Environnemental and Social Impact Assessment

CONSTRUCION OF UNLAODING DOCK (QUAY)

COMPLIMENTARY STUDY

Rapport provisoire June 2019

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SUMMARY

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SECTION 1. Introduction

The Environmental and social assessment is an instrument for sustainable development and decision support that integrates the economic, environmental and social components associated with the activities envisaged. It has become compulsory for more than twenty years, either under national laws and regulations, or because of the requirements of donor policies and directives for the projects they finance. Environmental assessment instruments, such as ESIAs and ESMPs, are a legal obligation for public and private developers. They are used for the analysis and environmental and social impacts of development projects and to determine the feasible mitigation measures, prior to decision-making. The environmental and social assessment of development projects is based on the concepts and principles of sustainable development.

This chapter presents the general information concerning the complementary environmental and social assessment of the unloading dock of the CIPREL V project.

o Context

o Methodology

o Institutional and regulatory framework

1.1. Context

This report assesses the environmental and social issues in the context of the CIPREL V unloading dock construction project (the Project).

This platform is only dedicated to the routing of oversized packages from the Power Plant, for example: Alternator, Gas turbine, Steam turbine, Chimney elements.

The Project was the subject of an Environmental and Social Impact Assessment (ESIA) carried out by the firms ERM and ENVAL. The field missions (biodiversity, social, consultations) carried out within the framework of the ESIA did not cover this sub-project, as it was not well defined at the time of the ESIA.

The ENVAL firm was mandated to carry out a complementary environmental and social assessment.

1.2. Methodology

This study was carried out in three phases: preparation, recognition and consultation mission, evaluation and writing.

Preparation: review of the proposed routes, pre-identification of potential E&S sensitivities, analysis of available satellite images and identification of the villages concerned. The preparatory phase made it possible to frame the field reconnaissance activities.

1. Reconnaissance mission: an environmental expert, a social expert, an industrial security expert, and an ENVAL biodiversity expert carried out

reconnaissance missions. The environmental expert characterized the environmental challenges, the industrial security expert identified and analyzed the risks, the biodiversity expert set out to characterize the different habitats covered and the presence of sensitive species, the social expert to characterize the social context and the presence of sensitivities such as cultures, dwellings, infrastructures, sacred site, subsistence activities (collecting wood, charcoal, etc.).

2. Assessment and report: an assessment report on the alternatives was carried out on the basis of data collected in the field (report of consultations, photographs, village profiles, etc.) and information available in the ESIA of the Project. The assessment of sensitivities is also based on expert judgment. For consistency, the recommended mitigation measures and good practices are similar in nature to those proposed in the Project ESIA.

3. Evaluation and report: a report evaluating alternatives was conducted based on data collected in the field (minutes of consultations, photographs, profiles villages, etc.) and information available in the ESIA Project. The evaluation of sensitivities is also based on expert judgment. For the sake of consistency, mitigation measures and good practices recommended are similar in kind to those proposed in the ESIA Project.

1.3. Report Contents

The areas discussed in this report are:

- Section 1: Introduction;
- Section 2: description of the Project;
- Section 3: identification, analysis and evaluation of the significance of impacts induced by the project;
- Section 4: Environmental protection measures;
- Section 5: Conclusion.

SECTION 2. Project Description

2.1. Loading dock

2.1.1. Description

2.1.1.1. Description RAVAUX

The scope of work consists of the construction of new facilities (Access, Quay, Unloading platform) on unoccupied and virgin land. In detail the works consist in carrying out:

- An unloading quay with a right of way on the lagoon of 80.00 meters in length on the bank and 10.00 meters in depth on the lagoon.
- An 80.00 meter by 25.00 meter concrete unloading platform allowing heavy packages to be recovered from the barge to a tank carrier by "shifting".
- An access route allowing this platform to be connected to the existing road network. (Distance 60.00 meters in length and 10 meters in width.)

2.1.1.2. DESCRIPTION OF CIVIL WORKS AND ACTIONS

The platform will cover a sufficient area of 2,000 m2 on which the land will be cleared and fully landscaped (Concrete slab only). This zone will have the support capacity for heavy vehicles and its drainage will be assured completely flat with the support capacity and drainage conditions for the circulation of heavy vehicles.

Any unsuitable material, such as rubble, wood, paper or any other material liable to rot or decompose, must have been removed from the backfill spaces.

The local site project must carry out a reception inspection of the spaces to be backfilled before any backfill. After a first Survey, the project considers Here, we consider that there are no risks related to industrial vevstiges (For example l Building network buried, ect), it is therefore not necessary to carry out preventive excavations

First, the soil must be cleaned and leveled, leaving it at a uniform height in order to place the various structures, with a slope suitable for the drainage of rainwater.

Once the soil has been prepared, the entire surface must be compacted. Refills should be laid in layers and compacted to a stable state using equipment suitable for the given soil type. Compaction must reach 95% of the single density of proctor.

