

SUMMARY OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Project Name : ELECTRICITY TRANSMISSION AND DISTRIBUTION NETWORK DEVELOPMENT PROJECT

Country : Cape Verde **Project No.** : P-CV-FA0-002
Department : ONEC **Division** : ONEC.3

A. BRIEF PROJECT DESCRIPTION AND KEY ENVIRONMENTAL AND SOCIAL COMPONENTS

Context and Key Components

Cape Verde aims to concentrate the generation of electricity on each island through the installation of stronger power production points, thus putting an end to the operation of older plants that have become inefficient in terms of production and environmental friendliness. Concentrating production requires that transmission and distribution networks fully cover the different islands and that they guarantee high levels of reliability preventing or minimizing the duration of power outages.

This implies: (1) rehabilitating existing plants: high levels of deterioration have occurred in the installations located on the seafront - mainly low voltage (LV) networks, although there are also cases of severe deterioration of medium voltage (MV) networks; (2) harmonization of power transmission and distribution lines: currently, there is no power transmission or distribution line whose voltage is above 20 kV. MV facilities operate at 20 kV (standard voltage), but there are several areas where they operate at 6, 10 or 15 kV. Therefore, this results in a high loss rate during transmission and distribution (up to about 25%); and (3) modernization of equipment such as the currently defective protective relays which cause and even worsen the duration of power cuts.

To improve the above situation, the Government of Cape Verde plans, with support from the Japan International Co-operation Agency (JICA) and the African Development Bank (ADB), to implement this project to interconnect and distribute electricity in six islands of Cape Verde, comprising: (i) the extension of the medium and low voltage (MV/LV) distribution network for urban development purposes; (ii) the electrification of rural communities; (iii) the interconnection of isolated electricity distribution networks (establishment of a closed loop system); (iv) the strengthening of MV network to meet future demand; and (v) the rehabilitation of existing MV/LV networks.

ISLANDS	NATURE OF WORKS PLANNED
Santo Antão	Extension, strengthening and rehabilitation of the rural distribution and electrification network
Sao Vicente	Extension, strengthening and rehabilitation of the distribution network
Sal	Extension, strengthening and rehabilitation of the distribution network
Maio	Extension, strengthening and rehabilitation of the distribution network
Santiago	Extension, strengthening and rehabilitation of the rural distribution and electrification network
Fogo	Extension, strengthening and rehabilitation of the rural distribution and electrification network
Sao Vicente, Sal, Santiago	Installation of Supervisory Control and Data Acquisition (SCADA) systems for monitoring, fault detection and management of distribution networks

The project will not introduce any new power-generating equipment; rather, only existing facilities will be used. This project does not specifically target gender issues although it implies gender parity. Women are particularly active and will be the project's main beneficiaries. The expected environmental impact will be insignificant in light of the safeguards taken into consideration (underground cables, timber poles, modification of tracks, etc.).

Institutional E&S Issues

The General Directorate of Environment (DGA) in the Ministry of the Environment, Rural Development and Fishery Resources is responsible for validating the environmental impact assessment (EIA) of projects in Cape Verde. The DGA comprises three Departments: the Department of Legal Services, Inspection and Assessment of Environmental Impact, the Department of Natural Resource Management and the Department of Information and Environmental Quality Supervision.

Legal Provisions

The project's environmental impact assessment was designed to meet both the requirements of national and international legislation in this area, especially those laid down by the African Development Bank Group. The main statutory provisions concerning these requirements are: The fundamental environmental policy (Law No. 86/IV/93) lays the foundation for Cape Verde's environmental policy. This policy is based on the principle of prevention, which consists in reducing or eliminating the causes and correcting the effects of actions or activities that could adversely affect the quality of the environment.

Decree-Law No. 14/97 of July 1 aims to optimize and ensure the use of natural resources, both qualitatively and quantitatively, as a basic premise for autonomous sustainable development and for guaranteeing the right of citizens to live in a healthy and an ecologically balanced environment. It also makes it a duty to safeguard and preserve the environment by conferring on the State and municipalities the responsibility to improve the quality of life for both the individual and the community.

Decree-Law No. 29 of 6 March 2006 defines the legal framework for assessing the environmental impact of public or private projects that are deemed likely to affect the environment (as is the case with this project), as well as procedures, conditions precedent and specifications that should be fulfilled for projects to be authorized and approved. This implies the submission of projects to the ministry or State agency responsible for the environment. Given the current set-up of the Ministry of Environment, Rural Development and Fishery Resources, which is responsible for environmental issues in Cape Verde, the process should be submitted to the General Directorate of Environment for appraisal and approval.

In view of their importance to the legal framework of the project and preparation of this study, other recent laws were also analysed, including the legislative decree concerning: (i) natural areas, landscapes, monuments and other spaces; (ii) cultural and natural heritage; (iii) forest-related activities; (iv) municipal, industrial and other solid waste; (v) air and water quality; (vi) territorial asset and land management; (vii) zoning of urban areas and standards for land use by public and private entities; (viii) exploitation of inert materials (sand dunes, etc.) and key environment-related conventions ratified by the country, namely those concerning desertification control, climate change, biodiversity, protection of the ozone layer,

exploitation of fishery resources, oil pollution and persistent organic pollutants, to name a few.

