

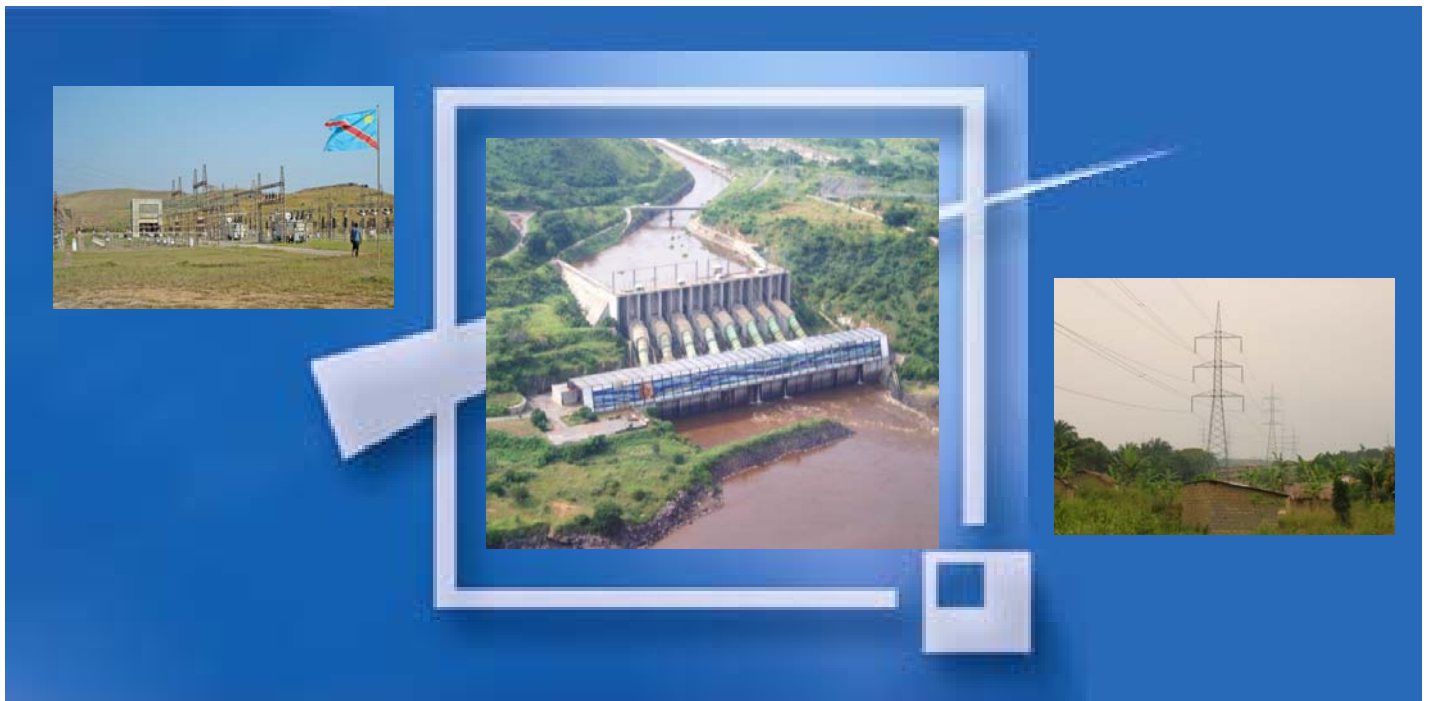
DEMOCRATIC REPUBLIC OF
CONGO



Central Coordination Office « BCECO »
National Electricity Company « SNEL »

REGIONAL AND DOMESTIC POWER MARKETS DEVELOPMENT PROJECT (RDPMDP)

Environmental and Social Impact Assessment of the RDPMDP



EXECUTIVE SUMMARY

R 1058 – December 2006



92-98, bd. Victor Hugo - 92115 Clichy Cedex - France
Tel: +33 (0)1 41 27 95 95 – Fax: +33 (0)1 41 27 95 96
E-mail: agro@sofreco.com

Contents

1	THE PROJECT	2
2	LEGISLATION AND INSTITUTIONAL ORGANIZATION	5
2.1	Legislation	5
2.2	Institutional organization	5
3	TECHNICAL PREPARATION OF THE PROJECT	7
4	THE PROJECT ENVIRONMENT	7
4.1	The physical environment	7
4.2	The biological environment	8
4.3	The social environment	9
5	ENVIRONMENTAL ASSESSMENT.....	10
6	THE SIGNIFICANT IMPACTS AND THE PRINCIPAL MITIGATION MEASURES	13
6.1	The positive impacts	13
6.2	The negative impacts and mitigation measures	13
6.2.1	<i>At social level</i>	<i>13</i>
6.2.2	<i>At the level of the natural environment</i>	<i>15</i>
7	THE PUBLIC CONSULTATION PROCESS.....	17
8	THE RDPMDP ENVIRONMENTAL AND SOCIAL MANAGEMENT PROCESS	18
9	PLANNING OF INTERVENTIONS.....	22
10	RECOMMENDATIONS.....	23

1 THE PROJECT

The Regional and Domestic Power Market Development project (RDPMDP) is one of the biggest World Bank financed projects concerning the rehabilitation of electricity infrastructures in the Democratic Republic of Congo.

The objectives of the investments to be granted for the implementation of the RDPMDP project are:

- to bring the Inga plant to a capacity of 1 322 MW respecting the N-1 security level, that is to say 1 500 MW available and rehabilitated;
- to eliminate power cuts in the city of Kinshasa;
- to set up 60,000 new connections and thus provide more than 500,000 inhabitants of Kinshasa with electricity, representing an improvement of 40 to 50% in the rate of electricity servicing;
- to improve production means in order to increase the share of production reserved for export.

The RDPMDP is divided into 5 components. Its overall cost is evaluated at 400 million USD.

The five main lines of intervention of the RDPMDP are:

1- Production

The production component essentially aims to make reliable, renovate or rehabilitate the Inga plants 1 and 2 as well as certain related structures, including the diversion canal which will be dredged and reshaped to supply a sufficient quantity of water to ensure the production level expected.

2- Energy transmission

This component targets energy conversion and transmission with the construction of a second high voltage line of 263.7 km between Inga and Kinshasa. The reference study for this component was carried out by EDF in 1984-85 and proposes two alternative corridors for the new line. This transmission line route has been completed by several alternatives.

3- Distribution

This component aims for the rehabilitation and extension of the Kinshasa distribution network, notably by setting up an injector in Kimbanseke and eliminating certain “black holes” (un-electrified areas). An electrical surcharge elimination program for certain sites in the capital will enable the quality of the service to be improved.

