

## EXECUTIVE SUMMARY

**E2079**  
VOL. 3

### 1. INTRODUCTION

This Environmental and Social Impact Assessment (ESIA) is an updated version of the report submitted to the World Bank in June 2003 entitled:

*Inga-Zambia Electrical Interconnection Reinforcement (SAPMP):  
Environmental and Social Impact Assessment  
SNC-Lavalin International, June 2003*

#### 1.1 UPDATED STUDY FRAMEWORK

In the early 2000's, the Société Nationale d'Électricité (SNEL) of the Democratic Republic of the Congo (DRC) proposed the reinforcement of the national electrical transmission grid interconnected with that of Zambia. This project was supported by the World Bank and was then initiated as part of the "South African Energy Market – SAPMP" program intended to facilitate exchanges and energy markets among SAPMP member countries.

A Project Environmental and Social Impact Assessment (ESIA) was performed in 2003 in compliance with World Bank requirements and DRC regulations. The Assessment, which included a Resettlement Action Plan (RAP), was approved that same year by the World Bank.

As part of more recent additional studies designed to optimize the Project, SNEL is today proposing to study to what extent repairing the various roads and trails that provide access to the electrical power lines and infrastructure might facilitate upkeep and maintenance management during the Project operating phase.

The Environmental and Social Assessment (ESIA) is therefore an updated version of the 2003 report, given that five years have already passed since it was first prepared. The ESIA incorporates the main changes that occurred since that time, with particular attention paid to identifying the challenges associated with maintenance access and paths, and compliance with the latest national and international guidelines.

#### 1.2 OBJECTIVE OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

This document is an updated support dossier, intended for the competent authorities of the World Bank and the Democratic Republic of the Congo, for the environmental and social feasibility assessment of the short-term work involved in reinforcing the national power grid interconnection between the DRC and Zambia.

The main purpose of this assessment is to ensure that the Project is still acceptable from an environmental point of view in 2008 and to put new mitigation measures in place during construction, if necessary.

The Environmental and Social Impact Assessment (ESIA) has the following main objectives:

- To integrate and consolidate the relevant information into a consistent whole to characterize the Project and the environment adequately.
- To identify and assess the Project's foreseeable impacts on the physical, biological and human environments.
- To recommend appropriate mitigation measures to optimize Project integration into the receiving environment and estimate the costs of implementing them.
- To define an Environmental Management Plan (EMP) to be applied during the Project preparation and construction phases.
- To include a Resettlement Action Plan (RAP), based on the expectations and concerns of the people consulted during the study, as part of the EMP.

SNEL performs its activities in conformance with the legal and regulatory framework that enables it to obtain easements, install infrastructure and carry out maintenance and repairs to its system, among other things. SNEL is committed to applying sustainable development principles to project management matters and to all the measures set forth in the Environmental and Social Management Plan and Resettlement Action Plan.

## 2. THE PROJECT

### 2.1 RATIONALE

The Democratic Republic of the Congo, by virtue of its Congo River, has 40,000 MW of potential hydroelectric power that greatly exceeds national consumption requirements and that could, by itself, satisfy the needs of all South African Power Pool member countries.

Exporting the excess capacity from the Inga units to Zambia and the SAPP member countries would bring in additional financial resources that would enable SNEL to develop the transmission grid on a national level and distribute electricity to towns and villages.

The DRC's integrated grid is currently interconnected with Zambia's, but the system has some shortcomings due to the degraded condition of the equipment. To enhance this export capacity other projects, such as PMURR and PМЕDE (Projet de Marché d'Électricité Domestique et à l'Exportation [Domestic and Export Electricity Market Project]), are underway to reinforce the generation and transmission sectors.

A number of solutions have been considered, from the early 2000's to date, to improve the transmission interconnection grid, taking short- and long-term objectives into account. One project that has received the backing of the World Bank has been selected today.

## **2.2 SELECTED PROJECT**

The project approved by the World Bank in 2003 has subsequently undergone some modifications in terms of its technical description, location and implementation methods. These changes are optimizations to ensure that the Project is still timely and acceptable in 2008 from environmental and social perspectives.

The selected Project, which consists of transferring 500 MW onto the South African grid in the short term, consists of rehabilitating, upgrading and reinforcing the transmission grid infrastructure on the DRC interconnection system between Inga and the border with Zambia. The work involves three separate aspects:

- **Rehabilitation and restoration to standard operating condition** of equipment on the entire existing  $\pm 500$  kVDC system between Inga and Kolwezi, and the 220 kVAC line between Kolwezi and Kasumbalesa;
- **Reinforcement of the grid by construction of 220 kVAC lines** between Fungurume and the Zambian border (Kasumbalesa to Luano-Zambia) with a tie line between Kolwezi - Panda at the Fungurume Substation;
- **Construction of access roads and maintenance paths** since accessibility to the territory is an important challenge to rehabilitation and construction work in the short term and to maintenance over the long term.

Some other reinforcement work is also needed on the SNEL system to support the desired transmission capacity; this includes expansion of the Panda and Karavia substations.

The overall cost of the SAPMP Project, according to a February 2008 estimate, is US\$ 347.47 million. Approximately US\$ 74 million of this amount is uniquely associated with construction of the 220 kV transmission lines.

### **2.2.1 Rehabilitation program**

All rehabilitation work, apart from the Panda and Karavia substation extensions, will be performed within the existing power plant, substation and transmission system rights-of-way. In fact, this work consists mainly of carrying out an intensive maintenance program on a system that has not always been kept in optimal condition over the past few years due to a lack of financial resources.