Project Beneficiaries

The project will improve the quality of electric supply and, for the same reason, the quality of life on the six islands covered. It concerns 94% of the total population living on these islands. The islands of Santiago, Santo Antao and Sao Vicente, totalling more than 80% of the country's population, have a poverty rate of between 30% and 45%. The intended beneficiaries of the project are households, government services and local economies of the six islands. Businesses, particularly in the tourism sector, will expand with the improved business and job opportunities.

The power company (ELECTRA) will directly benefit from: (i) the reduced network energy losses and the replacement of over 26,000 meters, in commercial and financial terms; and (ii) the introduction of the SCADA system, which will significantly improve the operating conditions of networks (the duration of works). More specifically, the project will be beneficial to the 50 rural communities that will be electrified.

B. MAJOR ENVIRONMENTAL AND SOCIAL IMPACT

Positive Impact

From an environmental perspective: (i) the replacement of overhead lines by underground lines (Sao Vicente Island) will mitigate the impact on the landscape and wildlife; (ii) closing down production plants - for example, in Ribera Grande (Santo Antao Island) - will reduce noise and pollution in the city centre; (iii) modernizing the network will decrease the number of accidents; and (iv) consistent monitoring of the networks will help to ensure supply security while reducing the duration of load shedding, the number of power cuts and the use of generators by private producers.

The expected project benefits during the works construction and operation phases are:
During the construction phase, in the vicinity of the sites:

- income generation through the creation of temporary jobs;
- development of small businesses (food, clothing, etc.); and
- increased income through the procurement of local and imported materials sold on the domestic market.

After the project implementation, the following positive impact is expected:

- improved quality of life through the possibility of using electrical appliances and lighting of homes;
- improved security, thanks to public lighting;

- increased economic activities stemming from the development of businesses, mechanization and electrification of stores and workshops;
- access to information services (new technology, TV, etc.); and
- improved performance of administrative and social services as well as economic operators based in the project area (better working conditions, possibility of IT equipment, communication facilities).

The consistent monitoring of networks, the introduction of the SCADA system and the strengthening of network capacity (from 6 to 33kV) will help to: (i) improve the technical performance of the network; (ii) increase transit capacity for electricity application; and (iii) reduce the frequency and annual duration of load shedding. The project is expected to cut down load shedding hours from 751 in 2010 to 102 hours in 2016. The improved technical performance will enhance the living standards of the population by ensuring uninterrupted power supply to health and educational facilities, productive activities and key sectors, including tourism - all of which will have an impact on business opportunities and job creation.

Negative Impact

The main negative impact stems from the following activities during the construction and operation phases:

1. Construction Phase

Laying of overhead lines

- There are no plans to open up of access paths for placement of poles.
- Poles will be of timber, with a height of from 8m (for LV lines) to a maximum of 12 m (but mostly 10 m). Low voltage (LV) poles will also be used in some cases to install street lighting.
- LV lines will normally consist of twisted cables. These are insulated cables and each pole will bear a single cable. Medium voltage (MV) cable lines will consist of bare (non-insulated) conductors and have three separate conductors per pole.
- Without prejudice to the safety distances for the special cases provided for by the regulations, the minimum distance of cables from the ground will be 5 metres for LV lines (insulated twisted cables) and 6 metres for MV lines (bare cables).

Laying the underground lines

- Underground lines will normally be laid along streets or roads.
- The works may disrupt traffic and the movement of pedestrians.

- The cables of underground lines and their connections will be insulated so that they can be laid even in flood zones.

Rehabilitation of existing lines

- Rehabilitation of lines will require the replacement of some components (stations, insulators and cables).
- In all cases, these works will entail access by personnel and equipment to existing lines. As with new overhead lines, there are no plans to open works access paths.
- Rehabilitation will substantially reduce the interval between operations on the currently degraded lines, which is advantageous in terms of reducing the presence of workers along the track of these lines.

Installation of transformer substations and/or switching substations

- The installation of new transformer or switching substations in brickwork cabins will involve the performance of civil works and the use of common construction methods and materials.
- These cabins are normally in urban areas. There are no plans to open access paths specifically to them.

Rehabilitation of transformer substations and/or switching substations

- Removal of obsolete equipment produces metal materials that may be recycled (steel and copper, in particular).
- However, some transformers may contain oils that are contaminated with polychlorinated biphenyls (PCBs). If it turns out that some transformers actually contain PCBs, special measures should be taken for their packaging and ultimate removal to prevent environmental and public health risks.

Procurement of land for the installation of infrastructure:

- The installation of secondary stations and poles require that land be acquired or that compensation be paid for the land occupied.

2. Operational Phase

Infrastructure operation and maintenance

- When operating at a maximum 20 kV, the lines affected by the project will produce weak electromagnetic fields.
- Transformers, most of which are placed in closed brickwork cabins, emit low levels of noise.
- The presence of live lines and equipment will always entail electrical hazards.
- The operation and maintenance of the infrastructure inevitably calls for the presence of a few people for routine checks and maintenance or repairs. One of the project objectives is precisely to improve network reliability and reduce the number (and duration) of power failures. In addition, the project aims to reduce the energy loss currently observed, as well as electrify areas that are not yet served by the power grid.

The summary table below indicates the scope of potential adverse environmental and social impact by type of impact.

