PROJECT: ROAD NETWORK REHABILITATION

COUNTRY: UNION OF THE COMOROS

SUMMARY OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

<table>
<thead>
<tr>
<th>Project Team</th>
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1 INTRODUCTION

This document is a summary of the Environmental and Social Management Plan (ESMP) of the Rehabilitation of Road Network RN2 and RN23 Project carried out in 2016. From an environmental and social perspective, the project is classified in Category 2 in accordance with African Development Bank (AfDB) requirements for environmental and social safeguards. This ESMP summary was prepared on the basis of the SEA in connection with two major road, RN2 and RN23, respectively in the Grande Comore and Anjouan islands, in accordance with environmental and social requirements in the Union of the Comoros and the AfDB’s Integrated Safeguards System. The project description and justification are first presented and the options compared in terms of feasibility. The environmental impacts have been summarized. Enhancement and negative impacts mitigation measures, as well as the monitoring programme have been presented. Public consultations held during ESIA have been presented as well as project-related complementary initiatives. The DGRTR requested a review of the ESIA and the conclusion points to the acceptability of the project for which the Environmental Authorization has been issued in the Union of the Comoros by the Directorate General for Environment and Forestry (DGEF) of the Ministry of Agriculture, Fisheries, Environment, Regional Planning and Urban Affairs (MAPEATU).

2. PROJECT DESCRIPTION, RATIONALE AND DESCRIPTION OF THE ENVIRONMENTS

2.1. Rationale

The RN2 on the Grande Comore and RN23 on Anjouan Island make it possible to connect major or high potential agricultural basins to high consumption, export and import zones. The project’s implementation will help eliminate one of the major constraints which is the poor state of roads which constitutes a major setback to the evacuation of agricultural produce from the Project Area (PA) and its supply with inputs for other basic necessities.

This project is in line with priorities outlined in the Comoros’ 2015-2019 Accelerated Growth and Sustainable Development Strategy (SCA2D), and ties in with the country’s transport sector policy that aims to “improve and modernize transport infrastructure in such a way as to provide better customer services at the least possible cost, and thus develop trade and tourism within the Union, and promote regional integration.” Besides, the project ties in with the sole Pillar “Development of basic energy and road infrastructure in support of economic diversification,” and to the Bank’s 2013-2022 Ten-Year Strategy, in particular, the “High 5s”.

The project’s overall objective is to enhance the mobility of goods and persons so as to cement the foundation for strong and sustainable growth, by promoting trade and supporting private sector development. The specific objective is to reinforce the sector’s governance and road transport infrastructure to ensure good quality, sustainable and safe transport services that are affordable to users.

The rehabilitation of these roads is in keeping with the continuity of the country’s National Road Transport Master Plan, especially with Pillar No. 1: “safeguarding and upgrading roads,” in regions where the population finds considerable difficulties in their movement and trade within the islands and with the country’s other islands, through ports, docks, and airports linking the islands.
2.2. **Project Description**

The project components are described as follows: **A. Road Works**: (1) rehabilitating 20 km of road on RN2 in Grande Comore and 23 km on RN23 in Anjouan; (2) protecting the coast from marine erosion; (3) developing parking areas along the road and reinforcing village crossings over 12km; (4) overseeing and supervising works; and (5) sensitizing the population on STDs and other pandemics as well as environmental protection and improving road safety in the project area. **B. Support Women’s Empowerment** in PA: (i) rehabilitating and equipping socio-economic infrastructure; and (ii) building capacity in the management of trade-related activities. **C. Institutional Support**: this component deals with capacity building and technical assistance. It will consist of activities aimed at planning and managing public works more effectively and transparently, reinforcing road safety, controlling axle load and providing the country with a regulatory framework that fosters the creation of road transport companies. **D. Project Management and Monitoring**: (1) support to the project implementing body; (2) communication/visibility; (3) monitoring-evaluation of the project’s socio-economic impact; (4) financial and accounting audit; and (5) budget evaluation. **E. Liberation of Project Right-of-Way**

The estimated total cost at this stage is UA 27.07 million or EUR 33.644 million.
2.3. Administrative Framework of The Comoros

The Comoran administrative body with supervisory authority over the environment is the Directorate-General of the Environment and Forests (DGEF), under the supervision of MAPEATU, which is responsible for periodic monitoring. It has three offices covering the islands concerned by the project that verify compliance with environmental requirements. It is the Department that issues authorizations for development works and user rights.

The Ministry of Transport is the Contracting Authority through the DGRTR and the Delegated Contracting Authority of the RN 2 / RN 23 Roads Rehabilitation Project which carries out these activities on behalf of the Vice-Presidency in charge of the Ministry of Finance, Economy, Budget, Investment and Foreign Trade. It includes a Transport Scheme Management and Monitoring Unit (PASDT) and will include an Environmental Implementation Unit for which capacity building is required.

2.4. Legislative and Regulatory Framework

In the Union of the Comoros, Law No. 94-018/AF of 22 June 1994 lays down the Framework Law on the Environment. Decree No. 01-052/CE of 19 April 2001 governs ESIA. Order No. 01-012/VP-MPEEEIA/CAB of March 2012 establishes and sets the terms of reference of the Evaluation Committee for Environmental Impact Studies (CEEIE). The DGRTR thus requested a review of the incidence of the proposed works on the environment and the assessment of the project’s socio-economic impact. These components are incorporated in the economic studies.

The Decree of 4 February 1911 organizes the land tenure system of (i) the Decree of 9 June 1931 reorganizing the land tenure system, amended by Decrees of: 20 July 1930, 09 June 1931, 15 August 1934 and 27 February 1946; (ii) the Decree of 6 January 1935 regulating expropriation for public utility; two Orders (a) 061-281 sets deliberation conditions and (b) 061-180 of 14 June 1961 organizes land tenure services; (v) Law No. 89-20 of 22 February 1989 relates to the exploitation of quarries; (vi) Law No. 94-037 of 21 December 1994 establishing the Water Code; (vii) Law No. 94-018/AF of 22 June 1994; (viii) Law No. 84-108 establishing the Labour Code and Law No. 11-001/AU of 26 March 2011 establishing the Public Health Code.