Here, it is planned to excavate the first 0.50 to 0.80 meters from the ground, then fill it with soil chosen from the material borrowed, in order to stabilize the future platform. Finally, a 30 cm layer of base aggregates will be used.

The embankments must be made in layers, spreading the materials on site with the necessary precautions to achieve the correct junction between the successive layers. Each layer will have a maximum thickness of 30 cm, the material then being moistened or dried, if necessary, in order to obtain an optimal compaction up to 95% of the Modified Proctor test.

2.1.2. Location

The unloading docks will be located at the entrance of Ndjem near the Jacqueville bridge. The map on the following page shows the unloading docks of the website.

Map 2-1: Wharf Site Location unloading

Source: Google Earth Pro, Modified by Cabinet ENVAL, April 2019

2.1.3. neighborhood

The quay construction site is adjacent :

- **The Jacqueville bridge;**
- **Ndjem village houses;**
- **EBRIE lagoon;**

The map on the next page shows the site plan of the quay construction site.

Map 2-2: Neighborhood wharf construction site

Source: Google Earth Pro, Modified by Cabinet ENVAL, April 2019

SECTION 3. Identification, analysis and evaluation of project impacts

3.1. Methodological Approach

3.1.1. Identification of impacts and impact analysis

The impacts generated by the project on the environment are taken into account through two main stages. The first concerns the identification and analysis of environmental impacts. The second deals with the assessment of the significance of the identified environmental impacts. The identification and analysis of environmental impacts will relate to the parameters below:

- **the three phases of the project;**
- **the components of the receiving environment;**
- **sources of impact activities;**
- **the nature of the impact.**

The three phases of the project are: development and construction, operation and cessation of activities. The components of the receiving environment analyzed during the study are the physical and socio-economic components of the environment. Sources of impact include all activities likely to have a direct or indirect effect on one or more components of the receiving environment. The nature of the impact represents the effect of the impact on the environmental component.

The definition of all potential impacts for this project has begun by examining a comprehensive list of impacts that the industry could face and on the basis of the experience of the team as part of the evaluation of impacts defining other possible impacts on physical, biological and / or socio-economic. The definition of potential impacts therefore incorporates:

- **the definition of potential sources;**
- **the definition of environmental sensitivities;**
- **the description of the potential impact.**

3.1.1.1. Definition of environmental sensitivities

The study of the initial state has established what were the environmental components that could be affected by the project.

3.1.1.2. Description of the impact

The description of the potential impact first indicates whether each potential impact identified is associated with predicted events or accidental events, such as

a spill.

The identification of the sources of impacts consists in determining the activities of the project likely to cause modifications on the physical environment or impacts on the components of the natural and human environment. This identification follows from the technical description of the project and the knowledge of the natural environment.

Finally, the description of the impact specifies how the environment could be affected.

3.1.1.3. Impact summaries

The result of this phase is presented in the impact summary matrix, defined for each phase as follows:

The methodology is adapted from one developed by Hydro Quebec.

Determining the value of the identified impacts is a function of two variables: the severity and likelihood of impact (value = Severity of the impact or importance × Probability).