Impact	Construction	Operation
Air pollution		
Water pollution		
Noise and vibrations	B	
Waste/Scrap	B	
Soil contamination		
Protected areas/biodiversity	B	C
Hydrology		
Soil erosion/landslide	B	
Landscape	C	C
Infectious diseases	B	B
Accidents/safety	B	B
Lifestyle/income		
Involuntary resettlement (§ f)		
Land acquisition (§ f)	C	C
Cultural sites (§ f)	C	C

Legend : Significant potential impact, B: Some impact; C: Existence of unknown impact;

No mark: Negligible

- *Air pollution*: an amount of air pollutants will be emitted by vehicles during the construction phase. However, the impact is negligible since: (1) there are virtually no major air pollutants in Cape Verde, so cumulative effect is negligible; and (2) construction works will be completed within a short time and thereafter no pollutants will be emitted by transmission and distribution equipment.

- *Water pollution:* there are no concerns about water pollution stemming from the construction of transmission and distribution lines, as well as secondary substations.
- *Noise and vibration:* the construction works will cause noise and vibration, mainly during the installation of underground lines. However, this impact is not permanent (line installation) and when the work is completed, the transmission and distribution equipment will not cause any noise or vibration.
- *Waste/debris:* At the works phase, the excess soil extracted during installation of poles, transformers and replacement lines, as well as fluids and oils from old transformers are the identifiable waste and debris.
- *Soil contamination:* the construction of power transmission and distribution lines, as well as secondary substations, will not cause any soil contamination.
- *Protected areas and biodiversity:* Protected areas in Cape Verde were created by legislation, but the official boundaries of all such areas are yet to be defined. However, there is no identified negative impact of the project on protected areas: the removal of some vegetation and minor cases of tree cutting during the construction of the power transmission and distribution lines may cause some impact on protected areas and wildlife. As for the overhead lines, the small size of their base and foundations, and the fact that there are no plans to open access paths during works implementation or for subsequent maintenance operations allow us to situate possible negative impact only at the level of birds. Bird collision with cables remains a possibility (with electrocution occurring in the case of MV lines built with bare conductors. However, with LV lines, the common solution entails the use of insulated twisted cables). These phenomena are always associated with the impact of overhead power lines on bird life. It is worth pointing out that birds are given great importance in many islands of Cape Verde, leading to the demarcation of Important Bird Areas (IBA) by the competent international agencies.
- *Hydrology and groundwater:* the construction of power distribution lines and secondary substations will not have secondary adverse impact on hydrology and groundwater.
- *Soil erosion and landslide:* Soil erosion may be caused by construction works when power distribution lines are built in mountainous areas or slopes. However, given the small scale of excavations for the foundations of poles, for which there are no plans, to open access to temporary work fronts, the impact of these risks is negligible. The construction of underground networks along existing roads should have no impact on the erosion process.
- *Landscape:* A key aspect of the environmental impact of overhead power lines is its integration into the landscape. This indicator, which refers mainly to the perceived "scenic and functional quality" of a given area, is one of the important aspects to be analysed in projects that may affect the landscape. The small scale of the overhead infrastructure (in particular, the diameter and

height of poles and the diameter of cables) and the material of poles (timber), except in some specific situations (anchoring, very high peaks that may require the use of metal poles), which shows that, overall, the new overhead lines will have a very low visual impact. Obviously, this question does not arise with regard to underground lines.

- *Accident and safety*: there is a likelihood of accidents during construction: (i) traffic situation caused by construction vehicles; and (ii) failure of power lines and electric shocks caused by the broken lines.
- It should be noted that no significant impact is expected on built cultural heritage, in areas that have a great tourism potential owing to their excellent geographic conditions and scenic value, such as the Integrated Tourism Development Zones (ZDTI). The project will have no negative impact. Instead, during the installation of new lines and the renewal of old ones, these high energy consuming areas will be taken into account. *Infectious diseases*: HIV prevalence in Cape Verde is relatively low, estimated at about 0.8% in 2007. However, the possibility of spreading HIV and other infectious diseases during the construction phase is undeniable.

Global Warming – Climate Change

Mitigation: The improvement of technical performance in the wake of the infrastructure and the system to be installed should lead to a reduction in energy losses and greenhouse gas (GHG) emissions at source. This reduction was estimated at 3,396 tCO₂/year and will be monitored throughout the project by using the JICA calculation methodology and parameters. In addition to reduced GHG emissions induced by increased system efficiency, there will also be fewer internal combustion engines and less use of firewood in some mountain areas.

Adaptation: Climate change and variability will cause unexpected changes in energy demand, which may put a strain on these systems. For instance, the excessive demand for air conditioning in hot weather will affect energy distribution efficiency. The installation of the Supervisory Control and Data Acquisition (SCADA) system as well as the modernization and strengthening of the capacity of lines will help to meet these increased needs.

In flood-prone areas (Riberia Grande), or areas very close to the coast, provision was made for the secondary stations to be raised by a few tenths of a centimetre to minimize risks.

To mitigate the impact of storms and sea air on electric installations (breaking of cables, oxidation of poles and equipment), technical decisions were taken, including the choice of materials: burial of distribution lines (Ponta do Sol) and transmission lines (north coast of San Antao). To avoid the effects of North winds, timber poles were used, thereby preventing the common phenomenon of metal pole corrosion.

Gender Issue Analysis

Generally, the project is for all. However, it is expected to offer women specific benefits, in particular: (i) increased security by providing more than 5,100 public lighting points; (ii) increased opportunities for small businesses, including in processing and conservation

activities requiring the use of electrical equipment; and (iii) lightening the burden of household chores through the possibility of using appliances. These benefits are particularly important in rural areas where many women assume the role of household head (in about 60% of households). Moreover, young people will spend more time on their studies in the evening and may carry out extracurricular activities.