4- Institutional support

The institutional support has three distinct sub-components.

A) Commercialization

The commercialization sub-component aims for the acquisition of 60,000 meters including approximately 50,000 standard meters, 10,000 meters for pre-payment and several hundred medium voltage (MV) meters.

B) Capacity building

The content of the SNEL's capacity building programmed is not yet detailed, but includes, in particular:

- The rehabilitation of the Sanga training centre:

This rehabilitation will lead to the following work:

- Training for trainers:

It is planned to organize training periods abroad for professionals and a training course on the design and management of training activities.

- Technical capacity building:

The technical capacity building of the SNEL will be particularly geared towards the commercialization part.

C) Sector reforms

The content of these reforms is not defined but aspects aiming for the commercialization of services will probably be taken into account.

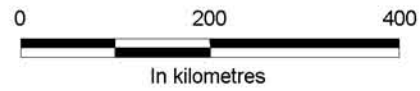
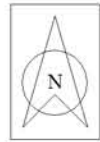
5- Support to project execution

The cost of this component is approximately 25 million dollars. It includes all the aspects involved in the execution of the project, notably:

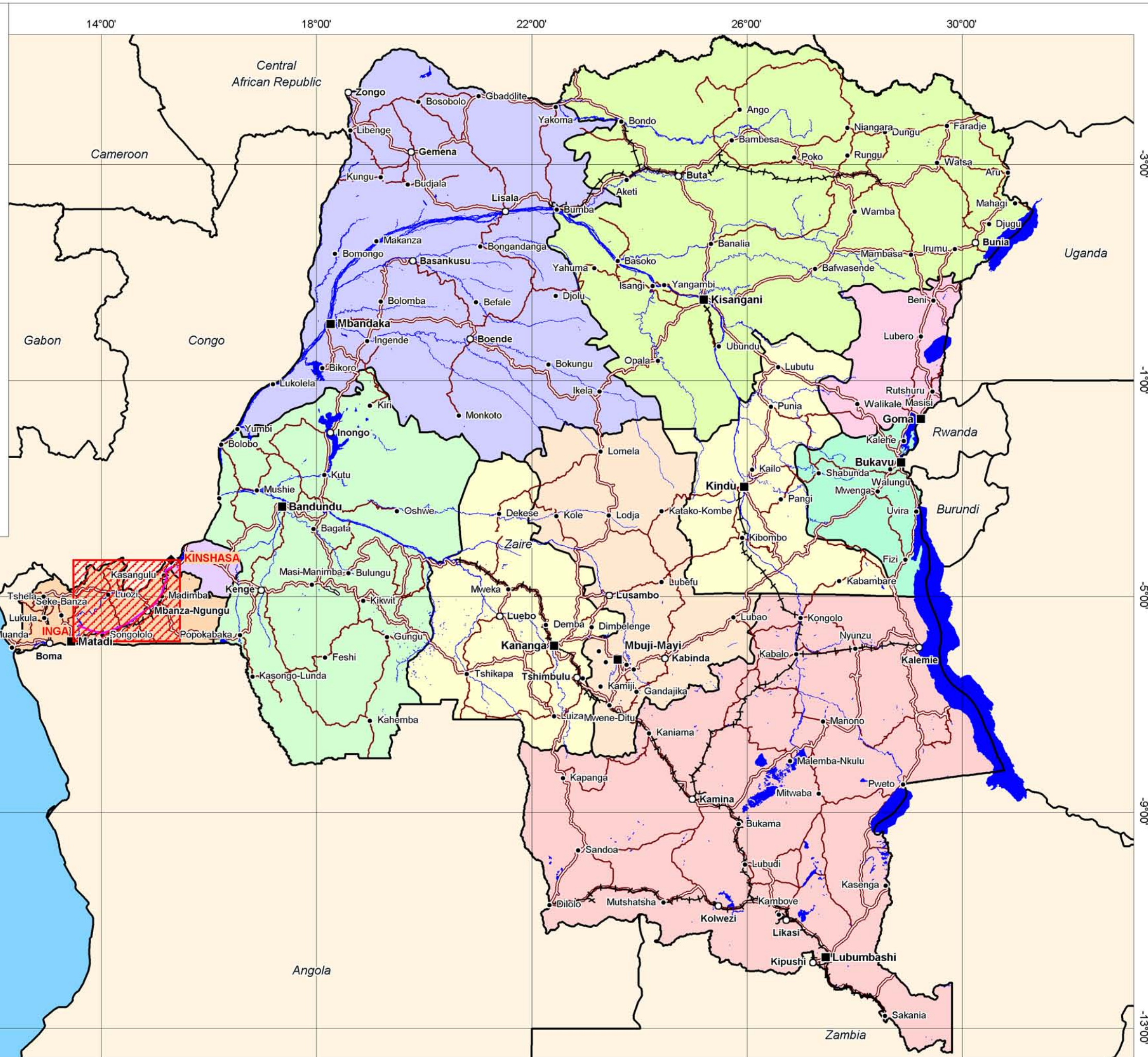
- engineering and supervision costs,
- the awarding of contracts and financial management,
- management and application of measures for mitigating environmental impacts,
- implementation of the Resettlement Action Plan (RAP) and the payment of indemnities and compensation,
- the expenses related to the operation of the Project Management Unit (PMU).

The map on the following page gives the location of the study zone on a national level.

- ◆ Capital city
- Capital of the Province
- Capital of the District
- Capital of the Territory
- Main country road
- Secondary country road
- +—+ Railway
- Water body / river system
- Ocean
- ▭ Provincial border
- ▭ Country border
- ▭ Planned high voltage electric line layout
- ▨ Study site



Projection system : Longitude / latitude WGS 84
 Cartographic base : EDF, 1985
 Production : SOFRECO
 The network points for the map projection are 4° apart



Environmental and Social Impact Assessment of the RDPMDP

National location of the RDPMDP components

Date : December 2006.



SNEL

2 LEGISLATION AND INSTITUTIONAL ORGANIZATION

2.1 Legislation

The DRC has no environmental regulations strictly speaking. Texts dating back to the colonial period specify that listed institutions must obtain an operating permit. However, the preparation of an EIS is not required by these regulations.

An “environment” framework law is currently being prepared and should see the day in 2007. This law should be followed by a regulation aiming for the performance of environmental impact studies for projects, programs, and plans that could have significant environmental repercussions.

Despite the absence of a specific law, a support structure for environmental management was set up within the framework of the PMURR.

The DRC has signed more than 25 conventions in the environmental domain including the Bamako, Bâle and Stockholm conventions that deal with the transport and management of hazardous waste including persistent organic products (POP), such as the PCB used in transformers and circuit breakers like dielectric oil.