Release of a definitive list of the work needed to maintain the 500 kVDC VHV line and associated equipment is scheduled for mid-2008, following completion of the diagnostic.

Previous surveys by SNEL indicate that this work will mainly involve replacement of a large number of broken insulators, sections of electrode conductors, shield wires and stolen angle steel pieces. Other routine maintenance work will also be required; e.g., maintaining minimum conductor clearances from the arborescent vegetation that grew up over time in the previously under-maintained rights-of-way.

All the anticipated work on the four switching substations (Selo, Kikwit, Kananga and Kamina) will also involve routine maintenance consisting of minor repeater repairs or replacements. There are no power transformers in these substations at this time since their only purpose is to provide telecommunications and transit, and no voltage transformation.

The nature of the work involved in the 220 kV lines between Kolwezi and Kasumbalesa will also be specified in mid-2008 when the diagnostic is complete. However, it will obviously include installation of new angle steel pieces to replace those that were stolen from many of the system towers. Replacement of broken conductors is also included in the maintenance work to be carried out inside the existing rights-of-way, substations and buildings.

### **2.2.2 Construction program**

Two interventions are planned from Fungurume to the Zambian border at Kasumbalesa:

- Construction of a 4-km, twin-conductor 220 kV tie line between the Panda Substation in Kolwezi and Fungurume Substation;
- Construction of a 280-km, single-conductor 220 kV line between Fungurume and Karavia substations and a twin-conductor line between Fungurume and Kasumbalesa, via the Panda and Karavia substations. Topographical studies carried out in 2005 altered the length of this line to 273 km in 2008.

The 220 kV lines will be constructed within a 50 m right-of-way. The average span between towers will be about 400 m and their minimum and maximum heights, depending on their distance and the profile of the land, will be 40 and 50 m, respectively.

### **2.2.3 Access roads and paths**

SNEL has identified accessibility to the territory for rehabilitation and line construction work as one of the major short-, medium- and long-term challenges because of the extent to which maintenance and emergency response program performance levels will depend, in large measure, on the access facilities available for carrying out this work. We are referring not only to technical, financial and organizational resources but also, and especially, to the logistical resources available and accessibility to the territory, since it covers a distance of over 2 000 km.

A technical review of the general condition of the existing access roads and maintenance trails was therefore carried out as part of the updated Environmental and

Social Impact Assessment. It was designed to determine to what extent the existing territorial land access roads on either side of the VHV and HV lines that provide SNEL with access to its transmission network can meet the specific long-term needs of the SAPMP Project maintenance and upkeep programs. Given the scope of the excessive organizational and financial resources needed, the assessment concluded that a construction and maintenance access strategy should be put in place and that it should include a set of adapted access methods (other than being restricted to access by land) capable of maximizing construction and maintenance performance while minimizing heavy interventions, and recurrent ones in particular, on the territory.

Access road rehabilitation is therefore deemed preferable to any new road openings, and no new roads requiring involuntary resettlement of local populations will be authorized.

### 3. ENVIRONMENT

The environmental characterization was based on documentary information and data collected directly on site in 2003 and 2008. These campaigns, which included helicopter over flights among other things, compiled data on land use, the presence of biological species and potential fauna habitats. Meetings were held with central and local department heads, administrations and agencies to gather recent data with regard to the physical, biological and social environment. Lastly, the inventory and initial characterization of the environment focused its efforts on participation by the people directly affected by the Project. Participation was ensured through meetings, interviews, direct or indirect consultations, investigations, partially directed interviews, research and on-site visits to organizations, communities, economic players and households. By taking these public groups' expectations, hopes and concerns with regard to the Project into account, the participatory process also identified the challenges emerging from the interconnection project and optimization.

Inventories conducted in 2008 in the area between Inga and Fungurume indicate that the land use situation and the environment in general have not changed since 2003. The biological environment is characterized by vegetation composed of Zambebian open woodland forest that are being degraded more and more today by the cutting and gathering of wood for charcoal making, and this constitutes a real threat to the forests. In terms of the human environment, the conditions previously observed in 2003 also remain the same in 2008. The local populations live almost exclusively on non-mechanized subsistence farming. Health, education and employment conditions remain precarious due to a lack of basic services. The poverty level is therefore very high, resulting in one of the world's lowest life expectancies.

Land use is unchanged since 2003 and no villages or dwellings have been established within the boundaries of the existing rights-of-way as was seen in the past.

The information process SNEL has been engaged in since 2003, to inform the people about electrical right-of-way usage limitations and safety, appears to be a success.

In the area between Fungurume and Kasumbalesa, south of Katanga province, the general land use situation has changed dramatically since 2003. All of Katanga is experiencing an economic boom thanks to ongoing mining activities. The arrival of these companies, which has increased substantially since 2004, is not only stimulating employment but migratory movement as well, since everyone hopes to find this new “Klondike” of wealth and prosperity. However, this economic renewal is putting additional pressure on natural resources and the demand for goods and services, and is resulting in a rise in the cost of consumables and construction materials, as the surveys carried out in 2008 show.

The study area traversed by the new 220 kV lines does not contain any ecologically vulnerable locations. It is situated almost entirely in zones dominated by the Zambebian open woodland forest characteristic of Katanga. The environment has low fauna potential and no known or inventoried specific biotope supporting endemic or endangered fauna species. This scarcity of flora and fauna is the result of heavy pressure on the available resources, especially through the cutting of wood for heating and subsistence hunting, which have intensified greatly over the past five years. There are no large rivers or streams in the area apart from the Lufira River.