The other instruments concern: Law No. 95-007 on biodiversity; (ii) Order No. 01/031/MPE/CAB on the protection of animal and plant species and the 15 agreements and conventions ratified: Multilateral Environmental Agreements (MEAs), including the three United Nations Framework Conventions: (1) The Convention on Biological Diversity (CBD); (2) The United Nations Framework Convention on Climate Change (UNFCCC); and (3) the Framework Convention to Combat Desertification (CCD), followed by the NAP/CD National Action Plan in 2013.

The country also prepared and adopted (1) the National Self-Assessment Report on Environmental Management Capacity Building (ANCAR); (2) the Strategic Programming Framework (CSP) on Climate Change; (3) the Growth and Poverty Reduction Strategy Paper (GPRSP); and (4) the vulnerability study on climate change.

2.5. Description of Scope and Sensitivity Assessment of Areas Crossed

The direct Project Area (PA), which includes all sites on which road rehabilitation work will have negative or positive environmental impacts, is shared between: (A) Grande Comore; (i) the right-of-way of the RN2 road domain (Moroni-Foumbouni); (ii) quarries: Dzahadjou Mbadjini and Itsoudzou Mbadjini; (iii) deposits: Pozzolanic deposits (Dzahadjou Mbadjini, Malé, Chindrini, Mindradou, Singani, Chouani, and Mbachile); and (B) in Anjouan Island; (i)
the right-of-way of RN23 (Sima-Moya); (ii) quarries in Vouani and Pouzini; and (iii) pozzolanic deposits in Sima and Lingoni.

The RN2 is a coastal road that links Moroni to Foumbouni and crosses several major agglomerations. These administrative localities make up 3 of Grande Comore’s 8 prefectures. The section targeted on RN23 is located between Sima and Moya. These two islands make up 94% of the country’s population.

The total population was estimated at 755,680 inhabitants in 2014\(^1\) distributed as follows: Ngazidja: 52% of the total population, Ndzouani and Mali respectively 42% and 6%. Women account for 51% of the total population. The project’s direct beneficiaries are, therefore, the PA population in general, and particularly road users, women members of associations who will be supported, beneficiaries of capacity building activities, businesses, and various service providers that will be mobilized.

The relief of Grande Comore is made up of two units (Karthala watersheds in the Bambao and Hambou regions) and the massif of the Karthala grid in the Mbadjini region (volcanic cones and lava flows). The soils are very permeable.

Terrestrial wildlife includes bats (Livingstone), lemurs, snakes, and iguanas. It is not threatened. The works will strictly follow the existing right-of-way. In Chindini, RN2 cuts across the Coelacanthe marine area in the process of being classified. The areas considered sensitive close to the RN2 are; the Ouroveni mangroves, and the coral reefs and white-sand coral beach of Chindini. The degradation of natural environments by human activity mainly through intensive deforestation, in addition to the Karthala volcanic dust deposits, has definite effects on the area’s vulnerability to hydro-meteorological and geological hazards. There has been increased run-off, with the following consequences: (i) slow and widespread floods; (ii) flash floods after violent storms and/or cyclones. They are often accompanied by mudslides or landslides. In Anjouan Island, the relief is very rugged with areas of high coastline and large cliffs with steep slopes causing significant erosion that leads to the formation of numerous ravines by surface water run-off. The PA is close to the marine and coastal ecosystem, including grass and coral reefs. Terrestrial wildlife also includes Livingstone bats, lemurs, snakes, and iguanas.

A study conducted by the UNDP “Development of a Pilot Digital Elevation Model (DEM) for Comoros Islands” with the aim of simulating a tsunami, however, indicates the encroachment of the sea on numerous segments (beaches), along the RN23. It is about 1m per year in areas that lack protection. As a result, and in a "no project" situation, the wildlife that is likely to be threatened by the disintegration of the RN23 in the marine coastal environment is marine wildlife.

With regard to precipitation, fluctuations and trends observed between 1960 and 1989 are expected to continue in the future, despite the absence of complete data. However, according to IPCC projections of the Atmosphere-Ocean General Circulation Model (AOGCM), climate change scenarios for small Indian Ocean islands for the 2040-2069 period point to an increase in the annual average rainfall by 3.1% (+ or - 0.45%) with a decrease of between -2.6 and -1.8% during the dry periods (June-August). According to projections carried out, the average annual temperature will rise by 1°C by 2050. IPCC temperature scenarios for the islands of the south west Indian Ocean point to an increase of 2.1°C between 2040 and 2069. The calculated rise in sea level should reach 20 cm by 2050. Extreme weather and climate occurrences are expected to increase in frequency and intensity in the future.

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\(^1\) According to a September 2015 survey by INSEED (National Institute of Statistics and Economic and Demographic Studies) on poverty and household consumption in the Union of the Comoros.
Each of the PA islands is provided with health services operating under favourable conditions; they are located in: (i) Moroni, capital of the Union of the Comoros, for the RN2; and (ii) Moutsamoudou, the main city of Anjouan, for the RN23. These centres are located at respective distances of 50 km from Foumbouni and 45 km from Moya.

In terms of gender specificities, women play an important role in trade. They are active in trade between urban and rural areas. Female labour workforce participation is relatively low (36% compared to about 81% for men) and more women are unemployed than men. Women's employment is also more likely to be precarious - there are very few women in non-farm wage labour (13.7%) and more women than men are self-employed. A high percentage of women work in the informal agricultural sector (about two-thirds). Although the country has ratified the Convention on the Elimination of All Forms of Discrimination Against Women, women remain under-represented in all spheres of socio-economic activities in the Comoros, in national politics (3 %), at the local level, in the administration, and in legal and judicial professions. Gender-based violence is a reality in the Comoros, but efforts to combat this situation are still limited.

