

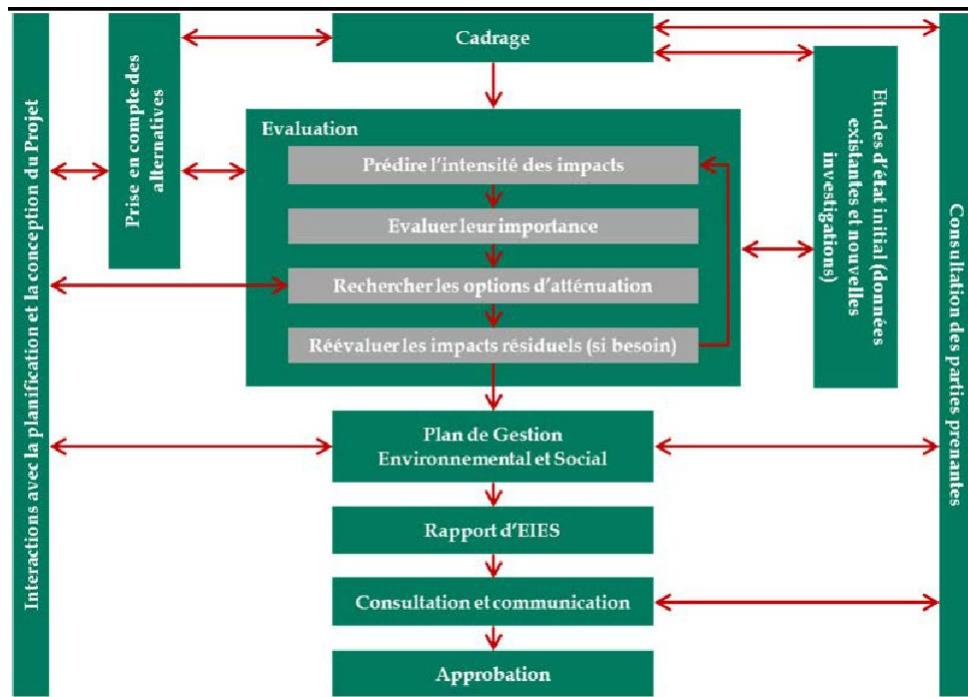
## 5.1 GENERAL METHODOLOGY FRAMEWORK

### 5.1.1 Preamble

The objective of the Environmental Impact Assessment and Social Assessment (ESIA) is to identify and assess the severity of potential impacts on receptors and identified resources; develop and describe mitigation measures that will be taken to prevent or minimize any potential negative effects and maximize the potential benefits; and communicate the severity of residual impacts that will remain once the applied mitigation. The general approach to evaluation of impact (EI) is shown in Figure 5.1.

This methodology is consistent with the recommendations of Decree No. 96-894 (1996) laying down the rules and procedures applicable to studies on the environmental impact of the Ivory Coast development projects.

**Figure 5.1 General Approach**



scoping phases and impact identification to determine environmental standards and social (E & S) applicable to the project and potential impacts associated with project may cause severe effects.

The impact assessment phase consists of an analysis of potential sources of impact associated with the project, and the sensitivity of the receptors natural and human environments. It is based on data derived from:

- studies of the environment and the social context in the initial state (to determine the sensitivity of the receiving environment); and
- interactions with the project team to develop the project description, analyze how the project can generate sources of environmental and social impacts (E & S), and (if applicable) identify possible alternatives to the project .

Once analyzed the impacts and mitigation measures identified, they are compiled into a management plan that will be used as a framework for the management of E & S impacts throughout the project.

Note that stakeholder engagement is an important element of the ESIA process, the scoping phase for the establishment and implementation of management plans. It allows:

- to inform stakeholders about the project;
- collect appropriate information on the environment to the initial state;
- understand the concerns and expectations of different stakeholders related to the project, so that these are taken into account in the ESIA and addressed in the impact assessment and definition of mitigation phase; and
- participate in project acceptance by the public demonstrating an appropriate level taking into account the contributions of stakeholders in the project planning to manage the environmental and social aspects.

### 5.1.2 *Predicting the intensity of impacts*

The term "intensity" covers all dimensions of the predicted impact on the natural and social environments, namely:

- the nature of the change (which resource or which receiver is allocated and how);
- the spatial extent of the affected area or the part of the population or affected community;
- its temporal extent (duration, frequency, reversibility); and

- if so, the probability of an impact following accidental or unexpected phenomenon.

Table 5.1 presents the definitions associated with the characterization of impacts used in this study.