The DRC has relatively recent labor regulations enabling the adequate management of staff safety to the extent that it is applied.

Since 1978, SNEL is the only State Company that can produce, transmit and distribute electricity in DRC, giving it de facto a monopoly. Although recent laws have liberalized the market to a certain extent, electricity production other than by SNEL is merely anecdotal.

The amendment of electricity prices depends on a relatively complex inter-ministerial committee.

2.2 Institutional organization

As a State company SNEL depends on a board of directors. The daily management is entrusted to an appointed delegated general administrator. The latter is supported by an assistant, a financial administrator, and a technical administrator. SNEL is made up of 5 branches, 8 departments and a legal division. The management of projects is usually performed by a management unit that is specially set up for the project and which exists for its duration. The monitoring and control of these projects is not carried out by a specialized department, but usually by one of the delegated administrators.

The SNEL does not have an environmental branch or department, and none of its structures has environmental management as its task. Nevertheless, the Prevention and Safety Branch has three employees that were trained as Environmental Managers (EM) within the framework of the PMURR projects carried out with the SNEL.

Although these EM have been trained, they are unable to ensure the environmental assessment of a project as important as the RDPMDP. However, if they are well

supervised, they are the best placed to carry out most of the tasks, thereby gaining experience.

At the level of the World Bank which will be one of the main sponsors of the RDPMDP, the demands are clear. For almost 15 years, Safeguard Policies that are constantly evolving, have been defining the environmental regulations that projects financed have to respect. An initial analysis carried out by the people in charge of the Safeguard Policies has enabled those which should be respected and monitored by the RDPMDP to be defined. This was possible through a detailed analysis of the project.

Figure 1: Safeguard policies that might apply

Safeguard Policies Triggered	Applying to the RDPMDP	Not applying to the RDPMDP	TBD*
Environmental Assessment (OP/BP 4.01)	X		
Some adverse impacts are possible, though neither major nor complex, notably from the rehabilitation of some power and water infrastructure, and the construction of a second transmission line.			
Natural Habitats (OP/BP 4.04)	(X)		X
Need to ascertain whether second transmission line would affect natural habitats.			
Forests (OP/BP 4.36)		X	
Pest Management (OP 4.09)		X	
Cultural Property (OPN 11.03)	(X)	X	
Indigenous Peoples (OP/BP 4.10)		X	
Involuntary Resettlement (OP/BP 4.12)	X		
Some small amounts of land and other assets may need to be acquired for the construction of a transmission line. Resettlement is unlikely, but is possible in very small numbers.			
Safety of Dams (OP/BP 4.37)	X		
Project involves rehabilitation of the existing Inga dam facilities, but does not involve new construction.			
Projects on International Waterways (OP/BP 7.50)	X	(X)	
Inga is located on the Congo river			
Projects in Disputed Areas (OP/BP 7.60)		X	
Environmental Category: B – Partial Assessment			
<i>The (X) correspond to modifications made to the preliminary observation represented by an x following the detailed environmental analysis of the project.</i>			
*TBD: "To Be Determined": to be determined during the study			

Sources: Table extracted and adapted from the World Bank's web site at the following address:
<http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=64290415&theSitePK=40941&menuPK=228424&Projectid=P097201>. Web site visited on 20 June 2006.

3 TECHNICAL PREPARATION OF THE PROJECT

The first phase of the project's technical preparation mainly took place on the basis of existing documents (technical and economic studies of the Inga-Kinshasa transmission line, EDF 1984, technical study of the rehabilitation of the Inga plants, Fichtner 2005) and through the acquisition of new data.

A number of documents defining the major outlines of the project have been produced. Nevertheless, in this first phase, the studies are still at pre-feasibility level for certain sub-components and feasibility level for the others. It is the latter that have enabled a detailed evaluation of social and environmental impacts. For the other sub-components, the detailed evaluation will take place progressively as the definition of the projects advances.

All of the project's sub-components will have to be defined in detail during 2007 and the majority of the works will begin in 2008.

In the transmission component, the data from the EDF study and the studies carried out during this first phase made it possible to define an acceptable line route, certain sections of which will need to be optimized during the detailed technical study. A detailed impact study has been carried out on this component.

The production component and the electromechanical works and dredging of the canal sub-components, are also sufficiently precise from a technical point of view to be assessed in detail. Finally, the Kimbanseke substation sub-component in the distribution component is also assessed in detail in the present phase.

As planned in the management framework, the other components will have to undergo a detailed environmental analysis when their definition is sufficiently developed.

4 THE PROJECT ENVIRONMENT

Although the project's main objective is to improve the quantity and quality of the city of Kinshasa's electricity supply, almost 90% of the activities (in terms of surface area affected and budget) will be carried out in the province of the Bas-Congo. The totality of the production component and 90% of the transmission component (HV transmission line) are concentrated in the Bas-Congo.

However, 100% of the distribution component is located in the province /town of Kinshasa. The majority of the transmission is included in what is known as rural Kinshasa and the distribution is mainly concentrated in urban Kinshasa.

4.1 The physical environment

DRC has a very dense river network. This is also true for the study zone. A map of watersheds has been produced and demonstrates that the line route selected is predominantly located at the head of watersheds that go from several hundred square kilometers to more than 10,000.

In the study zone, the relief is generally undulating, with, at certain places, plateaus of varying expanses.

The topography is the most uneven next to the INGA. Heading towards Kinshasa, the zone presents a series of upland areas and valleys of more or less uneven depths depending on their proximity to the river or national road no. 1. Alongside the transmission line the slopes can reach up to 30% over extremely short distances, which will not disturb the project. A series of longitudinal profiles for each section studied has been produced during this environmental assessment giving a good demonstration of this aspect.

4.2 The biological environment

Three natural habitats have been identified in the project zone including a critical natural habitat. The modification of the transmission line implantation site and, in certain cases, a new design, has enabled these natural habitats to be avoided.

For land requirements of an average width of 100m and a length of 263.7 km, 26.37 square km are considered as Directly Disturbed Areas (DDA) by the future line route.

From Kinshasa to Inga the physiographical units encountered can be classed as follows:

1°. Grass and tree savannah: plant formations covering large surface areas estimated to be 64.7% of the Directly Disturbed Areas (DDA) of the future electricity transmission line. They develop on very degraded land, plateaus and slopes. They are crossed yearly by running fires, which are favorable to their reconstitution. The wildlife and fauna biodiversity is very low. The trees and shrub vegetation present are scattered and twisted, and are often used by the local population for coal production and firewood.

2°. Shrubby fallow land or crops and regeneration: these cover small surface areas (approximately 20 % of DDA), essentially along the road network and around villages. As the environment is disrupted they rarely harbor significant wildlife, other than that of the surrounding physiographical units.