The country has 42.4% (almost 320,000) poor people, with an actual monthly consumption per capita below the national poverty threshold. About 18% of the population lives below the international poverty line set at USD 1.9 per capita per day (expressed in purchasing power parity for 2011). According to the latest World Bank forecasts, the sluggish economic situation in the Comoros is unlikely to lead to rapid progress in the fight against poverty by 2018. The incidence of poverty varies considerably between islands and is generally higher in rural areas and on the Island of Anjouan. The most vulnerable population is the large and unemployed family. The ratio of the inactive population to the working population is 76% (% of the working age population). The unemployment rate is 6.5% (% of the working age population).

In Grande Comore, the grand wedding is an unavoidable tradition. It represents economies of an entire lifetime and they grant access to the rank of a great dignitary. It is the cause of the considerable social uncertainty on the island, on the one hand, and strong social cohesion and significant income from the diaspora, on the other. Matrilineality is justified in myths; the Comorian considers brothers and sisters, their children, his mother and brothers and sisters of his mother and their children, as well as his maternal grandparents as family. Property is inherited based on the matrilineal system, that is, from mother to daughter, and it is the collective property of the lineage. The matrimonial home belongs to the woman and the husband lives there as long as he is her husband. For agricultural land, the man has access to his sister’s land and, through marriage, that of his wife, but has no right over it.

### 3. POTENTIAL IMPACTS, AND MITIGATION AND ENHANCEMENT MEASURES

#### 3.1. Negative Impacts

Apart from some compensations that are the subject of an Abbreviated Resettlement Plan, impact assessments are carried out on the road works activities associated with civil and maritime engineering activities where necessary on the existing right-of-way on RN2 and RN23 as well as on the adjacent maritime domain (for the RN23) according to the different project phases:

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2 Survey on household budgets conducted in 2014
(1) in the preparatory phase; (i) optimization / materialization of road delineation; (ii) supply of equipment and site installation; (iii) recruitment of labour.

2) in the works phase; (i) scarification of the existing pavement and storage of excavated material; (ii) earthworks and excavations for the construction / reconstruction of gutters and crossing structures; (iii) clearing and grubbing of some 30 trees on the surrounding area; (iv) generation of waste; (v) transportation and placement of riprap;

(3) in the Operations phase: (i) increased risks of accidents.

Each impact was identified from causal links, determined by the interaction between environmental components and project activities. The following matrix (Table 1) reflects this interaction with the environmental components.

Table 1: Matrix of interactions

<table>
<thead>
<tr>
<th>Elements that make up the environment</th>
<th>Biophysique</th>
<th>Humain</th>
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<tbody>
<tr>
<td></td>
<td>Eaux</td>
<td>Soils</td>
</tr>
<tr>
<td></td>
<td>Natural resources, water, atmosphere</td>
<td>Soil quality and use, water quality, surface water, ground water</td>
</tr>
<tr>
<td>MAJOR ACTIVITIES</td>
<td>Air</td>
<td>Sub-soil</td>
</tr>
<tr>
<td>DISPLACEMENT OF NETWORKS/COMPENSATIONS</td>
<td>mT</td>
<td>mT</td>
</tr>
<tr>
<td>ARRIVAL OF SITE MATERIAL AND INSTALLATIONS</td>
<td>MT</td>
<td>mT</td>
</tr>
<tr>
<td>RECRUITMENT AND PRESENCE OF WORK FORCE</td>
<td>MT</td>
<td>mT</td>
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<tr>
<td>CLEARING AND CLEANING OF RIGHT-OF-WAY</td>
<td>mT</td>
<td>mT</td>
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<tr>
<td>SCARIFICATION/STORAGE OF CUTTINGS</td>
<td>mT</td>
<td>mT</td>
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<tr>
<td>EARTHWORKS, CUTTINGS, BACKFILL, AND CREATION OF PAVEMENT</td>
<td>M T</td>
<td>M T</td>
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<tr>
<td>WASTE MANAGEMENT</td>
<td>mT</td>
<td>mT</td>
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<tr>
<td>PLACEMENT OF GUTTERS</td>
<td>MD</td>
<td>MD</td>
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<tr>
<td>PLACEMENT OF ARMOURSTONE</td>
<td>MD</td>
<td>MD</td>
</tr>
<tr>
<td>MOVEMENT OF PROJECT VEHICLES</td>
<td>mT</td>
<td>mT</td>
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<tr>
<td>INSTALLATION OF EQUIPMENT</td>
<td>mT</td>
<td>mT</td>
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Légend :  
- m: minor  
- M: major  
- T: Temporary  
- D: Durability  
- weak negative  
- strong negative  
- weak positive
3.1.1 In the preparatory phase

The project plans to adapt to the platform widths available in crossings of agglomerations, which vary, on average, between 9 m over the first 10 km and 8 m on the rest of the RN2; and 7 m on the RN23. In the inter-urban segments, some land expropriation will be necessary. They concern segments where improvements in road geometry are necessary. Overall, nearly 1.7 ha will be expropriated. They will mostly consist of private land, mainly used for agricultural purposes. The number of built assets, trees and businesses concerned is 162, divided into: 11 buildings, 39 outbuildings, 15 collective facilities and 84 fruit trees. 13 businesses have also been affected.

Repairs to the pavement and gutters will be carried out in agglomeration crossings without affecting the residents’ assets. In the inter-urban segments, some land expropriation will be required, as well as repairs and reinstatements of access. They concern segments where improvements in road geometry are necessary. Repairs to the pavement and gutters will be carried out in agglomeration crossings without affecting the assets. Consequently, the road layout will not affect any property on the RN2 and RN23, owing to strict implementation in collaboration with the DGRTR. Also, the arrival of equipment and materials may be a source of inconvenience for the local population and may become a potential source of conflict. This risk should be taken into consideration.

3.1.2 In the works phase

1. On the Physical Environment, and during the works, the quality of water will not be altered in any significant way. The impacts likely to be generated will be felt during the sewerage works (fitted out of water), their cross extensions, as well as multicellular works to replace the fording sites. The dust and exhaust gas emissions to be encountered by the surrounding population will be very limited and temporary. Moreover, its implementation does not present major risks that cannot be controlled. The main risk concerns flooding and road cuts to which the Union of the Comoros is subject.

