASSI

MINISTERE DE L'INTERIEUR, DE LA DECENTRALISATION ET DE L'ADMINISTRATION TERRITORIALE
COMMUNE DE BANDRANI YA MTSANGANI
LE MAIRE

(III)

Nº	Noms et Prénoms	Village	titres	Signature
52)	Hassmania Anothum	Saandani	Femme	
53)	Echat Chaarhondi	Saandani	Femme	
54)	Michtadi Mouchta	Uhitrouni	Notable	
55)	Amandi Saindali	Saandani	Notable	
56)	Fumeine Astadhi	Saandani	Notable	
57)	Bacar Madsidi	Saandani	Notable	
58)	Saindou Mahana	Saandani	Notable	
59)	Madidé Mohadali	Saandani	Femme	
60)	Hadidja Hassani	Sadani	Femme	
61)	Himidati Saindali	Saandani	Femme	
62)	Hassaria Attoumane	Saandani	Femme	
63	Anzilani Abdou BOINA	RTI/ANJOUAN		

MINISTERE DE L'INTERIEUR, DE LA DECENTRALISATION ET DE L'ADMINISTRATION TERRITORIALE
COMMUNE DE BANDRANI YA MTSANGANI
LE MAIRE

Mr LE MAIRE
YOUSSOUF SALIM

Fait à Saandani, le 23-11-2019

PROCES VERBAL DE REUNION

Date : 27 juin 2020
Début : 09h15
Fin : 09h50
Lieu : Mairie de Bandrani
Participants : voir liste de présence en annexe 1

Objectif de la réunion : la réunion avait pour objectif d'introduire les représentants du bureau d'études HYDROPLANTE auprès des autorités locales de la mairie de Bandrani à Anjouan.

La réunion a commencé par un tour de table où l'ensemble des participants a pu se présenter. Le maire de la commune a saisi l'occasion pour souhaiter la bienvenue à l'équipe projet et au Bureau d'Etude. Il a réitéré ses remerciements à l'adresse du projet quant à l'intérêt porté sur les bénéficiaires que sont : les localités de Saandani et Chitrouni.

En outre, un rappel a été effectué quant à la réunion tenue quelques mois auparavant conduisant à une divergence d'opinions (réunion de consultation publique au cours de laquelle certaines personnes ont émis leurs réserves sur la gestion future du réseau à mettre en place, leur adhésion au projet étant loin d'être satisfaisant).

Cependant des explications de nature à rassurer le projet furent apportées, précisant au passage l'opposition systématique d'une certaine frange de jeunes issus des communautés et réfractaire à tout changement.

Le chef de village de Chitrouni, soutenu par le Maire, a encouragé la bonne marche du projet et s'est félicité de l'approche sociale tendant à associer l'ensemble de la communauté, cette initiative est à encourager et « va dans le bon sens ». Il a rappelé que lui-même avait une compréhension peu claire quant à la gestion future du réseau. Des échanges avec certains cadres du village lui ont permis de lever cette ambiguïté, depuis son engagement au projet est total.

Dans ce même sens, les interventions qui ont suivi ont convergé et les chefs des villages se sont engagés à s'entretenir avec cette jeunesse réfractaire à tout changement, la question de l'eau potable étant cruciale pour les 2 communautés.

Avant de mettre fin à ces échanges, le responsable technique insulaire a remercié les chefs des villages de l'engagement manifesté pour permettre le bon déroulement de l'étude et a sollicité l'appui et facilitation de la part des autorités.

La réunion s'est terminée par la récitation d'une prière d'usage, demandant au tout puissant de rendre effective la bonne marche du projet et l'atteinte des objectifs fixés.