3°. Crops: these include cultivated agricultural areas such as village plantations and market gardening plots, especially along rivers and in humid valleys. In the future electricity transmission line zone they cover small surface areas estimated at 8 % of the DDA. They also include food crop fields scattered through other units.

4°. Forest gallery – savannah patchwork: this covers forest strips along alluvial beds surrounded by savannah. A watercourse maintains the humid substratum and favors the development of the ligneous stratum. It thus includes both forest biodiversity and savannah biodiversity, but with a low density. It covers approximately 0.25 % of the DDA of the future electricity line zone.

5°. Swamps: these cover a small surface area estimated to be 1.47% of the total surface area of the future electricity line. They are to be found along rivers where the substratum is temporarily or permanently humid (flooded with water). They are characterized by hygrophyte vegetation which is less rich in species.

6°. **Forest with hydromorphic soil:** this is found on alluvial beds with soil that is normally drained or surface-dry but with periodical, regular or occasional rises in the water level. Benefiting from a favorable micro-climate due to the closeness of the ravines and the depth of the valleys (substratum more fertile), this formation has a rich biodiversity. It covers a very small surface area, found only next to the Botanic Garden of Kisantu bordering the river Kungisi (affluent of the river Inkisi).

7°. **Secondary forests:** these are the result of the progressive development of post-crop vegetation (crop clearing, forestry activity). They include mature secondary forests (3.6% of DDA), young secondary forests or young forest growths (20.1%). They have a biological diversity that is richer than the other physiographical units encountered. As their biodiversity is highly sought after by the population, they suffer significant pressure from itinerant agriculture, burning for coal production, commercial hunting and forestry activity.

Generally speaking, the future electricity line zone is covered by degraded physiographical units (savannah, fallow land and young forest growths representing 84.5 % of DDA) with low species diversity. The SEIS report gives precise values in terms of surfaces directly affected by the project for each of these physiographical units.

4.3 The social environment

The work carried out can be divided according to four distinct socio-economic patterns from east to west. The first pattern is made up of an economy based on trade, agriculture and fishing associated with the INGA site, where a village of approximately 8,000 people depends partly on the economic activities of electricity production. The development of this village is essentially linked to previous work from the INGA sites 1 and 2. The increase of the population on the site despite the few available resources is probably due to the availability of electricity and potable water, and to the security offered by the INGA site, which is a strategic site.

In its current design the project has no negative influence on this economy.

The second pattern corresponds to the HV line route from where it leaves the INGA site to national road no. 1. The population is absent apart from several hamlets situated back from the line route. The area has itinerant crops and hunting due its proximity to the mature secondary forest.

The third pattern goes from Lufu to Kingatoko. It corresponds to an area scattered with villages and extensive cultivation. The line passes far from most of the towns and villages, of which there are approximately fifteen, and when this is not the case, it passes through zones of low or medium population density such as Mbanza Ngungu. This network, which corresponds to approximately 75% of the length of the line route, presents, at the border of the major roads, a patchwork of crops that are generally extensive and often itinerant intermingled with the savannah. There are also a few, rare, market garden areas. The economy is mainly based on agriculture, industry, essentially cement works, services and small-scale trade. Housing is not very dense apart from the major agglomerations, and is developing slowly.

The final socio-economic pattern corresponds to the peripheral zone of Kinshasa where there is low or medium density of housing. Apart from several recreational and tourist sites that are highly sought after by the “Kinois”, this zone presents a patchwork of market gardening cultivation, cash crops and small-scale livestock farms. These activities are relatively important in economic terms but also in terms of land tenure. They are most often located at the border of watercourses. This zone is developing rapidly and housing is being constructed at a fast pace. The land tenure is constantly changing.

5 ENVIRONMENTAL ASSESSMENT

The social and environmental evaluation of the RDPMDP was carried out between June and November 2006 by the consultancy SOFRECO with a team of national and international consultants.

Five reports deal with the totality of the social and environmental problems encountered in the project.

In brief, these five reports are presented as follows:

Three (3) of them define the environmental and social assessment framework:

- **The Social and Environmental Management Framework (SEMF)** describes the project at the level of the different components and sub-components. It provides information on the institutions and regulations governing the sector and gives the environmental and social regulations applicable. It describes the management organization of the RDPMDP in its implementation phase and the way in which the environmental management is envisaged. The SEMF also categorizes the sub-components as required by the PO 4.01 and defines their evaluation principles by giving the responsibilities of the different stakeholders according to the project cycle. Finally, the SEMF in these annexes gives guidelines concerning the probable impacts of the project activities in these different phases and orients the management of waste produced by the project. The SEMF is the basic element of this study as several of the sub-components are to be defined during the project and it will serve to guide the performance of their environmental assessment.
- **The Involuntary Resettlement Framework (IRF)** defines the sub-components for which the displacement and/or compensation of persons is inevitable. It fixes the rules by which these displacements will have to be carried out. The resettlement framework makes a comparative analysis of the policy and procedure of the World Bank (PO and PB 4.12) with regard to Congolese legislation dealing with land ownership and expropriation for purposes of common public interest. Finally, the IRF defines the procedures to be followed for the displacement of populations when necessary.
- **The Management of Cultural Heritage Framework (MCHF)** defines the rules to be followed to avoid damaging national cultural heritage that is already existing or discovered during works. In particular, it reviews the situation concerning the presence of grottos in the project zone and locates them. It defines the process to be followed if cultural elements are discovered during the works.

The two other reports produced within the framework of this environmental assessment are specific to components and sub-components that have been sufficiently defined

during the technical feasibility study, that it to say: the transmission component, the dredging of the diversion canal and electro-mechanical works sub-components of the production component, and the sub-component for the setting up of the Kinbanseke substation. These two components represent more than 4/5 of the total financing planned.

- **The environmental and social impact assessment (ESIA)** identifies and evaluates the impacts of the components and sub-components mentioned above with the detail required according to their categorization, namely: a description of the natural and human environments of the project zone, a description of the components and sub-components and of their alternatives, an identification of the impacts of the different alternatives, the selection of alternatives according to technical, economic, environmental and social criteria, the evaluation of negative, positive and cumulative impacts and the identification of probable synergies. The ESIA proposes mitigating measures to be implemented to limit significant negative impacts.
- **The Social and Environmental Management Plan (SEMP)** defines the ways and means by which the results of the environmental assessment will be implemented. For each mitigation measure adopted in the ESIA, it defines its implementation and determines the responsibilities of the different stakeholders involved in the RDPMDP. The SEMP also takes stock of the situation with regard to the budget necessary for the realization of the resettlement plans, the monitoring and control of the sites, the requirements in training and institutional support, etc., all of which is presented in the form of a summary.

