



AFRICAN DEVELOPMENT BANK GROUP

PROJECT : PROGRAMME TO SUPPORT THE TRANSPORT SECTOR - PHASE 2
AND RELATED AGRICULTURAL AND RURAL INFRASTRUCTURE
(PAST 2)

COUNTRY : REPUBLIC OF CONGO

SUMMARY ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

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Project Name : **PROGRAMME TO SUPPORT THE TRANSPORT SECTOR - PHASE 2 AND RELATED AGRICULTURAL AND RURAL INFRASTRUCTURE (PAST 2)**

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1 INTRODUCTION

This document is the summary of the Environmental and Social Impact Assessment (ESIA) of the Mila Mila-Mossendjo Road Construction Project. It concerns Phase 2 of the Transport Sector Support Project. Environmentally and socially, the project has been classified under Environmental Category 1, in compliance with Congo's requirements and those of the Integrated Safeguards System of the African Development Bank (AfDB). The ESIA was prepared in 2014.

The document first presents project description and rationale, and then Congo's legal and institutional framework. It also describes the major environmental conditions and compares the technical, economic, environmental and social feasibility options of the project.

The environmental and social impacts have been summarized and the inevitable impacts identified. Negative impact improvement and mitigation measures, as well as the monitoring programme, have been presented in the document. Public consultations held during the ESIA and supplementary project initiatives have been presented. The conclusion contains project acceptability for which an Environmental Compliance Certificate was issued for each country, and the Environmental Surveillance and Monitoring Programme disclosed in the two countries.

2. PROJECT DESCRIPTION AND RATIONALE

The First Priority Programme of the Central African Consensual Transport Master Plan (PPP/PDCT-AC) and the Central African Consensual Road Network (RRC) adopted in June 2007 provide for direct road links between the various capitals, with alternative and secondary roads making up the sub-region's road network.

The upgrading and paving of the Mila Mila-Makabana-Mossendjo road is an alternative to the Brazzaville-Libreville road link as it enables direct travel from Brazzaville and Pointe-Noire to Franceville in Gabon, with the possibility of a road/rail intermodality to Franceville and significant time gain. Also, to stop poverty from spreading in the country, reduce its dependence on the oil sector and enhance food security, Congo is today determined to diversify its economy and develop agricultural production. To meet these challenges, new Government guidelines for the coming years, outlined in the Growth, Employment and Poverty Reduction Strategy Paper (GEPRSP 2012-2016), attaches special importance to the agricultural sector, the development of which generates more inclusive growth and direct impact on the cost of, and accessibility to foodstuffs. It is against this background that the economic importance of Niari Department (Département du Niari), hitherto the country's bread basket, has declined over the years owing to constantly deteriorating transport and marketing infrastructure.

The Mila Mila-Mossendjo road links the Capital of Niari Dolisie Department, Makabana and Mossendjo, and covers the network of feeder roads along the road, and many localities and villages over a distance of **117 kilometres**. The two bridges on the rivers Louesse and Mpoungo complete this network. Thus, the modernization of the project road will address the weaknesses noted in many documents dealing with the transport development and planning strategy, namely the "Congo Road Master Plan" and the "Transport Sector Strategy". Such modernization of the road will, therefore, provide Niara Department with reliable transportation corridors to evacuate its agricultural products to the major consumer centres. Thus, it is a key element in improving the population's living conditions and reducing poverty, which will all contribute to national cohesion, enhancing food security and reducing poverty.

The project mainly consists in upgrading and paving the 116.35 km-long Mila Mila-Mossendjo road section and constructing all bridge infrastructure (river or railway crossings) including the bridges on the Sangha the Louesse and the Mpoukou. In addition to these road works, there is provision for the pavement of existing roads between Ouesso and Pokola, the rehabilitation of related rural and agricultural infrastructure, the improvement of the yield of the main crops in the project area as well as the development of agricultural products, the rehabilitation of socio-educational infrastructure and the upgrading of infrastructure for women’s groups and youth integration. Estimated to cost CFAF 224,75 billion, the project builds mainly on the infrastructure component and its sub-components listed below (Table 1):

Table 1

Description	
A.1.	Upgrading of 116 kilometres of RN6, including rest areas, a weighing station and a tollgate, 02 bridges on the Louesse and Mpoukou as well as environmental protection measures on the Mila Mila-Mossendjo Section and the construction of the bridge on the Sangha, the pavement of 45 km road between Ouesso and Pokola;
A.2.	Awareness-raising on road safety, HIV/AIDS, Ebola, the environment and early pregnancies;
A.3.	Rehabilitation of related rural and agricultural infrastructure (feeder roads, rural markets, warehouses and latrines, drying areas, agricultural input shops, drinking water boreholes, reservoir dams, etc.);
A.4.	Rehabilitation of social, health and educational infrastructure (schools, health centres, etc.);
A.5.	Specific measures for women (rehabilitation of social action units, multipurpose platforms, income-generating activities, etc.);
A.6.	Control and supervision of road and related agricultural and rural and socio-educative infrastructure rehabilitation works.

3. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

3.1 Congo’s Regulatory Framework

The ESIA is based on the following main instruments: (i) Law No. 003/91 of 23 April 1991 on environmental protection and Decree No. 99 – 149 of 23 August 1999 establishing the Environmental Protection Fund provided for by the above law; (ii) Decree No. 2009-415 of 20 November 2009 laying down the implementation scope, the content and the procedures for environmental and social impact assessment and statement; (iii) Law No. 16-2000 of 20 November 2000 on the forestry code which defines forests and protected and reforestation areas, and classifies animal species according to their scarcity; (iv) Decree No. 2002-437 of 31 December 2002 laying down conditions for managing and using forests; (v) Law No. 48/83 of 21 April 1983 laying down conditions for wildlife exploitation and conservation; (vi) Order No. 3863/MEF/SGEF/DCPP determining partially and totally protected animals provided for by Law No. 48/63; (vii) Decree No. 86/775 of 7 June 1986 rendering environmental impact assessments compulsory; and (viii) Order No. 835/MIME/DGE of 6 September 1999 laying down conditions for approving the conduct of environmental impact assessments.

3.2 Administrative Framework

Administrative supervisory authority over Congo’s environment is the responsibility of the General Directorate of Environment (DGE) which was attached to the Ministry of Tourism and Environment (MTE) on 2 March 2007. According to Decree No. 98-148 of 12 May 1998 laying down its powers and organization, DGE is the technical body which assists the Ministry to which it is attached in the discharge of its duties in this area. Moreover, several ministries are concerned by the management of the environment and intervene in a sector depending on their specific powers (ministries in charge of agriculture, livestock, water resources and forestry, fisheries, mines, hydrocarbons, industry, energy, health, population, town planning and housing, research, education, communication and culture).

3.3 African Development Bank (AfDB)

The AfDB applies its Integrated Safeguards System (ISS) of December 2013 through the following five operational safeguards: (i) Operational Safeguard 1: Environmental and Social Assessment; (ii) Operational

Safeguard 2: Involuntary Resettlement – Land Acquisition, Population Displacement and Compensation; (iii) Operational Safeguard 3: Biodiversity and Ecosystem Services; (iv) Operational Safeguard 4: Pollution Control and Prevention, Greenhouse Gases, Hazardous Materials and Resource Efficiency; and (v) Operational Safeguard 5 : Labour Conditions, Health and Safety.

The other AfDB applicable directives and policies are: (i) the Bank’s Gender Policy (2001); (ii) the Framework for Enhanced Commitments with Civil Society Organizations (2012); (iii) Disclosure and Access to Information Policy (2012); (iv) Bank Integrated Water Resources Management Policy (2000); (v) AfDB Climate Risk Management and Adaptation Strategy; and (vi) Environmental and Social Assessment Procedures for Bank Operations (2015).

4. DESCRIPTION OF PROJECT ENVIRONMENT

4.1 Project Area

The project area (PA) is located in Niari Department, which is one of the ten administrative Departments of the Republic of Congo, with a surface area of about 25,941 square kilometres. It is bounded to the north by Gabon, to the south by Cabinda (Angola) and the Democratic Republic of Congo, to the east by Lekoumou and Bouenza Departments and to the west by Gabon and Kouilou Department. It comprises two full-fledged municipalities, five urban municipalities and fourteen sub-prefectures (sous-préfectures). The PA extends to the sub-prefectures of Louvakou (Mila Mila village), Makabana, Moutamba-Tsimba, Mossendjo, Moungoundou-Sud, Mayoko and Mbinda (border with Gabon). The area is considered as the country’s bread basket. The project extended area of influence span to the Lekoumou Department boarding the Niara and Ouessou District and the Sangha Department.

4.2 Physical Environment

The PA has a wet tropical **climate** resulting from the predominance of low inter-tropical pressures from October to May and southern sub-tropical high pressures from June to September, with 1 200 to 1 650 mm of **rainfall** annually, 125 to 175 days of rainfall and 7 to 9 months of rainfall, interrupted by a short dry season from mid-January to mid-February and a dry season from May to September. Average annual **temperatures** in the project area are around 20°C, with peaks capable of exceeding 30°C. Average air **humidity** varies from 65% to 80%. There are often low **winds** with an average speed of 1.36 m/s. Climatic fluctuations have been highlighted and the entire project area has recorded a 0.5°C temperature rise over the past 100 years, and rainfall has been heavier, with seasons starting late by 15 days and models project an aggravation of the phenomenon, which will lead to a drop in agricultural productivity and increased erosion.

The study area’s **geomorphology** is characterized by a relief made up of two contrasting topographic landscapes (the Chaillu mountain range and the Niara depression) structurally dominated by the Chaillu schist-limestone and granite soils which are modified yellow soils.

