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REPUBLIC OF COTE D'IVOIRE

Union – Discipline – Travail

MINISTRY OF ECONOMIC INFRASTRUCTURES

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Project to support the Competitiveness of the Great Abidjan - SUF (P159697)

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ENVIRONMENTAL SAFEGUARDS INSTRUMENTS SUMMARY

February 8, 2018

1. Introduction

In the framework of the ***Project to support the Competitiveness of the Great Abidjan - SUF (P159697)*** four (04) safeguard policies were triggered. There are: OP 4.01 “Environmental Assessment”, OP 4.04 "Natural Habitats" OP 4.04 " Natural Habitats ", OP 4.11 "Physical cultural resources" OP 4.12 "Involuntary Resettlement". Thus, four (04) environmental safeguard instruments have been prepared, reviewed by bank’s specialists, consulted upon and disclosed within the Cote d’Ivoire and at the World bank website. Those safeguard documents are:

- Environmental and Social Management Framework (ESMF), disclosed in Cote d’Ivoire on January 30, 2018 and at the World bank website on February 07,2018.
- Environmental and Social Impact Assessment(ESIA) of Akwaba, disclosed in Cote d’Ivoire on February 26, 2018 and at the World bank website on February 26,2018.
- Environmental and Social Impact Assessment(ESIA) of Y4, disclosed in Cote d’Ivoire on February 25, 2018 and at the World bank website on February 26,2018.
- Environmental and Social Impact Assessment(ESIA) of the roads of the port, disclosed in Cote d’Ivoire on February 25, 2018 and at the World bank website on February 26,2018.

2. Outputs

2.1. Environmental and Social Management Framework (ESMF)

The Ivorian Government, with the support of the World Bank, has undertaken the preparation of the Projet to support the Competitiveness of the Greater Abidjan (PACOGA in French) which aims to support the future competitiveness of the Autonomous District of Abidjan and to increase its ability to compete in the attraction of high value-added investments creating jobs and wealth firstly, and secondly skilled workforce through the following components.

- Component A - Promotion of inclusive and sustainable mobility of people and goods in the Greater Abidjan Agglomeration;
- Component B - Urban Planning and Implementation of the Urban Master Plan
- Component C - Support to Institutional and Regulatory Reforms for Increased Private Investment and SME Participation in the Transport-Logistics and Construction Sectors in and around the Greater Abidjan Area.

The environmental and social issues for the project area concern the management of solid and liquid wastes whose current mode (proliferation of "wild" deposits) does not meet the accepted practices in terms of environmental protection. With the construction of new infrastructures, the problem of waste management in urban areas could become a real concern if this mode of management persists.

The second major challenge that the project could face is the tenure issue. Realization of new investments will require large areas resulting in expropriations. Thus, these expropriations should be done by involving the administrative authorities of the concerned ministries, the district, the commune and customary leaders taking into account the texts in force in order to avoid conflicts.

The third issue is the lack or insufficiency of infrastructure maintenance that could lead to the proliferation of certain vectors of diseases whose spread could quickly be out of control given the public nature of these infrastructures as well as the limited information provided to the population regarding hygiene and protection against disease.

The political and legal context of PACOGA's environmental sector and sectors of intervention is marked by the existence of relevant policy documents, including: the National Action Plan for the Environment, the Sanitation Policy, the Sanitary and Hygiene Policy, the National Development Plan (2016-2020),

the National Strategy for the Conservation and Sustainable Use of Biological Diversity and the National Strategy for the Management of Living Natural Resources.

Implementation of these policies required prior definition of an institutional, legislative and regulatory framework in which environmental actions in Côte d'Ivoire are now taking place. Thus, on the legislative level, Law No. 96-766 on the Environment Code was promulgated on 3 October 1996 and at the regulatory level, Decree No. 96-894 of 8 November 1996 setting rules and procedures applicable to environmental impact assessment of development projects. Other relevant laws reinforce this legal corpus, namely Law No. 98-755 of 23 December 1998 on Water Code, Law No. 2014-138 of 24 March 2014 on Mining Code, Law No. 2014 - 427 of 14 July 2014 Forestry Code and regulations on expropriation for reasons of public utility; also international texts such as the conventions ratified by the country. Besides, the World bank's environmental and social safeguard policies may also be considered by the project. And, four safeguard policies were triggered. There are: (i) OP 4.01 "Environmental Assessment", (ii) OP4.04 "Natural Habitats", (iii) OP 4.11 "Physical cultural resources" and (iv) OP 4.12 "Involuntary Resettlement".

Thus the Project is rated as a category "A" according to the Ivoirian legislation on Environment as well as the World Bank's environmental and social categorization criteria.

Activities under the PACOGA are likely to generate both positive and negative impacts on the socio-economic and environmental components. The positive impacts include development of commercial activities (restoration activities and small shops), improvement of the living environment in the project area (removal of garbage dumps and rehabilitation of stagnant domestic waste water); facilitation of movement of goods and people, reduction of number of accidents, improving people's access to basic infrastructure, creation of a recreational area, improving the port's attractiveness and increasing its competitiveness with other ports in the sub-region, job creation and poverty reduction.
The potential negative impacts include for instance dust flushes, production of waste, noise nuisance, disruption of traffic during work, risk of accidents during work, risks of sexual abuse of vulnerable persons (under-age girls, widows, women living with a disability), risk of conflict following the various expropriations, risk of loss of plant species and landscaped areas during the liberation of the rights of way.

As part of the preparation of the ESMF, stakeholder consultation sessions were held with stakeholders including administrative managers, technical structures, populations and the Environmental and Sustainable Development Directorate (ESDD) of the Autonomous District of Abidjan. (DAA), Port Bouet commune, the Anyama and Songon sub-prefectures. Following these meetings, the following recommendations were made:

- training of the officers of the Environment and Sustainable Development Directorate (ESDD) of the Autonomous District of Abidjan (DAA) and their implications in all PACOGA activities. Also, it is also recommended a logistical reinforcement as well as a specific budget for the ESDD to make this direction operational;
- securing the administrative reserves in order to avoid their misuse by the State;
- raising awareness among the population to respect the influence of the 25 meters of the lagoon edges;
- stabilization of the banks of the sea in order to avoid the disappearance of the drinking water supply network of Port Bouet, road of Bassam;
- involvement of customary and administrative leaders in the implementation of the project;
- provision of support to young people and women for Income Generating Activities as additional compensation to compensate for the permanent losses of property including land in the intervention villages of the project,
- involvement of traditional chiefs in the compensation of sacred groves in order to offer ritual expenses;
- in terms of grievances, the villages crossed by the construction project of the Y4 wish to benefit from electricity, drinking water, health center, schools;

- Appropriate provision for the protection of watercourses including the Nampé River in Songon;

In any case, the various alternatives, the organization of work and the technical capacity building as they will be determined in the specified documents (ESIA) will minimize these impacts.

The potential environmental and social impacts and risks listed above require different alternatives or measures for eliminating, reducing or compensating for these negative impacts. In addition to the organization of the site and the measures identified in the ESMP, and tailored for each activity, the PIU will:

(i) take into account the vulnerability aspects of communities bordering the works, the gender aspects and the effective participation of the actors concerned;
(ii) put in place a monitoring and evaluation system that ensures that the project activities guaranty protection of the physical and social environment;
(iii) implement the waste management plan;
(iv) implement the training program and communication strategies tailored to each level of the service delivery chain for better accountability of actors in order to reduce various types of pollution;
(v) implement measures to improve the positive environmental and social impacts of the Project, as the use of alternatives to reduce and recycle waste (industrial ecological approach);
(vi) incorporate binding clauses in the tender documents and approve the company's Environmental Health and Safety Plan before the work actually starts.

The institutional framework for the implementation of the ESMF involves several actors and technical structures, which are:

- The Project Steering Committee (PSC): The Project Steering Committee will ensure the registration and budgeting of environmental and social due diligence in Annual Work Plans and Budgets (AWPB);
- The Project Management Unit (PMU): The PMU will ensure that environmental and social aspects and issues are taken into account in the implementation of project activities. That body will include an Environmental safeguard specialist and a Social safeguard specialist;
- The National Environment Agency (NEA – "ANDE" in French): The ANDE will proceed with the examination and approval of the environmental classification of sub-projects, as well as the approval of environmental and social impact assessments (ESIAs). It will also provide external monitoring ;
- The National Agency for Waste Management (ANAGED in French): the ANAGED must ensure the monitoring of the safety on the work sites;
- The District and the Commune: they will participate in environmental and social monitoring through their services or technical directions;
- Executing agencies (PAA, AGEROUTE, etc.): they will monitor the implementation of the ESMPs that will result from the ESIAs of each project activity;
- NGOs and community associations: in addition to social mobilization, they will participate in the awareness building among the populations concerned and the monitoring of the implementation of the ESMF by interpellation of the principal actors of the PACOGA.