Table 1 which follows presents the environmental categorization that has been made for each of the components and sub-components, the level of fulfillment of the environmental assessment and the references for the continuation, if need be, of these assessments as the definition of the sub-components advances.

Table 1: Summary of the state of advancement of the environmental assessment process per RDPMDP sub-component

Components	Sub-components	category	evaluation	Documents of reference
Production Rehabilitation of the Inga plants and of the related structures	Electro-mechanical works	B	<i>Finalized</i>	<i>ESIA, IRF, SEMP</i>
	Dredging of the canal	B	<i>Finalized</i>	<i>ESIA, IRF, SEMP</i>
	Stone step limiting the flow of the canal	B	To be completed	SEMF
Transmission Construction of the second HV line Inga-Kinshasa (presented in the EDF study 1984)	Transfer station in INGA	B	<i>Finalized</i>	<i>ESIA, IRF, SEMP</i>
	Transmission line between Inga and Kinshasa	B	<i>Finalized</i>	<i>ESIA, IRF, SEMP</i>
	Terminal station of the line in Kinshasa	B	<i>Finalized</i>	<i>ESIA, IRF, SEMP</i>
	Interconnection of the new line with the existing network	B	<i>Finalized</i>	<i>ESIA, IRF, SEMP</i>
Distribution Rehabilitation and extension of the Kinshasa distribution network	220/20 kV injector in Kimbanseke,	B	<i>Finalized</i>	<i>ESIA, IRF, SEMP</i>
	LV and MV network in Kimbanseke	B	To be completed	SEMF, IRF, MCHF
	Electrification of Kimbanseke	B	To be completed	SEMF, IRF, MCHF
	Elimination of black holes (Mpsa, Kisenso, etc.)	B	To be completed	SEMF, IRF, MCHF
	Discharge program	B	To be completed	SEMF, IRF
Institutional support Acquisition of 60,000 meters	Prepaid meter	B*	To be completed	MCHF
	Conventional meter			
	Medium voltage meter			
Institutional support and capacity building of the Ministry of Energy and of the SNEL	Rehabilitation of the Sanga training centre	B*	To be completed	SEMF, IRF
	Improvement of commercial management	B*	To be completed	MCHF
	Training of trainers		Not applicable	Not applicable
Sector reform	Commercialization and others	B*	To be completed	SEMF
Support to the execution of the project			Not applicable	Not applicable
B* : As a precaution, these sub-components have been evaluated in category B. However, when they have been better defined they could be reclassified in category C. This reclassification will require the borrower to prepare a justification that will have to receive the non objection of the World Bank.				

6 THE SIGNIFICANT IMPACTS AND THE PRINCIPAL MITIGATION MEASURES

The project will trigger a certain number of significant impacts, both negative and positive. Most of the negative impacts will be concentrated during the period in which the project is carried out, whereas the positive impacts are to be found essentially once the operational phase has been reached.

6.1 The positive impacts

The RDPMDP will have positive impacts in the short term because it will secure the supply of energy transmission between INGA and Kinshasa and improve servicing at the level of the capital. It will also make it possible to improve the SNEL assets, to optimize the yields of existing structures (INGA damn) and to use an existing, renewable resource (water) by transforming it into electrical energy without creating, at this level, any social or environmental impact.

The probable increase in temporary and permanent jobs for the construction and maintenance of power supply lines also constitutes a significant positive impact given the current job rate.

The institutional reinforcement planned as part of the project should improve the management of the SNEL assets and the marketing capacities for its production. In the long run, it should also be possible to achieve a turnaround in its financial position.

6.2 The negative impacts and mitigation measures

All the work carried out will engender, at different levels, significant environmental and social impacts.

The work carried out on the dams and the electromechanical installations will, for the most part, have impacts that will have no repercussions beyond the sites themselves. Only the risk generated by the management of dielectric oils containing PCBs remains an impact that can be felt beyond the existing installations. A strict management program for these oils will be set up to guarantee that their storage respects the relevant safety conditions.

The new high voltage line, the new transforming stations, the passage of certain low voltage lines through urban zones, the trails that will allow access to them and the space necessary for the different equipment to carry out the work, may also result in the following negative impacts.

6.2.1 At social level

The principal project impacts are:

- Permanent and involuntary displacement of persons (expropriation for public utility purposes when houses are beneath the high voltage line and when land is in the area required for the pylons);

- Temporary and involuntary displacement of persons (displacement during the works or for a short period);
- Permanent or temporary loss of crop land;
- Risks of accidents for workers but also for locals during the construction work but also during the operating phase, in particular for lines under tension;
- Risks linked to sexually transmitted diseases due, in particular, to the presence of workers operating away from home;
- The impacts linked to electromagnetic waves;
- A modification in the SNEL's sales and marketing policy.

The principal mitigation measures defined that will serve to reduce the negative impacts at social level are as follows:

- Designing a final layout which minimizes the displacement and disturbance of the population;
- Keeping the people who live close to the installations to be erected informed;
- Indemnification and compensation for permanent and/or temporary losses according to strict criteria and with the greatest possible transparency;
- Making the workers and the local population aware of the dangers of the site;
- Providing adequate individual protection gear for workers during operations that present a risk;
- Adequate indications defining the area of the site and announcing the risks;
- Taking charge of treatment for persons injured within the framework of the project activity;
- Information and awareness campaigns regarding the transmission of sexually transmissible diseases;
- The production of a book of environmental obligations linked to each of the RDPMDP's services agreements;
- Setting up an environmental management unit within the project which must ensure that social aspects are taken into account during the execution of the project;
- Forbidding construction within 50 meters either side of the high voltage lines;
- Conducting a strategic environmental evaluation of the future pricing policy before its application.

6.2.2 *At the level of the natural environment*

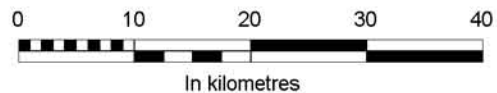
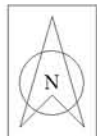
The principal project impacts are:

- A modification of soil erosion;
- Soil compaction;
- The disturbance of wildlife and flora;
- A disturbance at the level of surface water run-off;
- The contamination of soils and water by suspended matter and by pollutants (hydrocarbons, lubricants, etc.);
- The creation of new accesses to forest areas that could lead to massive deforestation and a degradation at the level of biodiversity;
- Disturbance of the natural habitat.