The dominant **geology** is precambrian under the equatorial climate . It mainly produces: (i) the schist-limestone series in low altitude areas; (ii) Niara superior Tilite ; (iii) the Louila and Bouenza series; (iv) the Chaillu series found in the Chaillu mountain range stretching from Makabana to Mossendjo. The project area is almost occupied by the schist-limestone and granite soils. With these various types of materials, finding gravelly soils will not pose any real problem, but their erodibility will require the rehabilitation of the borrow sites after exploitation as stipulated in the country’s mining code.

The **hydrography** of the main rivers is characterized by the Kouilou-Niari water catchment, a tributary of the Congo River. The Kouilou-Niari basin has a surface area of 55 340 square kilometres and covers the south-east of Congo. It includes the Mpoukou the river which is a stream that flows into the Louesse. The Sangha River located in the eponymous Department , is 790 km long and is the second largest tributary of the Congo River, on its right bank . This river is well fed in all year round and so quite regularly , which flows from north to south of Nola , in the southwest of the CAR , through Ouessou and flows into the Congo to Mossaka at 400 km upstream from Brazzaville.

4.3 Biological Environment

The savannah **vegetation** is made up of three sub-formations, namely: **(i)** the plateau savannah, made up essentially of grasses capable of reaching a height of 1.50m to 2.50m, mainly comprises *Hyparrhenia diplandra*, *Andropogon scbirensis*, *Panicum maximum* and *Imperata cylindrica*; **(ii)** the savannah of the hills and slopes, represented by a shrub vegetation which rarely exceeds a height of 1m; and **(iii)** the lowland savannah made up of *Imperata cylindrica* in floodable areas. The various species identified are: *Entandrophragma cylindricum*, *Guibourtia tessmannii*, *Corylus avellana*, *Entandrophragma utile*, *Cola acuminata*, *Baillonella toxisperma*, *Tectona grandis*, *Ceiba pentandra*, *Aucoumea klaineana*, *Gnetum africanum*, *Mangifera indica*, *Dacryodes edulis*, *Carica papaya*, *Persea americana*, etc.

There is a **wildlife** reserve (Tsoulou) in the project area. There is abundant and varied terrestrial wildlife in the project area, with a significantly high number along the road. Species protected by the national legislation have been identified and observed around the Tsoulou Reserve. They are: **(i)** Hartlaub’s duck (*Pteronetta hartlaubii*), the giant anteater, the swamp mongoose, the long-nosed mongoose, the black-footed mongoose and the dwarf crocodile classified under Category A of protected species and placed in the IUCN red list; **(ii)** elephants, about 10 to 20 of which have been located around Mila and in the islets downstream of the forest reserve area. Up to 2006, the forestry law classified these animals under Category B of species whose hunting is regulated; **(iii)** there is abundant bird fauna, comprising more than 187 species belonging to 42 families. It should be noted that no species is endemic to the project area. Thirty-two of these species are migratory.

Figure 1 below shows forest occupation in the PA in March 2013.

Figure 1: Forest Occupation Map



4.4 Socio-cultural Environment

The **population** of the sub-prefectures/communes covered by the project (Louvakou, Makabana, Moutamba-Tsimba and Mossendjo) was estimated at over **51,195** in 2007, representing 22.1% of the population of Niari Department estimated at **231,271**, out of Congo’s total population of **3,697,490**. The

mostly rural population is scattered all over the project area. It comprises many ethnic groups, namely: the Tékés, the Kunis, the Tsanguis, the Nzébis, the Punus, the Kotas, the Banbas, the Koutas, etc.

The poverty rate is still very high in rural areas (55%). The poverty affecting rural areas is largely explained by the inaccessibility of the region crossed by the road and inaccessibility to basic socio-economic facilities by the neighbouring populations.

Access to health centres and schools is very difficult owing to the deteriorated state of the road. Concerning school infrastructure, the project area has about twenty (20) primary schools, six (6) secondary schools, one (1) nursery school, one (1) high school, one (1) advanced forestry school and one vocational school. The education sector is facing some problems in the project area, namely: insufficient qualified teaching staff, insufficient and dilapidated school infrastructure and equipment, insufficient preschools, primary, vocational and secondary schools, lack of an administrative building and housing for teachers, lack of water points, etc.

Health **infrastructure** in the project area comprises two base hospitals (Makabana and Mossendjo) and a few integrated health centres (IHCs) and dispensaries. Each of the base hospitals in urban centres has a pharmacy, hospitalization rooms, a laboratory, a maternity and dilapidated means of transport. The diseases commonly diagnosed during medical consultations are many, the most serious being malaria, severe anaemia, hypertension, tuberculosis, typhoid, filariasis and fungal, bacterial and viral diseases.

Regarding **the status of women** in the project area, lack of income, material deprivation, and lack of training, prospects, empowerment and participation are some of the many forms of poverty and widening inequalities. In Niari Department, many women and girls live under such conditions.

Agriculture tops the list of **major activities** carried out by the population of the project area. They practise slash and burn shifting cultivation without fertilizers. Mixed farming is the most widely practised system of agriculture. Agricultural implements are still rudimentary and the workforce is made up mainly of family members. The main crops are: cassava, groundnuts, maize, oil palm, squash, onion, cowpea, yams, fruit trees and market garden crops.

Livestock breeding is traditional and considered as social or financial security. All the species are reared free-range with a more or less large herd size. The various species identified are cattle, sheep, goats and poultry.

Fishing is carried out in Niara River, Louessé River and other streams and swamps, some of which are far from the villages. Crustaceans (shrimps) are the most harvested species in the project area.

Handicraft is not developed in the project area and is hardly practised for profit. **Tourism** is not very developed in the study area. It should be pointed out that no tourist site will be affected by the works.

5. PRESENTATION AND SELECTION OF PROJECT OPTION

5.1 “Without Project” Situation

The "without project" situation amounts to leaving the road section and production basin access roads in their current, much degraded state, with its inconveniences to the various users. On the road, drivers are compelled to use the crossing method, constantly stopping and going, thereby consuming much fuel and emitting more heavy metals. The state of the road, therefore, quickly wears out all the mobile mechanical parts. Truck transit is often disrupted, if not paralyzed, as a result of heavy rainfall which renders some road segments completely impassable, leading to considerable increase in transport costs and reduced production competitiveness of agricultural zones in the project area. It also impedes health development projects by making them too costly. There are environmental effects such as air pollution by truck exhaust gases and dust during the dry season, and soil displacement due to erosion and the absence of sanitation systems. The “without project” situation is not consistent with the Congolese Government’s policy or that of its economic and social development. Therefore, the status quo is not in line with the country’s transport and road infrastructure systems improvement spirit and principles.

5.2 With Project Situation

5.2.1 Project Alternatives

Three development levels were examined in the Preliminary Design Study, namely: (i) an all-season earth road with a 10m-wide roadbed strictly following the existing alignment; (ii) a cheaply paved road with a double-layer surface dressing, a 7m-wide roadway and 2x1.5m-wide single-layer shoulders; (iii) an asphalt concrete road with a 7m-wide roadway and 2x1.5 metre-wide double-layer shoulders. **Environmentally and socially**, and in the final design study, occasional and localized optimizations of the road alignment may turn out to be preferable to crossing a drainage or displacing structures.

5.2.2 Option adopted

The third development level was adopted, consisting of: (i) in rural areas, a 7.5m-wide roadway, 2x1.5m-wide shoulders and, as applicable, concrete drains; (ii) at the crossing of large villages, a 7m-wide roadway, 2x1.5m-wide shoulders and 2x1.5m-wide sidewalks; and (iii) in urban areas, streets with a 9.0m-wide roadway and 2x1.5m-wide sidewalks. The new horizontal and vertical signalling standards recommended for corridors in Africa by the African Union, based on a Bank-financed study, will be implemented. Also, spaces will be provided along the road to be paved for the subsequent laying of optic fibre according to related country master plans. Regarding sustainability and optimization of the movement of goods and people, this variant offers a better "cost/benefit" compromise than the status quo.

The geometrical features for a reference speed of 80 km/h were taken into account and the speed is occasionally limited to 60 km/h so as to correspond, as much as possible, to the existing alignment in order to minimize: (i) the destruction of buildings, with a 50 km/h speed limit at village/inhabited area crossings; (ii) tree felling, including in areas with difficult topography signalled by vertical panels limiting speed and indicating dangerous bends.

There will be 63 hydraulic facilities, and 06 crossings, namely: (i) KP 37+400 Niari River: 152.5m- long; (ii) KP 43+700 Louessé River: 211.1m-long; (iii) KP 79+700 Abouhisi River, tributary of Itsibou: 40m-long; and (iv) KP 109+900 Itsibou River: 44m-long; 7 overpasses and 4 railway level crossings; (v) bridge on the Louesse of 106 m long, (vi) bridge on the Mpoukou of 60 m long and isolated crossing, (vii) bridge on the Sangha at Mbirou (Ouesso) of 525m long.