The Environmental and Social Management Plan (ESMP) includes the screening process, the key elements of environmental and social management (institutional and technical capacity building measures, training and sensitization measures, program of implementation and follow-up of the measures, institutional responsibilities, a budget which includes a provision for the realization of Environmental and Social Impact Assessment (ESIAs) including their implementation and follow-up / evaluation of the ESMF.

Key indicators to be monitored include:

• Number of sub-projects that have been subject to environmental and social screening;
• Number of ESIAS carried out and published;
• Number of sub-projects that have been subject to environmental monitoring and reporting;
• Number of actors trained / sensitized in environmental and social management;
• Number of sensitization workshops carried out.

The environmental and social management will be carried out under the coordination of the monitoring missions and under the supervision of the Environmental Safeguard Specialist (ES) and the Social Safeguard Specialist (SSS) of Project Management Unit (PMU) with the involvement of Environmental and Social Respondents (ESR) of technical services, NGOs and local beneficiary communities. The monitoring program will focus on ongoing monitoring, supervision and annual evaluation. External monitoring will be provided by ANDE through establishment of protocol between the Project and ANDE. Members of the Coordination Committee and the World Bank will also be involved in missions of support for the project implementation.

The table below summarizes the institutional arrangements for the implementation of the ESMP.

No	Steps/Activities	Responsible	Support/Collaboration	Provider
1.	Identification of the site location and principal technical characteristics of the sub-project	Municipality Autonomous District of Abidjan	• Technical Services of the District and Commune; • Executing agencies (PAA, AGEROUTE, etc); • Beneficiary • NGO	• PACOGA
2.	Environmental selection (screening-filling out of forms) and determination of the type of specific safeguard instrument	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA	• Beneficiary : population • Commune • Executing agencies (PAA, AGEROUTE, etc.); • NGO	• Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA • Environmental and Social Respondent of Commune and District
3.	Approval of the categorization by ANDE and the World Bank	Project Coordinator	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA	• ANDE • World Bank
4.	Preparation of the specific E & S safeguard instrument for Category A, B or C			
	Preparation and approval of the Terms of Reference	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA	Executing agencies (PAA, AGEROUTE, etc.);	• ANDE • World Bank
	Completion of the study including public consultation		Procurement Specialist (PS),, ANDE ; Municipality,NGO • Executing agencies (PAA, AGEROUTE, etc.);	Consultants
	Validation of the document and obtaining the environmental certificate		Procurement Specialist (PS), Municipality, District	• ANDE, • World Bank
	Publication of the document		Project Coordinator	• Media ; • World Bank

No	Steps/Activities	Responsible	Support/Collaboration	Provider
5.	(i) Integration of all measures of the work phase to be contracted with the company within the Request for Proposal (RFP) file of the sub-; (ii) approval of the ESMF-construction site	Executing agencies (PAA, AGEROUTE, etc.);	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA • PS	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS)
6.	Implementation of measures not contracted with the construction company	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA	• Procurement Specialist • Technical head of activity • Financial Management Specialist (FMS) • Municipality • Executing agencies (PAA, AGEROUTE, etc.)	• Construction companies • Consultant • NGO • Others
7.	Internal monitoring of the implementation of environmental and social measures	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA	• M&E Specialist • Financial Management Specialist (FMS) • Municipality • District	Owner's Engineer
	Dissemination of the internal monitoring report	Project Coordinator	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA	ESS-SSS/PACOGA
	External monitoring of the implementation of environmental and social measures.	ANDE	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA	Owner's Engineer
8.	Social and environmental monitoring	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA	• ANDE • Municipality • Beneficiary • ESFP of Autonomous District of Abidjan	• Laboratories / specialized centers • NGO •
9.	Capacity building of actors for social and environmental implementation	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA	• Other ESS-SSS • Procurement Specialist • FMS	• Consultants • Competent public structures
10.	Audit of the implementation of social and environmental measures	Environmental Safeguard Specialist (ESS) and Social Safeguard Specialist (SSS) of PACOGA	• ESS-SSS • Procurement Specialist • ANDE • Municipality and Autonomous District of Abidjan • Executing agencies (PAA, AGEROUTE, etc.)	• Consultants

The roles and responsibilities as described above will be integrated into the Project Implementation Manual (PIM).

The costs of the environmental measures of **415 000 000FCFA** XOF (**830 0000**USD) are spread over the five (5) years of the funding of the Project.

The table below outlines the composition of the costs of the project activities:

N°	Activities	Total Cost (FCFA)
1	**Institutional, technical and monitoring measures**	**380 000 000**
2	**Training**	**25 000 000**
3	**Sensitization measures**	**10 000 000**
	TOTAL (FCFA)	**415 000 000**
	TOTAL (USD)	**830 000**

Ultimately, the environmental and social management of PACOGA will be based on the implementation the current Environmental and Social Management Framework (ESMF). The ESMF will be supplemented by the Resettlement Policy Framework (RPF) elaborated in a separated document as well as Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plans (RAP).

2.2. Environmental and Social Impact Assessment(ESIA) of Akwaba

Justification and Brief presentation of the project

As part of the preparation of the Greater Abidjan Competitiveness Support Project (PACOGA), initiated by the Government of Côte d'Ivoire and the World Bank (WB), it has been identified the development of the Carrefour interchange Akwaba in the Commune of Port-Bouët, as a major sub-project to improve the competitiveness of the city of Abidjan

The development project of the Carrefour Akwaba is to build an interchange, prioritizing the main movement of the VGE - A 100 by its dropping in 2x3 lanes over the roundabout floor converted into four (04) channels allowing access to Akwaba multimodal station (future project of Abidjan Metro - Line 1) and ensuring all movements as follows:

- The VGE movement - Street Caribbean is provided by the roundabout on the ground;
- The link, Boulevard Marseille Ter - Expressway from the airport is provided by a loop passing over of the Akwaba multimodal station and above the Caribbean Street and the 100 A, while providing a loop adjoining the gyratory for other movements;
- The link, Expressway Airport - VGE is held to the ground by a feeder road "Turn right";
- The link Boulevard Ter Marseille - A 100 is provided by a "Turn Right" ramp passing over of the multimodal station Akwaba and origin of the Caribbean Street;
- The link Boulevard Ter Marseille - Street Caribbean is assured by a feeder road "Turn right";
- The EGWs bonds - Boulevard de Marseille Ter Rue Caribbean - Boulevard de Marseille and Ter 100 A - Boulevard de Marseille Ter are performed by the roundabout and a loop passing over the A 100, the Caribbean Street and multimodal station Akwaba;

- The link Expressway Airport - Marseille Boulevard Ter is provided by a loop passing over the A 100, The Street of the Caribbean and the multimodal station Akwaba;
- The link Expressway Airport - VGE is kept to the ground by a feeder road "Turn right."

This arrangement allows to manage the movements of lesser importance by the roundabout which offers good conditions for flow and exchange. It promotes important movements provided by feeder road or coves, in particular by allowing the various movements to / from the Akwaba multimodal station from the roundabout to the ground.

The interchange design will take into account both the purely functional aspect of the work (road type, uniform level of service, capacity, priority movements) as its integration into the urban space (the intersection is considered as a showcase of Abidjan).

Key environmental and social components

Zones of influence

The scope of this study covers all the areas of influence of the project, that is to say all the areas where project activities can have an impact. This includes all direct, indirect and cumulative impacts of any project on the physical, biological and / or human environment.

The indirect influence area is the Autonomous District of Abidjan, including the municipality of Port-Bouët.

The direct influence area consists of the right of way intersection to convert, which is bounded North East side by the French military zone (43rd BIMA in French), the Northwest side to the southwest by the Ebrié Lagoon (about 200 meters), the South West side by the General Hospital of Port- Bouët, Northwest side by the future area of ‘’Aérocité in French ‘’ and south side by the future Abidjan Metro - Line 1.

Air Quality and Noise

The air quality is pretty good overall. The calculation of traffic pollutants emissions shows that, compared to the current situation, it will be possible to compensate for the increased future traffic at air pollutant emissions through the development of road and park improvement fuels.

Noise levels at the study area meet the threshold not to be exceeded and are typical of areas with more or less traffic. Also, mapping the calculated sound levels reveals that the impact of the project is limited and insignificant.

Landscape

The landscape of the study area is an urban type, characterized mainly by areas of residential and commercial activities. We also note the presence of some of avenue trees having a landscape value along sidewalks and TPC of some routes covered by the project (Boulevard VGE, Expressway A 100 and Expressway AIFHB).

Water resources

The study area is characterized by the proximity of the Ebrié Lagoon (Baies de Biétry et Koumassi in French) and a groundwater (Quaternary aquifer). The lagoon waters are of poor quality, with very high organic pollutant content (DCO, BOD 5 in French) of nutrients such as phosphates and metals such as copper. Groundwater is highly mineralized.

For both types of resources, particular attention must be paid to the place of carcinogenic PAHs and microbiological pollutants whose levels are well above the accepted standards.

Population, economic activities, habitat and equipment

Overall, the census of population in the grip of the project consists of both owners and managers of economic activities than owners of frames and equipment:

- 06 owners of commercial and craft activities;
- 119 owners of agricultural activities;
- 72 commercial employees;
- 120 agricultural employees;
- 01 responsible for equipment.