The principal mitigation measures defined that will make it possible to reduce the negative impacts on the environment are:

- Designing a final line route which minimizes penetration into dense secondary forest areas and avoids natural habitats, whether critical or not;
- Information and awareness campaigns for workers regarding the protection of soils and waterways, in particular by limiting any disturbance to the soils and their vegetal covering;
- Prohibiting the acquisition of hunting or trapping equipment, etc. by the workers and any persons associated with the enterprises involved in the work;
- The obligation to restore the sites after the work to avoid erosion;
- The revegetation of the sites that have been stripped as a result of the works;
- The production of a manual of environmental obligations linked to each of the RDPMDP's services agreements;
- Setting up an environmental management unit within the project which must ensure that social aspects are taken into account during the execution of the project.

The map on the following page shows the complete layout of the electricity transmission line from its production site to its connection with the existing network in Kinshasa. It also shows the positioning of the future Kinbanseke station and the short transmission line connected to it. The zones where the layout will have to be optimized are also indicated on the map.



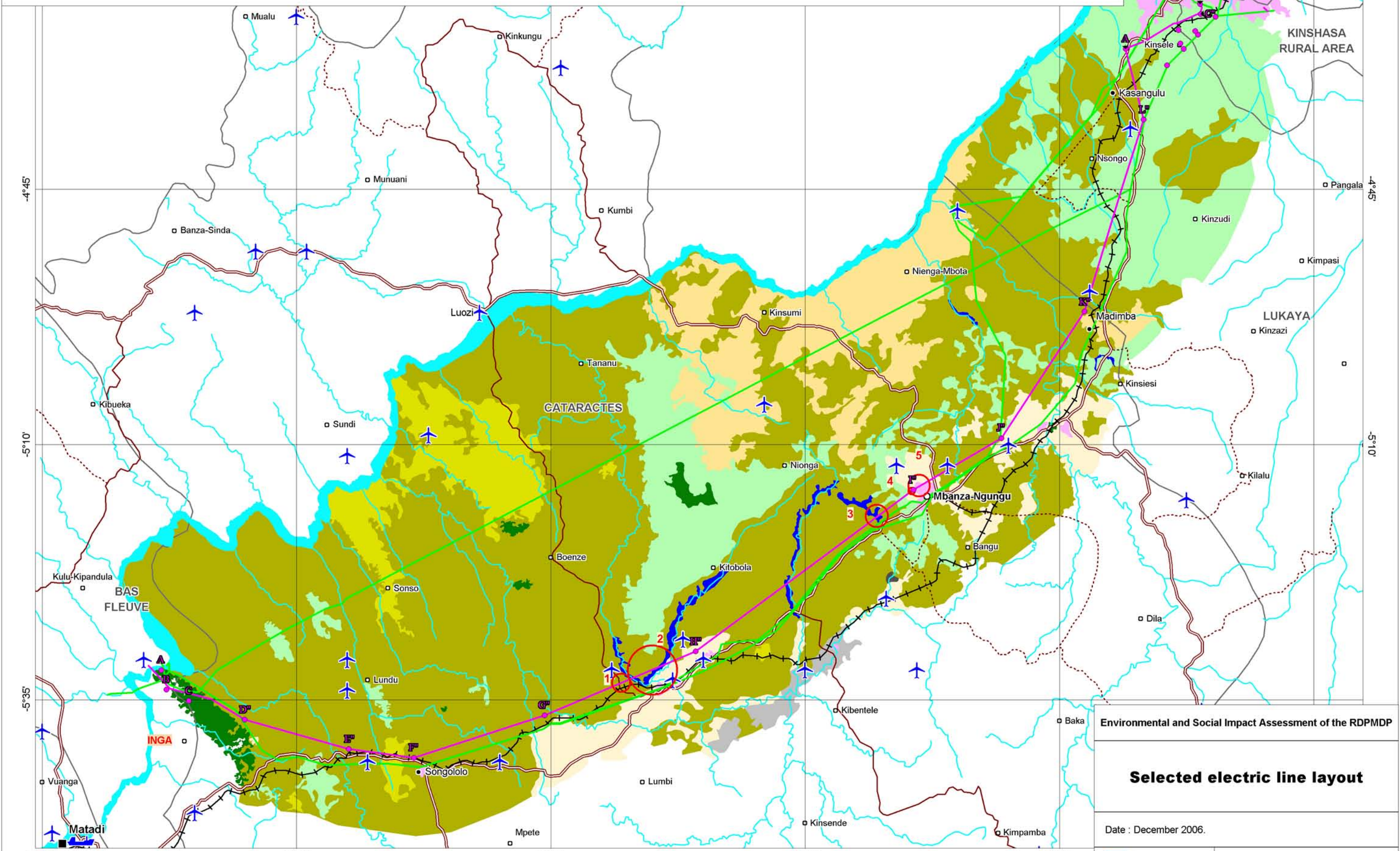
Projection system : Longitude / latitude WGS 84
 Cartographic base : EDF 1985
 Production : SOFRECO
 The network points for the map projection are 25' apart.

- Capital of the Province
- Capital of the District
- Capital of the Territory
- Other Town
- ✈ Airport
- ⚓ Port
- ⚓ Station

- Main country road
- Main regional road
- - - Secondary regional road
- Railway
- ▭ District border
- Existing electric line layout
- Planned high voltage electric line layout

- Secondary Forest (adult)
- Secondary Forest (sapling)
- Temporary swamp
- Forest gallery and savanna
- Savanna on hydromorphic soil
- Savanna in firm soil

- Farming and regeneration
- Farming
- Plantation
- Plantation of sugar cane
- Town
- Water body / River system
- Position of electric layout to optimize



Environmental and Social Impact Assessment of the RDPMDP

Selected electric line layout

Date : December 2006.



SNEL

7 INVOLUNTARY RESETTLEMENT

The Involuntary Resettlement Framework evaluates the number of persons potentially affected by the project and who need to receive indemnification.

For the Transport Component, that is to say over 260 km of high voltage line, an estimate has been made on the initial layout and on the new section route that goes to Kingatoko up until the main cut-off connection on the basis of leaving a width of 100m either side of the line (i.e. a total land requirement of 200m). The result of this evaluation is that 135 homes will be affected. The actual number of resettlements should be reduced to 2/3rds of this number due to the fact that the total land required will represent 100 m, leaving a width of 50 m either side of the line and that, during the detailed study of the route, the latter may be optimised at the level of the Bas-Congo towns and villages in order to avoid areas with a high population density.

For the Distribution component, the number has been estimated at 127 homes, including only 87 at the level of the line and of the Kimbanseke substation where the habitat is relatively dense.

It should be noted that over 60% of the homes affected are rudimentary, with a small surface area and built from primary materials (wood, corrugated iron, uncooked bricks, etc.) and several of them have not yet been finished; in some cases only the foundations have been laid. This phenomena is encountered frequently at the level of Kimbanseke.