Land Requisition and Compensation

The project will not entail the relocation of people during construction. However, some land requisition will be necessary to enable the organization of works (construction of transformers and installation of supports). In the requisition, preference will be given to negotiation with private owners of land crossed by the infrastructure, in accordance with the provisions of Legislative Decree No. 3/2007, especially if farmers whose properties are crossed by the lines suffer loss of earnings due to the requisition of surfaces used for erection of supports.

To determine the amounts needed for land acquisition, estimates of the number, type of poles, and the surface areas taken up by type of poles were made for each island and are presented in the following table.

Areas and estimates:

ITEM	Area (m2)	St Antão	São Vicente	Sal	Maio	Santiago	Fogo	Total	Amount in Euros
Construction of a 4x4m ² cabin for an urban transformer substation	16	13	28	3	9	12	11	76	36,480
Construction of a 4x6m ² cabin for an urban transformer or switching substation	24	0	1	1	1	0	2	5	3,600
Construction of a 4x8m ² cabin for an urban transformer or switching substation	40	0	1	3	0	1	0	5	6,000
Construction of a 4x10m ² cabin for an urban transformer or switching substation	50	0	0	2	0	0	0	2	3,000
Construction of a 10x30m ² cabin for an urban transformer or switching substation	300	0	0	0	0	1	0	1	9,000
1.5x1.5m ² foundations for the mounting of overhead transformer substations on poles	2.25	6	0	0	2	27	9	44	2,200
1.5x1.5m ² foundations for MV metal poles	2.25	13	0	0	15	58	41	127	6,350
1x1m ² foundations for MV timber poles	1	163	0	0	107	453	219	942	47,100
0.8x 0.6m ² foundations for LV timber poles	0.64	673	2410	1322	300	5988	2042	12735	87,030
TOTAL PER ISLAND (m²)		844	2054	1138	505	5009	1862	11413	200760

Amounts by surface type:

Land acquisition in urban areas for construction (secondary stations)	EUR 30 per m ²
Land acquisition in rural areas for construction (secondary stations)	EUR 50 per m ²
Medium voltage poles (in rural areas)	EUR 50 each
Low voltage poles (in rural areas)	EUR 10 each

The grand total amounts to EUR 230,000 - of which EUR 200,000 for land acquisition and EUR 30,000 for compensation. These amounts will be deposited in a suspense account reserved exclusively for land acquisition and damage compensation.

The Power Project Management Unit (UGPE) undertakes to carry out acquisitions prior to the works implementation. Such acquisitions must comply with best procurement practices. In this respect and following a participatory approach, it might be possible with the consent of the land owners concerned, to channel the amounts agreed towards the provision of public services (public lighting, dispensary, etc.), and not make payments to individuals.

C. ENHANCEMENT AND MITIGATION PROGRAMME

The following table presents general recommendations for mitigating any negative impact, applicable to all project interventions.

These measures are intended to proactively prevent or minimize any negative impact. In the few cases where that is not possible, the recommended measures are intended to correct the impact (where action is taken to tackle the adverse or unfavourable effects, bringing them down to acceptable levels) or to compensate (where they apply to unavoidable impact, the conditions prior to such impact will either be restored, replaced with similar resources or habitats, or compensated for).

The following table lists the officials responsible for implementing each measure, which is an important aspect aimed at defining the monitoring programme.

ACTIVITY COMPONENT	MEASURES	Responsibility
PLANNING AND PROJECT		
Erecting infrastructure	On parcels of land belonging to individuals; effort should be made, as much as possible, to ensure that the poles are planted on locations agreed upon with the owners.	Electra Electra
Land procurement	Give preference to negotiations with private owners of land crossed by the infrastructure, in accordance with legal provisions (Legislative Decree No. 3/2007) and ensure that the process is initiated in due time.	DGPCP
Work planning	The work planning should ensure that no activity involving earthworks takes place during the rainy season. Furthermore, the preferred habitats of the Cape Verde warbler (<i>Acrocephalus brevipennis</i>) are cane fields located near areas with high soil moisture, valleys and banks of temporary streams. If a branch line or pole is located in cane fields, this habitat should not be cleared, nor should poles or lines be installed during the nesting season (February to March and from June to November). This measure should be implemented, particularly on islands inhabited by this bird species and where the project expects to carry out works of that nature: Santiago and Fogo.	Contractor
CONSTRUCTION		
General		
Relations with the population	Establish a mechanism for communicating with the population, including (see a more comprehensive description in the part dealing with this point): holding of public meetings in each municipality where works are scheduled to take place, prior to the start-up of works: <ul style="list-style-type: none"> the establishment and circulation of a telephone line and an email address for receiving inquiries, comments and complaints; analysis and monitoring of contacts received; and provision to the population of regular information on work progress and their implications. 	UGPE, with the participation of Electra, the Contractor, the Control Unit and the Environmental Consultant
Relations with other stakeholders	It will be necessary establish close links, from the planning to the construction phases of the project, with local councils, the Highways Institute and operators of linear infrastructure (e.g. telecommunications), which may be affected by the project or influence its implementation. Special attention should be given to interventions in areas where there have been recent works that could be covered by a performance guarantee.	Idem
Labour recruitment	Give preference to the use of local and regional labour (of each island), provided that is consistent with the requirements of good workmanship.	Contractor
Staff training and sensitization	At the beginning of works, there should be provision for training and awareness-raising intended for the project teams to improve their understanding of the attitude to adopt to prevent or minimize the impact of their activities on the environment and promote good relations with the local population. The Contractor will provide these training and awareness sessions, with a systematic record of attendance and contents. Topics addressed should include the following: <ul style="list-style-type: none"> Environmental impact of works, good practices, preventive and corrective measures to be adopted; Rules and procedures for waste management at construction sites; 	Contractor