Analysis of variants

The choice of variant 2 and 3 induces certainly a strong use of the workforce, an increase of the businesses of the SMEs and a possibility to realize all the movements. However, the use of large amounts of materials in addition to the large number of people affected (436) is a major constraint.

Thus variant 1 is in the light of the provisions of OP 4.12 "involuntary resettlement" according to which it is necessary to minimize the movement of PAPs (327) when it is unavoidable to remember. In addition, it requires less materials for its construction and less surface occupation. This allows the 43rd BIMA to have a safe visibility and the Hospital Port-Bouët to exercise in peace without major disruption. It also helps. pedestrian and cyclist to move safely to reach the multimodal station.

Environmental and social impacts during (preparation / Installation & Construction phases)

positive impacts

Population

The work of the flyover constitutes a source of creation of some direct and indirect jobs in the project area because they require the use of labor. Thus, the project will create jobs at several levels, the number and qualifications will be set by the Construction company, depending on its needs during the work:

- the recruitment of several contractual and labor by the Company. The surrounding communities are a potential source for the supply of that labor;
- the creation of temporary jobs, including guarding, monitoring devices associated with alternating traffic, execution-off excavation and laying of sewerage and drainage works, which could be entrusted to young unemployed of neighbourhood of Commune of Port- Bouët directly affected by the project.

Social life

The arrival of Construction company staff will contribute to the lively social life of riparian areas. By their presence, relationships, ranging from simple friendships to deeper ties may arise from contact between the staff and the host population. This will contribute to strengthening ties and social cohesion.

Economical activities

The development of income-generating activities is the main positive impact of these phases, regarding economic activities. Indeed, we will note the installation of small shops (selling food and various consumer goods) near the site to meet the needs of the company staff.

Moreover, part of Company personnel could stay in the municipality of Port- Bouët. This will likely cause the increase of turnover of hotel managers or owners of houses for rental in the district.

Negative impacts

Air quality, noise and vibration, Landscape

The work inevitably will cause an increase in particulate matter (dust) in the zone concerned by the work, noise and vibrations toward neighbouring (in particular during movement of the different gear on site) and a degradation of the usual landscape views (especially with the presence of the first materials of the Company in charge of performing the work).

Soil and Water

The construction project activities may alter natural drainage conditions of runoff water in the project footprint. These activities could also cause contamination of soil and water (Ebrié Lagoon and groundwater), due to the use of chemicals (oil and fuel) and waste disposal.

Flora and fauna

The impacts of the project on the biological environment will be very low. It will mainly consist of the brushing of the bushy species, the stumping of some trees of avenge which are in the vicinity of the right of way. Plant losses could also be feared if new quarries of building materials are opened. However, these risks will be avoided because the technical studies revealed the presence of quarries being exploited in the Autonomous District of Abidjan, which supposes that the project will not open new quarries.

Population

The project, in its phases of work will affect the entire local population in various forms, including:

- housing access difficulties, economic activities, socio-educational facilities, health and religious;
- odors;
- noise and vibration;
- risk of respiratory and hearing problems;
- risk of congestion by building waste;
- disease transmission risks such as STDs and HIV-AIDS;
- disruption of traffic in the work area;
- risk of accidents due to moving vehicles.

Social life

The presence of the Enterprise staff will contribute to the lively social life of the neighbourhoods of course, but it can also be a source of conflict and social upheaval reports. Staff with relatively large financial powers, this could intentionally or unintentionally upset the established order in some homes and cause their dislocation. Such situations are often sources of conflict or confrontation that could constitute a threat to social cohesion and peace.

The social conflicts could also occur as a result of non-employment of young people concerned or the failure to comply with local habits and customs.

Economical activities

The economic activities located in the project area (commercial, artisanal and agricultural activities) will be lost permanently, thus causing a considerable loss of income for their owners and a loss of employment for some employees. This could especially accentuate the situation of household poverty linked to activities such as market gardening and horticulture.

Riparian economic activities in the project area will be therefore disrupted or suspended, due to dust and the risk of accidents related to the preparatory work. All the managers of business could face a drop in their turnover and direct generated revenues, although some provisions will be made for them to continue to exercise.

Housing and equipment

The release from the grip of the project mainly consists to destroy and / or move anything that is built and equipment on it. It will be in this case of permanent structures (for business, leisure center, restaurant and niches of the Ivorian Electricity Company (CIE)), in metal (for the box) and mesh (fence for car parks). In terms of equipment, it will be the Hobby Club Akwaba, the transformer H59 type and the niche of the CIE, and network CI-TELCOM.

The movement of heavy machinery and compaction work could cause cracking of some racks located near the Project Row. In addition, work could disrupt various networks suppliers.

The movement of dealer networks will likely result in inconvenience in providing services that will be more or less felt by the inhabitants of neighbourhood's areas. Still, the damage will depend on the nature and extent of work to be done in the Project area.

Impacts of operations / maintenance phases

Positive impacts

Landscape

The circulation of the exchanger will improve the quality of the landscape in the project area.

Population

Once the exchanger realized, urban mobility at the project area will be improved and other discomforts associated with the current configuration of the intersection will be reduced. One could even see an increase of the transport potential in common.

The exchanger commissioning also contributes to improving the living environment, due to the existence of sewerage and drainage works which will allow perfect wastewater and storm water. All this will help to reduce illnesses linked to unhealthy environment.

Finally, the operation of the exchanger will create new jobs with the maintenance work.

Economical activities

The exchanger will help the flow of traffic, which will be a time saver for managers of economic activity settled in the area, but also a source of influx of customers. It will promote an expansion of leasing activity in the areas concerned, whose access will become easier.

Housing and equipment

The traffic within neighbourhoods facilitated by the presence of the exchanger will promote the development of housing, with the completion of new construction by the beneficiaries and other items from buyers. The completion of new construction respecting a development plan to develop the meantime by the town authorities will strengthen the quality and comfort of the habitat at this level.

Moreover, dealers should register new subscribers. Anything that will encourage the expansion of these networks.

Negative impacts

The local population will be exposed to increased risk of traffic accidents related to the passage of the exchanger, in case measures about are not taken. Children and women who form the largest category of the population will be at risk. These populations will also be exposed to atmospheric pollution (carbon

dioxide, sulfur dioxide, nitrogen oxide, lead, dust, etc.) and noise related to the fluidity and the increase in traffic in the area.

Enhancement and mitigation measures

Enhancement measures

As measures of enhancement of positive impacts of the project on the environment during work phases (preparation / installation, construction) and operating / maintenance, it is recommended to:

- give priority to the recruitment of local labor for unskilled jobs by relying on local authorities, taking into account gender (young women as a priority);
- prioritize the local workforce in the recruitment process;
- promote the recruitment of women and vulnerable people;

Mitigation measures

Air quality, noise and vibration, Landscape

The Company will ensure to maintain and control vehicles for emissions of exhaust gases. Dust emissions will be mitigated in part by periodic and regular watering of platforms, by a liquid compound and without consequences for the environment (water, for example). Tarpaulins will be mandatory for the transport and storage of volatile materials. The water content of gravel will be adjusted to reduce the impact of dust before unloading.

The Company will also ensure maintenance and control vehicles for the sounds of the engines of different gears. The supply plan of construction site will limit the time passages of vehicle from 06.00 (morning) to 18.00 (evening). The use of noisy vehicles will be prohibited from 6.00 pm (evening) and 06 00 am (morning). Employees will have and use effectively personal protective equipment (eg, ear plugs). They will make the least possible noise after works hours, so as not to disturb the usual tranquility of the residents. The surrounding population will be regularly informed of site activities.

The Company will avoid discharging the spoils products and any other type of waste, wildly, on construction sites.

Soil and Water

The Company will monitor the movements of the various gear and other construction materials and sensitize the drivers of these vehicles on good driving practices. It will identify hydrocarbon storage sites and oils, and organize this storage on secure dedicated platforms. Chemicals are stored in appropriate areas and we must ensure their storage compatibility (information on the toxicity and safety data sheets available to workers).

Maintenance of equipment will be limited to areas defined for this purpose, equipped with a concrete slab and a drainage device discharging storm water through an oil separator. One will define strict procedures for filling tanks gear (equipment type, dedicated areas).

The company will also ensure that the collection, temporary storage and disposal in acceptable conditions for the environment, used motor oils. sedimentation basins will be set up for the recovery of wash water with pH adjustment (buffering acid) before discharge into the environment.

The Company will implement and ensure implementation an awareness program and employee training on all these aspects.