ANZAILANI ABDOU BOINA

RTI/GCF/ ANJOUAN

Réunion de rencontre entre le Bureau d'etude et les autorités locales de Saandani et de Chitrouni
Projet GCF-ANJOUAN

Liste de Présence

Date : le 10 Juillet 2020

Nº	Noms et Prénoms	titres	Villages	téléphonnes	Signatures
1)	Younson & Salim	Maire	Saandani	3423561	
2)	Mouhoudi Abdallah	Adj. Maire	Chitrouni	3453499	
3)	Dardaï Abasse	Chef Village	Saandani	3454211	
4)	Inzidine Loutfi	Adj. Village	Saandani		
5)	Bourhane Abdallah	Chef Village	Chitrouni	3314517	
6)	Ahamadi Saanmi	Adj Village	Chitrouni		
7)	Soumaila Said	D.R OMICON	Saandani	3332807	
8)	Ali Chaharane	Cadre	Chitrouni	3229358	
9)	Ali Boina	Notable	Chitrouni	3287209	
10)	Chaathubati Ahmed	Cadre	Saandani	3393102	
11)	Bourhane Athalitha	Cadre	Saandani	3376259	
12)	Mohamed Adinane	Conseiller M.	Chitrouni		
13)	Habib Loutfi	Conseiller M.	Saandani	3343809	
14)	Banchroiti Anlim	Conseillère M.	Saandani	3360680	
15	Anzilani Abdou Boina	RTIGCF Anjouan	Sima	3329002	
16	Daniel [illegible]	Hydroplante Ing Hydque	Ouani	3347585	

COMMUNE DE SAANDRANI – LE MAIRE

Mr LE MAIRE

Procès-verbal de réunion de concertation entre la communauté chitrouni de la zone 11 à Anjouan et le projet « Assurer un approvisionnement en eau résilient aux changements climatiques aux Comores » (ER2C) -PNUD/GCF

Région de : Mutsamudu
Commune de Bandrani Mtsangani

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

- *Date : 08 janvier 2022*
- *Lieu : Place publique de Chitrouni*
- *Début réunion : 14h20mn*
- *Fin de la réunion 15h45mn*

1. **Ordre du jour :**

Concertation entre le village de Chitrouni de la zone 11à Anjouan, et le projet ER2C.

La réunion a été présidé par le maire de la commune, l'équipe technique insulaire à Anjouan a assuré le secrétariat.

2. **Participants**

La réunion a vu la participation des autorités locales (préfet de la région de Mutsamudu, un député et maire de la commune, chefs des villages de Chitrouni et Saandani), des cadres, des jeunes et notables de Chitrouni, et Saandani.

3. **Compte rendu**

✓ La Maire de la commune a commencé par un mot de bienvenu et une introduction du sujet qui a fait l'objet de la réunion.
Il a remercié le village de Chitrouni, de la démarche entreprise pour demander leur reconsidération en tant que bénéficiaire directe du projet ER2C. il a souligné au passage les efforts déployés aussi bien par le PNUD que le gouvernement comorien afin d'avoir un projet de tel envergure et d'une grande importance pour soutenir les Comores, un petit état insulaire en voie de développement à se rendre résilient face aux changements climatiques. Au passage de remercier le PNUD et les bailleurs qui ont voulu financer ce projet.

✓ Le responsable technique insulaire a pris la parole pour relater les faits qui ont lieu jusqu'à la présente réunion.
La présente réunion fait suite à deux réunions organisées auparavant par le Projet ER2C et une troisième réunion sollicitée une délégation de la communauté de Chitrouni:

- Une réunion de consultation publique qui a regroupé les communautés de Saandani et Chitrouni en novembre 2019 dans la place publique de Saandani dont l'objectif était d'annoncer le projet aux deux villages qui forment la zone 11 en tant que bénéficiaire, mais

aussi de présenter le but et objectifs du projet. Durant cette réunion, une poignée de jeunes s'est prononcés avec réserve sur leur adhésion au projet, et d'autres encore ont embrassé le projet.

- Une deuxième réunion a été organisée par le projet, ayant pour but, de présenter le bureau d'études qui a été recruté aux autorités locales et villageoises. Au cours de la réunion, aucune des parties présente n'a exprimé une objection quant à l'intervention du projet au niveau des deux villages. Au contraire, les chefs villageois ont regretté leur réserve sur l'adhésion et ont pris l'engagement d'aller raisonner leurs sujets et déblayer le terrain afin que les études puissent avoir lieu. Au final, c'est seulement à Saandani que l'étude a pu se réalisée car à Chitrouni l'accès aurait été interdit au consultant par les jeunes.
- Après que le projet a eu lancé officiellement les travaux dans les zones 7, 9, 10 et 12, une délégation composée de 7 personnes toutes originaires de Chitrouni est aller voir le responsable technique insulaire (RTI) pour parler et voir si c'était possible que le projet reconsidère le village de Chitrouni pour bénéficier des avantages du projet.