ACTIVITY COMPONENT	MEASURES	Responsibility
	<ul style="list-style-type: none"> • Safety risks associated with the works, and preventive attitude to adopt; • First aid and what to do in case of accident; • General standards concerning relations with the local people; • Risks and prevention of sexually transmitted diseases. The training and awareness sessions should be organized whenever new workers are recruited. <p>During the works and after the monitoring and control exercise, additional training and awareness activities may be necessary if it happens that the previous sessions had failed to achieve the desired effects.</p>	
Demarcation, signing and closing of worksites	Proceed with setting up warning signs at worksites to limit the access of persons, machinery and equipment into areas so defined and confine the works related to the construction process to the areas of intervention.	Contractor
Access to private property	Regardless of the procedures for acquiring private land for the project, the performance of works on or even the crossing of private property shall be subject to prior notification of the owners and conducted in such a manner as to minimize damage to crops or other property on the land.	Contractor
Discovery of relics	In the unlikely event of discovery of historical relics, the works will be interrupted and the discovery notified to the local authority responsible for cultural heritage in order to determine the appropriate course of action. The head of the company concerned will ensure the collection and recording of all data.	Contractor
Restoration of sites	After the infrastructure has been put in place and the construction sites and equipment depots cleared, the sites should be rehabilitated without undue delay, unless there are plans for future use requiring that such sites be left in their current state.	Contractor

ACTIVITY COMPONENT	MEASURES	Responsibility
As-is drawings (maps at project completion)	Preparation of as-built drawings, with details of the location and tracks of overhead and underground lines. These as-built drawings must be signed by the designer and verified by the Control Unit.	Contractor, with the participation of Electra and the Control Unit
Installation and operation of worksites		
Location of sites	Construction sites and equipment depots should be set up preferably in places already equipped with infrastructure in order to avoid interventions in untouched areas of high ecological or natural value. They should not be located near homes, schools or other sensitive receptors or in flood-prone areas or areas involving the destruction of tree vegetation of botanical or landscaping importance.	Contractor
Storage and handling of hazardous substances	Oils, lubricants or other substances likely to contaminate surface or ground water and soil should be stored or handled in premises specially designed for this purpose, in order to protect the environment and human health. If the handling of oils and fuels is necessary, demarcated and waterproofed areas that may contain any spills must be provided.	Contractor
Drainage and maintenance of equipment	Drainage and maintenance of equipment should not be performed at the work site but in workshops set up for that purpose. However, if these operations must be done at the work site, due precaution must be taken to avoid soil and water contamination. Waste from these operations must be collected and conveyed to recycling, treatment or disposal centres.	Contractor
Waste and wastewater management	Worksites will have adequate sanitation facilities for the number of workers. Wastewater produced by the sanitary facilities and all other contaminated wastewater produced on site must be drained and, if the type of contamination so requires, treated before being discharged into the receiving environment. Wastewater discharge must be authorized in accordance with legal requirements (Decree-Law No. 8/2004).	Contractor
	Work sites should be equipped with appropriate technical facilities for storing the various types of waste, pending their removal. In particular, it must be ensured that the various types of waste are properly identified, and that they are neither mixed nor exposed to weather conditions which could cause their degradation or lead to soil, water or air contamination.	Contractor
	Waste produced by works must be sorted and placed in suitable containers to be transported to the storage site under proper conditions. After their reception, while waiting to be conveyed to recycling, treatment or disposal centres run by duly authorized operators, the various types of waste should be stored in compliance with the above instructions.	Contractor