Population

Regarding measures for the protection of the population in work phases against houses to access difficulties, economic activities and equipment, odors, noise and vibration, the risk of respiratory and hearing problems and the risk of accidents, it will proceed to the:

- development of corridors to facilitate movement of residents in the best possible conditions;

- periodic watering of platforms;
- establishment of a tarpaulin over the truck carrying the materials;
- adjusting the water content of gravel to reduce the impact of dust prior to discharge;
- carrying out the work between 08 am and 06 pm;
- maintenance of the population away from the field share of construction plant and equipment, to prevent the risk of accidents;
- establishment of adequate signage at the entrance of the residential areas to ensure the safety of users;
- speed limitation at 40Km / h in the worksite environment;
- the wearing of sound device and / or light back in operating condition of heavy equipment;
- Awareness and information for residents and users about the risks of accidents related to the movement of machinery and transport materials;
- Information of riverside residents and users of the channel concerned by the project, on the planning of works and safety measures to be followed;
- Information of and educate on STIs and HIV/AIDS;
- development of food sales areas on site for staff to eat in acceptable hygienic conditions;
- - employee awareness to avoid the consumption of any food subject to the deposit of dust and flies
- construction of equipment of a medical device for the evacuation of sick and / or serious injured to the nearest hospital;
- mandatory wearing of personal protective equipment (PPE)on site by each employee;
- regulating the movement of people and vehicles on site.

During operation / maintenance phase, risk of traffic accidents and exposure to air pollution (emission of gases, particles and dust) and noise, are factors for which the following measures are prescribed

- awareness of the local population;
- limiting the speed in the zone concerned;
- installation of no-horn signs near sensitive equipment (health, school, etc.);
- the remoteness of the population of devices, materials and construction products, in order to prevent the risk of accidents during maintenance work.

Municipal authorities in connection with the administration in charge of road safety (OSER in French) must intensify road safety campaigns and user awareness campaigns about the rules of the Road Code.

Social life

To avoid the risk of conflict and social upheaval reports at the study area, it is recommended the involvement of stakeholders in the project: Mayor, technical officials of the municipality, neighbourhood leaders, responsible for associations and youth groups, etc. This measure will be implemented jointly by the Client and the Company.

Economic activities, habitat and equipment

In order to mitigate the permanent loss of economic activities located in the grip of the project, we will discuss the implementation of the Resettlement Action Plan (RAP) developed as part of this study.

As for riparian economic activities in the vicinity of the site, performing works Company will take the necessary steps to protect persons engaged in such activities against any traffic accident. It will also ensure the implementation of food hygiene in the site of restauration points of the personnel.

In addition, measures must be taken to prevent cracks on neighboring buildings that might be caused vibrations related to the use of machinery and civil engineering equipment. Some precautions should also be taken during work near sensitive equipment. This will facilitate the movement of people in the

best possible conditions and watering work areas near these facilities to minimize harmful dust take-offs.

It is also recommended to the construction company to approach the technical services of dealers (water, electricity and telephone) to properly identify the locations of their networks before performing the work.

Risk analysis and accidents

The main sources of health and safety risks for this Akwaba intersection interchange project are the construction site, which will include at least one concrete batching plant, the various workshops (reinforcement and formwork workshops). , welding, etc.) and work areas. On the building site, will be stored quantities of diesel that are sources of risk.

the main risks associated with the development of the exchanger at the Akwaba intersection are related to risks of accidents, noise; falls, fire, explosion, electricity, and collapses.

Environmental and Social Management Plan (ESMP)

Organization ESMPs

The following organization is proposed for the implementation of the project ESMP:

- Contracting authority: Ministry of Economic Infrastructure (MIE);
- Delegating contracting authority: Road Management Agency (AGEROUTE);
- Coordination Unit: Greater Abidjan Competitiveness Support Project (PACOGA in French);
- Project management: Control Office (BC in French), with provision of an Environmental Manager of the Control Office (REBC);
- Construction company, with provision of an Environmental Manager of the construction company (REE in French);
- Mediation Committee (CM in French), led by the most senior of the Municipality of Port-Bouet (Mayor);
- National Agency for the Environment (ANDE in French), AGEROUTE and PACOGA, For environmental monitoring of the project.

Monitoring follow up and monitoring

The environmental and social monitoring by the Control Office (BC) is daily, during the works.

Monitoring will be done mainly by ANDE, who monitor compliance with national regulations on the environment, with the PRI-CI and AGEROUTE.

Supervision will be provided by the Environmental safeguards Specialist of the PIU (PACOGA). Experts in environmental and social safeguards of the World Bank (WB) will also provide technical guidance and assistance during implementation support missions.

An Independent Consultant (IC) will carry out the final assessment for the work.

Plan for capacity building, information and communication

The capacity building plan, information and communication will focus on:

- information and awareness on the project, with targeted actors the Technical Department of the City of Port- Bouët and the local population;
- training and awareness on health and safety at work, with targeted staff of the Construction company actor;
- support within the environmental and social monitoring, with targeted actor of ANDE;
- support as part of the environmental and social supervision, with targeted Environmental safeguards specialist of the PIU (PACOGA).

Public consultations

Public consultation consisted of a briefing by the administrative authorities of the Municipality of Port-Bouët (29th November 2017), an information session and public awareness (6th December 2017) and a survey of Association of Gardeners of Port- Bouët (8th December 2017).

During these meetings, it came to present the project, explain the purpose of the mission and to define the conditions for participation in the realization of field investigations. The selection of participants is made by the proximity of people to the project and the likelihood for them to be affected by potential negative impacts of the project.

These talks have raised the concerns and recommendations of the main beneficiaries or potentially affected stakeholders. To this end, the recorded major concerns or fears were:

- the influence of the draft provided for the project;
- identifying persons likely to be affected;
- the compensation arrangements for the loss of their property and income;
- the need to find another relocation site for growers of Port- Bouët.

Note that all these exchanges have yielded on one hand, the support of the project by local population of the project ways, and secondly, their involvement in the realization of the different phases of project the implementation.

Cost of social and environmental measures

The costs to be provided by the Client for the information and sensitization of local populations, the monitoring and implementation of environmental and social measures, the capacity building of the various actors are estimated at a ninety-Eight (98,000,000) XOF francs).

2.3. Environmental and Social Impact Assessment(ESIA) of Y4

Brief presentation of the project

Long considered, the idea of an orbital motor highway of Abidjan, still called Y4 route, takes more shape. Studies conducted by the group Novec / LBTP / BNETD between 2014 and 2016 led to set up the optimal route, divided into four sections:

- Section 1: Boulevard de France redresse - Anyama exchanger (A1): 24.4 Km;
- Section 2: Anyama Exchanger - North Highway (A3): 15 km;
- Section3: Northern Highway - Carrefour Jacqueville (West exit Highway which is scheduled to reach San Pedro City at long term): 17.6 Km;
- Section 4: Exchanger Anyama - Azaguié (19.6 Km) or Central East Exit Highway which at long term is expected to reach Adzopé and Abengourou and finally the border with Ghana.

As part of the preparation of Greater Abidjan Support Competitiveness Project (PACOGA), the Ivorian Government and the World Bank have identified the realization of the Section 2 of this peripheral motorway linking the interchanger of Anyama on the A1 highway to the northern motorway (A3) and to the crossroads of Jacqueville (highway Dabou) as one of the most effective ways to enhance the competitiveness of the city of Abidjan.

This project is submitted to request a fund to the World Bank (WB) and should improve the living conditions of the population and improve urban mobility. The project is located in the southern half of Ivory Coast, near the Atlantic coast and crosses the municipality of "Anyama". It is bounded by the cities of "Azaguié" at North, "Alépé" at East, "Bingerville"at southeast "Abidjan" in the South, "Songon-Agban" in the Southwest and "Adiaké" to the West.

Political, legal and institutional framework

Legislative framework

At the legislative and regulatory level, the development of this ESIA has been done in accordance with national policies and texts on environment protection, including the:

- ✓ National Action Plan for the Environment (NAPE) which constitutes the policy framework to better understand the environmental problems in the Ivory Coast;
- ✓ Law No. 2016-886 of 08 November 2016 on the Constitution of the Republic of Ivory Coast;
- ✓ Law No. 96-766 of 3 October 1996 on the Environment Code;
- ✓ Law No. 98-755 of 23 December 1998 on the Water Code;
- ✓ Law No. 2014-138 of 24 March 2014 on the Mining Code;
- ✓ Law No.2014-427 of 14th of July 2014 concerning the forestry Code;
- ✓ Law No. 2015-532 of 20 July 2015 on the Labor Code;
- ✓ Decree of 25 November 1930 on expropriation for reasons of public utility;

To these national instruments, there are ratified conventions by Côte d'Ivoire as well as the World Bank environmental safeguard policies, more specifically, those triggered by the project:

- ✓ OP 4.01 "Environmental Assessment";
- ✓ OP 4.11 "Physical Cultural Resources";

Institutional framework

At the institutional level, the project implementation will involve several national government agencies namely the:

- ✓ Ministry of Health, Environment and Sustainable Development (MINSEDD), with the National Agency for the Environment (ANDE); CIAPOL;
- ✓ Ministry of Economic Infrastructure (MIE), with the Project to Support Competitiveness of Greater Abidjan (PACOGA) and the Road Management Agency (AGEROUTE);
- ✓ Ministry of Transport (MT), with the Road Safety Office of Côte d'Ivoire (OSER) and the Road Fluidity Observatory (OFT);
- ✓ Ministry of Economy and Finance (MEF);
- ✓ Ministry of Water and Forests (MINEF);
- ✓ Ministry of Agriculture and Rural Development (MINADER);
- ✓ Ministry of Construction, Housing, Sanitation and Urban Planning (MCLAU);
- ✓ Ministry of Industry and Mines (MIM);
- ✓ Ministry of Employment and Social Protection (MEPS);
- ✓ Ministry of Health and Public Hygiene (MSHP);
- ✓ Ministry of Planning and Development (MPD);
- ✓ Ministry of the Interior and Security (MIS).