A cette occasion, le RTI avait suggéré d'organiser la présente réunion de concertation devant réunir les différentes couches de la population villageoise ainsi que les autorités locales pour certifier l'adhésion de la communauté de Chitrouni au projet et qu'au moment venu de lancer les travaux ces derniers soient réalisés dans un climat très favorable avec l'appui et la facilité de tout un chacun afin d'assurer le bon déroulement des travaux.

✓ Vient le tour du préfet de la région qui a pris la parole pour remercier les cadres de Chitrouni de n'avoir pas laisser passer une telle aubaine. Il a rappelé aux participants de revenir ne serait-ce que 10 ans en arrière pour faire une comparaison de la situation d'avant et celle qui se présente maintenant en termes de développement et d'augmentation de la population. Selon ses propos et son analyse, au vu du changement du mode de vie de la population comorienne en général, les infrastructures qui ont été dimensionnées il y a plus de trois décennies ne seront pas en mesure de supporter la population de Chitrouni pour un approvisionnement permanant et suffisant en eau d'ici 2030. Avec ce projet, vous avez l'opportunité de réhabiliter votre réseau et avoir des infrastructures à la hauteur de vos besoins d'ici deux décennies. De nombreux autres villages aimeraient en bénéficier et que malheureusement ils n'ont pas été ciblés.
A ces propos, il a exhorté toute la population, particulièrement les jeunes de beaucoup réfléchir et penser aux conséquences de leurs agissements qui peuvent couter cher au développement socio-économique de la commune et avoir des conséquences dans toute la région.

✓ Deux hommes en tant que cadre et notable du village se sont prononcés pour exprimer leur regret et prier que tout malentendu et derrière eux et que le projet reconsidère en tout état de cause leur demande de réintégration parmi les bénéficiaires directes du projet.

✓ Les femmes étaient représentées par l'intervention d'une jeune maman en tant que cadre et leader du village pour sensibiliser surtout les femmes, qu'elles sont les premières en lignes qui partent à la recherche de l'eau avec les sceaux et jerricanes sur leur tête et d'en rajouter que les projets ne sont pas conçus au hasard, qu'ils font l'objet de beaucoup d'études et d'analyse des besoins. Qu'elle espère que des leçons sont prises pour le future car en tant que pays pauvre, le développement socio-économique de leur village et comme dans beaucoup d'autres villages nécessite l'appui des différents bailleurs et des efforts de tout un chacun au niveau national.

✓ D'autres interventions ont suivi pour aller dans le sens de l'importance d'être réunis et soudés pour le développement des communautés.

✓ Le député de la région a pris la parole au nom de la communauté de Chitrouni pour confirmer l'adhésion et l'engagement de l'ensemble de la population villageoise de Chitrouni pour accompagner la mise en œuvre du projet. Ainsi, il a réitéré les remerciements envers le PNUD et le gouvernement d'avoir pu mobiliser un projet de cette grande envergure, et le GCF pour leur financement.

La réunion a pris fin sur un fatha pour prier Dieu de bénir le projet et qu'il arrive à bon point avec les résultats escomptés.

