AFRICAN DEVELOPMENT BANK GROUP

PROJECT: Energy Sector Support Project
COUNTRY: UNION OF THE COMOROS

SUMMARY ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

May 2013
A. Brief description of the project and major environmental and social components

The project aims at restoring and improving the functioning of the electricity network, from electricity production to distribution, and reducing technical and commercial losses in the initial stages. In addition, the project aims at enabling the country to focus on the development of renewable energy over the long-term.

The first sub-component aims at rehabilitating the network, restoring a sound operational structure in the electricity sector and ensuring sufficient production capacity coupled with a comprehensive distribution network, to ensure an 80% coverage and service rate across the country.

The second sub-component aims at diversifying the country's energy mix over the long-term, through rehabilitation, commissioning, and changing of the hydraulic equipment of existing micro-hydro-electricity plants and by developing the energy map and conducting studies on geothermal and hydro-electric sites to determine the potential of these resources.

The project’s main beneficiaries will be the citizens of the Union of the Comoros. Other beneficiaries will be the two state-owned power companies (MAMWE and EDA) which will witness an improvement in their performance and capacity.

Works on the first sub-component include:

a) Rehabilitating all existing generators;

b) Increasing production capacity at a lower cost (by procuring efficient generators with lower fuel consumption than those currently existing);

c) Improving the recording system of the amount of electricity produced and distributed by each generator and power plant (necessary for an efficient plant management in order to identify non-performing generators and reasons for potential losses);

d) Creating a control / management system of all networks and production plants to avoid shocks and reduce unexpected interruptions and facilitate synchronization;

e) Conducting studies on supply methods and fuel storage capacity within the plants which impact on cost and availability, representing a significant risk to the smooth functioning of the plant and, thus, the country’s electricity production;
f) Rehabilitating transmission lines and purchasing equipment to improve and secure distribution, reduce losses and ensure safety and proper management of operations / electricity transmission and distribution facilities;

g) Extending the MV and LV network to Anjouan, Mohéli and Grande Comore;

h) Improving production efficiency and reducing customer-related losses and fraud (improving metres; installing and connecting to the network);

i) Creating an organizational system that facilitates human resource management, specifically at the level of the production plant; distribution, connection and disconnection of customers;

j) Reviewing the billing system, especially rates proposed to public institutions for the payment of their bills;

Works for the second sub-component include:

k) Rehabilitating and commissioning of the Miringoni - Moheli micro-hydroelectric plant;

l) Rehabilitation, replacement of existing hydraulic equipment and commissioning of the Tratinga - Anjouan plant; and

m) Rehabilitation, replacement of existing hydraulic equipment and commissioning of the Lingoni - Anjouan plant.

The total project cost is estimated at USD 33 million, USD 18 million of which is financed by the AfDB and USD15 million is jointly financed by the World Bank and a Qatari Co-operation Fund.
Project Impact Area d'intervention du
More specifically, the project components financed by the African Development Bank are:

a) In Grande Comore:

- Reviewing 12 existing thermal units (Voidjou, Itsambouni, Foumouni and Mbandamaj)
- Installing a new 3 MW power unit;
- Increasing diesel storage capacity from 200 to 1,000 m$^3$ in Voidjou, from 50 to 150 m$^3$ in Itsambouli and from 8-50 m$^3$ in Foumboni;
- Providing a 30-day fuel reserve;
- Connecting 20 km of medium voltage lines to complete the distribution network;
- Renovating 120 km of medium voltage lines (MV);
- Renovating 150 km of low voltage lines (LV);
- Rehabilitating the 20 KV station in Voidjou;
- Extending the 20 KV station in Itasanbouni;
- Rehabilitating the 20 KV station in Foumboni;
- Installing 90 new transformers;
- Renovating electric metres; and
- Installing condenser batteries.

b) In Anjouan:

- Reviewing the existing four thermal units (Trenani)
- Rehabilitating three hydro-electric power stations (Lingoni, lower and upper Tratingua);
- Increasing diesel storage capacity from 60 to 500 m$^3$ in Trenani;
- Providing a 30-day fuel reserve;
- Connecting 20 km of medium voltage lines to complete the distribution network;
- Renovating 30 km of medium voltage lines (MV);
- Renovating 45 km of the low voltage line (LV);
- Rehabilitating the 20 KV station in Trenani;
- Installing 25 new transformers;
- Renovating electric metres; and
- Installing condenser batteries.