In terms of the social environment, the study area is characterized by a youthful population that is quite poor, often illiterate and living exclusively on subsistence farming, hunting, gathering and fishing. The population is spread out over relatively unpopulated areas, and hamlets and villages are most often located along traffic routes and in a few valleys and lowlands. The population's lifestyle is strongly conditioned by the available natural resources and traditional farming that, despite its random and often relatively unproductive nature, helps provide a seasonal food contribution.

The mining industry has been the country's economic support system for a long time and is currently booming. As a result the urban centres lying in the Likasi, Kambove, Lubumbashi and Kasumbalesa axis, which contain the overwhelming majority of the population, have seen a marked growth in their built up areas. These centres, as well as the villages located along the main road and the existing 220 kV line, therefore represent some constraints to Project construction. The 2003 Environmental and Social Impact Assessment found only 12 households eligible for resettlement compensation. Furthermore, no construction was inventoried in the area around the Karavia Substation (Lubumbashi). This situation remained virtually unchanged until 2005 at the time of the new line route topographical study mission that conducted a broad information campaign with respect to the coming Project and its right-of-way defined for public purposes. In the second half of 2007, the Joint SNEL-Provincial Administration Commission in charge of carrying out an inventory within the right-of-way boundaries said, in their Official

Verification Report, that many dwellings had been built in the right-of-way publicized in 2003.

To summarize: Project-related resettlement should involve 44 dwellings, 17 of which are permanently or at least irregularly inhabited, and 27 homes that are still in various stages of construction.

The surveys conducted in 2008 for this updated study also indicated that building activity was still ongoing within the dedicated 50-meter right-of-way staked out by SNEL as a public purpose easement.

To avoid situations where some population groups might feel aggrieved while still allowing those who are eligible to receive the compensation to which they are fully entitled, SNEL will shortly be consolidating, as part of an inter-departmental commission, the procedure for issuing the definitive list of people eligible for compensation, confirming prior notice as soon as possible, paying out the compensation and effecting the resettlements in a timely manner.

Socially speaking, the Projet is raising a number of expectations and hopes on the part of the local population and socioeconomic players. The communication process begun by SNEL in 2003 with respect to the SAPMP Project shows that these expectations and concerns are the same in 2008 as they were in 2003, namely:

**Rural electrification** is a major concern for all the leaders we met with. They believe the economic and social challenges associated with the Project are significant and stress the fact that, even though the VHV-DC and HV-AC lines run through their territory, the local population cannot benefit from the electricity. Lastly, according to some officials, electrification would substantially reduce charcoal production and would help kickstart the rural economy.

**Job creation** during construction and operation (including clearing brush from the right-of-way) was mentioned in all the villages, but also in the cities, by men as well as women, as the main benefit from this Project. Today, in 2008, this concern is well entrenched since the people affected by the Project who were contacted during the land surveys all said they wanted to work on the Project.

**Confidence in the SNEL compensation process** endures. The individuals consulted during the site surveys conducted as part of the updated study remain confident with regard to the information process SNEL has been carrying out since 2003, and they are open to discussions, just as they were in 2003. They see all the communication, information and compensation steps taken by SNEL since 2005 as being transparent and clear.

#### 4. SELECTED ROUTE

The line route from Fungurume to the Zambian border (Kasumbalesa) was prepared based on the following criteria:

- Avoiding constraint areas that could jeopardize the safety and reliability of the power transmission grid (flood plains, erosion zones, landslide risk areas, rocky outcroppings with falling rock);
- Avoiding isolated sectors that could present a risk for acts of vandalism and theft, compromising the integrity of the existing electrical heritage;
- Avoiding built-up and densely populated areas since buildings are incompatible with electrical power line rights-of-way.

Each constraint was analyzed with a view to bypassing it and proposing a route that would not only avoid dwelling relocations but disturbances to populations and anthropic activities. On-site observations and over flights were carried out with an SNEL transmission line specialist to validate every new alternative technically. These activities helped develop acceptable routes and to select some that were preferable to those proposed in 2003.

In 2005, as part of the ongoing Project optimization process, surveys and staking of the route that had been selected in 2003 and consultations carried out by SNEL resulted in a revision of the route to avoid newly built up areas in the Kasumbalesa sector.

The selected route of the 220 kV Fungurume - Panda - Karavia and Zambian border line minimizes population resettlement in conformance with World Bank guidelines and an analysis of the line indicates that it can be constructed in accordance with the established criteria. An impact assessment of the selected was conducted even though the receiving environments in the various segments do not present any major constraints that could prevent the Project from being completed. A program of consultations with those affected by the Project was also carried out, and the results helped optimize Project integration into the receiving environment and acceptance by local populations.

#### 5. IMPACTS

Interventions on the 500kV system will consist mainly in work that will not require extensive mobilization of equipment, workers and machinery and will be performed

inside the existing line rights-of-way and substation boundaries. The nature, scope and significance of the environmental impacts associated with work of this type are essentially those resulting from the periodic maintenance performed on the system. Even though the associated impacts can be considered relatively insignificant *a priori*, the environmental aspects must still be taken into consideration with respect to the environments traversed. The Project Environmental Management Plan (EMP) therefore includes a set of environmental best practices dedicated to the managers responsible for environmental protection during construction and operations.