Préfet de Mutsamudu

Maire de la commune de Bandrani

Mr LE MAIRE
YOUSSOUF SALIM

Député de Bandrani

Abou Achirafi Ali

Chef de village de Chitrouni

Daoudai ABdou

Représentant de l'association féminine

Bouchrati Anlim

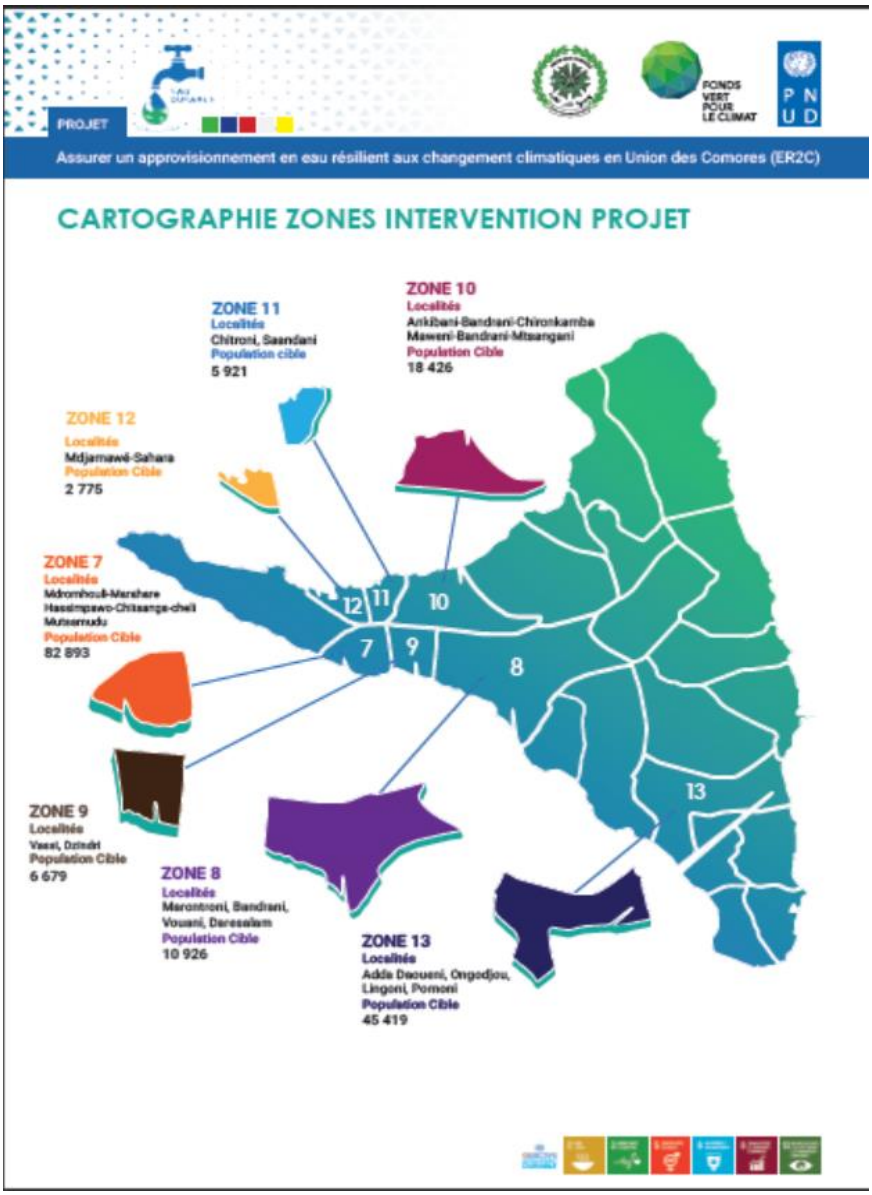
Représentant des jeunes

Loutfi Mouhamadi

Responsable technique insulaire projet ER2C-PNUD/GCF

Anzilani Abdou Bourhane

APPENDICE 2: Map of intervention areas in Anjouan



APPENDICE 3: Drinking water supply infrastructure in Anjouan by zone

Drinking water supply infrastructure in Anjouan by zone

Area	Localized	Works	GPS coordinates		
			X	Y	Z(m)
Area 7	Maraharé-Hassimpao-Schitsangashili	Capture	12°14'02.54"S	44°18'47.89"E	24
		Filtration			
		bleaching			
		R2 tank			
		R3 tank			
		Matrawe Catchment			
		Bouejou Catchment			