c) In Mohéli:

- Reviewing the three existing thermal units (Fomboni);
- Rehabilitating a micro-hydro-electric plant in Miringoni;
- Decommissioning the Nimachoi thermal power station;
- Increasing diesel storage capacity from 40 to 100 m$^3$ in Fomboni;
- Providing a 30-day fuel reserve;
- Connecting 20 km of medium voltage lines to complete the distribution network;
- Renovating 7 km of medium voltage lines (MV);
- Renovating 10 km of low voltage lines (LV);
- Rehabilitating the 20 KV station in Fomboni;
- Installing 5 new transformers;
- Renovating electric metres; and
- Installing condenser batteries.

With regard to various project components, and given that most of the rehabilitation and extension works on electricity production units will be carried out within the existing plants and other facilities, the environmental and social impact will mainly exist during the construction phase.

The main environmental impact is related to the risk of soil, water and air pollution, as well as bio-diversity degradation of areas directly affected by the passage of MV lines (cutting and pruning of trees).

The project’s objective is in line with the country’s objective of reducing poverty. Indeed, the rehabilitation and expansion of production facilities as well as transmission and distribution lines will bring about a reduction in the pockets of rural and urban poverty due to the unreliable source, which is characterized by very frequent technical load shedding by MAM-WE and EDA. The availability of power supply will result in development initiatives that will be beneficial, in particular, to women and the youth: establishment of SME and, small grocery stores, organization of crafts and trades (sewing, embroidery, hairdressing, carpentry, sawmilling, metalwork, painting, vehicle bodywork, plumbing, welding), better time management for women (fewer daily errands and chores relating to fuel wood -gathering,
..., cold chains (good food and vaccine preservation...), security lighting, media use (television, internet, computers, etc..), school lighting.

Power supply will also help in upgrading various sectors of the nation’s economy and development.

**B. Major environmental and social impact**

**Temporary positive and negative effects of the works**

**On the physical environment:**

The impact will include the pollution of the soil and water system through leaching of soil contaminated due to leakage of hydrocarbons, oils and other lubricants from construction equipment or transformers and by solid and sanitary and other waste from the work site.

Air pollution by exhaust fumes from project vehicles and noise generated. These effects will not be significant in most cases, given their distance from the residential areas, the limited areas they affect and their short duration.

**On the natural environment:**

The impact on local fauna and flora will result mainly from the building of MV lines that may involve pruning and sometimes the destruction of vegetation to protect new lines against the risk of damage.

The impact on the flora will be very limited given the location of MV lines along the road away from protected areas or areas with ecological value. This will be a factor limiting the impact on the remaining endemic flora; however, a number of trees must be felled, particularly at certain higher altitudes. The project will provide compensation for the loss of trees and will initiate the process of obtaining cutting permission from the Directorate General of the Environment. It should be noted that the LV / MV lines will be insulated cables and will therefore not require a utility corridor. Tree losses are mainly due to pruning or felling to protect the lines.

Furthermore, the erection of MV/LV poles or pylons will not be an obstacle to the movement of wildlife or livestock, but will have a potential impact on bats and large birds with risks of electrocution and accidents.

The Comoros has 324 transformers spread across the three islands (238 in Grande Comore, 73 in Anjouan and 13 Moheli). 35% of devices (114 facilities) were tested through colorimetry. It turned out that six devices were contaminated with PCBs (> 50ppm) and 84 are not contaminated (<50 ppm). The use of PCBs in electrical equipment was banned and phased out in the early 1980s, replacing it with mineral oils that are less dangerous to health and the environment. The management of end-of-life equipment is problematic, resulting in increased environmental contamination. Specific measures have been proposed (improving maintenance operations, permanent replacement of PCB-contaminated transformers, and storage of contaminated transformers in a given location to be exported for processing in a third country in accordance with the Stockholm Convention).
On socio-economic aspects:

The major positive impact of reinforcing and rehabilitating power generation facilities and transmission lines is that of affording MA-MWE and EDA a reliable source of electricity, thereby minimizing load shedding that is currently commonplace. Securing energy supply will have a very significant positive impact on socioeconomic activities of the population in the catchment areas, especially with new network extensions. The new lines will help the authorities cope with growing demand for energy and will thus have “economic effects” and “social effects” on economic growth. Small business owners and craftsmen will better equip themselves, diversify their professional activities and provide better quality services. Agricultural production will benefit from cold chains working 24/7, processed foods (canned vegetables, tomato puree, fruit juice, etc...) and livestock products (meat, milk, butter, curd, etc...) will be better upgraded and losses currently incurred due to poor conservation significantly reduced. Women will have this new energy supply which will lead to the modernization and development of the cities served and improve the quality of life. Education and health (e.g., maternity ...) facilities will better meet the population’s needs. Currently, livestock activities, market gardening (processing of tomatoes and other vegetables; preservation of fresh vegetables, etc.) and fruit farming suffer huge losses because they cannot develop without a cold chain running on a reliable electricity supply. Significant production losses are currently being registered.

Handicrafts cannot develop due to the lack of the energy required (frequent power cuts) for water supply (borehole operation), lighting (safety and evening activities) or operation of work tools (moulding or pounding of cassava, maize, rice (real repetitive chores), sewing and embroidery, hairdressing, saponification, dyeing, literacy, operation of health and community centres and services (video games, media, mobile phone recharge etc..).

Gender and Youth:

The situation of women and youth will improve due to the project’s major positive impact on employment. Organizing mini-credit schemes for their benefit, grouping them into cooperatives and providing micro-credit will enable them to develop their crafts while organizing the marketing channels. In rural areas covered by the project, women's activities are primarily focused on agriculture and they suffer huge yield and income losses due to shortages of the electricity that is essential in operating the cooling equipment and mechanized irrigation of off-season crops. Home comfort and hygiene, which are specifically ensured by women, also require adequate lighting and energy for the operation of equipment, including for water supply, fridges, media such as TV, radio, phones, video games, etc. Women will derive specific benefits from educational programmes resulting from the project, such as adult literacy. Women will also benefit from educational radio and television programmes intended for rural communities which will become more accessible.

The mechanization of repetitive tasks will help reduce drudgery in women’s work. The time freed up will enable them have access to informal education and to make time for other more rewarding activities. Children will also benefit: improved maternal care and a more motivating learning environment.

Improving the cold chain (better preservation of fresh food, vaccines, drugs, air-conditioning, etc...) will help preserve the Comorian population’s health, especially women, children and youths.
**Land-related components:**

Building new lines and rehabilitating existing lines will neither involve population displacement nor expropriation measures.

**Indirect Impact of the Project**

The project will not have indirect effects on the soil or water resources. The impact on the atmosphere will reflect on the climate due to expected reductions in greenhouse gas emissions, following a switch from fossil fuel use in thermal power units and other power generators to renewable energy.

The building of the power line will help improve the security situation along the road, given the obligation to maintain this infrastructure. The territories and districts will witness many development projects which will gradually be set up and make the region more attractive for an integrated approach to regional development. The sectors which will be particularly targeted are agricultural development, tourism and forestry.

**C. Optimization and Mitigation Programme**

**Optimization / mitigation measures during the construction phase**

**Concerning the physical environment:**

During the construction phase, MAMWE and EDA will take all measures to prevent erosion and restore the soil to its natural state after refilling trenches and completing the concrete foundations of the poles and pylons.

They will ensure only equipment that meets the manufacturer’s standards is used, avoid proximity to hospitals, schools, government offices, places of worship and use as much as possible electrical rather than pneumatic tools. They will also ensure they do not discharge effluent pollutants on the ground and in rivers, and will organize site sanitation and remediation works.

The prime contractors will, as much as possible, avoid altering the soil. They will conduct the stripping of top-soil before carrying out operations and rehabilitate the area after the works.

**Concerning the eco-systems:**

Mitigation measures consist in choosing work routes outside natural parks and natural reserves, avoiding the destruction of the forests and minimizing as much as possible the project rights of way.

The prime contractors will as much as possible replace the trees destroyed during the works, through compensatory tree planting. They will seek to create mechanisms that will enable large birds to find suitable and secure nesting on pylons. MV lines laid across valleys crossed by flocks of birds will be made visible through the use of devices.

They will prohibit the use of bare cables in new LV works and will systematically replace old bare cables to protect bats against the risk of electrocution.