Figure 2: Features of the Option Adopted

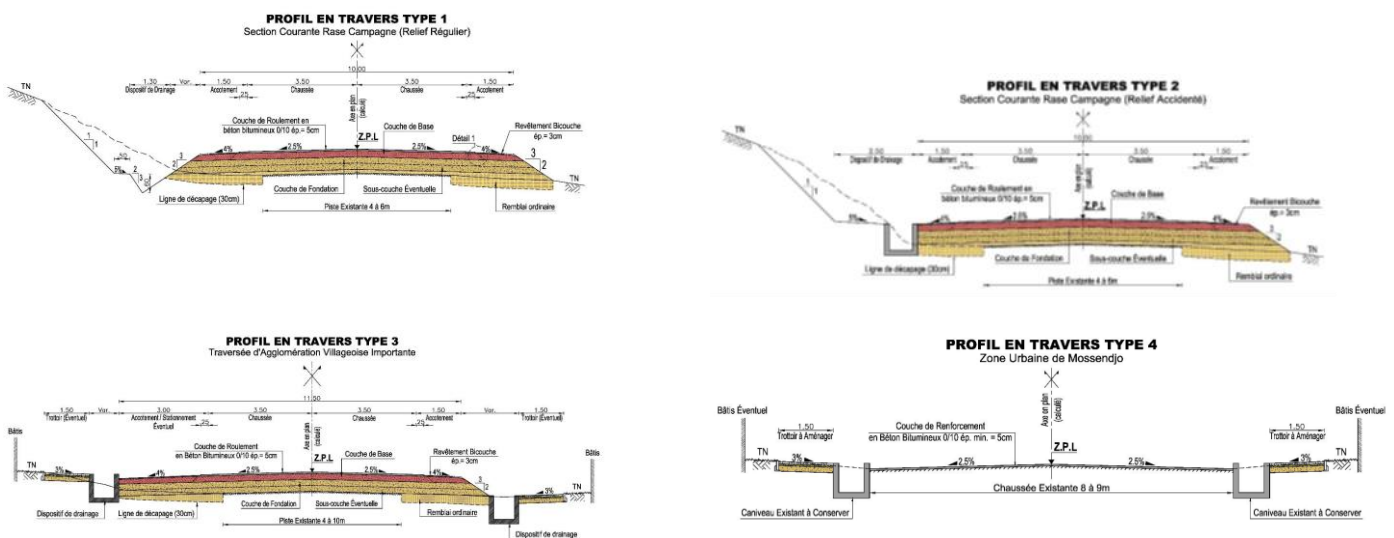
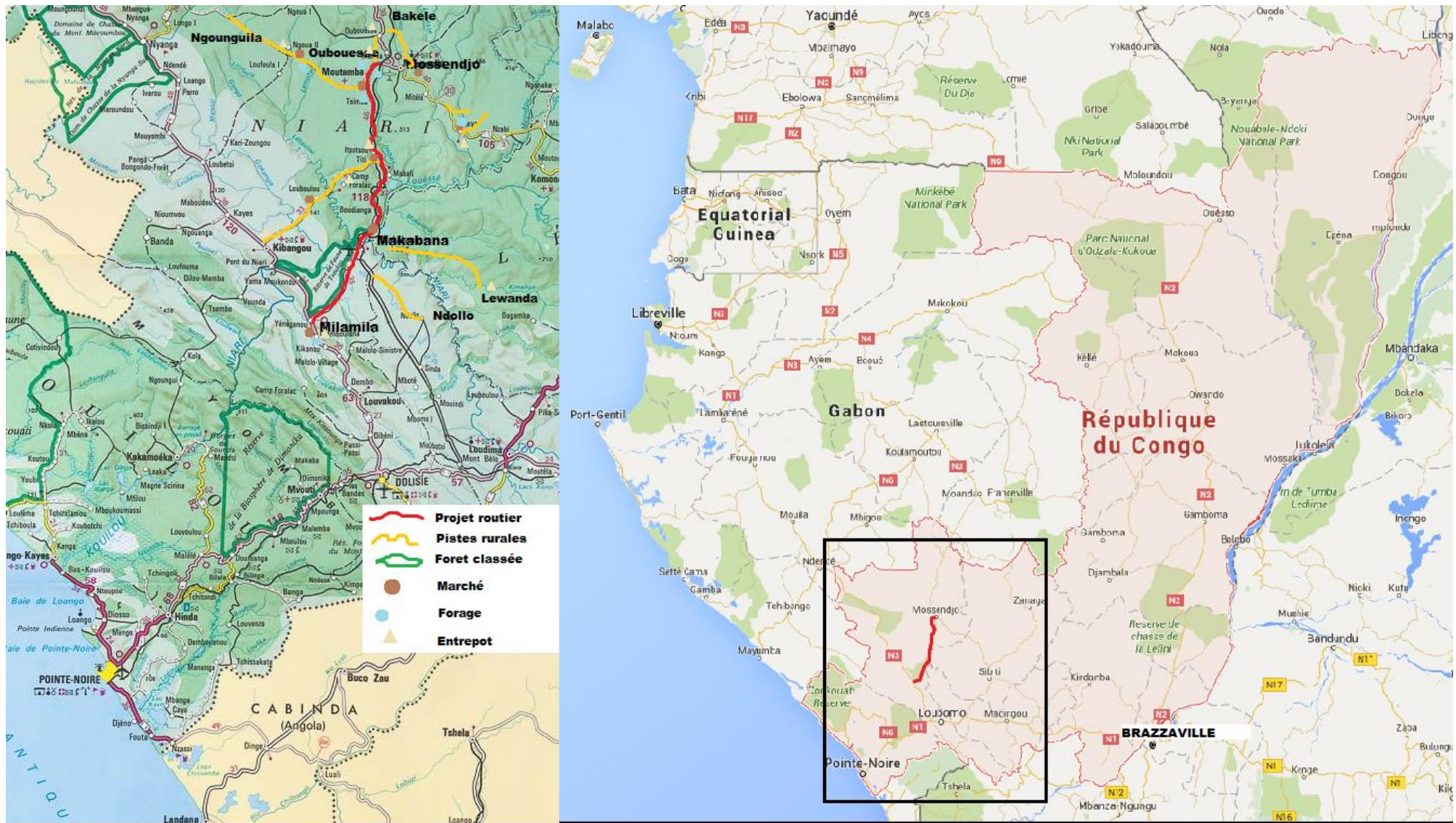


Figure 3: Project Map



5.3 Description of Right-of-Way and Sensitivity Assessment

The road can be divided into the following three (3) homogenous sections: (a) **Section 1:** Mila Mila-Makabana (KP 0+ 000 to KP 33+500) passes through regular and flat terrain. The existing 6m- to 10m-long earth roadbed is extremely dilapidated. Almost the entire road runs along the Tsoulou Wildlife Reserve and is marked by shrubby savannah and the absence of major streams; (b) **Section 2:** Makabana –Kibangou (KP 33+500 to KP 71+350). The road passes through relatively rolling terrain and crosses a degraded forest area interspersed with shrubby savannah. The forest crossing has a high relief between KP60+200 and KP64+000. The road crosses the Niari River and its tributary, the Louessé River. The slopes vary from 0.5% to 6%; (c) **Section 3:** the Kibangou – Mossendjo road (KP 71+350 to KP 117+256) passes through rolling terrain with degraded forests. It is the most used section. The existing roadbed is highly degraded with a bad surface. Its width varies from 6m to 8m. At the entrance to Mossendjo, 3.1 km of the road were recently upgraded. The width of the roadbed varies from 10 m to 12.5 m. Feeder roads to be rehabilitated are connected to these sections.

Besides the road, a tollgate and a weighing station will be constructed. The width of the right-of-way to be cleared will vary from 30m in the countryside to 25m at village crossings. There will be less vegetation cutting on Section 1 than on the other sections. However, there could be additional vegetation cutting in areas that are too winding (sharp bends) as well as the approaches to unguarded level crossings in order to provide appropriate geometric features for compliance with the reference speed for the project, as well as the required visibility at intersections.

Environmentally, none of the deposits proposed in the technical studies has been declared as being particularly sensitive. However, the environmental criteria to be taken into account in selecting deposits of materials should comply with the environmental prescriptions presented in the ESMP. Deposits, quarries and borrow areas are presented in Table 1 below.

Table 2: List of Deposits and Quarries

Location of Borrow Areas and Quarries	Estimated Volume in m3	
Existing Milesian camp sand borrow area		Section 1 210 810
Borrow area No.1 KP 9+100	57 503	
Borrow area No. 2 KP 12+500	38 084	
Borrow area No. 3 KP 20+300	15 223	
Borrow area No. 4 KP 20+300	100 000	
Borrow area No. 5 KP 37+100	28 560	Section 2 95 808
Borrow area No.6 KP 39+000	36 126	
Gravel quarry KP44 (Louessé)		
Borrow area No. 7 KP 52+700	22 022	
Exploited gravel quarry KP57+300		
Borrow area No. 8 KP 56+100	9 100	Section 3 196 620
Sand borrow area 77+800		
Borrow area No. 9 KP 82+300	19 360	
Sand borrow area KP114+000		
Borrow area No. 10 KP 114+300	32 360	
Borrow area No. 11 KP 118+300	34 900	Section 3 196 620
Borrow area No. 12 KP 118+360	110 000	
Total	503 238 m3	

6. POTENTIAL IMPACTS AND MITIGATION AND IMPROVEMENT MEASURES

Impact sources are defined as all the activities and/or facilities likely to cause environmental impacts during the implementation of the various project components. Impact receptors (or environmental components) likely to be affected by the project are the sensitive study area elements, that is those likely to be significantly modified by project-related activities (or impact sources). The interrelation is recorded in Table 2 below.

6.1.2 During the construction phase

On the physical environment: during works: **(i)** air quality will be deteriorated by the emission of dust, toxic gas and heavy metals into the atmosphere as well as sound emissions from mechanized works in the quarries and the right-of-way, without the mostly temporary release of exhaust gas (mainly CO₂) by machines and vehicles having a major impact on overall climate change; **(ii)** heavy rainfall in the project area will limit dust emissions and vegetation cover will muffle engine noise; **(iii)** soil structure and texture are likely to be degraded by activities such as: (a) the establishment of the construction sites, the opening of borrow quarries and excavations; (b) new provisional and final rights-of-way; and (c) the movement of machines out of the rights-of-way. These soils may be destabilized, exposed to erosion, compacted, rendered impermeable and eventually polluted by accidental hydrocarbons spills; **(iv)** as a result of heavy rainfall, the risk of erosion is quite high in areas with steep slopes, for cuttings and embankments or in open areas, so long as a pioneer vegetation does not stabilize them. Consequently, there is a high risk of regressive erosion at water discharge points; **(v)** during works, water quality may be temporarily deteriorated with respect to: (a) surface water by the transportation of fine particles downstream of water withdrawals in many streams crossed by the road to meet the high water needs for development works (construction site, sprinkle/compaction water, etc.); (b) ground water through leachate contamination; **(vi)** the disorderly discharge of construction site solid and liquid wastes (excavated material, various residual substances, etc.) degrades the natural environment near camps and the right-of-way of the road and feeder roads, but also during the rehabilitation of socio-economic facilities owing to the fact that the discharge points could be transformed into illegal dumps. This phenomenon will be seriously aggravated during the construction of culverts, drains and engineering works which will produce huge quantities of residual material (empty paint and solvent tins, fuel wood, residual concrete, etc.).