The studies carried out for the 220 kV resulted in a route that avoids most of the environmental constraints.

The physical environmental impacts will primarily be generated during the construction phase. They will be associated mainly with work in areas sensitive to erosion, and crossings over permanent or intermittent rivers and streams. The residual impact (after mitigation measures are applied) will be insignificant in all cases.

A number of mitigation measures are planned during construction to protect the soil against erosion and river water quality. These include: manual right-of-way clearing and preservation of herbaceous plant cover, stabilization of exposed soil, the use of existing infrastructure or special structures, and rehabilitation of the affected area when construction is complete. Such measures are part of the normal activities the Promoter and Contractor will have to engage in during construction.

No significant impact is anticipated on the physical environment during substation and line operation either.

The effects of the equipment will be minimized or cancelled out by following maintenance protocols and operating rules and implementing the recognized and proven measures prescribed in the specifications.

The Project will result in very few impacts on the biological environment.

These impacts will mainly be due to the cutting of trees and brush in the right-of-way. Grass cover will be maintained to prevent erosion phenomena. Right-of-way clearing will result in a loss of vegetation but this impact is deemed to be low since the vegetation is generally sparse and/or extensive use of the territory has degraded the environment substantially and reduced its fauna habitat potential.

Re-growth of brush in the right-of-way will, over the medium term, promote the return of species disturbed during construction and maintain the overexploited rare small mammal and bird populations.

The EMP technical clauses are measures likely to ensure respect for the environments crossed by the Project. They are designed to keep work within the authorized areas, limit clear cutting, and rehabilitate the site areas to their initial condition upon completion of construction. It is recommended that all construction be carried out in low water periods, and that fording across permanent rivers be prohibited when traversing the very rare wetlands and aquatic areas.

In terms of the human environment, the selected route will avoid the Project's negative impact, i.e. the need to resettle a large number of people living in organized built up environments (the villages of Nguba, Baya and Kampemba and the city of Kasumbalesa).

One important principle is avoiding resettlement, if possible, by seeking alternative routes, substation locations and access roads to bypass villages or any other population centres. When resettlement becomes unavoidable, the principle is to do everything possible to minimize the impacts.

According to official surveys, resettlement associated with the Project should involve 44 dwellings, 17 of which are lived in permanently or at least sporadically, and 27 houses still in various stages of construction.

Public consultations have helped prepare a Compensation and Resettlement Plan that will be implemented in accordance with the rules prescribed by the regulation and will meet the needs and expectations of the most vulnerable groups such as women, children and the elderly. Resettlement and compensation terms and conditions for temporary and permanent loss of income are enhanced through a new SNEL policy with regard to the multipurpose use of right-of-way land. This policy will promote the continuance of some farming activities when the line is in operation.

Land acquisitions and easements will result in land use modifications and the disturbance or displacement of some human activities. The RAP will be applied in all cases and the amount to be paid will be determined in conformance with the rules set forth in the regulation.

Among the Project's negative aspects we should also mention the far from insignificant economic benefits for a region with high unemployment. The men could be hired on a temporary basis as unqualified laborers for land clearing, among other things, and women, in addition to farming activities (depending on the construction season) will increase the sale of produce and the number of small businesses.

In terms of the 220 kV line' impacts on human health, many scientific studies (epidemiological and basin) carried out on potential risks of exposure to the magnetic fields generated by high voltage lines indicate that the risks are non-existent, either to people or livestock. Only impacts on health associated with camp management, water,

hygiene and the prevalence of HIV-AIDS infection may produce a medium impact. Assistance that might be provided by NGO's and agencies like UNAIDS, that are very active in the region, is anticipated.

The Project's indirect impacts include development of a market for this energy potential that could be referred to as "clean" in comparison with the fossil fuel electrical power generated by some SAPP member states. The availability of this energy will enable these interconnected states to become less financially dependent on thermal power plant generation. Such generation is already very costly and is becoming more so every day because of the twin factors of rising fuel costs in general and high maintenance costs. Continuous mode operation of such plants has always been the main financial expense for the various operators or national authorities.

Such plants could be put on cold standby if the Zambia and SAPP interconnection were reinforced, thereby resulting in substantial savings by reducing operating expenses and improving operating company financial statements.

From an environmental point of view, run of the river hydroelectric generation such as the Inga Project, has undeniable advantages over other means of electricity generation since it avoids the negative impacts of thermal power plants.

The Environmental and Social Impact Assessment, that is part of the SAPMP Project, was approved by the World Bank in 2003. The Project has been optimized and improved with regard to integration into the receiving environment and in 2008 is still a Project that is in line with sustainable development objectives.

## **6. ENVIRONMENTAL MANAGEMENT PLAN**

### **6.1 PLAN OBJECTIVES**

The objective of the Environmental Management Plan (EMP) is to describe measures, actions and resources to be used during the Project design, construction and maintenance phases to eliminate or reduce to an acceptable level the key Project impacts on the biophysical, socioeconomic and health areas that were identified in the Environmental and Social Impact Assessment. Another goal is to ensure that the local populations' concerns and expectations with regard to the Project are taken into account in a fair and balanced manner, supplementary to the Population Compensation and Resettlement Plan<sup>1</sup>.

More specifically, the Plan must:

- Protect health and safety and prevent environmental risks;

<sup>1</sup> SNC-Lavalin International: Reinforcement of the Interconnection System with Zambia (SAPMP) Updated study: Population Compensation and Resettlement Plan, June 2008.