2. On the biological environment, no site of interest will be affected by the project. However, the RN2 delineation in Grande Comore is located almost 5km downstream of the Karthala protected area’s perimeter and of the Cœlacanthe future marine area undergoing the process of classification. These sites are already impacted by the existing right-of-way. Moreover, the project envisaged, as an activity in the agglomerations crossing areas, reinforcement that consists in building within the existing width, a new, stronger and more durable pavement structure than the existing one. Quarries and deposits have all been identified.

3. On the Social and Cultural Environment

Civil works will lead, along the roads and in the worksites, to increased risks of traffic accidents, pollution due to the noise of transport vehicles and equipment during working hours.

During construction, site personnel may adopt behaviours that do not respect the usual norms and practices. Moreover, the presence of employees of the firm with relatively high incomes could foster moral depravity (prostitution, banditry, etc.), that can lead to an increased STIs and AIDS prevalence.
4 On the Socio-Economic Environment

A provision in the DQE will be used to carry out repairs / restoration of property and networks just a few metres off the right-of-way. These are mainly fencing, energy, telecommunications, access stairs and pavements infrastructure in the crossings of agglomerations.

3.2 Positive Impacts

During the construction phase, the project’s beneficial impacts will be socio-economic in nature, with employment opportunities offered to local youths: (i) direct employment on construction sites; and (ii) indirect employment related to the development around commercial activities of workers' camps (sale of agricultural and handicraft products, and food).

During the exploitation phase, the beneficial impacts will all be linked to Project-financed facilities: (i) improvement of traffic conditions in terms of road safety; (ii) reduction of erosion on steep sloping terrain through the use of adequately drained retaining walls and the removal of water from RN2 and RN23; (iii) sustainability of roads through coastal protection, which also contributes to seafront buildings and vegetation and resilience to climate change; (v) creation of new sources of income for vulnerable groups in society; (vi) creation of temporary employment during the life of the project. It is expected that the project will facilitate travel to these islands and will provide social benefits, by improving access to social centres (schools, dispensaries, the administration, markets, etc.). The time thus saved will be put to better use on other domestic chores and economic activities in which women are more present.

The project’s beneficial impacts on the biological environment will be linked to (i) reforestation, which will enable Forest and Water Officers to extend their knowledge of the areas they manage in collaboration with other sector services.

3.3 Mitigation and Enhancement Measures

Before the construction phase

The authorities will insert environmental clauses in the tender document, and the main prescriptions intended to protect the natural environment will concern: (i) site remediation and restoration; (ii) waste management requirements; (iii) temporal limitation requirements for new trenches and channel openings for new outlets and related filings. The main prescriptions to protect the human environment will involve: (iii) a preferential recruitment mechanism for local staff; (iv) application of safety regulations (installation of barriers, signage of building sites, indications of detours, etc.) for local residents and users; (v) enforcement of labour regulations and the wearing of personal protective equipment by construction site staff (gloves, dust masks, noise-resistant helmets, etc.)

Before the establishment of remote sites and construction sites, the company should submit to the prior approval of the Contracting Authority and PMU for each of the sites in Grande Comore and Anjouan Island a site movement and possible set up plan as well as a site environmental protection plan in accordance with the environmental guidelines of the legislation in force in the Union of the Comoros. This plan should include: (i) the setting up of remote sites and equipment warehouses in the vicinity of localities and / or agglomerations, so that the DGRTR can take possession of the infrastructure at the end of the works; (ii) waste recovery and treatment; (iii) the recovery and transfer of inert waste to local NGOs for use in day-to-day operations and house maintenance (timber processing, steel and HDPE falls, etc.); (iv) the organization of collection and disposal of used objects (filters, batteries, empty cans, etc.)
Before works commencement, the contractor should carry out a field delineation based on implementation studies and final picketing. This includes: (i) identifying property owners liable to suffer damage (fences, access stairs, etc.); (ii) defining access to properties that must be maintained during construction and/or retrofit.

The widths retained by the DGRTR have free right-of-way. For over the first 11 kilometres on RN2, an initial optimization made it possible to avoid property destruction. The choice made it possible to retain 7m as rollable surface width; the rest of the route makes it possible to avoid any expropriation and retain 6m as rollable surface width. The values comply with road related instruments in the Union of the Comoros (type 2 and 3).

In the construction phase

The mitigation measures by the Administration will include: (i) the organization by specialized NGOs of information and awareness-raising campaigns with technical services, schoolchildren, local population, local customary chiefs and imams; local, regional and national authorities, users and municipal authorities, using all possible means of information. They will also include: (i) issues of safety, risk and global climate change (mainly targeting young people in schools, clubs and youth centres); (ii) incentive to encourage local hiring and sub-contracting to local SMEs and NGOs during construction in such areas as sensitization or collection of climatic, agricultural, forestry and wildlife data. During the conduct of civil engineering works, the company should ensure the preservation of terrestrial wildlife and water resources by applying fire prevention measures and techniques.

Furthermore, the company should respect the living environment of the riparian population since the works take place in existing rights-of-ways: (i) by erecting mobile signals in works areas, especially at night, and road signs and speed limitation signs in hazardous areas; (iv) by rehabilitating access restricted by the works to residents. It will also preserve the health of the riparian population; (v) by ensuring that its staff respect local customs and practices; (vi) by periodic health checks for its staff.

The mitigation measures set out in the Specifications are not specifically limited to environmental aspects. Both in the construction and operation phases, they mainly concern the integration of principles of good environmental practices and technical measures in line with road standards, both for improvements and the construction of structures. They relate to: (i) personnel management; (ii) set up and hygiene conditions of the construction camps; (iii) organization and management of hydrocarbons deposits (control of risks of flow, explosion or fire); (iv) origin of materials (quarries) and conditions of their transport and the organization of storage required for works or generated by the works and rehabilitation / constructive works; (v) traffic regulation and the phasing of works; (vi) solid and liquid waste management; (vii) site restoration and dismantling of interim facilities at the end of the works. The contract documents spell out all the requirements to mitigate the negative effects resulting from the works sites.