On the biological environment: **(i)** a surface area of about 11.5 ha will be cleared during works execution (all the lots), and close to 1300 trees¹ felled, excluding occasional felling when the rehabilitated alignment deviates significantly from the current alignment (7 sections totalling 1.3 km). Clearing and tree felling will take place only around woodlands bordering the road. Threats will mainly concern the destruction of cash crops (cocoa, banana, groundnuts and, incidentally, oil palms) and food crops (cassava and maize) along the road, as well as pioneer grassy and woody vegetation that has colonized the current right-of-way and makes up its main landscape. Wood cutting for the camps will not pose a serious threat to these forests as non-precious wood cut along the right-of-way could be used for domestic purposes to meet the needs of the local population as well as those of the construction site camps. Gas and dust emissions from the movement of machines on the roads under construction, and asphalt manufacturing equipment and plants are also sources of impact on plant life.

The potential impacts of works on wildlife, especially the Tsoulou Wildlife Reserve, are: **(i)** noise, gas and dust emissions from civil engineering equipment, and dynamite blasts in quarries will scare away animals whose habitats have not been destroyed, although such impact will be limited in time and space and; **(ii)** the risk of increased poaching by the local population to supply select customers made up of staff of the works company. The project runs along the reserve and no fragmentation is envisaged, with the alignment following the existing road.

On the human environment: during works, the exploitation of quarries will lead to: **(i)** noise pollution by excavation machines; **(ii)** soil erosion; **(iii)** dust pollution; **(iv)** increased risk of road accidents due to transportation of materials from quarries to construction sites; **(v)** noise pollution during working hours; **(vi)** various nuisances and risk of respiratory diseases for staff and neighbouring inhabitants due to gas emissions; **(vii)** possible risk of soil and water pollution by fuel and drain oil leakages or by the disorderly discharge of purging compounds, or the storage of materials and hydrocarbons and the preparation of binders and bituminous emulsions. Also, construction site workers could adopt behaviours that are likely at odds with the habits and customs of the people of the project area. Furthermore, the massive presence of the Contractor's workers with relatively high amounts of cash may **(viii)** encourage moral depravity (prostitution, banditry, drug addiction, etc.), which may lead to increased STI and AIDS prevalence rate.

¹ Source: Project Quantitative Details.

On the socio-economic environment: the project will directly impact: (i) 606 dwelling houses in 18 villages (10 in Lot 1 and 8 in Lot 2), as well as 2443 fruit trees, affecting close to 597 households, 148 of them headed by women, and comprising 2925 dependents, given the average household size of 4.9 persons. The project will also impact 11 churches, 1 primary school, 3 markets, 1 integrated health centre, 2 neighbourhood headquarters, 1 forestry economy premises and 600 graves²; (ii) water (2 boreholes to be displaced) and electricity (18 public lighting lamp posts to be displaced) supply will also be interrupted. In the context of the PA where the people are attached to their land of origin and do not accept to leave it, the issue will, therefore, be to avoid displacing many families from one place to another, but to move them back a few metres away from the road right-of-way. During works, the presence of construction site transport vehicles and machines will (iii) impede the fluidity of local traffic (which is already very low), with very light temporary consequences on the transportation of goods and services, the neighbouring people and their livestock, increase in direct transportation costs and momentary disruption of access to socio-educational and religious facilities.

6.1.3 *During the operation phase*

Physical environment: the potential impacts during the operation phase will be: (i) worsening of the surface run-off phenomenon in low-lying areas during the rainy seasons due to increased paved surface. The phenomenon will heighten in villages with a lot of clay soil. Moreover, the improvement of the road will lead to (ii) foreseeable increase in heavy duty vehicle traffic, especially vehicles transporting hazardous and harmful materials (hydrocarbons, chemical products, organic pollutants, etc.) which are environmental risk factors in the event of accidental spills.

Biological environment: given the surface area of the right-of-way compared with the region's forest area, the original features will still be present. However, degradation features around big villages such as Makabana, Kibangou and Tsimba could develop into landscapes where the road upgrading and the rehabilitation of feeder roads may lead to the creation of new farms, new investments in real estate and rapid population increase caused by the return of the emigrant population. Only the involvement of traditional authorities, the sensitization of the population on the protection of resources and the reinforcement of control with appropriate logistics, that is surveillance equipment, means of transportation and supervisors, could prevent illegal exploitation. Moreover, improved road traffic quality will lead to increased road traffic, which will increase the risk of accidents for animals (domestic and wild) crossing the road.

Human environment: higher traffic will also constitute (i) a risk and potential accident factor at road crossings and in urban centres not only for the neighbouring populations and road users, but also for their domestic animals. The quality of the road which will henceforth be an all-season road is expected to lead to (ii) an influx of people from all areas to carry out various activities (trade, tourism, hiking, leisure, etc.), which could increase the pressure on natural resources, cause disruptions and socio-cultural conflicts, undermine local habits and destabilize the balance of habits and customs; (iii) hunting, which already is a source of protein for the population of the region, could increase in order to supply meat in the markets of urban centres which are now more accessible and for which the road is more practicable.

6.2 **Positive Impacts**

During the construction phase, the project will have positive socio-economic impacts, with job opportunities for local rural youths: (i) direct on-site jobs, and (ii) indirect jobs related to the development of some commercial activities around workers' camps (sale of agricultural and handicraft products, the opening of restaurants, etc.). By avoiding any modification of the natural water drainage systems to ensure permanent water flow, the design of crossings, culverts and drains seeks to eliminate disruption of economic and agricultural activities by the flooding, resulting from storm water, of the road infrastructure itself, dwelling areas and cultivated farms. Work generated may stand at around 70,000 people/d for each lot of the road. The project will generate close to 300,000 people/days of work in total, of which close to 20% for women. Consequently, to help integrate young engineers in the job market, there are plans to recruit, on

² Source: Project Resettlement Plan.

a competitive basis, 24 jobless young engineers (road construction engineers, topographers, geotechnical engineers, etc.), 40% of them women, and to send them to work on the construction sites of the Contractor and the works control firm.

During the operation phase, the positive impacts of the road on the **physical environment** will all be linked to the facilities financed by the project and to the construction of the tollgate and the weighing station and the establishment of a maintenance system to sustain the road infrastructure: (i) the construction of crossings will contribute to environmental sanitation; (ii) the construction of outlets and run-off drainage canals, the reinforcement of shoulders and banks, and the stabilization of embankments will reduce landslides and loss of land; and (iii) permanent maintenance will help to significantly reduce risk of degradation.

The positive impacts of the road on the **biological environment** will all be linked to: (i) opening up of the country by the road, which will enable Congo's forestry workers (forest guards) to extend their control around the Tsoulou Wildlife Reserve as well as in the underpopulated forest areas located at Mossendjo and in its northern areas, and which will facilitate research activities (inventory of specific local species, prospection of sensitive sites to be protected, etc.), including for the Mossendjo-based National Forestry School, which are said to be very favourable to the road which enables access to, and extension of the training of controllers right to the Gabonese border at Mbinda.

The project benefits for users and the population comprise: (i) improvement of the state of the road which will reduce the risk of accidents; (ii) facilitation of access to various health, education and development infrastructure (markets, water, etc.) for the villages of the PA. This will improve the living conditions of the population of the said PA; (iii) facilitation of the sale of the products of the PA (agricultural products, fisheries products, goods produced by women's CIGs, etc.).

To enhance these impacts, measures have been taken in terms of related facilities, namely: (i) the rehabilitation of feeder roads in the three districts (Makabana, Moutamba and Mossendjo) totalling close to 300 km; (ii) the construction of 11 rural markets (Yaya, Ngoua 2, Dzabi, Leboulou, Dimani, Tsimba gare, Dihsse, Mossendjo and Mossendjo gare, Makabana Malembo) comprising a pavillon, a warehouse and latrines; (iii) the sinking of 13 boreholes and rehabilitation of the Mossendjo dyke; (vi) the rehabilitation of 3 fish farms and the establishment of a shrimp market. The project will, thus, constitute a leverage for improving the living conditions of the population of the PA, and reducing poverty among the most underprivileged people.

6.3 Mitigation and Improvement Measures

6.3.1 Prior to the Construction Phase

The Administration will in the bidding documents (BDs) for works include environmental clauses whose main provisions intended to protect the natural environment will concern: (i) the restoration of sites and preservation of natural resources: eliminating and reducing slopes, revegetation of borrow areas and deposits, planting of roadsides trees, seeding and protection of local species, the cost of which are presented in the bill of quantities; (ii) the preparation of the road right-of-way should be according to the same principles and lost species will be compensated by planting the appropriate local species of roadside trees at the entrance to, and exit of major towns and villages.

The main provisions designed to protect the human environment will concern: (v) a mechanism for the preferential recruitment of local staff; (vi) the application of safety regulations (presence of fire extinguishers, establishment of barriers, etc.) for the neighbouring population and users; (vii) the application of labour regulations concerning the wearing of personal safety equipment by construction site workers (gloves, dust protection masks, ear protectors, etc.)