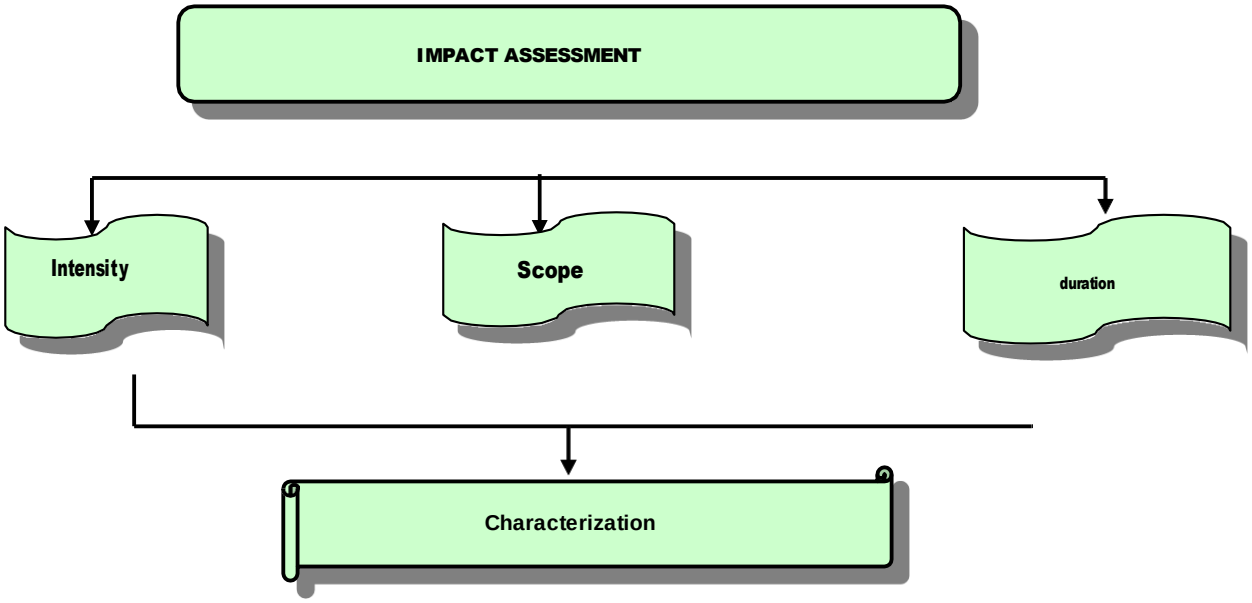
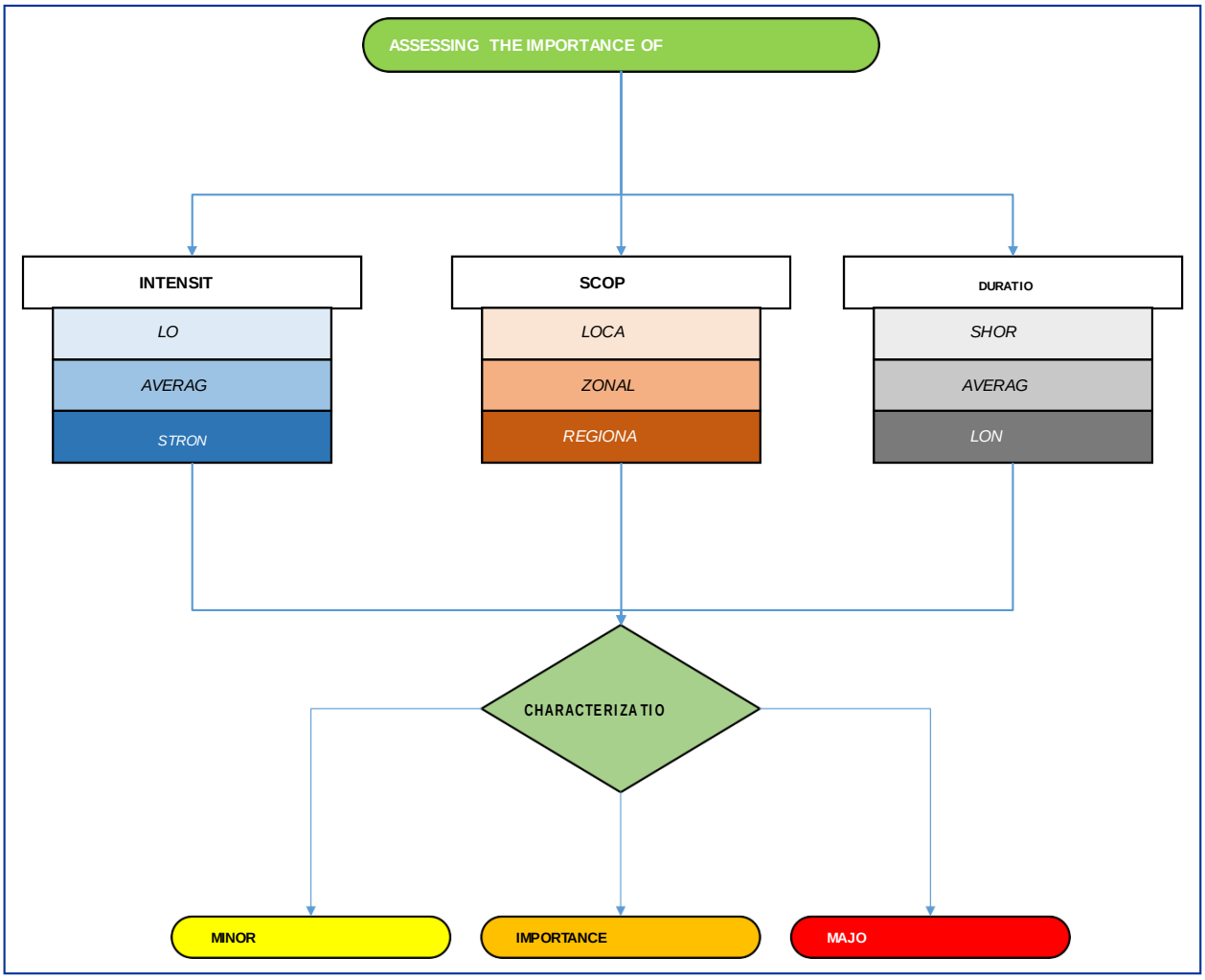


Figure 3-1: Impact characterization chart

3.1.2. Assessment of the significance of impacts

Assessing the significance of the impact is made by the combination of different indicators (intensity, scope, duration) defined above taking into account the impacts of significance network (Below the impact assessment chart as proposed by ANDE).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This approach is essentially based on the assessment of the value of the environmental components as well as the intensity, extent and duration of the anticipated effects (positive or negative) on each of these components. This frame of reference is as follows.