They, therefore, focus mainly on the organization of works and equipment of remote sites in order to mitigate general disturbances. Since the main measure is adaptation by proper sizing, key activities devoted to coastal protection with heavy rocks over 4,200m, retaining walls, drainage structures, gutters of ridges and furrows, are the project’s key components.
In the exploitation phase

In order to reinforce the positive impacts on the human environment, the project also considers capacity building through component B by: (i) rehabilitation and provision of socio-economic infrastructure; and (ii) capacity building in business management. Ultimately, the project will generate beneficial outcomes in the exploitation phase.

3.4. Cumulative Impacts

The cumulative impacts are those resulting from the combined action of activities related to the project itself and those of actions and/or associated projects or in the same project area. These are mainly cumulative impacts generated by: (i) the RN 1 Moroni - Mitsouili rehabilitation project (Moroni towards the north); (ii) the Moroni port extension; and (iii) optic fibre laying in Grande Comore Island.

In this regard, coordination with DGRTR services will focus on:

(i) measures for the rational management of pozzolana resources in the existing quarries identified both for supplies to the rehabilitation of the two roads and the extension of the Moroni port, as well as the cumulative sound nuisance, dust emissions and risk of accidents. It should be noted that for all three projects, the intensity of these impacts is gauged according to a situation of convergence on Moroni town. In this regard, a close coordination of worksite traffic is required, particularly for quarries. The objective is the non-congestion of RN1 and RN2.

(ii) Close co-ordination with the ICT Ministry is also required, with regard to the redoing of areas that already have optic fibre segments in addition to network displacements already considered in the road project’s QED.

3.5. Residual Impacts

Residual impacts are those resulting from the application of the mitigation measures at the end of the project. They are mostly positive. However, there will be technological risks such as (i) fires and/or (ii) accidents. To reduce these risks:

(i) hydrocarbons will be stored away from the rest of the site’s facilities in a fenced area, with the locking of an entry gate after service hours. A fire extinguisher will be close to the pump access area. Since the soils in the Comoros are very permeable, a concrete pavement will first be cast, and a low wall built on the pavement on the periphery of the cistern. Furthermore, a fire extinguisher will be installed in all the sites with risks of fire (wooden forms, welding stations, tank trucks, etc.).

(ii) The company's ESAP must include a description of the procedures to be followed for accidents resulting from traffic, works sites or construction site set up: For all worksite activities and for all works site activities, employees will be informed of the nearest health centres. A list of useful telephone numbers will be provided. Each of the bases will have to include an emergency kit.
4. ENVIRONMENTAL RISK MANAGEMENT AND CLIMATE CHANGE

4.1. Project Related Environmental Risks

The main environmental risk will be the pollution of the environment and it is linked to the poor management of works-related waste such as pollutants (storage, transport and use). For that, a Waste Management Plan is required in the specifications. It will include the recovery of all types of waste, sorting them, reusing them and disposing of them in controlled sites. It should be noted that given the nature of the works, almost 85% of the scarification of existing pavements have been reused as the foundation layer of the rehabilitated road.

During the construction phase, there will also be another risk related to road accidents. To this end, security measures, awareness-raising and training are considered for locally hired staff, the population, staff involved, and competent services, including civil protection. The measures include: (i) sensitizing and training of site workers and point teams from riparian communities in rapid response techniques in the event of disasters; (ii) safety measures to be followed in hazardous or risky areas; (iii) providing communication and rapid evacuation equipment; (iv) contracting with workers’ health services and health centres; (v) establishing and supplying local pharmacies; (vi) sensitizing the population on prevention of health risks and road safety; (vii) organizing epidemiological surveys to assess the project impact on the environment and human health.

4.2. Climate Change

The Comoros is vulnerable to the adverse effects of climate change. It is faced with the combined action of very violent precipitations associated with strong winds, given that it is located at the edge of cyclone-prone areas. Climatic hazards cause the main climatic risk in the project area to be terrestrial erosion due to violent precipitation associated with the frenzied deforestation noted by the MTEF, as well as marine erosion due to the rise in sea level associated with strong swells and extreme rainfall in a frequent cyclonic situation. Marine erosion is already occurring and the land on which the RN23 is built suffers from strong erosion that washes away the road and land on the most sensitive sections.

A UNDP-financed study reports the risks of submersion of some coastal areas through the combined action of sea-level rise through a tsunami simulation, with parameters that follow the 2006 tsunami; the Comoros developed a National Tsunami Warning Action Plan that was submitted to the Indian Ocean Consortium coordinated by ISDR. It should be noted in this context that the rehabilitated road is one of the measures of the disaster relief organization process.

The project has been the subject of climate categorization 1 since the RN23 is located almost entirely along the sea.

The options chosen in the project design contribute to the adaptation to this risk. Figures 2 and 3 that follow respectively illustrate the current state of the approaches to RN23 and the scheme chosen for the design of protection aimed at resilience to marine erosion onslaughts.
Figure 2: current state of approaches to RN23 figure 3: marine protection design

These include the installation of heavy stone embankments associated with protection walls - dykes along RN 23 over 4,200m. Beyond these protective measures against marine erosion, the land, plantations, riparian populations and public facilities benefit from this.

The project will therefore help to (i) reduce exposure to climatic hazards and (ii) the relief plan (orsec) tied to the National Tsunami Warning Plan.

5. ENVIRONMENTAL AND SOCIAL MONITORING PROGRAMME

5.1. Organization of environmental and social supervision and monitoring

As part of this project, a monitoring programme will first aim to ensure that the mitigation and enhancement measures proposed in the ESMP will be effectively applied during each of the successive phases of the project (installation, construction and operation).

It will include: (i) project management (MTPTR), represented in the Comoros by the PMU as Delegated Contracting Authority; (ii) 2 environmental focal points per site (the RN2 and RN23 located on two separate islands), designated by the works contractor to ensure the application of environmental measures during the construction phase; (iii) project management or technical assistance for supervising and monitoring the implementation which also includes an environmentalist; (iv) the decentralized structures of the Directorate-General for the Environment and Forestry (DGEF), under the supervision of the Ministry of Agriculture, Fisheries and the Environment, responsible for periodic monitoring.