Drinking water supply infrastructure in Anjouan by zone

Area	Localized	Works	GPS coordinates		
			X	Y	Z(m)
		Filtration			
		R_Reservoir R4			
	Mutsamudu-Mouroumhouli	R_Sangani Reservoir	12°10'08.91"S	44°23'59.99"	122
		Tank			
		Charge Breeze			
		Tank loading			
		SF1 tank			
		SF2 tank			
		bleaching			
		Capture			
		SF3 tank			
		Moina Pareto catchment			
		Maboungani catchment			
		Filtration			
		R1 tank			
Area 8	Voiani-Bandra-Voiani	Habbaislam catchment	12°11'40.75"S	44°20'29.06"E	144
		Dagolajou catchment			
		Filtration Station 3			
		Marontroni Reservoir			
		Voiani Catchment			
		Charge Breaker 1			
		Breeze Charge 2			
		Filtration Station			
		Mlimajou Reservoir			
		R3 tank			
		R1 tank			
		Bandrani-Voiani Reservoir			
		Filtration station 1			
		Bandrani-Voiani Catchment			
Area 9	Dzindri	Ciresse catchment	12°12'50.42"S	44°27'08.67"	546
		Cpatage_Zikelen			
		Charge Breaker 1			
		Capture_Padzani			
		Breeze Charge 2			
		Load Breaker			
		Load Breaker			
		Load Breaker			
		Treatment place			
		Tank			
	Vassi	Capture	12°14'04.82"S	44°21'10.51"E	216
		Bache_Reprise			
		Treatment place			

Drinking water supply infrastructure in Anjouan by zone

Area	Localized	Works	GPS coordinates		
			X	Y	Z(m)
		Existing tank			
		Projected reservoir			
Area 10	chiron komba	Tank	12°11'39.21"S	44°21'05.11"E	201
		Central Reservoir			
		Bandrajou Reservoir			
		Load Breaker 2			
		Bandrani Reservoir			
		Moueni Reservoir			
		Treatment place			
		Ntsongohari Load Breaker			
		Charge Breaker 1			
		Capture			
		Hakoujou3			
	Ankibani	Hankomo	12°11'48.97"S	44°21'39.40"E	223
		Ziara Reservoir			
		Charge Breaker 1			
		Breeze Charge 2			
		Trondoni Catchment			
		Treatment place			
		Ankibani catchment			
		R3 Ankibani			
		R2 Ankibani			
Area 11	Saandani	Dzitsoni Catchment			
		Load Breaker			
		Break load			
		filtration station			
		Chlorination station			
		Reservoir/break load			
		Saadani Reservoir			
		Reservoir Bollard Fountain			
		Tank			
		Filtration Station 2			
		Mtsangani catchment			
Area 12	Mjamaoue-Sahara	Cafene catchment	12°11'47.84"S	44°18'47.84"E	43
		Load Breaker 1			
		Haitosi catchment			
		Load Breaker 2			
		Filtration basin			
		Chlorination station			
		Load break/tank			
		Mjamaoué Reservoir			
		Catchment of Mjamaoué			

Drinking water supply infrastructure in Anjouan by zone

Area	Localized	Works	GPS coordinates		
			X	Y	Z(m)
		Filtration basin			
		Chlorination station			
		Tank			
Area 13	Adda Doueni	CatchmentHapessi	12°17'45.35"S	44°29'41.47"E	744
		Filtration station 3			
		R4 Mpapani tank			
		TankR5 Hapessi			
		Hamcoco catchment			
		Filtration station			
		Chlorination station			
		R2 Hacouma Tank			
		R1 tank			
		R3 Hachimbwi tank			
		Filtration station 2			
		papahi capture			
	Ougoujou	Kangani Catchment	12°17'09.24"S	44°24'43.77"E	20
		Bache Reprise 2			
		Mremahoja catchment			
		Filter station 4			
		Chlorination station			
		R7 tank			
		R3 Trindini tank			
		R8 tank			
		R4 tank			
	Lingoni-Pomoni	Capture 1			
		Capture2			
		Lingoni Reservoir			
		Filtration station 5			
		Breeze Charge 3			
		Collection basin			
		Mavitrijou catchment			
		Breeze Charge 4			
		Charge Breaker 5			
		Breaker Charge 6			
		Load Breaker 7			
		Pomoni R12 tank			
		Pomoni R13 Tank			
		Irrigation catchment			
		Irrigation tank			