ACTIVITY COMPONENT	MEASURES	Responsibility
Washing of concrete mixers	The wash water from concrete mixers and concrete residuals that might be produced by the works should not be discarded on the ground, but should be collected and transported to a controlled repository where they will not harm the environment.	Contractor
Air quality and noise pollution	Care must be taken to ensure that all equipment, machinery and vehicles used for works and equipped with a combustion engine are in good working order, to limit undesired emission of air pollutants and noise nuisance.	Contractor
	Construction works that could cause noise should be performed only outside normal rest hours near residential areas. When noisy works must be carried out close to schools or other noise-sensitive receptors, working hours should be so scheduled as to limit the nuisance caused.	Contractor
	It is forbidden to burn in the open any kind of household, industrial and toxic or hazardous waste, and all types of scrap metal (Article 40 of Decree-Law No. 5/2003).	Contractor
Emergency response	Work sites will be required to have first aid resources (human and material) adapted to the foreseeable risks and the number of workers concerned. Staff should also be familiar with response procedures in the event of an emergency.	Contractor
	Locations used for the storage or handling of hazardous substances should have the necessary resources (absorbents - sand or sawdust, tools and containers for collecting spilled material) for a rapid response to spills to minimize the quantity of substances spilled and the size of the area affected. Staff assigned to these facilities should have special training on the handling of spills.	Contractor
	Locations used for the storage and/or handling of flammable substances must be provided with emergency fire response equipment (at least fire extinguishers that are appropriate to the substances concerned) and the staff should be trained in the use of such equipment.	Contractor
Installation of overhead networks		
Transportation of equipment	Equipment for overhead lines will be transported by existing roads up to the point nearest to the installation site. Thereafter, it will be transported manually to the site without opening up any access paths. When crossing the land between roads and installation sites, care should be taken not to damage vegetation, agricultural land or any other property on the land.	Contractor
Opening of foundations and erection of poles	Vegetation should be removed only in so far as strictly necessary for opening foundations for poles and for such other operations as may be performed at each spot.	Contractor
	Soils and rocks from uncontaminated excavation operations will be reused to erect the poles of overhead lines. Any such materials that cannot be reused are deemed to be waste and must be conveyed to its final destination. Its uncontrolled spread is prohibited in places where it could cause damage.	Contractor
	When erecting the poles, necessary precaution should be taken to minimize the impact on adjacent areas.	Contractor
Unrolling of cables	When cables are being unrolled, necessary precaution should be taken to prevent impact on tree vegetation, crops and other property on the land crossed by the cables. If necessary, temporary gantry-like structures should be used to facilitate crossings.	Contractor
Restoration or damage compensation	If the works on private property cause damage to crops or other property, the Contractor must proceed with the repair of such damage or, where this solution is not sustainable, with the fair and timely compensation of the owners.	Contractor
Installation of underground network		

ACTIVITY COMPONENT	MEASURES	Responsibility
Inspection of structures adjacent to the track of the lines to be installed	Inspection of structures adjacent to track where underground lines will be placed (and where the opening and backfilling of trenches as well as compacting operations will therefore be centred). These inspections must be performed prior to the start-up of works and after their completion. An inventory will be prepared (including photographs) to allow identification of any damage caused by the works and which should therefore be repaired.	Contractor
Management of material from digging trenches	Uncontaminated soil from excavations will be reused to backfill the trenches of underground lines. Any such soil that cannot be reused is deemed to be waste and must be conveyed to its final destination. Its uncontrolled spread is prohibited in places where it could cause damage.	Contractor
Disruption of pedestrian and automobile traffic	When trenches are opened along the road, they should be fenced off and warning signs placed at the worksites to ensure the safety of pedestrians, motorists and the staff carrying out the works.	Contractor
	There must be continued access to land and buildings located along trenches through installation of secure and clearly signalled temporary structures. This also applies to trenches that cut across the roadways.	Contractor
	Upon completion of the underground cable installation, the trenches should be resealed and the pavement repaired as soon as possible, to ensure its durability and the absence of irregularities that may present a traffic hazard.	Contractor
Replacement/renovation of existing infrastructure and equipment		
Management of disabled or replaced transformers	Transformers to be removed and replaced will be analysed for contamination with PCBs. In any case, such transformers will need to be removed and stored away to prevent the spilling of oil into the environment, until they are transferred to an operator qualified and authorized to conduct treatment. If they contain PCBs, extra care should be taken, given the hazardous nature of these substances. In particular: (1) prevent the spill of transformer oil. In case of spill, collect the oil right away, by scraping the ground that might have been contaminated, and store it in an airtight container; (2) transformers and containers with PCB-contaminated oil should be kept in an enclosed space, with a covered floor and protected against exposure to high temperatures; (3) storage of PCBs must be clearly marked, indicating the contact information of the person in charge of the storage; (4) the sealing of transformers and containers with PCB-contaminated oil should be monitored to avoid leakage; (5) the composite metals of transformers may be recycled only after decontamination by a duly qualified and authorized operator.	Contractor
EXPLOITATION		
Measures precedent to the operation of infrastructure		
Public information on electrical hazards, behaviour and preventive measures	Before switching on the infrastructure installed as part of the project, the neighbouring populations should be informed in good time, through public meetings and/or distribution of information leaflets. The information provided to them should focus on the electrical hazards associated with the infrastructure and the behaviour that would allow them to avert such hazards. The pupil population of these areas should be particularly targeted.	Electra
Access to private property	Maintenance operations should be carried out after notification of the owners of private land crossed by the lines and by mutual agreement. Where the intervention is an emergency rendering such notification impossible, due precaution should be taken to prevent the deterioration of private property and destruction of crops or any other property on the land.	Electra
DEPARTURE FROM WORKSITES		
Waste management	Waste arising from works should be sorted and placed in appropriate containers for transportation to the storage site under good conditions. After their reception, and pending their transfer to recycling, treatment or disposal centres run	Electra

ACTIVITY COMPONENT	MEASURES	Responsibility
	by operators duly authorized thereto, the various types of waste should be properly identified, and not mixed or exposed to the elements as that could lead to their degradation or cause soil, water or air contamination.	
Rehabilitation	After removing the structures erected during the project, it will be necessary to proceed with the rehabilitation of the areas affected, including the surroundings of the infrastructure, as well as the storage (if applicable) and construction sites. The exercise consists in restoring the environmental conditions and features that existed prior to the project implementation.	Electra

D. MONITORING PROGRAMME AND OTHER INITIATIVES

Given the impact analysis and the mitigative measures recommended, it would be advisable to indicate how the following activities should be implemented:

- Monitoring activities to confirm that these measures are effectively implemented; and
- Actual inspection activities intended to measure and assess the project impact on key environmental and social factors, as well as identification of additional mitigative measures that may be necessary in light of such measurement and assessment.