Table 3-1: Network significance of impacts

Duration (courtemoyenne Long)	Scope (localezonale-regional)	Intensity		
		Low	Average	Strong
short	Local	minor	minor	minor
Average	Local	minor	minor	Average
Long	Local	minor	Average	Average
short	zonal	minor	minor	Average
Average	zonal	minor	minor	Average
Long	zonal	minor	Average	major
short	regional	minor	Average	Average
Average	regional	minor	Average	major
Long	regional	Average	major	major

Source: Fecteau, April 1997

The correlation established between each of the indicators used to establish the following classification:

- **impact of major significance (Ma)** a major impact means that the integrity of the nature of an item and its use are changed significantly; the impact endangers the life of humans, animals or plants.

- **Impact of average significance (A):** a medium-sized impact means that the integrity of the nature of an element and its use are partially modified; the impact does not endanger the lives of individuals or the survival of an animal or plant species.
- **Impact of minor significance (Mi):** a minor impact means that the integrity of the nature of an item and its use are changed slightly.

I.e. Intensity × Range × Duration. The correlation established between each of the indicators makes it possible to establish the classification of major, medium or moderate, minor and negligible importance.

Assessment of the significance of the impacts; Comparative assessment of variants

This is to quantify the importance of expected impacts to prioritize mitigation solutions and compensation required. Impact significance is assessed using various indicators such as the intensity of the impact; the scope of the impact and duration of the impact.

The intensity of the environmental impact expresses the relative importance of the consequences due to the alteration of a component of the environment. It depends on both the value of the environmental component considered and extent of the disturbance (degree of disturbance) it undergoes. The value of the environmental component incorporates both its eco systemic value and its socio-economic value.

The significance assessment process consists of implementing the following three (3) steps:

Step 1: Evaluate the intensity of the disturbance imposed on each component and determine the duration and scope of the effects generated by each activity.

For each of the parameters (Intensity, Range, Duration) an analysis is made beforehand:

Analysis of the intensity and degree of disturbance of the environment linked to the impacts: the intensity of the change generated by an impact source is either strong, medium or weak, depending on the degree of modification of the element of the social or environmental environment studied ; it will respect the following classification:

- strong or highly disturbed impacts (S): If these cause a profound alteration of an environmental component; and may involve the entire environmental component affected or significantly altered by its use.
- Average impacts or medium disturbance (A): If these cause an average alteration of an environmental component, that is to say if they reduce somewhat the use and the quality of the component environmental.
- Low impact or low disturbance (L): If these do not bring about changes in the quality of an environmental component and whose concern is not significant.

Analysis of the scope or geographic extent of the impacts: this indicator measures an area or a proportion of the population. It corresponds to the spatial influence of the change or to the number of individuals likely to perceive this change in the study area; it is a question of paying particular attention to the geographic scope of the anticipated impacts, by determining, if necessary, the following levels of scale:

- impact with regional scope (Re): if the impacts are felt in the different regions crossed by the project; the affected item is used or the effects of the change on it can be seen by the general human or animal population in the main study area;
- impact at local extent (Lo): if the impact is felt by a limited population of the project area; the affected element is used or the effects of the change on it can be perceived by the human or animal population located in the area circumscribed by the works sector or in the immediate adjacent space;
- impact at specific point (Po): if the impact will be felt by a small group of individuals; the affected element is used, or the effects of the change on it can be perceived by a portion of the human or animal population located in the area circumscribed by the works sector.

Analysis of the duration: it consists in analyzing the period during which the impact will be felt on the components of the environment, distinguishing:

- long-term impacts (Lo): impacts whose effect will be felt continuously and for the life of the project and even beyond;
- medium-term impacts (M): impacts whose effect will be felt continuously, but for a time less than the duration of the project;
- short-term impacts (Sh): impacts whose effect will be felt at a given time during a specific activity.

Step 2: Determine, using the estimation grid, the significance of each impact.

Step 3: Record the results of the analysis in the grid synthesis impact assessment and determine whether the affected components of the project as well as the extent of cumulative impacts as well as those where there is uncertainty as
to their nature and their meaning.

The presentation of the significance of impacts is done using a synthetic matrix. This matrix shows each impact by specifying its intensity, scope and duration to achieve important.

3.2. Positive Project Impacts

3.2.1. Development and construction phase

The positive impacts of the project in the planning and construction phases focus on the human environment and local, regional scope.

3.2.1.1. Business opportunities for private economic operators

The planned investments take into account the purchase of construction materials and equipment to be installed as well as site development and construction operations. Thus, the start of the project remains a business opportunity for construction and technical control companies

The facilities required for the construction of the quay are an asset for land use planning. The planned developments cannot escape strict construction standards and the authorizations of the manager of the coastal area of maritime affairs. They will fit into the local master plan.