Prior to the building and establishment of camps and construction sites, the contractors should submit for prior approval by the control mission (a) a construction site building plan comprising materials and fuel storage areas, workshops equipped with watertight pits and mechanisms for containing oils as well as

repackaging them in drums before they are returned to the supplier and (b) a construction site environmental management plan comprising the waste (solid, liquid, chemical and inert) management plan as well as ESPPs, (d) HSE and (e) the required fire control plan, in compliance with the environmental provisions of the legislation in force in Congo and with the project ESIA/ESMP. **Prior to the commencement of works**, the project supervisor should, based on the final design, picket the road on the ground with a view to compensating the PAPs. An overall amount of **CFAF 867.1 million** has been allocated for compensation. An escrow account will therefore be opened to cover compensation hazards and assistance for the relocation and resettlement of vulnerable persons. A provision of **CFAF 50 million** has been provided for in the contractors' bill of quantities to cover chance discoveries as well as compensation during any optimization of the alignment requiring expropriation. The project manager should also identify access to villages, markets or property which have to be maintained during works and/or restored.

6.3.2 *During the Construction Phase*

Contractors should ensure the conservation of wildlife and fish by: **(i)** avoiding the creation of artificial barriers to the movement of wildlife; **(ii)** carrying out blasting under the control of mining and forestry officials through sequential explosions to minimize vibrations and shock waves; and **(iii)** implementing preventive and technical measures to prevent bush fires and poaching. As already applied in Congo under PAST 1 (on the Dolisie-Mila Mila-Doussala section (Gabonese border)), bypasses in forest management units (FMUs) will be strictly forbidden. Monitoring carried out jointly by water and forestry officers, local vigilante committees and **control missions** will help to ensure the protection of forest resources in the area during the construction phase.

The mitigation measures to be implemented by the **Administration and control missions** will include: **(i)** organizing 12 information and awareness campaigns per year, that is 36 in total, by specialized NGOs for technical services, school-goers, the local population, traditional rulers, (local, regional and national) authorities, users, transport unions and local communities, using all possible communication media (schools, the press, radio and television stations). These campaigns will focus on project components, natural resource conservation, the preservation of sites and cultural monuments, security, risks and sanitation issues, health issues, (early pregnancies, STI/AIDS prevention, Ebola fever and waterborne diseases); **(ii)** banning the staff of contractors from eating, carrying on construction machinery and trading in game and wood; **(iii)** establishing road worthiness tests for the vehicles of contractors and staff, with the imposition of penalties, where necessary; (iv) marking trees prior to the commencement of works; and (v) providing incentives to promote the hiring of local manpower and subcontracting with local contractors during the execution of works such as the construction of markets and warehouses, the extraction of sand or the construction of small structures.

Measures concerning erosion control and reforestation have been specified in the bill of quantities and the ESMP. They will be implemented by contractors regarding erosion, but also by ENEF, together with local NGOs, community groups or individuals, regarding reforestation. The boundaries of the Mossendjo ENEF forest, the newly established FMU (2015) and the Tsoulou Wildlife Reserve will be clearly marked on the ground and restrictions indicated through information panels such as prohibition of bypass, logging, manoeuvres, movements and creation of new quarry sites put up along the road. Control will be carried out by the relevant government and forestry services, mobile brigades, and forest guards, in accordance with the rules and procedures in force.

In addition, contractors should respect the local population's living environment by: **(i)** setting up asphalt mixing plants outside dwelling areas. Asphalt will be supplied to the plants in barrels (loads). The plants will, however, be dismantled and removed at the end of the project; **(ii)** placing temporary signals in construction sites, especially at night, road signs and speed-limit signs at bypasses and dangerous areas; **(iii)** rehabilitating the access roads used by local residents and the property damaged by the construction works. They should also preserve the culture, habits, customs and health of the population by: **(iv)** ensuring that the Contractor's staff respect them; and (v) ensuring the periodic health control of their staff.

The **related facilities** retained are designed to address the grievances voiced by women's associations and the local population regarding access to water supply (boreholes), feeder roads, markets and warehouses, health services, women and youth multipurpose centres, community centres, processing equipment and expendable farm equipment for market gardening and agricultural production, knowledge acquisition, economic empowerment, mobility and access to means of transport. In addition, **Component A5** will seek to contribute to efforts to alleviate poverty and significantly reduce gender inequalities by empowering women, supporting their activities and supervising them (in communities, cooperatives or associations) in order to better prepare them for empowerment and promote gender equality by enabling women to act as change agents through their activities.

6.3.3 *During the Operation Phase*

To limit long-term impacts of the operation of the engineered road on the natural environment, the mitigation measures will mainly focus on: **(i)** the adoption of the annual budget of the DGGT for the material and financial resources required for the regular implementation of the periodic maintenance programme (inspection of drains and openings, and necessary ditch cleaning operations, maintenance of animal crossing areas, including appropriate road signposting); **(ii)** provide the local population with incentives to develop livestock and fisheries activities in order to substitute game with meat from livestock (sheep, goats, poultry, or even ranched game) and fishery products; **(iii)** encourage the development of ecotourism activities to help develop wildlife resources in place of poaching so as to ensure their "concerned" conservation by the local people themselves.

To reduce long-term negative impacts on the human environment, mitigation measures will mainly involve: **(i)** enforcing road safety regulations by installing speed-limit panels (80 km/h in open country, 60 km/h in winding areas and 40 km/h in urban centres), creating speed bumps at the entrance to/exit from villages as well as at the entrance to schools and markets; **(ii)** installing more road signs near railway level crossings; **(iii)** erecting fences between schoolyards and the road; **(iv)** raising the awareness of the local population and transporters on the consequences of increasing speed due to improved road conditions.

It is necessary to ensure biodiversity maintenance and conservation in ecosystems which are now **more accessible** to traffickers and poachers in the Tsoulou Reserve and the PA by: **(i)** carrying out annual environmental and forest monitoring; **(ii)** supporting the upgrading of the environmental, forest and wildlife GIS tracking system; **(iii)** raising awareness and building institutional capacity, particularly in the Mossendjo National Forestry School (ENEF); and **(iv)** establishing three eco-guard forest posts (Mila Mila, Makabana and Kibangou).

An Environmental and Social Management Plan (ESMP) has been prepared. It comprises a set of initiatives to be implemented so as to limit, mitigate or remove the potential negative impacts identified (mitigation measures to be enforced, monitoring and follow-up measures, necessary support measures for improving the population's living environment, awareness-raising and capacity building) and apportion responsibilities for the enforcement and monitoring of the above-mentioned measures. The mitigation and support measures will be: **(i)** included in bidding documents in view of contract performance (supplementary general conditions, special technical specifications, price schedule and priced bill of quantities); **(ii)** presented in detail and validated by control missions, forestry services (Ministry of Forest Economy) and the DGE (Ministry of Environment and Tourism) before the commencement of works; **(iii)** audited during the construction phase to ascertain the quality of such implementation; and **(iv)** monitored during the actual operation of the cross-border road to appraise their effectiveness.

6.4 **Residual Impacts**

Residual impacts are those felt after implementing mitigation measures at the end of the project. The impacts include: **(i)** landscaped patterns due to the presence of infrastructure (slopes) and bridges; **(ii)** issues related to the safety of the local population due to road traffic exacerbated by an increase in the frequency of vehicles running at higher speeds; **(iii)** issues related to noise pollution due to the same causes. These impacts are summarized in Table 3 below.

Table 4: Summary of residual impacts

Sources of impacts	Negative impacts	Proposed mitigation and improvement measures	Residual impacts
Preparatory phase			
Installation of the construction camp	Clearing of vegetation in the workers' camp right-of-way Camp buildings and facilities	Select sparsely or relatively reforested areas near the construction site	Minor substitution
		Limit the area occupied by the construction camp	Marginal
		Transfer buildings to the road maintenance services of the ministries in charge of roads as well as other entities	Positive
Vacation of rights-of-way	Clearing of vegetation in works and quarries right-of-way	Compensate the felling of trees by reforestation and planting of roadside trees in the villages and towns crossed by the road	Positive
Construction phase			
At the end of the road project	Pollution/contamination by bituminous products or oils/loss of agricultural value due to the accumulation of waste (debris from earthworks, etc.)	Implement a waste and pollutant management plan (EAP)	Positive
		Collect, remove and convey drain oil to authorized disposal mounds, and clean up sites	Positive
		Collect and dump stripping and demolition residue in authorized disposal mounds as they are produced	Minor
	Risk of accidents and health impacts of air pollution	Adequate signalling at the project site (road signs, reflectorized markings and speed bumps)	Minor
	Difficulties faced by the population in accessing interior sections	Construct and rehabilitate rural roads adjoining the highway	Positive
Operation phase			
Frequent and heavy traffic	Noise pollution	Indicate maximum speed limits	Minor
	Traffic accidents	Construct speed bumps	Minor
Install vertical and horizontal road signs			
Impacts on wildlife and vegetation	Increase in illegal logging	Conduct forest and wildlife audits	Positive
		Support the upgrading of wildlife tracking GIS and GPS	Positive
		Provide support to ENEF	Positive
Easy access for poachers	Increase in poaching	Establish forest posts	Positive

6.5 Cumulative Impacts

Cumulative impacts are those resulting from the combined action of activities related to the project itself and related actions and/or projects or in the same impact area, except those of phase 1 of the same project on the Dolisie-Mila Mila-Doussala road section. These mainly include cumulative impacts generated by: **(i)** the project to rehabilitate and modernize the so-called COMELOG railway on the same geographical corridor as the project; **(ii)** the rehabilitation of rural roads, markets/warehouses and socio-economic facilities which are the project's compensatory measures.