Appendice 4: List of fully protected species

Nom scientifique	Nom en français	Nom comorien
Mammifères	Roussette de Linvingstone	Ndéma
Pteropus livingstonii	Petite Roussette des Comores	Nguva
Roussettus obliviosus	Dugong	Kima
Dugong dugon	Lemur mongoz, Maki	
Lemur mongoz	Tous dauphins et toutes les	
Cetacea	baleines	
Oiseaux	Heron de Humblot	
Adrea humbloti	Faucon pèlerin	
Falco pregrinus	Buzard de Maillard	Panduzi, Ivanga, Bundibacangui
Circus maillardi	Drome ardéole	Mweya, Ngakanga, Lulu
Dromas ardeola	Pigeon des Comores	Ninga
Columba polleni	Pigeon vert des Comores	Chinding, Ndehu
Treron griveaudi	Founigo des Comores, Pigeon	Msopve
Alectoenas sganzini	bleu	Nakushiru, lulu
Otus capnodes	Petit-duc d'Anjouan	Perachwa
Otus moheliensis	Petit-duc de Mohéli	Narimudu, Kwasiru
Otus pauliani	Petit-duc du Karthala	Nyandronga, Nadonga
Hypsipetes parviriostris	Bulbul des Comores	Mbera-gog, Mbere
Turdis bewsheri	Grive des Comores	Ntuba, Shitsozi
Humblotia flavirostris	Gobe-mouches du Karthala	
Nesillas mariae	Fauvette de Mohéli	
Nesillas longicaudata	Fauvette d'Anjouan	
Nesilas brevicaudata	Fauvette de la Grande Comore	
Decrirus fuscipennis	Drogon de la Grande Comore	
Zosterops mourouniensis	Zostérops du Mont-Karthala	
Foudia eminentissima	Foudy des Comores	
Nectarina comorensis	Souimanga d'Anjouan	
Nectarina humbloti	Souimanga d'Humblot	
Cyanolanius comorensis	Artémie azurée des Comores	
Reptiles	Tortue verte	Nyamba
Chelonia mydas	Tortue imbriquée, tortue à	
Eretmochelys imbricata	écaille	
Dermochelys coriacea	Tortue luth	
Ohurus cuvieri	Iguane de la Grande Comore	
Poissons	Flambée de Levasseur	
Latimeria chalumnae		
Corail		Mtakamaka
Antipathes dichoioma		Mrikudi, Mremdu
		Mkafure, Mrobwa

Appendice 5: List of partially protected species

Nom scientifique	Nom en français	Nom comorien
Mammifères	Roussette de seychelles, des	
Pteropus seychellensis	Comores	
Microchiroptera :	Tous les microchiroptères	
Miniopterus mino		
Myotis goudoni		
Tadarila pumida		
Oiseaux	Inseparable a tête grise	Mpwayi, karrarrowki
Agapornis cana	Perroquet noi	Issui
Coracopsis nigra	Peroquet vesa	Kwendzou
Coracopsis vasa	Puffin d'Audubon	

Nom scientifique	Nom en français	Nom comorien
Puffinus therminieri Tachybaptus ruffucolis Accipitridae, faloconidae Tytonidae Aredeidae Laridés Charadriidae Scolopacidae Sulidae Phoenicopterridae	Grebe castageux Tous les rapaces diurnes et nocturnes sauf ceux en liste I Tous les herons et Aigrettes Tous les canards Tous les stenes, goélands Tous les becasseaux, chevalliers etc ….. Tous les fous Tous les flamants roses	
Reptiles Gekkonidae Chamaeleontidae scincidae	Tous les Geckos Tous les caméléons Tous les Mabuyas	
Poissons carcharhinidae	Pour les requins et raies : L'exportation des nageoires est interdite sauf autorisation	
Insectes Lepidoptera	Tous les papillons, sauf les espèces à la liste I	
Mollusques Tridacnidae Cassidae Cymatiidae Cupraeudae Muricidae Chiton comorensis Pinctada capensis	Les bénitiers Les casques Les conques ou tritons Les porcelaines Les Murex Huître perlière	
Echinodermes Holothuridae et Stichopodidae	Les Holothuries	Boo sera
Plantes Cyatheaceae Orchidaceae Tambourissa leptophylla Corissa comorensis Euclae sp	Les fougères arborescentes Les orchidées	Kowray