This supervision will aim to verify the effectiveness of: (i) proposed environmental and social measures, including mitigation measures; (ii) the conditions outlined in the various legal and regulatory instruments; (iii) commitments by the contracting authority and the project manager; (iv) requirements for other laws and regulations on hygiene and public health, and the management of the population’s living environment.
In the operational phase, the monitoring programme will aim to ensure that mitigation or adverse impact of compensation measures actually play the expected role, as well as ensure that the expected positive impacts of the project’s operation will indeed be achieved.

The main objectively verifiable indicators that will be used to monitor these positive impacts will be: (i) rehabilitated paved roads; (ii) the number of new (formal and informal) businesses opened by men and women; (iii) the number of jobs created directly and indirectly and filled by men and women; (iv) the number of equipped and functional infrastructure; (v) the number of young boys and girls initiated and trained.

6 PROGRAMME COST

The total cost of the ESMP includes SAI campaigns, plans under the responsibility of the contractor, provisions for repairs of assets and other networks as well as fees for environmentalists of the Delegated Contracting Authority, that of the Contracting Authority, as well as that of the Directorate-General for the Environment in charge of periodic monitoring.

It stands at about KMF 467.03 million, or about EUR 949,315. It, therefore, accounts for 2.82% of the project cost. The distribution by road is presented in Table 4 below.

<table>
<thead>
<tr>
<th>Headings</th>
<th>Roads</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RN2 Moroni - Foumbouani</td>
<td>RN23 Sima-Moya</td>
</tr>
<tr>
<td>Compensation</td>
<td>139,312,772</td>
<td>45,520,603</td>
</tr>
<tr>
<td>SAI campaigns (reforestation, use of volcanic lava, reconversion, extraction of marine aggregates)</td>
<td>10,000,000</td>
<td>16,000,000</td>
</tr>
<tr>
<td>Detour/signalling plans (company)</td>
<td>3,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>HSE plan, including training</td>
<td>2,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Waste management plan</td>
<td>6,000,000</td>
<td>6,000,000</td>
</tr>
<tr>
<td>Reforestation</td>
<td>15,000,000</td>
<td>25,000,000</td>
</tr>
<tr>
<td>Reconversion of marine aggregate extractors</td>
<td>0</td>
<td>32,200,000</td>
</tr>
<tr>
<td>Capacity building in Environmental Management for Town Hall staff</td>
<td>5,000,000</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Provision to repair structures and networks</td>
<td>10,000,000</td>
<td>10,000,000</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td><strong>190,312,772</strong></td>
<td><strong>147,720,603</strong></td>
</tr>
<tr>
<td>Environmental Focal Point PMU</td>
<td>22,000,000</td>
<td>22,000,000</td>
</tr>
<tr>
<td>Engineering Team’s Evaluation and Monitoring Unit</td>
<td>42,000,000</td>
<td>18,000,000</td>
</tr>
<tr>
<td>Environmental control DGE / MEFT</td>
<td>7,500,000</td>
<td>7,500,000</td>
</tr>
<tr>
<td>Training of RAP Monitoring Committee</td>
<td>5,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>266,812,772</strong></td>
<td><strong>200,220,603</strong></td>
</tr>
</tbody>
</table>
7. PUBLIC CONSULTATIONS AND INFORMATION DISSEMINATION

The environmental assessment and the Resettlement Action Plan were carried out on the basis of a participatory approach, which had been initiated from the upstream stage of the project.

Finally, it emerges on the one hand from the use of basic documents, digitized topographical maps and field visits, as well as interviews with representatives of the various technical departments of the ministries concerned, international organizations such as the UNDP, NGOs, private operators, socio-professional groups, people living along the roads, government and local authorities, village leaders and opinion leaders.

Prior to each meeting, the content of the project was presented to the group consulted in terms of economic, social, cultural and environmental issues and in terms of mitigation and improvement measures. Thus, the opinions and comments of the target population and groups were incorporated into this summary.

Public consultations were held on the roads involved in June 2016. Community meetings were held in each village involved in the project in the presence of dignitaries and imams in most cases. The population expressed its basic concerns and expectations and expressed its support for the project from a development perspective. Minutes of these meetings were prepared and can be consulted at the DGRTR.

Each time, the population expressed its acceptance of the project from a development perspective. The consultations resulted in an analysis of the positions, interests and influence of the various stakeholders, and the proposal of strategies for their involvement and participation in the project's implementation. Their expectations and suggestions are summarized in Table 3 below. They were taken into consideration in the project. Their questions and concerns were discussed. A summary of the answers given has been provided in Table 3 below.

Table 3: Expectations of persons consulted

<table>
<thead>
<tr>
<th>Expectations/suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Safety measures for children relating to the works;</td>
</tr>
<tr>
<td>- Integration and direct or indirect employment of mainly young people.</td>
</tr>
<tr>
<td>- Development of a grid of positive and negative impacts for better understanding by the population;</td>
</tr>
<tr>
<td>- Installation of a safety mechanism;</td>
</tr>
<tr>
<td>- Project support at social level, including women’s empowerment and youth employment;</td>
</tr>
<tr>
<td>- Works will be adapted in consultation with the dignitaries when cutting through villages to reduce the risk of accidents;</td>
</tr>
<tr>
<td>- Recruitment of local labour force;</td>
</tr>
<tr>
<td>- Information on compensation procedures for potential damages to access structures and their re-establishment;</td>
</tr>
<tr>
<td>- Recruitment of local labour force</td>
</tr>
</tbody>
</table>

All public administration actors were consulted during preparation and evaluation missions (Vice-Presidency in charge of Regional Planning, MTPTR, MAPE, etc.). Discussions with them contributed, for example, to the definition of the content of women's empowerment assistance at the Chindini fishing site in the "Institutional Support & Capacity Building" component.

During project implementation, all partners will be regularly consulted through village meetings. Moreover, the ESMP summary has also been published on the Bank's website.
9. CONCLUSION

It appears from the environmental and social assessment that the project’s implementation would have certain negative localized impacts on the socio-cultural and socio-economic environments during the rehabilitation of RN 2 and 23. It will also have significant positive impacts, including resilience to the effects of marine erosion due to climate change. Potential negative impacts will have no ecological effects both in the immediate area of the project and in its vicinity, as they are technically circumscribed within reasonable limits or sometimes offset by the appropriate corrective measures in the proposed ESMP. Measures to improve the positive impacts have reinforced the project scope.