At this stage, the expected impacts of the rehabilitation/modernization of the railway line can be summarized in terms of:

- **positive impacts** for which the project has taken preventive measures: **(i)** the use and sharing of the same platform in several sections; **(ii)** seven crossing gantries in lieu of level crossings have been included in the road project; **(iii)** the railway stations of Makabana, Titi, Tsimba and Mossendjo serve as intermodal stopovers for the evacuation of agricultural produce for which markets and warehouses are envisaged.
- **synergistic effect:** the road project and its ripple effects on the revitalization of the area's economy will create the need to modernize or at least increase the frequency of rail traffic on this railway line.
- **negative impacts:**
 - further expropriation required for lateral extension may render some plots unserviceable and inaccessible (plots flanked by the two platforms);

- meeting/crossing points will become inevitable, hindering the upgrading of the railway line in the future;
 - increased exploitation of geological resources, and borrow, sand and gravel pits;
 - desertion of the two existing road/rail bridges.
- **risks:** the railway modernization project may:
 - modify some of the road project's constituent elements, resulting in new changes and further expropriation (increase in rail speed necessitating the adjustment of bends that encroach on the road);
 - higher rail frequency and speed can increase the risk of accidents for passengers at crossings, but also expose the local population to noise pollution and vibration.

It will be necessary to ensure close collaboration and planning between the DGGT/contractors/control missions and the Congo-Ocean Railway Corporation (CFCO) during the preparation of the road works studies phase for the two lots.

7. ENVIRONMENTAL RISK MANAGEMENT AND CLIMATE CHANGE

7.1 Environmental Risks Related to the Project

During the road construction phase, environmental risks will involve, for the most part: accidental spills of hydrocarbons, bituminous material, explosive products and other substances used for road construction. Accidents could occur at work sites or at water and river crossings, or could be accidental fires, against which safety and training measures have been put in place with the competent authorities, in particular, civil protection, the gendarmerie, forest guards, water and forestry services, etc.

The specifications require that contractors prepare **Environmental Action Plans (EAPs), Site Environmental Protection Plans (PPES), Fire Control Plans** and **HSE**, including emergency response procedures. The detailed PPES for construction sites will indicate all the precautionary measures adopted. This does not prevent the risk of pollution of ditches (or streams) and/or water tables due to the accidental spillage of waste oils and fuels or leakage of stored materials. The related measures concern: (i) the sensitization and training of construction site workers and ad hoc teams on emergency response techniques in case of natural disasters; (ii) the safety measures to be observed in dangerous or hazardous areas; (iii) the installation of communication and emergency evacuation equipment; (iv) conclusion of contracts with workers' health care services and health centres; (v) the establishment of, and provision of medical supplies to community pharmacies; (vi) sensitization of the local population on prevention against health hazards and on road safety; and (vii) the organization of epidemiological surveys to assess the project's impacts on the environment and on human health.

Other technical measures relate to the development of safe maintenance areas for trucks and the storage of pollutants, in order to avoid any spillage that may pollute natural resources. Safety measures will be implemented on-site to: (i) ensure good retention capacity around fuel, oil and bitumen storage tanks; (ii) dig up ditches for the disposal of oils, greases and other liquid pollutants from maintenance workshops, motor vehicle and equipment washing facilities and loading areas; (iii) handle explosives in accordance with the provisions of the Congolese Mining Code. In steep slope areas, there will be a need to prevent risks of erosion at points where rights-of-way are straightened (rockslides, landslides and platform cave-in).

7.2 Climate Change

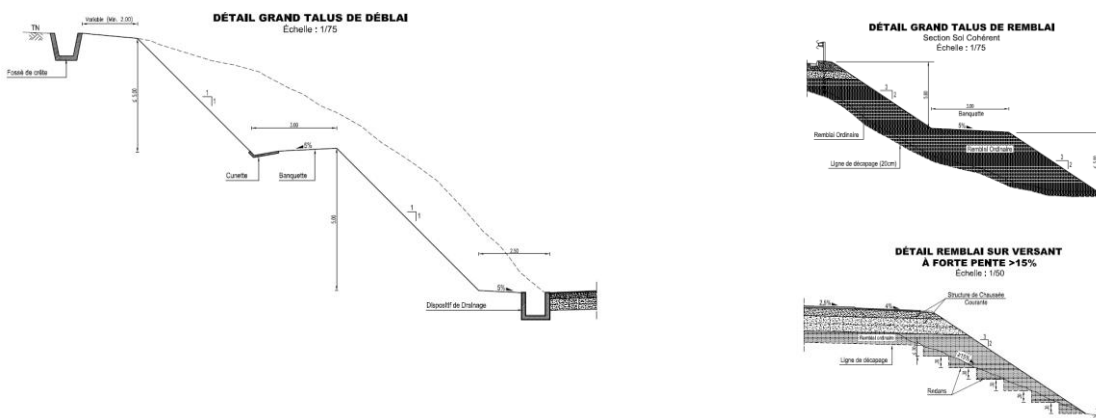
As indicated in Section 4.2 (i), the main climatic risk concerns floods and erosion due to heavy rainfall in the region. Accordingly, the project has been classified under Environmental Category 2 in terms of climatic risk. Consequently, the actions to be implemented include: (i) weather-proofing the road sections to be upgraded; (ii) ditching at the toe of the slope and at its crest, but also construct masonry rip-raps and vegetate some slopes in order to prevent erosion; and (iii) sizing hydraulic structures and bridges, taking into account peak flow return periods of 50 years and 100 years respectively. All measures are included in the construction record which specifies the modes of execution of related works and their breakdown in the price schedule, the technical specifications and priced bill of quantities.

Sections with rugged terrain and steep cross slopes with erosion risks and against which adequate measures are envisaged are:

- Makabana to Kibangou section (Lot 1): (a) KP 57 to 58 + 500, (b) KP 61 + 800 to KP 62 + 550, that is 2.5 kilometres;
- Kibangou to Massanga section (Lot 2): (a) KP 78 + 400 to KP 79 + 650, (b) KP 87 + 000, (c) KP 92 + 450 to 900, (d) KP 97 + 000 to 97 + 222, (e) KP 100 + 000 to 101 + 900 at the entrance to Massanga, that is 4.60 kilometres;
- Massanga to Mossendjo section (Lot 2): (a) KP 105 + 500 to 105 + 850, (b) KP 107 + 400 to 108 + 500, (c) KP 110 + 000 (Itsibou River) to 111 + 100 (entrance to Mossendjo), that is 2.5 kilometres.

The technical specifications described above are illustrated in Figure 4 below.

Figure 4: Erosion Control Mechanisms



In addition, the main mitigation measures for the felling of trees to be implemented so as to combat the effects of global warming include: (i) the restoration of borrow areas of the road and related rural roads through the systematic planting of trees and re-vegetation; (ii) the planting of trees on both sides of the road in villages crossed by the road, and compensatory afforestation under the control of the relevant technical services as well as ENEF of Mossendjo. About **3,700** trees will be planted. These measures will be implemented by contractors, for the restoration of quarries, and NGOs for tree planting in villages and decadent forest areas. Thus, the project will contribute to mitigating greenhouse gas emissions. A detailed reforestation plan is required for bidders as well as NGOs responsible for tree planting and long-term monitoring. The related budget is presented in the priced bill of quantities and summarized in Section 8.2.

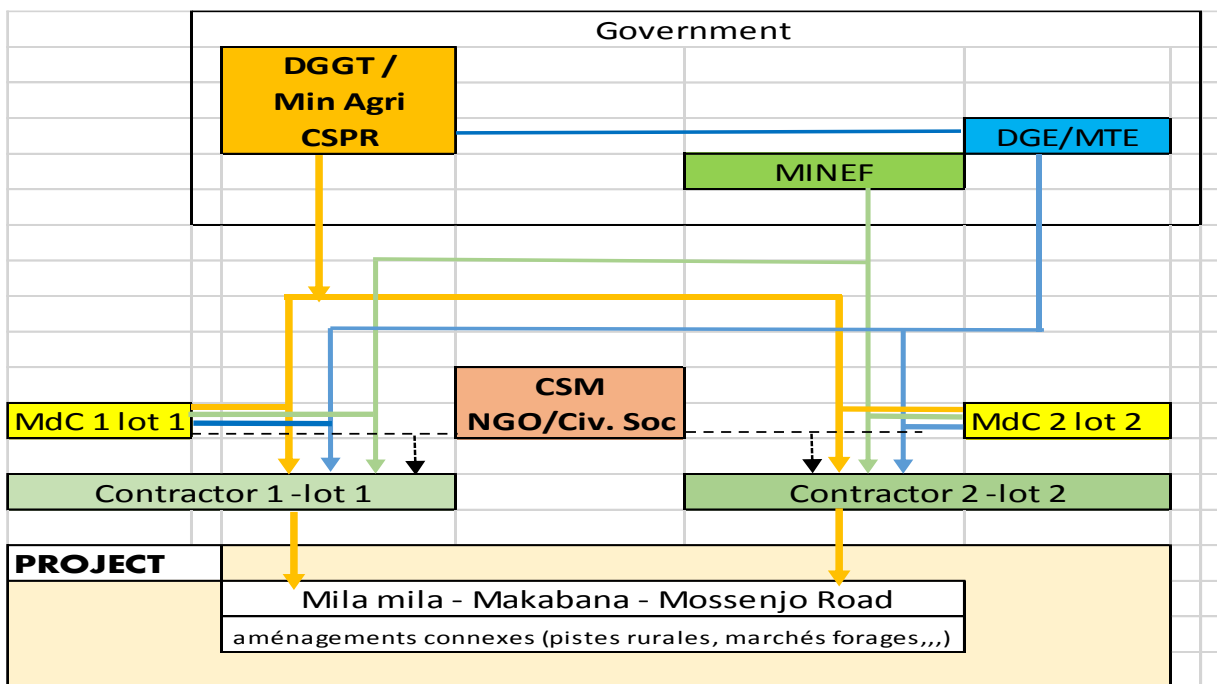
8. ENVIRONMENTAL AND SOCIAL MONITORING PROGRAMME

The objective of environmental monitoring is to regularly and periodically assess the degree of implementation or enforcement of the mitigation measures recommended by the ESMP, including for related rural roads and facilities. This effort is based on monitoring compliance with the regulations, construction site management, the conduct of specific environmental and social work and the search for solutions to specific problems. The monitoring programme will mainly seek to ensure that the proposed mitigation and improvement measures in the ESMP will be effectively applied during each of the successive phases of the project (installation, construction and operation).