Before discussing these activities, describe the general project implementation framework, indicating its key stakeholders and their responsibilities in respect of the management of environmental and social impact.

Implementation Framework and Responsibilities for Environmental and Social Management

- The Power Project Management Unit (UGPE): Pursuant to Article 25 of Decree-Law No. 29/2006, the General Directorate of Energy at the Ministry of Tourism, Industry and Energy (MTIE), as the executing agency, is responsible for monitoring the project environment. An E & S focal point will be appointed in the UGPE, to be trained by experts from a consulting firm. In practice, the UGPE will play the role of client (knowing that the General Directorate of Energy is the official sponsor of the project). In that capacity, it will define from the outset the terms of reference applicable under the project with regard to environmental and social management, taking into account the legal requirements and those of the project funding bodies (ADB and JICA). The UGPE will be responsible for liaising with various government agencies involved in this process (particularly with the DGA, given its expertise in environmental matters and its functions in the EIA process).
- General Directorate of Heritage and Procurement (DGPCP): The DGPCP, an organ of the Ministry of Finance and Planning, will be responsible for the acquisition of private land needed for project implementation, in accordance with Legislative Decree No. 3/2007.
- Electra: In addition to its participation in defining interventions to be performed on each island, Electra will, as the project beneficiary, monitor the works and manage their interferences with the functioning of other networks. It is felt that Electra's expertise and contacts will greatly facilitate relations with the local populations.

Once the works are completed and the new infrastructure approved, Electra will incorporate it into its networks. It will be responsible for the operation and maintenance as well as the environmental and social management of the project.

- **Contractors:** Contractors (assuming that both lots will be awarded separately) will be responsible for carrying out the work under the supervision of the Control Agency. They will be the main actors in the production of environmental and social impact assessments during the construction phase.

They should have the necessary resources for works implementation and management of various aspects, such as quality, safety and the environment. The location and operation of sites fall within their responsibility.

- **Control Agencies:** Control Agencies will control the planning and implementation of construction works to ensure compliance with the terms of reference.

In practice, the Control Agency will also monitor the level of environmental and social impact of works, without prejudice to the intervention of a consultant specialized in the areas.

- **Environmental and Social Consultant:** The UGPE plans to hire an external consultant with extensive experience in environmental and social management. This consultant will assist the client to ensure that project implementation meets the requirements and expected performance levels.

The consultant will have no direct responsibility for implementing the construction works. However, s/he will be responsible for certain activities relating to project environmental and social management and will ascertain the implementation of measures provided for in this study, as well identify and recommend the adoption of any additional measures deemed necessary.

Monitoring activities

Monitoring activities will aim at ensuring that the required mitigative measures are actually implemented.

Responsibilities relating to the implementation of each of these measures are indicated in the table showing the enhancement and mitigation programme. It now remains to indicate responsibilities regarding ascertainment of their implementation.

Consequently, the following general principles should be considered:

- Latest two weeks prior to works start-up, the Contractor will submit to the UGPE (assisted by the consultant and the Control Unit whose opinion it may seek), for approval, the environmental management plan explaining the expected environmental and social impact and measures for their mitigation.
- In the course of its intervention, the Contractor will best practices, comply with legal requirements and implement the measures falling within its responsibility, keeping supporting records of all such operations.

- Each week, the Contractor will take stock of the situation and describe the most relevant facts concerning the environmental and social aspects. Once a month, it will submit a report containing all information from the record entries and an assessment of the month's events.
- The Control Agency will be responsible for carrying out daily control of the intervention of contractors whose records it will check and validate.
- If it finds any serious shortcomings or omissions, the Control Agency will directly invite the Contractor to correct them.
- The Control Unit will keep the UGPE informed of work progress. It will hold a weekly briefing on the most relevant environmental and social facts, without prejudice to any ad hoc statements that may be issued in the event of an emergency;
- The environmental and social consultant will begin his/her work before the start of construction works in order to: (i) ensure that the conditions precedent to project approval laid down in the Environmental Impact Declaration (EID) were complied with; (ii) work in cooperation with the UGPE to prepare for the dissemination of information on the project and organize public sessions/meetings to be held in each city where works are scheduled to take place prior to the start of such works.
- Once the Contractor's environmental and social management plan has been validated and work started, the Consultant will visit the sites regularly (in principle, every three months). During these visits, s/he should be able to see first-hand the extent of implementation of the measures and, in general, the environmental and social outcomes of the project.
- The Consultant will participate in preparing documents intended for external bodies and the discussion and resolution of environmental or social issues requiring his/her intervention.
- The Consultant will be responsible for preparing reports on the project's environmental and social management. To that end, s/he will rely on information provided by other stakeholders, depending on their functions.

Monitoring of Environmental and Social Activities

The following indicators are recommended for monitoring, to measure and assess the project's impact on certain environmental and social factors.

It should be pointed out that information obtained by means of the recommended monitoring may be useful not only for this project, but also for better understanding and management of the impact of similar projects and Cape Verde's power network.