There will be compensatory reforestation following the felling of fruit and other trees.
**Socio-economic and land-related components:**

- The prime contractor must implement a participatory approach to disseminate project information to secure the cooperation of the population involved.
- Where works are envisaged in cultivated fields, this should be after harvesting.
- Promote the use of local labour, sub-contract to local craftsmen.
- Make an inventory of those who might be affected by the felling of fruit trees or other trees as a result of the connection of new MV lines and compensate them.

**Health and Safety Aspects**

The works and components of this project will be implemented with MA-MWE and EDA resources.

- MA-MWE and EDA will regulate traffic in the works area.
- Residents will receive notification prior to the commencement of works concerning temporary problems of access to certain sites owing to the works organization and for security reasons. The sites will be permanently and fully marked out (sign-posts, flashing lights, etc...) in collaboration with municipal road services, etc... Detours will eventually be created.
- MA-MWE and EDA will ensure that waste from the works sites is recycled or dumped in controlled landfills.

However, if these two companies outsource part of these works, the selected contractors will be required to take into consideration the recommendations set out in the Environmental and Social Management Plan on mitigating the adverse impact and enhancing positive effects:

- The company will take the necessary steps to minimize the scope of works and projects and reduce distance of the access to the roadway.
- Workers will have the equipment required for the works (protection against electric shocks, safety harnesses for high altitude works, helmets, gloves and insulated shoes, etc.).
- The contractor will be responsible for restoring the sites upon completion of works and disposing of waste generated during works, including the stripping of soil contaminated by spills and ploughing 50 cm of the soil compacted by machinery;
- The contractor will provide guarantees for the good working condition of construction equipment in compliance with the manufacturer’s standards, especially regarding leakage of fuel and lubricants, noise level and rate of emission of gaseous pollutants; and
- The contractor will provide sanitary facilities, if necessary, on works sites (toilets, drinking water, shelter, etc…) and manage waste.
**Long-term optimization/mitigation measures during the operational phase**

**Concerning the physical environment:**

During maintenance and repair works on various facilities, the operators will be careful to avoid any soil and air pollution. They will also ensure there is no discharge of pollutants into the water system.

Special attention will be given to the generation and management of solid waste, including hazardous waste (insulating oils contaminated or not contaminated with PCBs, soiled rags, chemicals, batteries ...). This waste will be transported to the hazardous waste storage facilities to be provided in line with this ESMP.

**Ecosystems and bio-diversity:**

Operators will perform maintenance works only on restricted environments or within already existing facilities. They will undertake to restore the sites after operations, especially for works relating to the transmission line.

They will also ensure regular pruning of trees to ensure their preservation and maintain devices enabling large birds to find suitable and secure nesting on electricity pylons.

**Socio-economic aspects:**

The major positive impact resulting from the provision of reliable energy will be socio-economic and will involve the development of local crafts and all economic sectors (agriculture and stockbreeding and their processed value-added products dependent on cold chains; sawmilling, carpentry, metalwork, sewing, embroidery, hairdressing, saponification, oil milling, etc...).

To mitigate the risk of limiting access to electricity for the poorest families, MA-MWE and EDA must adopt promotional prices for the poorest, taking into account marginal families (women heading households due to divorce, widowhood, the disabled, pensioners, etc...). The new facilities will be equipped with "prepaid" metres.

**D. Monitoring Programme and Related Initiatives**

It is the responsibility of the two units involved in environmental and social aspects (to be created in MA-MWE and EDA) to verify the proper implementation by the contractors of the environmental and social impact mitigation measures contained in the ESMP. Their periodic inspection report will be forwarded to the AfDB and other competent authorities; they will include their observations and comments on the relevance and feasibility of impact mitigation and compensation measures contained in the ESMP.

The environmental and social monitoring programme will be under the responsibility of the prime contractor or under its direct control, if there is a sub-contractor. Its nature and aspects covered in this programme will depend on the scale of the works to be carried out.

This programme will involve monitoring general measures (informing neighbouring population, employment conditions as relevant, site marking, and proper application of safety rules). The programme will also involve the monitoring of measures on soil quality and structure, protection of water resources, solid waste management, bio-diversity protection and private property and human environment protection.
A bi-monthly environmental and social monitoring report will be published by MA-MWE and EDA during the construction phase. During the operational phase, this report will be published at six-month intervals.

Capacity building will be required, to enable various actors (Energy Department, MA-MWE, EDA, Environmental Department...) to be in a better position to carry out their responsibilities. This capacity building effort will be carried out through training/sensitization of parties involved in environmental evaluations specific to the sector.