An amount of 1 300 000 USD has been earmarked for resettlement. This amount takes into account the value of the homes and of the land for people with and without land titles, including squatters, non built assets, removal costs etc. and the increase in the number of homes within the designated areas between the date of this valuation and the period when the population count is carried out.

8 THE PUBLIC CONSULTATION PROCESS

Consultations took place in the 4 districts of the town of Kinshasa that will be affected by the project as well as in the 6 large agglomerations of the Bas-Congo Province where the execution of the project could have significant environmental and social impacts.

The Consultations were carried out on the basis of a summary presenting the principal activities of the project, the probable impacts, the proposed mitigation measures and an overview of the evaluation process which will be set up explaining the role of the consultations carried out and the coming stages of the evaluation process, if the project obtains financing.

The districts and locations consulted in the town of Kinshasa are:

- Kingatoko,
- Kimwenzu Gare,
- Plateau Mont Ngafula,
- Kimbanseke (Sakombi district).

In the Bas-Congo, consultations took place in the following towns, villages and cities:

- Kimpese / Lukala,
- Mbanza ngungu,
- Inkisi/Kisantu,
- Madimba,
- Mission Catholique Sonabata,
- Kasangulu.

The principal preoccupations expressed by the participants during these consultations in terms of positive impacts can be summarized as follows:

- Most of those in charge would like to see their neighborhoods supplied with good quality electrical power, with less or even without power cuts;
- Certain peripheral districts of the city of Kinshasa and cities, towns and villages of the Bas-Congo are preoccupied by problems of deforestation and the destruction of the biodiversity, at the heart of erosion problems. The lack of electricity is at the origin of this deforestation and the destruction of the biodiversity.
- Moreover, all the project zone managers would like to see the enterprises hired to carry out the work give priority to local labor rather than bringing in workers to carry out the tasks that the local population are capable of doing.

All of the negative impacts create considerable concerns for the participants who wish to see all the mitigation measures, such as listed, applied for the well-being of the local population.

Lastly, the majority of the “land chiefs” and tribal leaders present during the consultations expressed the wish that SNEL should agree to respect their rituals before the construction work on the high voltage line.

Please note that the consultation process is continuing, with the diffusion in the areas affected, of validated study reports and the possibility for the interested parties to write down their comments in a special book set aside for this purpose. The information and consultation process, whose rules are defined by the SEMF, the SEMP and the RAP, will continue throughout the project.

9 THE RDPMDP ENVIRONMENTAL AND SOCIAL MANAGEMENT PROCESS

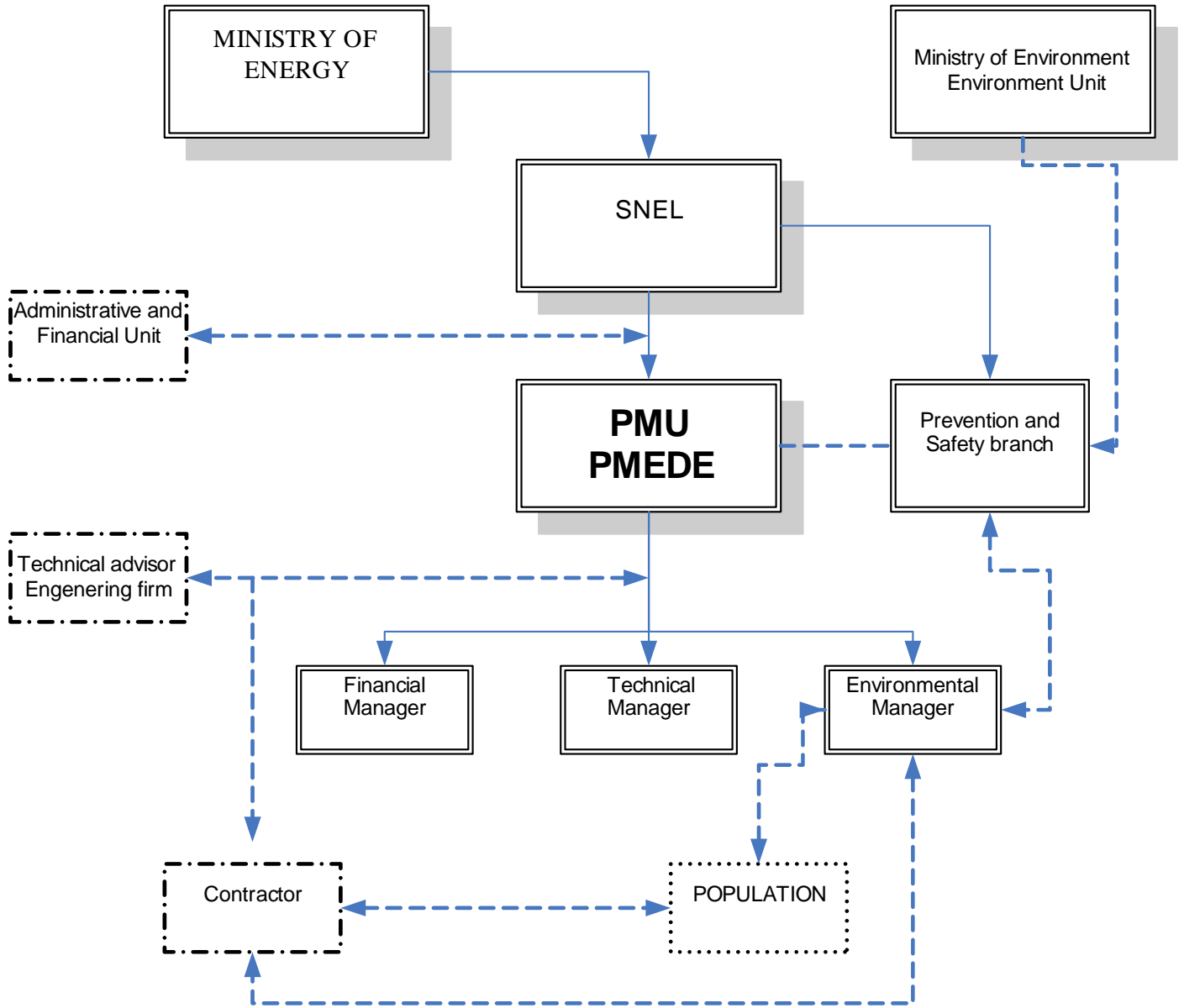
In order to implement the series of recommendations stemming from the study on environmental and social impacts and to ensure the evaluation of the sub-components yet to be defined as part of the environmental and social management, the implementation of structures responsible for these activities within the SNEL and the Project Management Unit (PMU) is necessary.