- Comply with the standards, regulations, know-how and good practices, and employ appropriate technologies;
- Carry out activities in accordance with sound management principles and use equipment that is in good operating condition;
- Take environmental risk supervision measures into consideration and put preventive and corrective measures in place to deal with any event that could present health hazards and/or environmental dangers;
- Design and build an energy transmission system in accordance with South African Power Pool standards.

## 6.2 PROJECT ORGANIZATION

The SAPMP Project Management Unit (SAPMP-PMU) recommended in the 2003 EMP was approved by the World Bank and has been functioning since 2004. It coordinates numerous activities including those relating to technical aspects and tender calls to companies and engineering firms for rehabilitation and reinforcement of the SAPMP VHV-DC and HV-AC electrical grids. The activities include incorporating environmental considerations into the tender documents and implementing the population compensation and resettlement process.

The Project EMP and RAP have therefore been in effect since 2004

**The SAPMP-PMU is responsible for implementing these plans.**

**The Consulting Engineer** mandated by SNEL to take charge of engineering, technical specifications and construction supervision is responsible for overseeing Contractor implementation of most of the design- and construction-related environmental monitoring and mitigation measures.

Although the SAPMP-PMU and the Consulting Engineer have specific technical and administrative responsibilities, each of them must take the following environmental conditions into account in their activities:

- Abide by the commitments made in the governmental authorizations and existing regulations respecting health, safety and the environment;
- Plan, build and operate the Project in accordance with the sustainable development objectives by complying with the requirements of relevant laws and regulations<sup>2</sup>;

<sup>2</sup> Cadres et Lois du Congo Belge [Frameworks and Laws of the Belgian Congo] (*Electrical energy, general provisions with regard to population notification and compensation, Land – Transmission of electrical energy over private property, Electrical energy distribution concession*), the Property Code (Land tenure and real estate regime, Expropriation for public purpose), DRC Labour Code, and those collected in Chapter 2 – Legal, institutional and administrative framework.

- Implement the mitigation measures proposed in the Environmental and Social Impact Study, the EMP and the RAP.

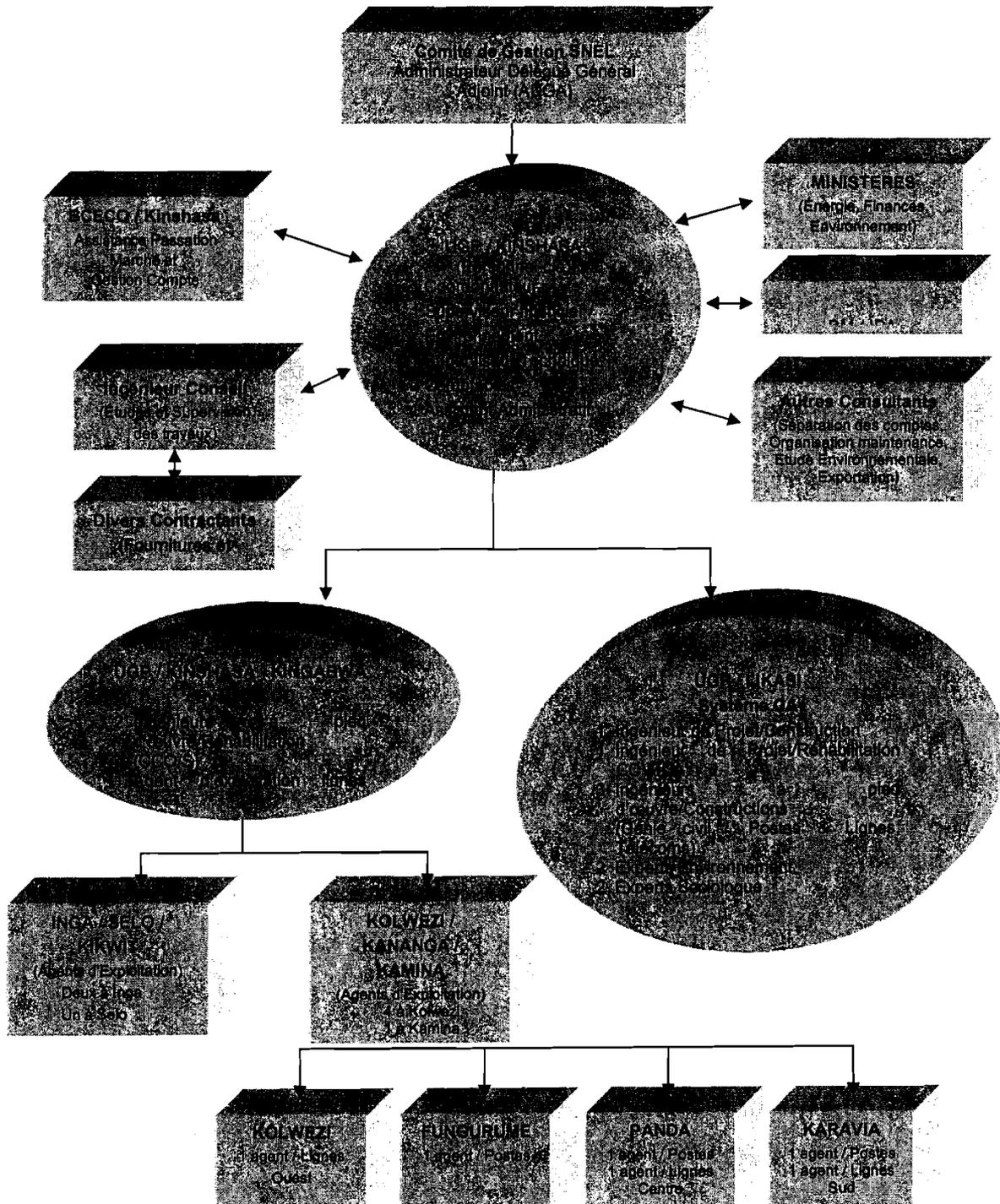
The SAPMP-PMU's terms of reference directly involve environmental and social aspects such as:

- Supervising the work of consultants in providing community health services, water and sanitation for the benefit of the local population;
- Supervising the preparation of environmental assessment and population compensation and resettlement action plans;
- Making environment and sociology specialists available to the Project to provide oversight and environmental monitoring of the works.

The structure thus adopted involves some 40 individuals, most of whom are drawn from existing SNEL resources. It should be noted, however, that the environmentalist and sociologist positions (a total of four) still need to be provided in the PMU as of 2008. These posts will have to be on the job in all cases at least six (6) months prior to the start of construction activities.

The SAPMP-PMU organizational structure was supported by the World Bank and is fully in line with best project management practices. It is capable of implementing and finalizing the population compensation and resettlement process, incorporating environmental measures into tender documentation and supervising and monitoring construction.

Figure 6-1 UGP Organizational Structure



### **6.3 ENVIRONMENTAL MANAGEMENT PLAN COMPONENTS**

The EMP includes the essential Population Compensation and Resettlement Plan and provides a set of measures or actions designed to prevent and/or minimize the Project's impacts on the environment as identified in the Impact Study. The scope of these measures and/or actions directly depends on the nature of the proposed work but also on the selected Project's adequate environmental performance.

The Environmental Management Plan has been in effect by the SAPMP-PMU since 2004 and includes the following minimum requirements:

- I) A description of the consultant's organization, each participant's environmental responsibilities, and how each participant must interact in relation to others to ensure that the work is in conformance with environmental projections;
- II) The skills and training required for the various participants (environmental officer, liaison officer, inspector, construction superintendent, workers, etc.) including the awareness training to be given to all workers.
- III) The following worksite environmental requirements:
  - Environmental supervisions and compliance;
  - Air, water and soil conservation;
  - Respect for local communities;
  - Site restoration;
  - Waste management;
  - Emergency plan in case of an accident or accidental spill;
  - Worksite control (access, etc.).

### **6.4 EMP IMPLEMENTATION AND SUPERVISION**

The purpose of environmental supervision is to ensure that the methods and recommendations already put forth in 2003 to protect and improve the physical and social environment are applied. Such supervision takes different forms in the pre-construction and construction stages.

- In the pre-construction stage:
  - Transparent and fair implementation of the Population Compensation and Resettlement Plan and consideration of specific expectations;
  - Inclusion of environmental and social mitigation measures in the final design of the works and tender documentation;
  - SAPMP-PMU training and support by the Consulting Engineer.
- In the construction stage:
  - Physical and social environmental supervision of construction activities and assurance that the prescribed mitigations measures are applied during construction;

- Management of claims from people affected by the Project;
- RAP performance evaluation, which should be done during the construction period (scheduled over two years), to improve compensation and resettlement procedures before operation commences;
- Follow-up and documentation of actions taken.

To perform these tasks, the supervision program requires:

- The Project Management Unit (PMU/SNEL) to put an Environmental Cell in place no later than one year prior to the start of construction. Such a cell has been in operation since 2004;
- The Consulting Engineer responsible for construction management and completion to appoint a Health, Safety and Environment Manager as soon as the contract is awarded. This manager has therefore already been named and is working with the SAPMP-PMU.

Since the 2003 environmental assessment and creation of the SAPMP-PMU in 2004, the Promoter, PMU/SNEL, has continued and developed a large number of EMP-related activities with administrations, provincial delegations, institutions and local populations. Among other things, the purpose of these discussions was to inform the general population more directly about the Project and its potential impacts, and also those households subject to compensation or resettlement when their dwellings were located within SAPMP Project easement boundaries.

- In 2006 and 2007, the main provincial departments were involved in these discussions. The key communication activities included measurement and staking surveys to set out the easements PMU/SNEL required for their Project.
- In 2007, Mdo representatives also conducted on-site missions to validate land use and occupancy. Local populations were always involved in these mission activities.
- Again in 2007, official SAPMP Project presentation ceremonies were scheduled with provincial authorities including the Provincial Governor, Burgomaster, Provincial Minister in charge of Infrastructure, Urban Development, Transport, Public Works and Energy, Cadastre and Agriculture Division Heads and local people were in attendance. Territorial administrators and leaders of towns targeted for community interest infrastructure development all took part in the decision-making process. Lastly, the local press also covered these events for the purpose of disseminating information to the greatest number of people concerned.
- PMU-SNEL also took more specific additional actions:
  - 2006/2007: Measurement and staking reports covering the new line and substations were prepared by the competent provincial territorial cadastre departments;
  - 2007: The SNEL / Provincial Administration (Cadastre and Agriculture departments)

Joint Committee prepared an Official Verification Report identifying assets and property and providing a preliminary compensation estimate; individual information data sheets were completed by eligible individuals;