The Comoros has a strong tradition of community or association management. Successful management of any electricity and environmental impact management initiative must involve the community. Its involvement from the start-up phase is highly recommended.

Presentations of the project and environmental measures and particularly of the constraints relating to these measures will be organized before the commencement of works by a Community Relations Officer.

Awareness campaigns on the benefits of the project will be scheduled, with emphasis on protecting metres (against fraud) and bills payment.

The project will place at the disposal of local authorities and businesses an international assistant to support the teams that will be created in implementing the actions recommended in this ESMP including:

- Supporting the capacity building of various parties involved;
- Supporting the proper formulation and establishment of good environmental, social and safety procedures;
- Monitoring environmental and social performance as well as staff health and security;
- Monitoring sensitization actions and participatory approach with the population as part of project components
- Supporting the adoption of environmental management systems and workplace health and safety by the two companies - MA-MWE and EDA, in accordance with international standards

E. Institutional Measures and Capacity Building Needs

MA-MWE and EDA do not have a unit or section dedicated to the environmental and social monitoring of their projects. To address this situation, a technical and administrative unit must be set up within these two companies and its role will include:

- Catering to the company’s environmental dimension of production, transmission and distribution activities from the project design phase;
- Designing the content of environmental and social components of future projects, foreseeing the potential impact and identifying the appropriate support measures;
• Producing ESMPs for new projects;

• Carrying out environmental and social monitoring of projects being financed in the field of electricity generation, transmission and distribution;

• Taking into consideration the social dimension of transmission and distribution projects; impact of electricity pricing on the population’s level of poverty, organizing expropriation for public purposes, moving and relocating families, providing legal compensation, socio-professional support at new housing sites, etc.;

• Sensitizing contractors and the population on their environmental protection role;

This unit will be responsible for environmental and social follow-up and monitoring of this project; in this regard, it will be the Bank’s contact party for the successful implementation of the environmental and social component.

The officials of this unit could undergo training.

The MA-MWE and EDA should also recruit or appoint an in-house security officer to ensure implementation, follow-up and sensitization of security officers under the security component (purchasing PPE, PPE use by security officers, accident response, formulation of safety indicators ...).

The Energy Department (supervisory authority of the two prime contractors) should appoint or hire a Community Relations Officer in order to implement the information, consultation and public awareness programme under the ESMP.

F. Public Consultations and Information Dissemination Requirements

The views and concerns of those living in the project impact area have been noted through discussions and interviews. Three stakeholder groups have been identified:

• The local population, comprising traders, road users, district and village residents, etc...);

• Local authorities;

• Civil society and NGOs

Through the various discussions, great expectations were expressed at all levels (he authorities, civil society, NGOs and the population heard) regarding the indisputable need for access and regular supply of electricity.

All concerned are aware and convinced that facilitated access to electricity will help make life easier for the population and preserve their health and support the country’s educational system.

This project will also help in preserving the environment by reducing deforestation-related problems affecting the forests of the three islands, with the use of wood as an energy source (heating, kitchen, distilleries ...).
The success and sustainability of such a project is dependent on the involvement of all parties concerned, including the role of NGOs and the civil society in sensitizing those who will derive benefits from its implementation.

G. Cost Estimates

All environmental impact mitigation costs during the construction phase will be included in the contract costs (Protection against soil, water, air pollution, etc.)

Total ESMP cost therefore stands at EUR 314,000, comprising:

- The cost of building the two oil, transformer and hazardous waste storage facilities, is estimated at EUR 100,000;
- The costs of support measures such as raising public awareness of project benefits and of the risk of accidents and the implementation of the participatory approach, is estimated at EUR 15,000;
- Capacity building cost is estimated at EUR 20,000;
- The cost of recruiting an international expert is estimated at EUR 64,000;
- Costs related to the creation of an environmental management system: EUR 10,000; and
- Costs of reforestation and compensation for loss of vegetation are estimated at EUR 105,000.

H. Implementation Schedule and Report Preparation

The project implementation team will put in place environmental mitigation and enhancement measures and activities. The schedule of implementation of these activities and reporting are the same as for similar to the project implementation schedule.

The AfDB will also conduct a detailed project implementation review during its monitoring missions. The reports provided by the project team must include the physical outputs, environmental impact assessment forms and the audits conducted. These reports will be submitted annually to the Bank.