The project is considered to be environmentally and socially acceptable. It was issued a certificate by the DGE / MTEF.

10. REFERENCES and CONTACTS


Contacts: For further information, please contact:

- Mr Kurt LONSWAY, Environment and Climate Change Division, (k.lonsway@afdb.org)
- Mr Pierre MORE NDONG, OITC 2 (p.morendong@afdb.org)
- Mr Modeste KINANE, Environment and Climate Change Division, (m.kinane@afdb.org)
- Mr Salim BAIOD, Environment and Climate Change Division, (s.baiod@afdb.org)
<table>
<thead>
<tr>
<th>Impact Receiver</th>
<th>Impact description</th>
<th>Measures advocated</th>
<th>Implementation period</th>
<th>Actors</th>
<th>Objectively verifiable indicators</th>
<th>Verification means</th>
<th>Order of priority</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biophysical environment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Air quality | Dust and smoke generated by the works on site and borrowed areas | - watering the sections affected by the works  
- regularly performing engine oil changes  
- get employees to wear dust masks (PPE: Personal Protective Equipment ; In all cases) | Beginning and during construction | - Company  
- control mission | Road segments are watered during construction  
Vehicles regularly and normally undergo oil changes (with traceability and labels) | Survey and Monitoring Report by DGRTR and Company | Indispensable |
| Water quality | Groundwater pollution | Cleaning the surroundings of the various workshops at the end of works  
- regularly collect liquid waste from construction sites in view of their disposal | During construction | - company  
- Project manager | Application of hygiene and safety rules | DGRTR control and supervision report on the HSE system | High priority |
| Soils | - Risk of soil quality degradation  
- Fight erosion in runoff areas  
- modification of soil morphology | - Establishing a mechanism for collecting used oils  
- Stabilizing the slopes  
- returning everything to the original state after any intervention | During and after works | - company  
- control mission  
- environmental officer of the DGRTR | Absence of contaminated sites | Construction records and DGRTR | High priority |
| Wildlife | No impact of wildlife habitat destruction | Maximum avoidance of accidents with wildlife | During construction | - local population  
- DGE | Undisturbed ecology | Population surveys | Priority |
| Loans Quarries Site facilities | Nuisance to wildlife and the population | Revegetating borrowed areas, flatten slopes, restore flow of water | During and at the end of construction | - company  
- control mission  
- Project manager  
- DGE | Borrowed areas restored Undisturbed ecology | Visit to borrowed areas and site facilities | Priority |
| Landscape | Reduce the visual impact on the landscape | Reforestation when crossing agglomerations and in borrowed areas  
Avoiding to dephase the natural environment | At the end of construction | - local population  
- DGE | - tree presence  
- reforestation number  
- natural state observed and restored | Visit to borrowed areas | Indispensable |
| **Human Environment** | | | | | | | |
| Health and safety | - Risk of injury and equipment accidents  
- Risk of pulmonary infection | Applying hygiene and works safety rules  
Providing all field workers with PPE | During construction | - company  
- control mission  
- Project manager | Rate of accidents on site Notify accidents on a daily basis | Site records Verification by the HSE, DGE and DGRTR worker | High priority |
| Employment | Recruitment of local labour force | Training the population on HIMO techniques and basic knowledge of HSE | Prior to site set-up and during construction | - company  
- Project manager | Number of workers hired and trained | Company’s activity report | Priority |
| Traffic | Improve the level of road services, and the movement of goods and persons | - placing road signs at risky locations  
Placing speed bumps | During and after works | - company  
- control mission | - Level of road traffic  
- risk of accidents decreased or nil | DGRTR and road safety activity reports Company | High priority |
<table>
<thead>
<tr>
<th>Impact Receiver</th>
<th>Impact description</th>
<th>Measures advocated</th>
<th>Implementation period</th>
<th>Actors</th>
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<th>Verification means</th>
<th>Order of priority</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agriculture</strong></td>
<td>Development of Agriculture</td>
<td>Rapid disposal of agricultural products</td>
<td>After the works</td>
<td>Ngazidja Chamber of Agriculture</td>
<td>Routine maintenance works performed</td>
<td>Activity report of the Chamber of Agriculture</td>
<td>Indispensable</td>
</tr>
<tr>
<td><strong>Trade and transport</strong></td>
<td>Development of the trade and transport sectors</td>
<td>Routine maintenance of the road for sustainable benefits Fighting road criminals</td>
<td>During construction and operation</td>
<td>- Chamber of Commerce - Transports' unions - DGRTR</td>
<td>Enhance volume of trade and travellers Lifespan</td>
<td>Activity report by the regional trade and transport departments and by the DGRTR</td>
<td>Indispensable</td>
</tr>
<tr>
<td><strong>Tourism activities</strong></td>
<td>Development of tourism</td>
<td>Routine maintenance of the road for sustainable benefits Ensuring road safety</td>
<td>During and after works</td>
<td>National headquarters and tourism authority - company DGRTR</td>
<td>Number of tourists Free movement</td>
<td>Survey of hotels and the population on traffic</td>
<td>Priority</td>
</tr>
<tr>
<td><strong>Infrastructure and cultural heritage</strong></td>
<td>- Minimize the risks of destruction of underground networks - Minimize noise pollution in schools</td>
<td>- Identifying pipes in underground networks - Setting up construction workshops far from schools, mosques, public squares and in interaction with other companies</td>
<td>Before and during construction</td>
<td>- company - operators of underground networks</td>
<td>- number of infrastructure damaged - number of incidents and accidents in schools, public places ...</td>
<td>DGRTR and company reports of activity</td>
<td>Priority</td>
</tr>
<tr>
<td><strong>Women's living conditions and the fight against HIV/AIDS</strong></td>
<td>Improve women's living conditions Save women from STDs</td>
<td>Creating and financing income-generating activities for women Sensitizing women in the vicinity that benefit from small projects on the dangers of STDs</td>
<td>During and after works</td>
<td>- company - Ministry of Health, Solidarity, Social Protection and Gender Promotion Red Cross and health NGO</td>
<td>Number of projects carried out for women Number of women infected and sick</td>
<td>Economic and health survey of women and nearby hospitals</td>
<td>Priority</td>
</tr>
</tbody>
</table>
Environmental and social clauses relating to works implementation:

Provisions relating to the sensitization of site personnel on the project’s environmental issues and risks of accidents

The company’s safety and environmental officer should carry out an awareness campaign for residents and site staff on the project’s environmental issues, especially possible risks of accidents.