Key environmental and social components of the initial state

Project's area of influence

The project influential areas have been delineated to cover all the activities planned in the project area, including all related activities linked to the project and define to have a direct, indirect and cumulative effects at long-term of the project on physical, biological and human environments:

- The direct influence area consists of the grip of the planned construction of Section 2 of the highway Y4, the sites that will be selected for the installation of the base life of the company. This route will have a length of 15 km and the width is 120 m.
- The indirect influence area is the area that lies beyond the direct influence. It includes the Autonomous District of Abidjan which includes the Municipality of Anyama and its neighborhood.

Climat

Côte d'Ivoire is bathed in a tropical climate. It is crossed, from South to North, by various climate zones. According to the rainfall, four (04) climates are distinguished (Eldin, 1971, Goula, 2005, Goula and al., 2007):

- in the South, the Attiean climate, of the subequatorial type;
- at the Center, the Baoulean climate, of the equatorial type of transition attenuated;
- in the North, the Sudanese climate, of tropical transition type;
- in the West, the climate of Mountain.

The study area is subjected to an Attiéen climate, marked by four (04) seasons clearly differentiated by the rainfall regime, in the absence of important variations of the temperature:

-the big dry season, from December to April, characterized by a very cloudy and foggy sky in the morning, clear and sunny the rest of the day. Precipitation is rare;

- the great rainy season, from May to July, characterized by very high cloud levels, frequent and abundant rains, and often long (24 hours or more), in the form of moderate to heavy rains;
- the short dry season, from August to September, characterized by a high number of rainy days but very low amounts of water collected;
- the short rainy season, from October to November, characterized by a very high temperature and a high water vapor tension.

Air quality, noise and vibration

Dust concentrations along the section 2 were all greater than the limit value of 50 micrograms / m3. The dusty environment could be the effect of the current weather (Harmattan) and resuspension of dust from unpaved roads.

Carbon dioxide was present in the environment at concentrations at times higher than 1000 ppm (allowable concentration in enclosed environments), but less than 5000 ppm (on a regular exposure of eight working hours). This gas could reflect a strong human activity in some areas (Anyama and Yaokro).

The concentrations of nitrogen dioxide, sulfur dioxide and VOCs were very low (<1 ppm, our equipment detection limit) along the section 2.

Landscape and Relief

The project area has a very rugged terrain. The morphology of the project site is dominated by horizontal interfluves and thalwegs with very high slopes. The landscape is marked by the presence of various buildings and fields.

Water resources

The project area contains a water system consisting mainly of small streams that are the Nieke , the Anguédédou , the Djibi and the Bete.

The Nieke is the main river in the project influence area . It is a tributary of the left bank of the Agnéby, with a northeast flow and southwest direction.

Studies on the quality of ground and surface waters indicate that pH values are below 6. Surface water and groundwater are not suitable for human consumption according to WHO standards. They must first be subjected to treatment.

Groundwater is relatively well oxygenated with values between 5.61 mg / L (well 1) and 7.51 mg / L (Drilling 2) for a meduim value of 6.72 mg / L (Table). But on the other side, the average value of dissolved oxygen concentrations (3.3 mg / L) encountered in the surface water is lower than that one of groundwater. The water encountered in the area are clear to slightly turbid from one section to another station. The levels of nutrients (NO3, NO2, NH4 +, PO43-) of surface and ground waters of the study area are generally low and vary depending on the station.

The concentrations of COD in surface water are low. They are respectively 15 and 10 mg / L for rivers R1 and R2. Similarly, BOD5 values are low and fixed at 5 mg / L for both stations. These values of COD and BOD5 encountered in the rivers of the study area, are below guideline values do not exceed proposed by World Health Organization, and are respectively less than 30 and 3-7 mg / L.

Population

The town of Anyama is located at 25 km from Abidjan on the Abidjan-Agboville section and is part of the greater Abidjan. It is also accessible by Abidjan-Ouagadougou railway.

Anyama is a sub-prefecture in the south of Ivory Coast and northern of the autonomous district of Abidjan which it is part. It is limited by the:

- East, by the sub-prefecture of Alépé;
- South by the sub-prefecture of Dabou;
- North by the Prefecture of Agboville and the sub-prefecture of Azaguié.

The Municipality of Anyama is more urban (87 567 inhabitants) than rural (22 628 inhabitants). This finding is in line to accentuate especially as the population of the city (6.49%) had a higher growth rate than the rural population (2.8%).

Environmental and social impacts

Positive impacts in phases of preparation / installation and construction / operation

The positive impacts in preparation and installation phases will be:

- at the population level, the creation of direct, indirect and temporary jobs for local communities, increasing people's incomes and improving the living conditions of many households;
- On economic activities, the development of income generating activities around the base life;

The positive impacts during operation and maintenance will be:

- at the population level: improving urban mobility and ease of access to neighborhoods;
- the level of road traffic: the traffic flow of vehicles, improved conditions of movement of goods and people (comfort, security, etc.), the creation of new lines of transport.

Negative impacts in phases of preparation / installation and construction / operation

The negative impacts of the project on the biophysical and human environment in the different phases (installation, construction and operation and maintenance) and the general recommendations related to them are presented in the table below.

ACTIVITY SOURCE OF IMPACT	COMPONENT OF AFFECTED ENVIRONNEMENT	CARACTERISATION OF THE IMPACTS	MITIGATION MEASURES
INSTALLATION AND CONSTRUCTION PHASE			
Release of the right of way Execution of the work	Air quality Noise and vibrations Landscape	▪ Dust increase ▪ Noise and vibrations pollution ▪ Degradation of usual views	▪ Controlling the technical visit of vehicles ▪ Watering platforms regularly ▪ Installing a tarpaulin on the trucks carrying the materials ▪ Adjusting the water content gravelly ▪ Planning and restricting the work between 8 am and 6 pm ▪ Respecting of the tranquility of local residents by employees ▪ Prohibiting the storage of any waste products along the roads
	Soils Waters	▪ Modification of natural drainage conditions of rainwater ▪ Risks of soil and water contamination	▪ Storing chemicals in appropriate areas ▪ Limiting Equipment maintenance to areas defined for this purpose ▪ Collecting, storing unused oils temporary under environmentally acceptable conditions ▪ Developing Employee awareness and training program
		▪ Risks of soil and water contamination	▪ Installing sediment barriers in areas of the site that could drain sediments to surface water ▪ Identifying an area for maintenance operations of engins, to better control the flow of oils, greases, etc. ▪ Recovering solid waste (leftover food, packaging, paper, etc.) from the workers' camp, and collecting waste in garbage bins and collected regularly, by a specialized company to transfer them to the landfill

ACTIVITY SOURCE OF IMPACT	COMPONENT OF AFFECTED ENVIRONNEMENT	CARACTERISATION OF THE IMPACTS	MITIGATION MEASURES
			▪ Installing mobile toilets and passing contract to the management of wastewater for treatment to a structure approved by CIAPOL ▪ Collecting regularly materials from demolitions, as well as solid waste by a waste collection company
	Vegetation	▪ destruction of vegetation	▪ Defining clearly sites to be cleared for the needs of the project

ACTIVITY SOURCE OF IMPACT	COMPONENT OF AFFECTED ENVIRONNEMENT	CARACTERISATION OF THE IMPACTS	MITIGATION MEASURES
Release of the right of way Execution of the work	Population	▪ Difficulties of access ▪ Olfactory nuisances ▪ Noise and vibrations ▪ Risks of breathing and hearing problems ▪ Risks of congestion by site waste ▪ Risks of disease transmission (STIs and HIV-AIDS) ▪ Disturbance of the road traffic ▪ Risk of accidents ▪ Loss of goods and cultures	▪ Developing the passage corridors to facilitate the movement of residents ▪ Watering regularly the platforms ▪ Installing a tarpaulin on the trucks carrying the materials ▪ Adjusting the water content of the gravelly ▪ Planning and restricting works between 08h00 and 18h00 ▪ Keeping the population away from the scope of equipment and construction equipment ▪ Establishing an adequate signalization at the entrance to residential areas ▪ Sensitizing the residents and users on the risks of accidents related to the movement of trucks and the transport of materials ▪ Informing the local populations and workers on schedule and to respect safety measures ▪ Developing awareness program on HIV/AIDS ▪ Developing food sales areas on the construction site ▪ Having on site a medical equipment and drugs ▪ Using personal protective equipment for workers and visitors adequately ▪ Managing the movement of people and vehicles on the construction site ▪ Compensating the PAPs before the beginning of the work
	Sociale life	Risks of conflict and disruption of social relations	Involving projects stakeholders (mayor, technical officers of the town hall, district leaders, leaders of associations or youth groups)