- 2007: A land grant request was made from the authorities concerned for erection of infrastructure of public interest such as schools, health centres, access to potable water, and rural electrification from the HV lines and extensions to the Panda and Karavia 220 kV HV substations;
- 2008: Expert reports and estimates of identified assets were prepared by provincial Cadastre and Agriculture departments;
- 2008: SNEL installed sign panels in strategic locations along the new line route indicating the existence of the corridor;
- 2005 through 2008: On each site visit to Katanga, awareness was raised among the local population, authorities and media with respect to the Project and compensation procedures being developed, their transparency and fairness;
- 2008: A comprehensive dossier of all actions taken since 2003 was prepared and submitted to the Department of Land Affairs, in conformance with the procedure that resulted in the signing of a presidential order of expropriation of the corridor for public purpose;
- 2008: An estimate was made with IDA (World Bank) of the upwardly revised cost of population compensation and resettlement operations given the significant changes that took place on the ground since the Project and Project Loan Agreements were signed in 2004.
- In 2008, the route of the new line was visited by the Cadastre Departments and was completely staked out. In the course of these visits:
  - An inventory of real estate to be compensated was prepared, and
  - An inventory of fields and crops was submitted to the Agronomics Departments.

In addition, His Majesty the Central Government Minister of Land Affairs visited the Project area in Katanga to learn about the environmental and social impacts the line would have on the land and to install milestones at the locations of the markers indicating the start of the line to the Fungurume HV Substation and its continuance to Kasumbalesa.

Compensation measures were also scheduled for seven development centres in conformance with recommendations made as part of the initial 2003 study, including those based on local population concerns. These centres are the Nkanga Mission, Kahidi, Shinga, Tumbwe, Bungu Bungu, Nsatumba and Kapemba, and include the following community infrastructure and improvements:

- School construction;

- Health centre construction;
- Well drilling for potable water;
- Electrification.

All the people and administrative and traditional authorities said they knew about the Project and that PMU/SNEL had already initiated the compensation and resettlement process.

The people have confidence in the process and its transparency.

The EMP and RAP environmental supervision process is accompanied by monitoring tools for documenting and communicating the results of the plans put in place to Project personnel and the various levels of Project responsibility. These tools include periodic reports, memoranda and official communications produced by the various participants to document the actions taken, nonconforming situations and the steps taken to correct them.

The following table shows the sequence of environmental actions included in the EMP and the reciprocal supervisory responsibilities.

**Table 6-1 Environmental Actions**

AUTEURS	DESTINATAIRES	FRÉQUENCE	DESCRIPTION DES SITUATIONS
Contractant	Entrepreneur/UGP	Mensuelle	- Rapport du suivi régulier de la formation du personnel de surveillance, documentation des actions, avancement et surveillance du PGES
Contractant	Entrepreneur/UGP	Bi-mensuel	- Rapport d'activité de non-conformité (Niveau I) Observations terrain, solutions et résultats
Contractant	Entrepreneurs/UGP	Immédiate (jour-même)	- Rapport de violation et non-conformité critique (Niveaux II et III). - Problème spécifique qui exige correction immédiate (mise à jour site culturel, archéologique, autres)
Entrepreneur/RSSE	UGP/SNEL	Quand requis	- Rapport de mise en place de l'UGP et programme de formation PGES/PCR
Entrepreneur/RSSE/RCS	UGP	Mensuelle	- Rapport régulier d'implantation du PCR
Entrepreneur/RSSE/RCS	UGP	Mensuelle	- Rapport régulier du PGES, des activités de formation de l'UGP, des contractants et des cas de non-conformité (Niveau I)
Entrepreneur/RSSE/RCS	UGP	Bi-mensuel	- Actualisation du programme de construction, activités spécifiques et localisation des sites de chantier
Entrepreneur/RSSE/RCS	UGP	Immédiate (jour même)	- Rapport d'activité de non-conformité (Niveaux II et III) et de problème spécifique demandant modification des travaux
Entrepreneur/RSSE/RCS	UGP	Immédiate (jour-même)	- Révision des normes de conformités pratiques de suivi et/ou action correctrice pour non-conformité.
Entrepreneur/RSSE/RCS	UGP	Quand requis	- Directive de changement du programme technique et du plan de formation
Entrepreneur/RSSE/RCS	UGP	Immédiate	- Changement de l'activité et surveillance spécifique
UGP	UGP	Mensuelle	- Rapport d'implantation et formation du PCR et actions
UGP	Entrepreneur/RSSE	Immédiate Quand requis	- Notifications et directives pour les actions de non-conformité de niveau II et III
UGP	Entrepreneur/RSSE	Quand requis	- Changements découlant des interactions extérieures (BCECO, public, ONG, Gouvernement, autres)
UGP	Entrepreneur/RSSE	Quand requis (immédiate)	- Notification des révisions des sites de chantier
UGP	UGP	Trimestrielle	- Rapport de conformité environnementale du PGES
UGP	UGP	Immédiate	- Rapport de non-conformité (Niveau II et III) et révision des normes de conformités pratiques
UGP	UGP	Trimestrielle	- Rapport régulier de la formation de l'UGP pour le PGES
UGP	Gouvernement de la RDC (MAFET)	Fin du Projet	- Gouvernement de la RDC (MAFET)
UGP	Gouvernement de la RDC (MAFET)	Trimestriel)	- Gouvernement de la RDC (MAFET)

## 6.5 IMPLEMENTATION TIMELINE AND COST

The EMP and RAP execution timelines were scheduled over a period of 36 months. This includes 12 months for putting the PMU in place, preparing the EMP and RAP and implementing the RAP. EMP implementation as such is included in the currently- planned 24-month schedule for the construction and operation phases.