This campaign will continue throughout the duration of the works to mitigate the risks of accidents and various nuisances for the population and wildlife. The following will be prohibited:

- night works in built-up areas;
- movement of heavy equipment (trucks, bulldozers, etc.) overnight in built-up areas;
- use of toxic chemicals.

Provisions concerning hygiene, construction site cleanliness and remote site pollution prevention

Provisions for worksite and remote site hygiene and cleanliness will be added to the internal regulations of the company in charge of the works.

It is forbidden to dispose of waste materials or volatile materials such as mineral spirits and oil or paint thinners by pouring them on the ground, into streams, and into coastal areas.

Liquid waste from the site should be collected regularly and disposed of by appropriate methods used in the field.

Carry out maintenance work on vehicles and machinery in a designated place. Provide onsite a supply of absorbent materials as well as well-identified and sealed containers to receive petroleum residues and waste.

Under constant supervision, undertake all handling of hazardous substances or contaminants.

Store hazardous substances in watertight containers in safe, weatherproof storage areas. Keep storage areas locked and check the inventory of these substances.

Provisions for combating soil erosion

The company should carry out the following measures to combat erosion:

- Observe deadlines for earthworks in areas that do not impede the normal flow of water downstream of the structures;
- Install armourstones or gabions in areas with strong currents or marshes;
- Reinforce embankments and backfills with armourstones, gabions, masonry fragments or by plant protection;
- Carry out works before the rainy season.
Provisions related to marine wildlife protection

The company is prohibited from carrying out temporary improvements (storage and parking areas, bypass road or works) in wetlands and coastal areas.

Site installation

- Setting up remote site and parking for equipment

The remote site will be set up more than 200 m from surface water points (streams, swamps) in order to prevent pollution.

The remote site and parking will be located away from built-up areas to avoid nuisances such as odours from hydrocarbons, noise, etc.

- Opening of detours, various access tracks

The choice of detour delineations, access routes to material extraction, and water collection stations for works purposes should be made carefully to avoid areas of biological diversity (flood areas)

Clearing

The right-of-way will also be watered during clearing to avoid raising dust. Care should be taken to avoid destroying topographical markers and other works carried out by land registration services.

Earthworks

The requirement to water earthworks areas should be strictly observed. The areas will be watered as much as required by the control mission, especially the stretches of road crossing agglomerations.

Water collection for work purposes

Water pumps used for collecting water for construction must be in good working order to avoid diesel and oil leaks likely to pollute water (rivers or swamps) used for human and animal consumption.

All spills or discharges of any type of wastewater, hydrocarbons and pollutants into surface water and the soil will be strictly prohibited.

Construction of wastewater facilities

The earth from excavation works will be removed to ensure the premises are clean and function properly.

Withdrawal from site and equipment

The grounds of the remote site and parking will be rehabilitated after the cleaning of solid waste (used filters, used tyres, rubble, domestic waste, etc.) and liquids.

Safety precautions

Security arrangements will be made for people living near the sites: construction sites will be marked by tags and signposts.

In built-up areas, barriers will be erected to prevent the public and outsiders from entering construction sites.

Provisions will be made for the safety of workers: wearing of dust masks, gloves and safety shoes.
Union of the Comoros  
Unity-Solidarity- Development  
Vice Presidency  
in charge of the Ministry of Agriculture, Fisheries,  
Environment, Regional Development  
and Urban Affairs  

Environmental Authorization No. 16-022/VP-MAPEATU/CAB, relating to the realization of rehabilitation works on RN2 and RN23 National Roads.  

THE VICE-PRESIDENT  
Mindful of Law No. 94-018/AF of 22 June 1994 to protect the Environment, amended by Law No. 095-007/AF of 19 June 1995;  
Mindful of Decree No. 01-52/CE of 19 April 2001 on Environmental Impact Studies;  
Mindful of Order No. 12-012/VP-MPEEIA/CAB of 24 March 2012 to establish and spell out the duties of the Environmental Impact Studies Technical Evaluation Committee;  
Mindful of Decree No. 16-095/PR on the composition of the Government and Secretaries of State of the Union of the Comoros;  
Mindful of the file of the concerned;  

HEREBY AUTHORIZES:  

Article 1: In accordance with the decree on Environmental Impact Studies, notably Article 16, after consideration of the case relating to rehabilitation work on RN2 and RN23 National Roads, the Vice Presidency in charge of the Ministry of Agriculture, Fisheries, Environment, Regional Development and Urban Affairs, approves rehabilitation works on RN2 and RN23 National Roads.  

Article 2: The Vice Presidency in charge of the Ministry of Environment, in accordance with Article 17 of the said Decree No. 01-52/CE of 19 April 2001 on Environmental Impact Studies, shall exercise control over the application of measures provided for in the Study. All related costs shall be borne by the project initiator.  

Article 3: In accordance with measures provided for in Impact Studies, the project initiator shall repair all significant damages to the environment that shall result from rehabilitation works on RN2 and RN23 National Roads.  

Article 4: This authorization may only be suspended or withdrawn subject to a report by the Directorate-General of the Environment and Forests (DGEF), in the event of non-compliance with prescriptions or in the event of shortcomings in the implementation of the Environmental and Social Management Plan (ESMP).  

Article 5: This authorization, which does not exempt the project initiator from any responsibility in the implementation of the ESMP in accordance with the instruments in force and from the implementation of his project, has been issued to serve as and when necessary.  

Done in Moroni on 10 June 2016.  
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Email: ministeragricomores@yahoo.fr