ACTIVITY SOURCE OF IMPACT	COMPONENT OF AFFECTED ENVIRONNEMENT	CARACTERISATION OF THE IMPACTS	MITIGATION MEASURES
	Economical activities	Disturbance of local economic activities	Making necessary arrangements to protect persons carrying out activities near the site against any traffic accident
	Habitat and equipments	▪ Destruction of supports ▪ Risks of cracking of some house ▪ Disruption of services	▪ Compensating for destroyed buildings ▪ Taking technical measures to prevent cracking of residential structures ▪ Facilitating the movement of people near sensitive equipment in the best possible conditions ▪ Watering work areas near equipment to limit the harmful effects of dust ▪ Involving electricity, water and telephone services in the equipment displacement before work begins
	Land and crops	Loss of land Destruction of cultures	Compensating the PAPs
EXPLOITATION AND MAINTENANCE PHASE			
Restoration of road traffic Periodic maintenance	Population	▪ Risks of traffic accidents ▪ Exposure to air and noise pollution	▪ Raising awareness of local populations ▪ applying the speed limit at 40 km/hr ▪ Installing horn warning signs near sensitive equipment

ACTIVITY SOURCE OF IMPACT	COMPONENT OF AFFECTED ENVIRONNEMENT	CARACTERISATION OF THE IMPACTS	MITIGATION MEASURES
			▪ limiting access of the population from machinery, equipment and cleaning products

Public consultations

Information sessions and public consultations were organized from 29thNovember to 5th December 2017 in Anyama, in order to consult with all those directly involved in this project (authorities and technical services, local populations crossed by the project and other economic operators), the need of taking into account the natural and human environment in the design, implementation and operation. Also, these sessions were there, to collect the aspirations of the population toward the project.

Environmental and Social Management Plan (ESMP)

The main tools that will help monitor and control the environmental and social measures will be the:
- monitoring reports;
-follow up reports;
-results of the populations surveys.

Environmental and social monitoring

The environmental and social monitoring is a science-based process to measure the real impact of a project, and to assess the adequacy of the proposed mitigation measures. This is about, the review and continuous observation of one or several relevant environmental and social components during the operation period of the project.

The approach to the development of the monitoring program takes into account the diverse backgrounds of whom will be affected and the various issues identified. The presentation of monitoring program of the area elements takes into account the following order of the elements presentation in the ESIA.

It will be subject to the control of the competent authorities according to current regulations to enable them to verify that the measures in the ESIA are properly implemented.

Monitoring will be done mainly by the National Agency for Environment (ANDE in French), which will monitor compliance of a national regulatory environment, accompanied by the PIU-PACOGA and AGEROUTE.

The main points of focus to environmental and social monitoring of the project are:

- safety and health;
- Information of the local populations about the project;
- compliance status and / or fitness of construction equipment;
- the implementation of devices for traffic safety sign;
- the provision of conform personal protective equipment and their actual usage by staff;
- compliance with work schedules;
- the effective development and implementation of guidelines and procedures relating to the environment, safety and health;
- gender based violence;
- waste management;
- the recruitment of local staff;
- maintaining air quality;
- maintaining the quality of water resources

- soil stabilization.

The monitoring will be assured daily by the Environmental Specialist of the Owner's Engineer (REBC), during the work.

Plan for capacity building, information and communication

In order to enable the different actors involved in the implementation of the project to properly fulfill their mission, it is essential to implement a capacity building plan, information and awareness of these actors.

This plan will focus on:

- information and awareness on the project, with targeted actors of the Technical Department of the Municipality of Anyama and the local population;
- training and awareness on health and safety at work, with targeted staff of the Construction company actor;

Cost of social and environmental measures

The cost of the measures amounts estimate for the recommendations aiming at attenuating the negative impacts of the project is **three hundred and eighty-five million** (385 000 000) XOF.

2.4. Environmental and Social Impact Assessment(ESIA) of roads of the port

Context and justification of the project

The Port Authority of Abidjan (PAA) plays an important role in the Ivorian economy. The qualitative and quantitative shortcomings of the PAA's transport infrastructure is one of the weak links in the logistics chain of these activities. The endless congestion observed on the roads inside the port area, the uncontrolled parking of vehicles, including trucks and the deterioration of the environment are harmful consequences of these deficiencies. In order to meet these challenges in the port area, the State of Ivory Coast through the Greater Abidjan Competitiveness Support Project (PACOGA) has identified a set of priority roads to be strengthened. It is a total of twenty-three (23) routes included in two (02) municipalities of Abidjan: Port-Bouët and Treichville.

This ESIA concerns three (03) roads. These are the following routes:
-MAERSK-SIEPBA,
-UNICAO-PARC OIC Belt and
- Zimbabwe - Vridi Cité - Bvrd de Petit Bassam.

The road transport infrastructure improvement and rehabilitation project will improve the accessibility of the Port and increase the flow of traffic in the port area.

Presentation of the project

Location of itineraries

The Project is housed in the cities of Port-Bouët and Treichville. Project areas are characterized by intense industrial and commercial activities. The locations of these channels are listed in the following table:

N° WAY	Désignation of roads	Typology of ways	Landmarks and GPS Coordinates		Length
1	MAERSK-SIEPBA	2x1 ways	OP88 (Beginning of the Project)	N 05°16'44.4'', W 004°00'23.9''	400 ml
			P90	N 05°16'40.1'', W 004°00'23.6''	
			FP 91 (End ofProjet)	N 05°16'32.1'', W 004°00'23.7''	
2	Belt UNICAO-PARC OIC	2x1 ways	P 96	N 05°16'00.6'', W 004°00'08.2''	1200 ml
			FP 102	N 05°16'20.3'', W 003°59'53.6''	
3	Zimbabwe – Vridi Cité - Bvrd de petit bassam	2x1ways	OP 101	N 05°16'21.9'', W 003°59'57.3''	2800 ml
			P109	N 05°15'59.9'', W 003°59'18.2''	
			FP 114	N 05°15'31.2'', W 003°58'54.4''	

<u>Legislative and institutional framework</u>

Legislative framework

At the legislative and regulatory level, the development of this ESIA is supported by several national texts on environment protection, including the:

- ✓ National Action Plan for the Environment (NAPE) which constitutes the policy framework to better understand the environmental problems in the Ivory Coast;
- ✓ Law No. 2016-886 of 08 November 2016 on the Constitution of the Republic of Ivory Coast;
- ✓ Law No. 96-766 of 3 October 1996 on the Environment Code;
- ✓ Law No. 98-755 of 23 December 1998 on the Water Code;
- ✓ Law No. 2014-138 of 24 March 2014 on the Mining Code;
- ✓ Law No. 2015-532 of 20 July 2015 on the Labor Code;
- ✓ Law No. 2014-427 of 14 July 2014 on the Forest Code;
- ✓ Law No. 2014-390 of 20 June 2014 on Orientation on Sustainable Development;
- ✓ Law No. 2003-208 of 07 July 2003 on the Transfer and Distribution of State Competences to Territorial Communities;
- ✓ Law n ° 99-477 of August 02, 1999 as amended by Ordinance n ° 2012-03 of January 11, 2012 on the Social Welfare Code;
- ✓ Decree No. 96-894 of 8 November 1996 laying down the rules and procedures applicable to studies relating to the environmental impact of development projects;

- ✓ Decree of 25 November 1930 on expropriation for reasons of public utility;
- ✓ Decree No. 96-206 of 07 March 1996 relating to the Committee on Health, Safety and Working Conditions;
- ✓ Decree No. 96-894 of 8 November 1996 laying down the rules and procedures applicable to studies relating to the environmental impact of development projects;
- ✓ Decree No. 98-40 of 28 January 1998 on the Advisory Technical Committee for the Study of Questions Affecting the Health and Safety of Workers;
- ✓ Decree No. 2012-1047 of 24 October 2012 laying down the procedures for applying the polluter pays principle as defined by Law No. 96-766 of 03 October 1996 on the Environment Code;
- ✓ Decree No. 2013-224 of 22 March 2013 as amended by Decree No. 2014-25 of 22 January 2014 regulating the purge of customary land rights for general interest;
- ✓ - Decree No. 2014-397 of 25 June 2014 laying down the implementing rules for the Mining Code Act;

To these national instruments, there are ratified conventions by Côte d'Ivoire and the World Bank policies, more specifically, those triggered by the project:

- ✓ OP 4.01 "Environmental Assessment";
- ✓ OP 4.11 "Physical Cultural Resources";

Institutional framework

At the institutional level, the project implementation will involve several national government agencies namely:

- ✓ the Ministry of Health, Environment and Sustainable Development (MINSEDD), with the National Agency for the Environment (ANDE); CIAPOL;
- ✓ the Ministry of Economic Infrastructure (MIE), with the Infrastructure Renaissance Project of Côte d'Ivoire (PRI-CI) and the Road Management Agency (AGEROUTE);
- ✓ the Ministry of Transport (MT), with the Road Safety Office of Côte d'Ivoire (OSER) and the Road Fluidity Observatory (OFT);
- ✓ the Ministry of Economy and Finance (MEF);
- ✓ the Ministry of Budget and the State Wallet;
- ✓ the Ministry of Construction, Housing, Sanitation and Urban Planning (MCLAU);
- ✓ the Ministry of Industry and Mines (MIM);
- ✓ the Ministry of Employment and Social Protection (MEPS);
- ✓ the Ministry of Health and Public Hygiene (MSHP);
- ✓ the Ministry of the Interior and Security (MIS).