8.1 Responsibilities

Responsibilities will be borne by: (i) the **client**, represented by the **General Delegation for Major Works (DGGT)**, through the Project Implementing Unit (CERD-AfDB) which is already familiar with Bank procedures for similar projects, notably PAST 1 (Dolisie-Doussala road section), which has already been implemented, together with the services of the **Ministry of Agriculture**; (ii) **Senior Environment Officers** appointed by the **contractors** responsible for construction in order to enforce environmental measures throughout the construction phase; (iii) **the project management team** responsible for controlling and monitoring the implementation of specific environmental works; (iv) **the decentralized entities of the Ministry of Forest Economy**; (v) the World Wildlife Fund (WWF), in collaboration with the General Directorate of Environment (DGE) of the Ministry of Tourism and Environment (MTE); (vi) a **Follow-up and Mediation Committee (CSM)**, chaired by the relevant Prefect, comprising elected representatives, the representatives of the client and the project management, the villagers concerned and the relevant ministries responsible for sensitization, control and settling of disputes, as well as alerting and imposing sanctions where instructions are not complied with.

Figure 6: Organization



During construction site development, **surveillance** will seek to ensure that the proposed improvement and mitigation measures are effectively implemented during the construction phase. The MdC, in collaboration with the decentralized entities of the DGE/MET, will mainly be responsible for verifying the results and assessing their accuracy (ESMP matrix performance indicators and targets) during construction. The Works Surveillance and Environmental Monitoring Programme will be an integral part of the environmental and social impact assessment reports prepared by the control mission. The Programme will also be an integral part of the environmental and social impact assessment report prepared by the Contractor. Bank quarterly supervision missions will help to assess the quality of the project's environmental and social impact assessment.

The Surveillance Plan will be implemented during the construction phase. Its main objective will be to validate the magnitude of project impacts and ensure that the activities implemented by the Contractor comply with the environmental requirements specified in the bidding documents. The main tasks will be to: (i) ascertain assessment of the negative impacts identified; (ii) ascertain the effectiveness of the measures proposed; (iii) examine the specific conditions for the applicability of the measures proposed; (iv) oversee the implementation of the measures proposed during the construction and operation phases; (v) monitor the measures envisaged; (vi) propose remedial actions in the event of occurrence of major impacts; (vii) carry out an environmental impact assessment upon completion of the project. Surveillance will be based on environmental indicators and will also take into account Cameroonian and Congolese requirements regarding the Bank's standard limits. The local communities' information requirements should also be incorporated in monitoring systems. Environmental surveillance should be the subject of reports, following the main construction phases.

The Monitoring Plan mainly seeks to periodically and regularly control the project's long-term impacts during the construction phase. The impacts will be monitored to ascertain their magnitude and take the necessary remedial action. Impacts should also be monitored using objectively verifiable indicators. Thus, the status of indicators should be determined at the end of the project to serve as reference. The monitoring system will focus on basic project implementation status indicators and some support indicators for each specific activity. However, all monitoring-related issues cannot be resolved using measurable and quantifiable indicators. It may therefore be necessary to use more qualitative assessments for some specific themes.

8.2 Surveillance Programme Cost

The mitigation measures adopted are included in the priced bill of quantities of the construction works, construction site facilities as well as the budget of control missions for each of the two lots. Compensation will amount to CFAF 861.1 million included in the budget of the Resettlement Plan. The total cost of the ESMP is estimated at CFAF 2.27 billion or 1.9% of project cost. It includes the cost of compensation and presented in the table below.

Table 5: ESMP Cost

Headings	LOT 1: Mila - Titi and Related Feeder Roads	LOT 2: Titi - Mossendjo and Related Feeder Roads	Total		
Compensation for Property Destroyed	526 570 817	340 530 243	867 101 060		
Protection of Slopes and River Banks	4 827 720 000	-	4 827 720 000	PM priced bill of quantities / work contract	
Rehabilitation of Vegetation	92 000 000	92 000 000	184 000 000		
Hygiene and Safety Plan (PHSE)	287 000 000	287 000 000	574 000 000		
Wildlife Preservation	79 400 000	17 600 000	97 000 000		
Water Conservation	160 000 000	160 000 000	320 000 000		
Support for Income-generating Activities (IGAs)	30 000 000	30 000 000	60 000 000		
Information/Education/Communication Campaigns	40 000 000	40 000 000	80 000 000		
Environmental Monitoring by the DGE/DRE	45 000 000	45 000 000	90 000 000		
Total ESMP in CFAF	1 259 970 817	1 012 130 243	2 272 101 060		

The supervision of the main indicators of biotic and abiotic environments as well as objectively verifiable pollution indicators, which will be used to monitor the impact of ESMP actions, will be: (i) the rate of regeneration in deforested areas and the success rate of species planted; (ii) the number of analyses and the results of water quality analyses; and (iii) the rate of prevalence of diseases related to dust and gas emissions, waterborne diseases or STI/AIDS and other infectious diseases reported by health centres from the start-up of project execution, and their treatment; (iv) the number of expropriated families that have been compensated, including the time of compensation and the match between the compensation received and the value of the asset expropriated; (v) trends in traffic and the number of motor accidents, pedestrians knocked over and collisions with pets and wildlife.

During the operation phase, the monitoring programme will ensure that the negative impact mitigation or compensation measures effectively play their expected role, but also ensure that the expected positive impacts of the project will effectively materialize. The main objectively verifiable indicators that will be used to monitor these positive impacts will be: (i) trends in cross-border road traffic (measured at weighing stations and tollgates), particularly the tonnage crossing the border with Gabon; (ii) the area of food and cash crops cultivated due to easier access; (iii) the number of new (formal and informal) businesses started by men and women; (iv) the number of jobs created directly and indirectly, and taken by men and women; (v) the number of social facilities constructed and functional; and (vii) the boys' and girls' enrolment rate.

9. PUBLIC CONSULTATIONS AND DISSEMINATION OF INFORMATION

The ESIA was conducted based on a participatory approach which was initiated upstream of project during the validation of its terms of reference by the relevant groups. It is the result of the exploitation of primary documentation, digitized topographic maps and field visits, and interviews with the representatives of the various engineering departments of relevant ministries, NGOs, private operators, trade unions, several donors, the local populations, local authorities and communities, village chiefs and opinion leaders. Before each meeting, the project contents was presented to the group consulted in terms of economic, social, cultural and environmental issues, and in terms of mitigation and improvement measures. Thus, the opinions of, and comments made by, the population and target groups were incorporated into the ESIA document. During the implementation of phase 1 of the project (Dolisie-Mila Mila-Doussala road section (Gabon border)) all the above partners were regularly consulted.

Opinions were taken into account during the assessment of impacts and definition of environmental measures. Four public consultations were held from 10 to 12 April 2014 in the localities of Mila, Makabana, Mountaba-Tsimba and Mossendjo involving village representatives, administrative or local authorities, the Departmental directorates of Niari and Consultant’s experts in order to present the project in a simple summary and to sample opinions, concerns and suggestions. The concerns voiced by the participants during the different public consultations are summarized in Table 5 below.

Table 6: Summary of public consultations

Fears and expectations	
-	Disregard for the customs and traditions of the local people by non-native staff during works execution and poor behaviour;
-	Disregard for the rights of landowners during the establishment of borrow sites;
-	Destruction of houses, fruit trees, sacred sites and graves;
-	Increase in accidents during works execution and long-term road-related safety issues;
-	Fear of not reaping benefits from the project such as job opportunities.
Expectations	
-	Compliance with road construction standards;
-	Compliance with land tenure rights;
-	Opening up of the area and rapid evacuation of patients and pregnant women to health centres;
-	Awareness campaigns on HIV/AIDS control and road safety;
-	Recruitment of labour in neighbouring villages.
Wishes	
-	Rehabilitation and construction of additional classrooms in primary schools using durable materials, as well as the construction of school fences, health centres and boreholes in primary schools and health centres;
-	Construction of feeder roads at Makabana and Moutamba-Tsimba and road networks in Makabana and Mossendjo and paving of the Mossendjo Gare-Mossendjo Poste road section;
-	Support in the form of medical supplies to integrated health centres (IHCs) located in the project area;
-	Provision of equipment to, and capacity building of, agricultural and livestock sector actors in the localities crossed by the road;
-	Creation of many jobs for people living along the road;
-	Construction of a footbridge (bridge) over River Itsibou which cuts Tsimba village into two;
-	Rehabilitation of the Makabana Sports Complex;
-	Street lighting along the road;
-	Completion of the project as soon as possible.

To understand the conditions under which women and the local population are living, specific working sessions were held with them during the Bank's project preparation mission. These working sessions enabled them to express their concerns and needs in various domains (access to drinking water, health care, farms, small agricultural implements, etc.). Based on these concerns and specific needs, it was agreed that besides tarring the main road, the project should build related facilities. Most of the related facilities retained address the concerns voiced by the population in terms of access to water supply, health services, knowledge acquisition, economic empowerment, mobility and access to means of transport, etc.