3.2.1.2. Fight against poverty

The work will require a staff requirement. Unemployed young people will be asked for the various construction works. Staff employed on site will receive a salary. This phase will contribute to poverty reduction in the department in the current social context of Côte d'Ivoire, where a worker is directly responsible for at least five people and indirectly for the entire community forming the extended family.
Besides this, these staff will constitute a clientele for small businesses in the project area. This will boost the income of traders.

3.2.1.3. Job and Internship Opportunities

The planning and construction phase will require labor. Several temporary jobs will thus be created. Indeed, the construction of the Quay will create temporary jobs (laborers, workers, guards). These jobs will help reduce the unemployment rate of the local population.
The construction phase can also be used by students, especially those interested in civil engineering, the environment and energy, to see how a site looks.

3.2.1.4. Tax Payments

The purchase of the materials will give rise to the collection of Value Added Taxes (VAT) by the Ivorian State. In addition, the payment of wages on the job site will require the withholding of income tax and other tax.

For the construction phase of the installations, certain materials and equipment will be imported. Customs duties and import taxes will therefore be sources of foreign exchange for the Ivorian financial management.

3.2.2. Operational phase

3.2.2.1. Increased income generating activities

The popular, small catering businesses, generally held by women, will develop (increase in income) in response to the presence of staff unloading boats at the village of NDJEM in the dock construction phase.

3.2.2.2. Sanitation lagoon Plans

The presence of the unloading quay will contribute to the sanitation of the lagoon plan in the village concerned (NDJEM). Human presence on the site will dissuade villagers from continuing to pollute the lagoon. To date, it has been observed that the edges of lagoon plans are generally used as dumping grounds by the local population (garbage dump, WC, urinals, etc.).

In addition, maintenance around the quay will contribute to the sanitation of water bodies.

3.3. Negative impacts of the project

3.3.1. Development and construction phase

3.3.1.1. Impact on air quality

The installation and operation of the site, including the presence of workers, equipment and materials will lead to gaseous emissions including oxides of carbon (COx), nitrogen (NOx) and sulfur (SOx) and aerosols. However, these incidences will be localized taking into account the number of machines that will be involved and the duration of the work.

3.3.1.2. Physical and chemical pollution of water and soil

During the work, hazardous products such as hydrocarbons, lubricants and waste oils can be accidentally or deliberately spilled into water. On the other hand, certain construction materials will also be used, on the site, in particular concrete, greases and motor oils, formwork products, any paints for various uses during construction work.

Due to the presence of ships, there is a risk of discharges or spills of polluting substances liable to degrade the quality of the water, such as: (i) washing of containers containing organic debris, detergents, plastics, wood and other solid waste; and (ii) accidental oil spills (diesel, oils, lubricants).

3.3.1.3. Waste generation

Throughout the construction period, many by-products and waste will be generated. The largest volume of waste will be that of green waste (grass, etc.). We can also note other wastes in smaller quantities consisting of packaging (packaging bags), metal scrap, formwork, empty containers, etc.

3.3.1.4. Disturbance of the aquatic ecosystem

Quay construction activities could disrupt the aquatic ecosystem of the project area.

3.3.1.5. Socioeconomic

3.3.1.5.1. Road safety

Road traffic will be disrupted by the movement of vehicles carrying construction materials and concrete. Such densification heavy vehicle traffic could cause accidents.

3.3.1.5.2. Disruption of fishing activities

Quay construction activities could disturb fishermen in the project area. In fact, the work will make the fish flee and modify the fishing place. This will have an impact on fishing.

3.3.1.6. Work accidents

On site, there is the risk that injury could occur. These relate to both mechanical and manual tasks. They could come from the movement of mobile machinery (collision) or the load being handled (fall, reversal). Falls of people or objects could be caused during work at height. The site staff will also be exposed to the risk of drowning.

3.3.1.7. Risks to worker health

During the planning and construction phase, the project staff will be exposed to different kinds of health impacts from work, including sensory disturbances manifested by the sound of machinery.

3.3.1.8. Water Reduction in the Lagoon

The use of 10 m by 80 m lagoon for quay construction will reduce the current scope occupied by the lagoon Ebrié slighty.

3.3.2. Operation phase

3.3.2.1. Generation of solid waste

Waste will be generated from project activities, maintenance and upkeep of equipment. They mainly consist of used rags, packaging, electrical equipment, etc. In general, all the solid waste produced is likely to pollute the receiving environment by increasing the volume of waste to be eliminated.

3.3.2.2. Water pollution

During the quay's operating phase, due to the presence of ships, there is a risk of discharges or spills of polluting substances liable to degrade the quality of coastal waters, such as: (i) washing of containers containing organic debris, detergents, plastics, wood and other solid waste; and (ii) accidental oil spills (diesel, oils, lubricants).

3.3.2.3. Increased lagoon traffic

The transport of equipment by lagoon will not cause an increase in lagoon traffic (One transport barge, 4 trips planned over 6 months.)

3.3.2.1. Disruption of fishing activities

The transport of equipment by lagoon will have a negative impact on fishing. The transport barge using the channel dedicated to navigation and still used by fishermen (Installation of wooden stake serving as support for the net.) These devices must be dismantled to let the barge pass.