The organization proposed in order to guarantee the activities required for the environmental assessment process during the work and the subsequent operational phase, is presented in the following diagram. The integration, within the protection and safety branch (PSB), of the responsibilities for the environmental management of the SNEL assets and projects is necessary to enable implementation while respecting the rules of the RDPMDP environmental evaluation process. The branch’s task is above all

to verify that the evaluation process has been carried out and to manage the relations necessary with the Ministry of the Environment, internal communications at the SNEL and, where applicable, public relations.

The PMU will also include, within its team, an Environmental Manager who has been trained through the PMURR environmental training program. The latter is familiar with the World Bank's safeguard policies and has a good command of their application. His task will be to oversee the daily management of the RDPMDP evaluation process such as defined in the different documents produced within the framework of this study.

Figure 2: Organizational structure proposed for the environmental management of RDPMDP



The companies selected to carry out the work will, on a contractual basis, have to ensure a large part of the actions to limit the environmental and social impacts during the work period. The control units will represent the client and will thus ensure the control of the companies' environmental obligations on a daily basis. Each body will be attributed contractual obligations for the application and monitoring of environmental measures. The EM of the PMU will inspect the sites systematically and will notify any divergences from the contractual obligations. He will be able to ask for the penalties in the contracts to be applied in case of non performance of these obligations.

Through the project's financing, the EM and the PSB will be provided with the means to enable them to fulfill the tasks incumbent upon them.

The social and environmental management plan and framework of the RDPMDP give the majority of the measures that have to be applied to mitigate the negative impacts. These documents provide, inter alia, details of the share of responsibility for the implementation of the environmental assessment process and for the implementation of the different mitigation measures and their monitoring. The SEMF provides the standards and directives applicable to the project. It describes the standard measures that apply to the project as a whole (waste management, health and safety of the workers and populations living next to the project, etc.). It defines the organisational structure which will be in charge of applying these measures. As for the SEMP (Social and Environmental Management Plan), it specifies the mitigation measures specific to the components and sub-components that are defined in sufficient detail. These measures involve both the human environment and the natural environment, including in particular the optimisation of the original EDF route in certain places to limit the resettlement of local populations, the protection of workers, informing the local populations about the risks related to high voltage electric lines, consumer price surveillance at the level of Inga in order to avoid artificial inflation, etc.

It will be necessary to hire an international expert to support the PSB and the EM in the implementation of the environmental evaluation process. Considerable support will be necessary during the preparation of different tender documents and contracts, which will later become less frequent and will serve to guide the actions.

The preparation of the resettlement plan will be assigned to the SNEL who will hire local consultants specialized in the domain. The international expert will have to provide training and follow up these processes to ensure that the OP 4.12 and the IRF are respected. The local consultants will carry out censuses in accordance with the framework planned once the location of the infrastructures has been precisely defined. The amount necessary for displacements due to resettlement and for various indemnities has been provided in the project budget.

The budget necessary for the entire process, including the recruitment of consultants, the payment of displaced persons and compensation, the diffusion of information and public consultation, the equipment and operation of the Environmental Manager of the SNEL for the performance of tasks directly associated with the RDPMDP, the training of the SNEL agent, etc., amounts to approximately 3 million USD for a 5 year period. The table presented below provides the details of this budget.

Table 2: Estimated cost for the implementation of the Environmental Assessment (EA) process over a 5 year period

	Cost in \$US
Institutional support (international expert for 18 months over 5 years)	450 000
Training of SNEL agents abroad	110 000
Equipment (including purchase of a four-wheel drive)	59 000
Team and vehicle operation	120 000
Unforeseen 10%	73 900
EA process sub-total	812 900
Resettlement and compensation	
Declaration of common public interest and information of the population	100 000
Preparation of resettlement plans (local consultant)	118 000
Cost of resettlement for the transmission component	569 750
Cost of resettlement for the Kimbanseke substation sub-component	179 750
Cost of resettlement for the other sub-components	70 000
Provision for resettlement associated with constructions realized after October 2006 and before the census	175 343
Unforeseen (20% of compensation)	163 900
Resettlement/ compensation process sub-total	1 376 743
Environmental Assessment process TOTAL	2 189 643
Provision for the construction of the waste storage site	300 000
Provision for other mitigation measures	150 000
Provision for compensation for damage to crops and others	100 000
Provision for the requirements of the different specialist consultants	300 000
Provision for non-defined mitigation measures sub-total	800 000
Grand Total	3 039 643

10 PLANNING OF INTERVENTIONS

The first stage of the implementation of the environmental management process is the declaration of common public interest of the land that will be used for the realization of the high voltage power transmission line (Transport Component) and the Kimbanseke distribution substation (Distribution sub-component). This declaration will make it possible to legally limit the acquisition of land in the future territory of the transmission line and the transforming substations. A detailed map of the total land requirements using high definition satellite images would enable disputes to be limited. An information campaign must be carried out using maps, once the declaration of common public interest has been made. This stage is crucial to avoid the land requirements defined having their occupation drastically modified by the end of the technical studies which will define the exact positioning of the pylons and thus, gives the possibility to carry out the census as required by OP 4.12.

The training of the SNEL personnel involved in the environmental assessment, in particular for the protection and safety branch (PSB) is also an element to be implemented as a priority, including support by the international expert.

The integration of the environmental obligations, the results of the ESIA and the project's different environmental and social management policies which have been produced, that is to say the SEMP, MCHF and IRF, within the consulting engineer's Terms of Reference, to begin with, and within the Terms of Reference of the contractors who carry out the works thereafter, is primordial.

Subsequently, the interventions will have to follow the project development cycle, including where applicable:

- additional studies in particular to establish which people need to be relocated and/or indemnified,
- the inclusion of specific mitigation measures in the various tender documents produced per sub-component (technical studies, works, meetings) and in the contract taking into account the various ESIA recommendations.
- the monitoring and control of the implementation of the mitigation measures, resettlements and compensations paid, etc.

11 RECOMMENDATIONS

At institutional level, it will be important for SNEL to develop its environmental management capacity given the national scale challenges it will face. The main recommendation is therefore the creation of an Environment section within the Prevention and Safety Branch that will manage all of these issues. The RDPMDP will be a good springboard, as will the SAPMP which is also financed by the World Bank. As these two projects focus on environmental management, the Environment Section could standardize the approaches for the two projects and, particularly, make significant savings by using the support of one international consultant for the entire department whereas s/he was initially dedicated to the RDPMDP. The Environmental Managers of the SNEL trained by the PMURR should be part of this section so that they are rapidly operational and do not lose the capacities they have acquired.