As for private institutions, there are the:

- Owner’s Engineer;

- Company;

Public consultations

Public participation is within the regulatory framework of Decree No. 96-894 of 8 November 1996, determining the rules and procedures applicable to studies relating to the environmental impact of

development projects, in Articles 11 and 16 and policies of the World Bank in particular its Operational Policy 4.01 (Environmental Assessment).

For this purpose, two (02) publics information and consultation sessions were organized in the City of Port-Bouët (Port-Bouët Town Hall) and Treichville (Treichville Town Hall) respective on December 29th ,2017 and January 05th 2018, in order to present to all the actors directly involved in the realization of this project (authorities and technical structures of the administration, populations bordering the footprints of the roads to be rehabilitated and other economic operators), the need to take into account the natural and human environment in its design, construction and operation. Also, these sessions were there, to collect the aspirations of the population toward the project.

Also, these public meetings were aimed at gathering the aspirations, expectations and fears of these populations in order to associate them in the final decision-making concerning the project.

Following these consultations, the main concerns formulated among others are:

-the potential physical impacts of the project on the populations;
-the method of managing the damage to be suffered by the population and the possible date of the release of the sites and the compensation;
-the nuisance of the traffic of heavy goods vehicles on the neighboring populations of Vridi city with the exploitation of the way Zimbabwe - Vridi Cité - Bvrd of Petit Bassam and the proposal of a way of bypass for these trucks;

-the starting date of the works and the duration of the project

Initial status of the project site

Physical environment

Relief

The relief of the study area is characterized by valleys associated with lowlands and interfluves. Extreme altitudes range from 100 to 500 m, with an average of around 250 m.

Soils

From a geological point of view, the study area belongs to a sedimentary basin whose age ranges from early Cretaceous to Quaternary. However, only Tertiary and Quaternary formations outcrop.

These formations are composed by:

- tertiary sands;

- Quaternary and current marine sands;

- ancient and recent alluvium characterized by their highly variable texture from compact plastic clays to coarse gravel sands.

Climate

The study area is subject to an equatorial climate of transition (Attiean climate), characterized by a long dry season (from December to April), a long rainy season (May to July), a short dry season (from August to September) and a short rainy season (October to November).

Hydrography

As for the hydrology of the study area, it includes the Ebrié lagoon, which covers 566 m² of surface area with an average width of 7 km and an average length of 150 km with an average depth of 4 m. this lagoon is divided into several sections by the Aghien and Potou lagoons, the Assini Canal, the city of Abidjan and the Vridi canal.

Hydrogeology

The hydrogeological framework of the study area comprises two (02) aquifers, which are those of the Quaternary and the Continental Terminal. These two (02) aquifers contain respectively the Quaternary aquifer and the Continental Terminal aquifer, also known as the Abidjan aquifer. This sheet consists of coarse fluvial sands, sandy clays and clay sands. It benefits from a natural protection, in particular, its great depth (from 90 m of depth), its inclination of the North towards the South and the existence of the major fault of the lagoons shelters it from a rise of salt water in the boreholes used for the AEP of the populations of the Autonomous District of Abidjan.

Air

Human activities are the main source of air pollution in the project areas. The sources of emissions of air pollutants identified are as follows:

-the exhaust gases of public transport vehicles, private individuals and trucks;

-the two-wheeled vehicles;

-the significant lifting of dust, especially in the dry period;

Noise

The real sources of noise pollution in the project area are human activities and wheeled vehicles.

Biological environment

Vegetation

In the project area, vegetation has disappeared completely due to urbanization.

Fauna

There are only a few animals (salamanders, lambs, snakes, pigeons, crows, mice).

Human environment

- Populations: no household in the right of ways;

- Land: the project site is part of the port domain: public domain of the State;

- Economic activities: there are commercial activities, particularly in the neighborhoods of the Zimbabwean crossroads to Petit Bassam, the axis linking the UNICAO belt to the ICO park.

- Equipments: various networks (electricity, drinking water, telecommunication, drainage and sanitation.

Impact of the project on the environment

Positive impacts

On the physical environment

The project will have no significant positive impact on the physical environment, in the preparation and installation phase, as well as in the construction phase.

In addition, as a positive impact of the project on the physical environment during the operation and maintenance phase, we could note the improvement of the quality of the landscape in the project area.

On the biological environment

The project will have no significant positive impact on the biological environment, during the preparation and installation phase, during the construction phase and during the operation and maintenance phase.

On the human environment

Positive impacts on the human environment will include:

• at the level of the population and social life: the recruitment of the local workforce, the creation of friendships, the improvement of the road fluidity, the reduction of the risks of accidents;

• at the level of economic activities: the growth of economic activities;

• at the level of habitats and equipment: the opening up of certain equipment, the strengthening of sewerage and drainage networks;

• at the level of the living environment: the improvement of the living environment;

• at the level of safety and road traffic: increasing the potential of public transport, ease of access to riparian neighborhoods

Negative impacts

On the physical environment

The negative impacts of the project on the physical environment during the installation and preparation phase and during the construction phase will be:

• air quality: increasing the concentration of air pollutants and dust;

• noise : noise pollution affecting residents;

• landscape: the degradation of the usual views of the landscape;

• surface water: risks of contamination of the Ebrié Lagoon by solid and liquid waste generated on work site.

No negative impact has been identified on the physical environment during operation and maintenance.

On the biological environment

The project will have no significant negative impact on the biological environment, during the preparation and installation phase, during the construction phase and during the operation and maintenance phase.

On the human environment

The significant negative impacts on the human environment during the installation and construction phase will include:

- at the level of the population: difficulties of access to housing and socio-educational and sanitary facilities, noise and accident risks;
- at the level of economic activities: the disruption of the different economic activities;
- at the level of habitats and equipment: risks of damage on the various networks;
- at the level of the living environment, health and safety: the disruption of pedestrian and vehicular traffic and the disruption of access to certain car parks.

Environmental mitigation measures

Preparation and installation phase

Impact Identification			Mitigation Measures
Activities sources of impact	**Component affected**	**Impact Identification**	
- Release and preparation of the project site General Installation of the site	Air quality	Increased concentration of air pollutants and dust	- Watering periodically the platforms; - Setting up a tarpaulin on the trucks carrying the materials; - Limiting the speed to 40 km / h; - Avoiding inappropriate travel; - Adjusting the water content of gravel to mitigate the impact of dust before unloading - Providing employees with IPE
	Noise	Noise pollution near residents	- Planning and restricting work at night (between 8pm and 5am); - Taking steps to ensure the residents' peace of mind through the employees;
	landscape	Degradation of usuals views	-prohibiting the storage of waste throughout the roads;
	Population	- Risks of hearing and breathing problems - Risk of accidents	- Watering the platforms; - Setting up a tarpaulin on the trucks carrying the materials; - Adjusting the water content of gravel to mitigate the impact of dust before unloading; - Planning and restricting work at night (between 8 pm and 5 am) - Respecting the tranquility of local residents by the employees; Limiting the speed of construction vehicles to 40 km / h; - Sensitizing drivers and set up a code of conduct
	Economical activities	Perturbation of economic activities	- Resettling the owners of activities with the support of the cities of Port- Bouët and Treichville prior the beginning of any works

Impact Identification			Mitigation Measures
Activities sources of impact	**Component affected**	**Impact Identification**	
	Land	Risks of disputes, conflicts and land speculation	Negotiate with the customary owners or with the Technical Services of the City of Port-Bouët and Treichville or any other legal person likely to provide sites for the installation of the base of the company as well as for the opening of the zones deposit
	Equipment and networks	Disturbance of drinking water and electricity systems	Contact the technical services of the networks Owners such as SODECI and CIES for the relocation of the drinking water and electricity networks before starting work