This overall 36-month period is divided into two major phases: pre-construction and construction activities.

The pre-construction phase includes establishment of the PMU, RAP implantation (for which the inventory of assets for individual compensation of displaced person has already been completed), obtaining permits and authorizations, inclusion mitigation and EMP measures in tender document drawings and specification, contractor selection, and enhancement of PMUEC personnel capacities.

The main activities associated with the construction stage are: environmental supervision of construction, managing population claims and adding value to the Project by installing community infrastructure, reviewing construction conformance and enhancing personnel capacities. These activities will be carried out over time, throughout the Project, until it is in operation and handed over to SNEL by the Consulting Engineer. The timeline is presented below.

The main costs associated with implementing the EMP during the design and construction phases (supervision) are human and materials resources needed to put the RAP in place and provide the associated compensation.

As previously noted, the environmental requirements proposed for establishing and supervising the EMP are those usually automatically included in the General or Special Conditions accompanying typical major project construction contracts. Taking these requirements into account as part of the Project work will not result in any additional costs, other than those already provided for the works.

Nevertheless, a budget of nearly one million dollars (\$1,000,000.00) has been included in the Project budget for the Population Compensation and Resettlement Plan.

Figure 6-2 EMP Implantation Chronogram

Implementaiton Schedule	Pre-construction											Construction																				
	mois											1	2	3	4	5	6	7	8	9	.....	24	1	2	3	4	5	6	7	8	9	.....
<b>ORGANISATIONAL FRAMEWORK</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	.....	36										
1. Creation of PMUEC	█																															
2. Personal Training	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█										
3. Creation Control/Follow-up Team		█																														
<b>Compensation and Resettlement</b>																																
1. Inventory of People and Properties			█	█	█	█	█	█	█	█	█																					
2. Evaluation/Negotiations				█	█	█	█	█	█	█	█																					
3. Allocation of Lands																																
4. Payment of Compensations																																
5. People Resettlement																																
6. Demolition of Infrastructures																																
7. Plan Follow-up																																
8. Claims																																
<b>Environmental Management Plan</b>																																
1. Preparation of EMP	█	█	█	█	█	█	█	█	█	█	█																					
2. Preparation of Training Program	█	█	█	█	█	█	█	█	█	█	█																					
3. Soumission																																
4. Contractor Selection																																
5. PME Implementation																																
6. Follow-up Project																																
7. Follow-up Data																																
8. Follow-up Report																																
9. Conformity Report																																
Organization Framework Activities	█	█	█	█	█	█	█	█	█	█	█																					
Preparation Activities	█	█	█	█	█	█	█	█	█	█	█																					
Implementation Activities																																

**Tableau 6.1 EMP implementation**

CHALLENGE	MITIGATION MEASURE	PROJECT PHASE	RESPONSIBILITY	COST
Environmental authorization	Obtain operating permits (MAFET)	Pre-construction	PMU/SNEL	N/A
Misc. Permits	Obtain permits	Pre-construction	Entrepreneur/Contractor	N/A
Involuntary resettlement (OD 4.30/OP 4.12)	Implement RAP	Pre-construction	PMU/SNEL	\$435,000
	Compensate population	Pre-construction	PMUEC/PMU	
	Follow up on RAP	Construction	PMUEC/PMU	
Environmental management	Implement PMUEC	Pre-construction	PMU/SNEL	Included in Project
	Include mitigation and EMP measures in Tender Documentation	Pre-construction	Entrepreneur/PMUEC	
	Prepare emergency plan	Pre-construction	Entrepreneur/Contractor	
Reinforcement of SNEL capacities	Set up PMUEC	Pre-construction	Entrepreneur/PMU	Included in Project (\$50,000)
Soil erosion	Do not use machinery to clear sloping land	Construction	Entrepreneur/Contractor	Included in Project
	Preserve grassy strata and roots	Construction	Entrepreneur/Contractor	
	Stabilize exposed areas when work is complete	Construction	Entrepreneur/Contractor	
	Level ground when work is complete	Construction	Entrepreneur/Contractor	
	Inspect site after first rainfall	Construction	Entrepreneur/Contractor	
Rivers	Do work in dry season	Construction	Entrepreneur/Contractor	
	Install culverts where required	Construction	Entrepreneur/Contractor	
	Re-establish natural profile and flow of disturbed rivers	Construction	Entrepreneur/Contractor	
Surface water & groundwater	Minimize stripping	Construction	Entrepreneur/Contractor	
	Use machinery & equipment that are in good condition	Construction	Entrepreneur/Contractor	
	Have absorbents of site in case of hydrocarbon spills	Construction	Entrepreneur/Contractor	
	Maintain machinery at least 100 m from rivers	Construction	Entrepreneur/Contractor	
Air & ambient noise level	Use machinery that is in good operating condition	Construction	Entrepreneur/Contractor	
	Prohibit machinery without mufflers on the site	Construction	Entrepreneur/Contractor	
	Do work between 7:00 a.m. & 8:00 p.m.	Construction	Entrepreneur/Contractor	
Vegetation	Make the cut arborescent vegetation available to villages near the line route	Construction	Entrepreneur/Contractor	
	Prohibit workers from harvesting	Construction	Entrepreneur/Contractor	
Fauna	Prohibit workers from hunting	Construction	Entrepreneur/Contractor	