3.3.2.2. technological risks

During operation, the main major risk is the risk of the quay collapsing if the foundations are destabilized.

3.3.2.3. Work accidents

Accidents likely to occur are falls on the same level, falling objects, injuries, collisions, drowning, etc.

3.4. Evaluations of impacts

This step is to describe the significance of adverse impacts by following the method developed in Chapter 4.1 of the Methodology.

The importance of each of the impacts identified in the previous chapter is established by crossing the severity and likelihood of occurrence. Gravity is defined taking into account the intensity, scope and duration of the impact.

Table 3-2: assessing the significance of impacts Summary (phase of development and construction)

RELEVANT ZONE	ACTIVITY CAUSING IMPACT	ENVIRONMENTAL COMPONENT AFFECTED			NATURE OF EFFECT	CORRESPONDING IMPACT	TYPE OF EFFECT	ASSESSING THE SIGNIFICANCE OF IMPACTS			
		PHYSICAL	BIOLOGICAL	HUMAN			(positive negative)	Intensity ()	Scope	duration	SIGNIFICANCE the impact
Construction Site of the quay	fuel supply by technical boat + Transportation logistics lagoon boat	Water (lagoon)			accidental fuel spill, lubricating oils, and other products	Pollution of the lagoon	Negative	Low	Local	short	minor
Construction Site of the quay	Work dock construction				of lagoon water reduction	Traffic disruption lagoon	Negative	Low	Local	Long	minor
Project Area	Traffic construction equipment	Air			Emission of NO_x and VOC (motor gear)	Air pollution	Negative	Low	Local	short	minor
Construction Site of the quay	Work dock construction				dust emission	Air pollution	Negative	Low	Local	short	minor
Construction Site of the quay	Work dock construction		Water flora		Disruption of local aquatic flora	Damage to aquatic biodiversity	Negative	Low	Local	short	minor
			aquatic fauna		Disruption of local fauna	Damage to aquatic biodiversity	Negative	Low	Local	short	minor

RELEVANT ZONE	ACTIVITY CAUSING IMPACT	ENVIRONMENTAL COMPONENT AFFECTED			NATURE OF EFFECT	CORRESPONDING IMPACT	TYPE OF EFFECT	ASSESSING THE SIGNIFICANCE OF IMPACTS			
		PHYSICAL	BIOLOGICAL	HUMAN			(positive negative)	Intensity ()	SCOPE	DURATION	SIGNIFICANCE of IMPACT
Construction Site of the quay	Movement of machines + Construction + dock equipment installation work			Personal Work ac	ident	Violation of safety	Negative	Strong	Local	Average	Average
				Neighborhood vis	al impact due to the work of Change	landscape	Negative	Average	Local	Average	minor
				staff construction site + neighborhood	Waste production	Deteriorating living environment	Negative	Low	Local	short	minor
					Noise emission	Noise pollution (affecting the faculties hearing if> 80dBA)	Negative	Average	Local	Average	minor
					Vibration emission	vibration pollution	Negative	Low	Local	short	minor
				Socioeconomi	Traffic disruption lagoon	boat collision	Negative	Average	Local	Average	minor
Construction Site of the quay	Transportation equipment and concrete blocks				Disruption of traffic	Disruption of socio-economic activities	Negative	Average	zonal	short	minor
Construction Site of the quay	Work dock construction				Disruption of fishing activities	Disruption of socio-economic activities	Negative	Average	zonal	short	minor
Construction Site of the quay	Movement of machines + + Recruitment of staff Dock Construction + Presence of workers			Socioeconomi	Creation of temporary jobs and business opportunity	Improving economic conditions	Positive	Strong	regional Average		major
					Increased tax revenues	Improving economic conditions	Positive	Average	Local	short	minor

Source: Office ENVAL, June 2019

Table 3-3: Summary Assessment of the significance of impacts (operational phase)

RELEVANT ZONE	ACTIVITY CAUSING IMPACT	ENVIRONMENTAL COMPONENT AFFECTED			NATURE OF EFFECT	CORRESPONDING IMPACT	TYPE OF EFFECT (positive negative)	ASSESSING THE SIGNIFICANCE OF IMPACTS			
		PHYSICAL	BIOLOGICAL	HUMAN				Intensity	SCOPE	DURATION	SIGNICANCE OF IMPACT
Quay	Unloading ship + Truck loading + Maintenance	Water (lagoon)			accidental fuel spills, oil and grease pollution	of the lagoon	Negative	Low	Local	Long	minor
	+ Operating activities				Wastewater production	Pollution of the lagoon	Negative	Low	Local	Long	minor
	Boat traffic	Air			Emission of NO_x and VOC (motor gear)	Air pollution	Negative	Low	Local	Long	minor
Quay	Operating activities			Waste production	staff	Deteriorating living environment	Negative	Low	Local	Long	minor
Lagoon	Circulation of the barge in the dedicated channel.			Neighborhood Dis	uption activities peaches	Deterioration of economic conditions	Negative	Strong	Local	Long	Average
Quay	Berthing / un-berthing of vessels			Personal Work ac	ident	Violation of safety	Negative	Low	Local	Long	minor
	+ Unloading ships + Maintenance of equipment and facilities			Staff + neighborhood	Risk of collapse	Violation of safety	Negative	Low	Local	Long	minor
					Noise emission	Noise pollution (affecting the auditory faculties if> 80dBA)	Negative	Low	Local	Long	minor