During the construction phase, consultation with the population will continue following the same approach and based on the ESMP. It will mainly seek to: (i) highlight all the impacts identified while explaining in detail the mitigation or improvement measures envisaged; (ii) involve the population who are already familiar with the project objectives and requesting its completion, as they are already reaping the benefits of the first phase.

The DGE-MTE, local authorities and the population will be involved in the organization of ESMP information seminars during launching workshops prior to the commencement of works for each lot. This consultation framework will involve all the actors concerned by the road works (mayors of district councils, traditional rulers, technicians from various services and ministries, etc.) in order to ensure that the measures proposed are completed/strengthened in consultation with the latter and that they design programmes and actions within their sphere of competence.

10. SUPPLEMENTARY INITIATIVES

10.1 Resettlement Plans

The Resettlement Plan, whose executive summary is appended to this ESIA summary, provides detailed information on the persons affected, compensatory measures and related activities (legal status, consultations, monitoring, etc.).

10.2 Related Facilities and Support Measures

The road project already delivers on the security desires and concerns expressed by the local population through several related facilities: (i) the embellishment of village entrances; (ii) the development of bus stops along the road and parking areas in villages; (iii) the construction of animal crossing areas in specific locations; (v) the pavement in bituminous concrete of 45 km of the existing Ouesso-Pokola road, (v) the development of security facilities in schools, markets, etc.

However, the project also intends to address the concerns expressed by the local population by implementing some support measures, namely: (i) strengthening the entities operating in the country to support associations providing assistance to the local population; (ii) promoting health community services which are now more accessible to the local population; (iii) promoting community water supply projects; (iv) raising the awareness of the population on the importance of education; (v) improving the quality of education by promoting technical education and adult education; and (vi) constructing boreholes to provide drinking water in some disadvantaged villages.

They consist of : (i) Rehabilitation of health infrastructure : rehabilitation of buildings, (ii) drilling of two large boreholes (iii) supply of emergency medical equipment to the Hospital Ex - Comilog and Makabana in Mossendjo Reference Hospital , (iv) fencing and provision of emergency medical equipment to the Integrated Health Centre Pokola ; (V) rehabilitation of the Integrated Health Centre of Bomaka , (vi) 2 primary schools in Pokola (including a school for the village the local population), 1 secondary school at Pokola , 2 preschools in Oueeso and Pokola , (vii) Rehabilitation and equipment 2 multifunctional platforms for women (and Ouesso Pokola).

11. CONCLUSION

The potential negative impacts of the project will have no major irreversible environmental effects, both in the immediate project area and in its environs, because they may be technically circumscribed within reasonable limits, and mitigated by the adequate corrective measures specified in the proposed ESMP. The project is deemed acceptable from the environmental and social standpoints.

12. REFERENCES AND CONTACTS

- The Project's ESIA Report;
- Environmental and Social Management Plan Report;
- Comprehensive Resettlement Plan Report

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) MATRIX

Potential Negative Impacts	Proposed Mitigation Measures	Entity in Charge of Implementation	Entity in Charge of Supervision	Implementation Schedule	Performance Indicators	Cost (CFAF)
Compensation	Constant monitoring of the compensation process	CPSS-DGGT/PAR Committee	CPSS-DGGT/PAR Committee	Before the start of works	- Number of disputes/complaints - Compensation paid before the start of work - External Audit Report	PIR included (867 000 000)
Demolition of houses/fences	Constant monitoring of the demolition process after the preparation of the compensation completion report and resettlement/disposal of rubble at the authorized landfill	Contractor by lot	Control mission/ CSPR-DGGT	Before the start of works	Number of disputes/complaints	Included in the works budget
Clearing of vegetation/trees in the base camp, warehouse and market rights-of-way	Select areas with sparse forest or relatively close to construction site	Contractor by lot/competent services	Control mission/CPSS-DGGT/MINEF/DGE-MTE	Before the start of works	Minutes prepared by forestry and provincial services	Reforestation plan 120 500 000 , included in the works budget
	Limiting the area occupied by the base camp		Control mission		Number of disputes	
	Obtaining authorization from relevant services before felling trees		Control mission/CPSS-DGGT/MINEF/DGE-MTE		MdC Monthly report	
Clearing of vegetation/trees in the road/bypass and feeder road (borrow sites and quarries, etc.) rights-of-way	Obtaining authorization from relevant services before felling trees in the right-of-way	Contractor/NGO	Control mission/MINEF services	Before the start of works	MdC report/Tree felling authorizations by forest services	
	Protection/re-vegetation and planting of trees along the road sections		Control mission/NGO/MINEF services	During project implementation and completion	Number of corrective actions taken and executed Replanting rate	
Air pollution (dust)	Watering of work site emissions	Contractor by lot	Control mission	During project implementation	Activity sheets and work site log Number of disputes	
Soil pollution, particularly soil contamination, loss of agricultural value, and landscape degradation due to the accumulation of waste (excavated material, earthworks, etc.).	Design and implementation of a waste management and environmental assurance plan (EAP)	Contractor by lot	Control mission/NGO/DGE-MTE	Before the start of works	Approval by the DGE-MTE	PPSE and Waste Management Plan 1 620 017 250 included in the Contractor's budget
	Collection/disposal of oils in authorized landfills				Provincial service reports	
	Collection and disposal of waste and demolition waste as and when they are produced (Waste Management Plan)			Authorization by environmental services		
	Installation of waste collection pans in the construction camp			Monthly report		
Collection and disposal of household waste in authorized landfills		During project implementation				
Noise and air pollution	Raising the awareness of the Contractor on compliance with existing standards on site noise (75dB) and proper maintenance of construction machines	Contractor by lot	Control mission	During project implementation	Number of disputes/Implementation of the recommendations included in the MdC control report	
	Installing the gravel washing tank near crushers/screens			Upon the installation of the crusher unit		
	Standard dust removal system for the asphalt dryer system /Fireplace		Control mission	Upon the installation of the asphalt unit		
	Watering service tracks and site where necessary/ Truck load limitations and/or tarp Watering of service and site tracks, if necessary/Limitation of truck loads and/or tarp		Control mission	During project implementation	MdC monthly control report	Included in the works budget
Accidents and health impacts of air pollution	Design and implementation of an EPP, and PHSE	Contractor by lot	Control mission/DGE-MTE	Before the start of works	Validation by the DGE-MTE	Contractor's budget
Health and safety hazards	Equipping workers with PPE (boots, helmets, masks)			During project implementation	Number of disputes	Works budget

PAST 2 Mila Mila-Mossendjo Road: SUMMARY ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

Potential Negative Impacts	Proposed Mitigation Measures	Entity in Charge of Implementation	Entity in Charge of Supervision	Implementation Schedule	Performance Indicators	Cost (CFAF)
Fire risk	Anti-fire equipment and response plan	Contractor/fire services	Control mission/DGE-MTE	Before the start of works	Validation by DGE-MTE/Control mission report	Site facilities budget (see PHSE)
Inaccessibility by the population	Marking the works site, installing pedestrian crossings	Contractor Lots 1 and 2/NGO	Control mission/DGE-MTE	During project implementation	Implementation of recommendations in the MdC monthly report	Project budget
Risk of spread of STIs/HIV/AIDS	Design and implementation of an HIV/AIDS Awareness Programme					
Pollution of water by oil, waste oil	Works signalling and bypass plans	Contractor by lot	Control mission	Before the start of works	MdC monthly report	Included in the works budget Installation of the works site
	Making provision for a first aid box	Contractor by lot	Control mission	Before the start of works. During installation of the construction camp	MdC monthly report	
	Preparing and putting up a works site health and safety notice	Contractor by lot	Control mission/DGE-MTE	During installation of the construction camp	Monthly report Six-monthly report on inspection by DGE/DRE-MT Degree of implementation of environmental and technical clauses	PHSE 849 000 included in the works budget Installation of the works site Included in the works budget
	Preparing and putting up safety instructions in the event of an accident					
	Disposing liquid product storage facilities in holding tanks	Contractor by lot/NGO	Control mission/DGE-MTE	During project implementation	Six-monthly report on inspection by DGE/DRE-MTE Degree of implementation of environmental and technical clauses	Included in the works budget Installation of the works site (works budget)
	Sealing oil handling areas, including an oil separator					
Contamination of groundwater by sewage (construction camp)	Installing construction camps in compliance with health standards	Contractor by lot	Control mission	At the end of the project	Degree of implementation of environmental and technical clauses	Included in works budget
	Regularly emptying sanitary facilities and disposing the products in authorized sites					
	Draining oils in specific maintenance areas/collecting them in appropriate tanks and disposing them in an authorized landfill	Contractor by lot	Control mission	During project implementation and completion		
Noise pollution	Establishing noise protection mechanism (solid fences in residential areas)	Contractor by lot	Control mission/DGGT Control Mission/ DGGT /DGE-MTE/MINEF	During commissioning	Degree of implementation of environmental clauses Half-yearly inspection report on the degree of implementation by forestry services	Included in works budget
Traffic accidents	Speed-limit sign					
	Installing road signs and markings					
Traffic accidents at crossing corridors	Installation of specific road sign/animal crossing/ Tsoulou National Park/ Prohibition of hunting, etc. forest control posts			During commissioning	Degree of implementation by forestry services	101 400 000 included in the works budget
Indirect impacts on vegetation and landscape	Planting of roadside trees/stabilization/ landscaping	Contractor lot/DGGT	by Control mission/DGGT	During/during commissioning and upon project completion	MdC monthly reports and technical audit	Maintenance budget
Chronic erosion and pollution of rivers	Adopting technical drainage/Erosion control measures	Contractor lot/DGGT	by Control mission/DGGT	During/upon commissioning and after construction	MdC monthly reports and technical audit	320 000 000