- Land acquisition: Monitoring land acquisition is the responsibility of the DGPCP, which it should assume throughout the process of acquiring the land needed for the project. The outcomes achieved will be reported on quarterly. In view of exchanges and previous experiences, it is expected that land acquisition will be by mutual agreement as is normally the case for other infrastructure projects in Cape Verde. Expropriation cost monitoring is intended to provide updated data, which may be used as the basis for estimates on future projects.
- Electrification: The purpose is to keep track of the number of new power connections provided by the project. This operation should take place after the completion of construction works. The outcomes will be reported once a year.
- Birdlife: It is recommended that birdlife be continuously monitored to identify possible changes in the presence of wild birds along medium voltage (MV) overhead lines and thus obtain essential information needed to assess the impact of these lines. This post-project monitoring will be carried out by Electra. The recommended monitoring will produce semi-quantitative data through the application of the following methodology: (i) the monitoring should be performed each year in the same month, preferably after the rainy season, all along the track of MV overhead lines in the study; (ii) the monitoring should be done by walking the full extent of the lines. The idea is to look out for and collect, for confirmation purposes, all wild bird species located at 10 metres on either side of the lines or in a canal 20 metres below.
- This information should be provided to the DGA for analysis, assessment and publication online.
- Electrical hazards: This is intended to monitor accidental contact that may occur after the completion of construction works. The results obtained will be reported quarterly. The entire infrastructure of the electricity transmission and distribution network will be subject to these checks, which will not be limited to facilities covered by the project. Each accident will be closely scrutinized to verify any recurrent causes or circumstances and identify measures for preventing further incidents.

E. INSTITUTIONAL PROVISIONS AND CAPACITY BUILDING NEEDS

Within the MTIE, the Project Management Unit of the General Directorate for Energy will be supported by a consulting firm that will handle the environmental and monitoring and evaluation aspects. The arrangement will make it possible to address monitoring and capacity building issues, environmental, safety and health concerns, as well as social and resettlement aspects. This Unit should ensure the implementation of the Environmental and Social Management Plan (ESMP) and will carry out quarterly monitoring throughout the project implementation phase, as well as train stakeholders on environmental and social (E & S) aspects.

ELECTRA, the end beneficiary of the works, has an Environment and Quality Unit, headed by a management sub-advisor, but nobody is assigned specifically to environmental duties. The Unit is tasked mainly with compiling data from water quality inspection control laboratories. Capacity building in environmental, social and safety is necessary in ELECTRA. In addition, ELECTRA will need to be strengthened internally in terms of operational resources that would enable it to fully perform its functions.

The strengthening will happen with the help of the E & S Unit hired to monitor the project, for which purpose the sum of EUR 200,000 has been earmarked. It should be noted that the Environment and Social Consultant will organize working sessions with ELECTRA executives responsible for operating and maintaining the new infrastructure on each island. These sessions (one for the islands of Santo Antao, Sao Vicente and Sal, and another for Maio, Fogo and Santiago) will cover at least:

- The process of monitoring the project's EIA aspects;
- The experience and information obtained in the course of construction works;
- The mitigative and monitoring measures to be implemented during the operation.

F. PUBLIC CONSULTATION AND INFORMATION DISSEMINATION REQUIREMENTS

As part of the socioeconomic dimension of the feasibility study, the stakeholders (Electra, households, local authorities, economic operators and NGOs) were consulted in an effort to identify the needs, from which the project was designed. The identification and preparation mission visited three islands and met with local authorities and NGOs. The meetings with a number of donors based in Cape Verde afforded an opportunity to exchange views on the need to seek synergy in interventions. The project area population was consulted and their concerns taken into account in drafting the Environmental and Social Management Plan (ESMP). During the appraisal mission, various stakeholders were consulted, including State institutions and NGOs. The survey of 30 NGOs – 12 of which responded – and the population made it possible to pinpoint the major concerns, namely:

- The environmental impact of the physical presence of existing infrastructure is considered insignificant;
- The main concerns about the adverse environmental effects of the project relate to the risk of short circuit and accidents involving people, especially children, and animals, as well as the visual impact of overhead network entanglement, i.e. LV power lines with telecoms lines.
- The main expectations relate to the disposal of the numerous small plants, cost reduction, noise and gas emission reduction; benefits for consumers such as improved services and lower prices, and for Electra, such as reduced theft and vandalism, falling costs and improved financial situation of the company;

- Key recommendations include the use of local labour, signalling of work areas, timely information of the authorities and local communities, minimizing of damage to crops, site rehabilitation and project environmental monitoring.

G. COST ESTIMATES

The estimated costs of measures aimed at mitigating the negative impact of the project and compensation are as follows:

Enhancement and mitigation programme

- | | |
|--|--------------------|
| • Land acquisition and compensation: | EUR 230,000 |
| • Mechanism for communicating with the population: | EUR 20,000 |
| • <u>Total:</u> | <u>EUR 250,000</u> |

Monitoring programme and additional initiatives:

- | | |
|--|--------------------|
| • Environmental and social consultant: | EUR 200,000 |
| <i>Grand total:</i> | <i>EUR 450,000</i> |
-

All other costs should normally be included in the cost of the works or in the running budget of the entities (UGPE, DGPCP, Electra, Contractors and Control Units)

H. IMPLEMENTATION AND REPORTING TIMETABLE

The timetable for implementation, particularly for monitoring the activities of the ESMP, should correspond to the programme for implementing the project on the ground.

If possible, reports thereon will be integrated in the scheduled management report of the Project Management Unit meant for the Japan International Cooperation Agency (JICA) and the Bank. Whatever the case, these reports will be submitted quarterly with the support of the Consultant provided for under the project and in collaboration with ELECTRA.