AREA CONCERNED	ACTIVITY / IMPACT SOURCE	ENVIRONMENTAL COMPONENT AFFECTED			NATURE OF EFFECT	IMPACT CORRESPONDENT	TYPE OF EFFECT	ASSESSING THE IMPORTANCE OF IMPACTS			
		PHYSICAL	BIOLOGICAL	HUMAN			(positive negative)	Intensity	Scope	duration	importance the impact
Project Area	Berthing / un-berthing of vessels + Unloading ships + Maintenance of equipment and facilities			Socioeconomic	Increased income generating activities	Improved socioeconomic conditions	Positive	Average	zonal	Long	Average
					Remediation Plan lagoon	Improved socioeconomic conditions	Negative	Low	Local	Long	minor
					Increased tax revenues	Improving economic conditions	Positive	Average	regional	Long	major

Source: Office ENVAL, April 2019

SECTION 4.
environmental protection measures

This chapter presents the environmental protection measures in relation to this project.

4.1. Development of methodology for protective measures

The application of mitigation measures aims to eliminate, minimize, compensate and / or prevent negative impacts and enhance the positive impact of project activities on the social and biophysical environment. In certain cases where the situation cannot be corrected or improved, certain actions of the project will make it possible to improve the environmental conditions in a given environment. We will then speak of recovery measures, and these measures will not necessarily be applied in the disturbed area. The classification of the measures is as follows:

- Mitigation measures: Mitigation measures are used to eliminate the source of impact or reduce its intensity, so that the impact is acceptable on a social and environmental level. These measures will be applied in the immediate area of the disturbed areas or in the sectors which will be directly affected by the changes induced by the project;
- Improvement measures: these measures are taken to improve existing social or environmental conditions which are not directly affected by the project.

The proposed measures were defined following the determination of the potential impacts of the project. They were developed taking into account the general objectives retained for the development of measures relating to the potential impact on an element of the social and environmental environment, namely:

- Respect the laws, directives, standards and regulations of the Ivorian state;
- Meeting the principles of sustainable development;
- Mitigate negative impacts and enhance the positive aspects.

4.2. Mitigation of impacts of development and construction stage

4.2.1. Measures in case of accidental oil spills

CIPREL must prepare an emergency plan in the event of an accidental spill of contaminants and submit it to the Project Manager before the start of work. The measures to combat and control spills of contaminating products on the site must be clearly identified and workers must be aware of them and able to implement them in the event of an accident.

CIPREL must put on site: (i) spill control equipment (absorbents such as peat, shovels, pumps, machinery, containers, gloves, insulation, etc.); (ii) communication equipment (radio transmitter, telephone, etc.); (iii) security equipment (signage, etc.).

4.2.2. Material transport and storage measures

During the execution of the works, CIPREL must (i) limit the speed of the vehicles on the site by installing traffic signs and flag bearers; (ii) regularly water the traffic lanes in populated areas (if it is a dirt road); (iii) provide for diversions by existing tracks and roads as far as possible.

In residential areas, CIPREL must establish the schedule and route for heavy vehicles which must circulate outside construction sites so as to reduce nuisances (noise, dust and traffic congestion) and bring it to the approval of the Project Manager.

To ensure order in traffic and road safety, sand, cement and other fine materials must be kept tightly closed during transport to prevent dust from flying away and spillage during transport. Materials containing fine particles must be covered with a securely attached tarpaulin. CIPREL must take special protection (nets, tarpaulins) against the risk of projections, fumes and falling objects.

4.2.3. Solid waste management

CIPREL must deposit housekeeping waste in sealed bins and that must be emptied periodically. In the event of evacuation by the site's trucks, the skips must be covered so as not to allow any waste to escape. For hygienic reasons, and in order not to attract vectors, daily collection is recommended, especially during periods of heat. CIPREL must dispose of or recycle waste in an environmentally sound manner.

CIPREL should transport the waste, if possible, to the existing disposal sites.

4.2.4. Protection against noise pollution

CIPREL is required to comply with the regulations in this area, in particular by limiting site noise which may seriously annoy local residents, either by an excessively long duration, or by their extension outside normal working hours.

4.2.5. Prevention against work-related illnesses

CIPREL must plan the following preventive measures against the risk of disease: (i) introduce the wearing of masks, uniforms and other suitable shoes; (ii) systematically install and provide the site personnel with the basic medicines required for emergency care free of charge. And first aid means on the quay and have a map of the health centers closest to the quay.