Construction Phase

Impact of Identification			Mitigation Measures
Activities sources of impact	**Component affected**	**Impact Identification**	
Scouring Installation of Blocks Pavement and Equipment	Air Quality	Increased concentration of air pollutants and dust	- Watering periodically the platforms; - Maintaining qualitatively and periodically machinery and vehicles; -Setting up a tarpaulin on the trucks carrying the materials; - Avoiding inappropriate travel; - Adjusting the moisture content of gravel to reduce the impact of dust before unloading; - limiting the speed of vehicles to 40 km / h;
	Noise	Noise pollution near residents	- Planning work schedules according to the type of occupation (housing, industrial, commercial) - Respecting the tranquility of local residents by employees
	Landscape	Degradation of usual views	-Storing materials (aggregates) and excavated products in landscaped and protected areas
	Soils	- Degradation of lowlands - Unavailability of land for cultivation - Erosion risks due to gully erosion - Risks of contamination by hydrocarbons and oils	- Installing sites outside sensitive areas such as schools, clinics, etc. - Building mechanical workshops capable of receiving the machines and construction vehicles for the various revisions and routine maintenance; - Requiring the contractor to equip himself with specific equipment according to environmental rules to collect the draining oils: sealed concrete tank, sealed tanks; -Requiring the contractor to equip himself with specific equipment according to environmental rules to collect the draining oils: sealed concrete tank, sealed tanks; - Removing and destroy all used oils or maintenance of machinery and other construction vehicles by specialized companies of the place;

Impact of Identification			Mitigation Measures
Activities sources of impact	**Component affected**	**Impact Identification**	
			- Establishing a waste management plan to prevent soil contamination from employee waste and accidental leaks
	Water Resources	Risks of contamination of water resources	Taking steps to prevent dumping of waste near water sources
	Fauna and flora	Loss of vegetation cover Loss of habitat for animal species	- Receiving prior authorization from the Mines and Technical Services Department of the town halls of Port-Bouët and Treichville for the choice of deposit zones - Directing the choice of land deposit to already degraded areas -Choosing sites that do not affect well-regenerated fallow habitats; - Prohibiting the deposit of materials from the demolition of old structures or the stripping of bitumen in the lowlands; - Prohibiting the installation of washing and waste removal areas for gravel rolled on the crest lines or on the slopes of the lowlands; - Rehabilitating the borrow areas before the closure of the site
Scourging/ pavement of Roads	- Population and living environment - Social and cultural life -Economical activities	- Difficulties of access to housing and socio-educational, health and religious facilities - Risk of accident - Risk of hygiene and respiratory infections - Risk of interruption in the drinking	- Informing local populations and users about the work schedule and safety measures to be respected; - Keeping the population away from the scope of equipment and construction equipment; - Establishing adequate signal at the entrance of residential areas; - Keeping the population away from the scope of equipment and construction equipment; - Establishing adequate signage at the entrance of residential areas; - Watering periodically the platforms; - Contacting the technical services of the concessionaires such as SODECI and

Impact of Identification			Mitigation Measures
Activities sources of impact	**Component affected**	**Impact Identification**	
		water supply of the populations - Sound and atmospheric pollution - Transmission risks of STI / HIV/AIDS - Risk of interruption in the drinking water supply of the populations - Difficulties of access to housing and equipment - Risk of accident - Sound and atmospheric pollution - Transmission risks of STIs / HIV/AIDS - Disturbance of garbage disposal - Disruption of economic activities	CIE to localize the drinking water and electricity networks before the start of work; - Setting up a tarpaulin on the trucks carrying the materials; - Adjusting the moisture content of gravel to reduce the impact of dust before unloading; - Planning and restricting work at night (between 8 pm and 5 am) - Requiring the respect of the residents' peace of mind by the employees; - Informing and sensitizing construction site staff and local residents about HIV/ AIDS - Setting up food sales areas on the construction site; - Providing the site with a medical device; - Paving the lanes by half-floor or identify bypass lanes
Scourging/pavement of Roads	Habitats and équipements	- Disruption of access to homes and equipment - Risks of cracking of certain frames - Disruption of r networks	- Facilitating the movement of people specially students in the best possible conditions by the development of pedestrian ways, for example; - Watering the work areas near the equipment to limit the harmful flights of the dusts
Scourging/pavement of Roads	Traffic and security	Disturbance of road traffic on the roads to be developed Risk of accident	- Planning a work schedule; - Sensitizing and informing residents and users about the risks of accidents related to the movement of machinery and the transport of materials;

Impact of Identification			Mitigation Measures
Activities sources of impact	**Component affected**	**Impact Identification**	
			- Planning the installation of traffic signs and speed limits as school exits, places of worship, markets and river health centers approach; - Requiring the speed limit at 40 Km / h; - Ensuring the existence of back-off horn and / lightening on construction machinery - Reinforcing the security measures by the markings on the ground (horizontal signaling) as well as the traffic lights and the alarms -Paving the lanes by half-floor / identifying deviation lanes; - Proposing alternative routes (access - diversion routes) for vehicles mainly those of residents

Exploitation and maintenance phases

Impact Identification			Mitigation measures
Activities sources of	**Component affected**	**Impact Identification**	
Recirculation of tracks	Health population Traffic and safety	- Sound pollution - Increased risk of accidents	- Requiring speed limitation in the residential areas of the projects to be set at 40 Km/h -setting speed bumps, - Installing the horn warning signs near health centers, schools and places of worship; - Encouraging economic operators to modernize their car park; - Implementing an IEC plan / Intensification of road safety campaigns towards road users and populations; - Sensitizing the local populations on the respect of the road signs

Environmental and social management plan (ESMP)

The main tools that will help monitor and control the environmental and social measures will be the:
- monitoring reports;
-follow up reports
-results of surveys of the populations

Environmental and social monitoring

Environmental monitoring consists of observing the evolution of the constituent elements of the natural and human environments potentially affected by the Project, to verify that the environmental measures taken (follow-up measures) are effectively effective.

Environmental monitoring is carried out by the National Agency for Environment (ANDE). It will track changes in the state of the environment, including sensitive environmental elements and significant operational activities, based on environmental indicators, throughout the duration of Project activities.

The main points of attention to environmental and social monitoring of the project are:

- safety and health;
- information towards the local population about the project;
- state of conformity and / or suitability of the construction equipment;
- establishment of road safety signaling devices;

- provision of compliant personal protective equipment and their effective use by the staff;

-respect for working hours;

- development and effective implementation of environmental, safety and health guidelines and procedures;
- waste Management;
- recruitment of local staff;
- maintaining the quality of the air;
- maintaining the quality of water resources
- soil stabilization.

The monitoring will be assured daily by the Environmental safeguards specialist of the Owner's Engineer (REBC), during the work.

The environmental and social mitigation measures proposed under the ESIA that includes the ESMP should be monitored to ensure that they are well established and implemented during implementation. of the Project according to a timetable in due form. The primary objective of environmental monitoring is to monitor the proper execution of all activities and works throughout the duration of the Project, in keeping with the environmental commitments made by the sponsor. Generally speaking, it is respect and protection of the environment. The term "commitment" is essentially related to environmental measures that are proposed in the ESIA, laws and regulations, authorizations issued by the Ministry in charge of the Environment as well as all other commitments (contracts, markets, etc.) taken by companies against the Project. In addition, monitoring will, where appropriate, identify unforeseen impacts, and if necessary, adjust measures to eliminate or mitigate them.

The indicators and parameters that will be used for the environmental monitoring program will have to conform to the national standards in force in line with the World Bank Operational Policies. The monitoring of the works will be carried out during all the phases of implementation of the Project from the conception of the plans and specifications until the end of the exploitation, the rehabilitation of the last site / zone exploited and the closing of all the used sites.

Capacity building, information and communication plan

In order to enable the different actors involved in the implementation of the project to properly fulfill their mission, it is essential to implement a capacity building plan, information and awareness of these actors.

This plan will focus on:

- information and awareness on the project, with targeted actors of the Technical Department of the Municipalities of Port-Bouët and Treichville and the local population;
- training and awareness on health and safety at work, with targeted staff of the Construction company actor;
- support within the environmental and social monitoring, with targeted actor of ANDE; the acquisition of cars and monitoring materials; support as part of the environmental and social supervision, with targeted actor, the hiring of an Environmental safeguards specialist of the PIU (PACOGA)

Cost of environmental and social measures

The cost of environmental and social mitigation measures is estimated at Seventy-three million five hundred thousand XOF (73,500,000 FCFA) according to the decomposition of the following ESMP matrix:

N°	Désignation of activities	Units	Quantities	Units Costs (XOF)	Total Cost in (XOF)
1	**IEC measures and awareness**				
1.1	Information, Education, Communication and sensitization of site staff and populations on HIV / AIDS, etc.	session	02	5 000 000	10 000 000
1.2	Information, awareness and training campaigns for road users and local residents on road safety	session	02	5 000 000	10 000 000
	Under Total 1				**20 000 000**
2.	**Protection measures**				
2.1	Protection equipments	kit	1	15 000 000	15 000 000
2.2	Arrangement of corridors and footbridges of construction site	-	1	15 000 000	15 000 000

N°	Désignation of activities	Units	Quantities	Units Costs (XOF)	Total Cost in (XOF)
	Under Total 2				**30 000 000**
3	**Training of actors**				
3.1	Hygiene and safety standards for rehabilitation works	kit	1	10 000 000	10 000 000
3.2	Environmental and social monitoring of works	kit	1	10 000 000	10 000 000
3.3	Environmental and social audit at the end of the works	study	1	3 500 000	3 500 000
	Under total 3				**23 500 000**
	GENERAL TOTAL				**73 500 000**