4.2.6. Hygiene, Health, and Safety Plan

For safety and hygiene on the site, it is necessary to already plan at this phase of the works a Health and Safety and Health Plan (PHSS) whose purpose is to plan the measures to be put in place in order to control the risks and situations arising from site activities. The PHSS is also the basic support that will allow site supervisors to educate other workers on the anticipated risks. It will be one of the means to meet the regulations concerning the health and safety of workers.
The works personnel must be equipped with Personal Protective Equipment (PPE). Means of fighting accidents, including first aid kits, fire extinguishers, etc. must also be available on site.

4.2.7. Waste Management Plan

All the waste likely to be generated during the work (green waste, household waste, wood waste) must be listed and categorized. A waste management plan must be drawn up and implemented during the works phase. This plan will include, among other things, the types of waste produced, the method of collection, the method of disposal and the actors involved.

4.2.8. Measures for the preservation of air quality and environmental noise

During the planning phase, two types of emissions will impact air quality: dust particles emissions and gaseous emissions (NOX and VOC). The measures to be implemented are:

- carry out the technical inspection of the equipment before its use;
- carry out a periodic review of vehicles and vehicles before and during the work;

- make adequate PPE available to staff (mufflers);
- make semi-annual air quality checks;
- set up a gas leak detection system
- water the site periodically;
- designate a QHSE manager.

In order to maintain a healthy sound environment, the following measures should be implemented:

- avoid the simultaneous starting of all vehicles at the same time;
- shut down the engines as soon as possible to reduce idling time;
- generalize the wearing of personal protection (earplugs), especially for workers working in a fixed position (noisy area);
- make workers aware of irreversible noise damage to their hearing in collaboration with occupational medicine;
- opt for less noisy and less vibrating machines below the WHO regulatory thresholds.

The working hours will be planned to take into account the period (time of day and day of the week) of the sensitivity of the environment to noise.

4.2.9. Measures for the protection of surface water and groundwater

During all phases of the project, groundwater will be exposed to pollution risks related to the spillage of used oils and fuels. The following measures should be implemented:

- contain any spills;
- treat spills by structures approved by CIAPOL;
- fix accidental spills of products or hydrocarbons by pumping;
- strictly limit excavation, stripping and excavation work to the perimeter as necessary ;
- carry out the technical inspection of the equipment before the start of work;
- store used oils, products and hydrocarbons in a retaining capacity

In addition to the sites, it will be wise to capture, channel and direct the waters that flow precipitation, throughfall to avoid pollutants and contamination and surrounding waterways.

4.2.10. Mitigation of risks of fire and explosion

The installed equipment run on electricity. On the website the use and storage of hydrocarbons are implemented. The risk of fire and explosion are existing. The following provisions are to be followed to avoid any emergency:

- Prohibit the fire in the assembly workshop;
- Install pictograms and signals;
- Install means to fight against fire:
- Train staff in the use of means of struggle against fire;
- Form a team of intervention in case of fire and make annual recycling;
- Develop evacuation plans by area and install;
- Implement a simplified emergency plan;
- Establish an alert procedure;
- Identify two meeting points in case of emergency;
- Conduct periodic emergency and emergency evacuation plan tests;
- Perform maintenance and interim verification of control equipment against fire.

4.2.11. Measures to prevent illness and accidents at work

To fight against accidents at work, it will be necessary to put in place the prevention, forecast and intervention measures:

- Assess the overall risks of the site;
- Establish a professional risk prevention plan;
- Train staff in firefighting and first aid rescue work;
- Continually educate staff on the risks associated with work areas;
- Practice visual communication: display of types of risks and safety instructions by area;
- Install changing rooms and showers by genre;
- Provide staff with specific work clothes for each work station and make wearing compulsory;
- Provide staff with non-slip shoes and make wearing compulsory;
- Make personal protective equipment (PPE) available to staff adapted to each work station on the basis of the risk assessment and make wearing compulsory;
- Have a first aid kit (medicine box);
- Carry out medical examinations on hiring and periodically according to the types of risks identified by occupational medicine;
- Declare all the national staff to the CNPS;
- Establish health insurance for all staff;
- Establish an agreement with local medical structures for the rapid management of emergency cases.

Conclusions

This additional study provides guidance to CIPREL regarding the implementation of the quay, with regard to the significant environmental aspects identified and analyzed.
It made it possible to highlight the environmental and social impacts that the said project could generate. However, their assessment highlights that the negative impacts are mainly of minor significance. The risks corresponding to these negative impacts remain significant, but mitigate with the implementation of MMRs and EIPS planned and recommended. Compensation measures have therefore been proposed in the event of an accident leading to a fuel spill, collisions.
Taking into account mitigation and compensation measures for negative impacts allows the promoter to ensure that the consequences, both beneficial and harmful, that his project will have on the environment will be duly integrated into the design of said project to lead to management.