**Table 5.1 Terminology for impact characteristics**

Intensity	Impacts
Type	<p><b>Direct</b> - resulting from direct interaction between the project and resource / receiver.</p> <p><b>Indirect</b> - résultant direct interaction between the project and its environment, due to interactions occurring thereafter.</p> <p><b>armature</b> - impacts from other follow-up activities to the project.</p>
scope	<p><b>Local</b> - limited impact in the project area and its surroundings.</p> <p><b>regional</b> - impacts felt beyond the local areas, even in the extended region.</p> <p><b>Internationale</b> - impacts felt at the international level, thus affecting another country.</p>
duration	<p><b>Temporary</b>- Short-term impacts, on the order of hours to weeks.</p> <p><b>Short term</b> - impacts predicted to last only during drilling and construction operations (up to about 2 years).</p> <p><b>Medium term</b> - impacts predicted to last between two years and the end of the project (20 years).</p> <p><b>Long-term</b> - anticipated impacts of a longer duration than the project but which will cease in time.</p> <p><b>Permanent</b> - impacts causing a permanent change on the receiver or the affected resource (s) and extending well beyond the lifetime of the project.</p>
Frequency	<b>keep on going</b> - impacts occurring frequently or continuously.
Probability*	<p><b>intermittent</b>- occasional impacts or appearing only in specific circumstances.</p> <p><b>Unlikely</b>- but unlikely event that may take place during the project.</p> <p><b>Possible</b> - event likely to occur at some point during the project.</p> <p><b>Likely</b>- the phenomenon will occur during the project (eg it is inevitable).</p>

\* For unforeseen events only.

The intensity evaluates the predicted change of the resource or the receiver. An evaluation of the overall intensity of an impact therefore takes into account all the dimensions of the impact to determine whether it is of negligible intensity, low, medium or high. Given the wide range of environmental and social impacts addressed in the ESIA, the terms characterizing the intensity of an impact should be defined according to the different issues addressed.

#### **5.1.3      *Sensitivity / Vulnerability / Importance of resources and receptors***

The severity of the impacts resulting from impact of a given intensity, depend on the characteristics of resources and receivers according to their sensitivity, vulnerability and importance.

The quality or importance of a resource will be determined taking into account for example, its national or international designation, its importance to the local community or broader, ecosystem services and their economic value. The evaluation of the sensitivity of human receptors, for example a fishing community or wider social group, will take into account their likely reactions to change and ability to adapt to and manage the effects of the impact.

The sensitivity, vulnerability and the importance of resources and receptors are evaluated on the basis of data relating to the environment to its original condition. If necessary, specific criteria of the sensitivity of evaluation are presented in the relevant sections of the impact assessment.

#### **5.1.4      *Assessing the severity of impacts***

All human activity imposes a change on natural and social environments because physical interactions with natural systems or other human activities. To provide information to policy makers and other stakeholders on the importance of different impacts of the project, the team in charge of the ESIA shall assess the severity of any change.

There is no statutory definition of the severity of an impact. Thus, as part of the ESIA, the evaluation of the severity of impacts is based on the team's professional judgments in charge of the ESIA using objective criteria when they are available, and legal norms, national government policies and regional recognized good industry practices and opinions of stakeholders. When no specific standard is available or that they do not provide enough information to determine the severity of impacts, the assessment will take into account the intensity of the impact and the quality, importance or the sensitivity of the resource or the affected receiver (e).

**intensity** impact and quality / importance / receiver sensitivity are evaluated together to determine if an impact is severe or not and

if so, its severity (defined as minor, moderate and major). Negligible impacts considered include those that are light and transient, and those in the range of environmental and natural social change. This principle is illustrated schematically in Table 5.2.

**Table 5.2 Impact severity matrix**

		Sensitivity / Vulnerability / Importance resource / receiver		
		Low	Average	Strong
Intensity of the impact	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	minor	moderate
	Average	minor	moderate	major
	Strong	moderate	major	major

The specific criteria used to assess the severity of each type of impact will be clearly defined as part of the impact assessment.

- An impact is negligible when a resource / receptor (including people) is assigned (e) in any way by a particular activity or when the intended effect is judged "Imperceptible" or indistinguishable from natural background.
- An impact is minor when a resource / receptor is affected (e), but the intensity of the impact is small enough to remain within the limits of applicable standards (ie regulations and guidelines applicable) or in the absence of standards when sensitivity / vulnerability / importance of the resource / receptor is low.
- An impact is moderate when its intensity remains within the standards, but is between a threshold below which the impact is minor and a level likely to be on the verge of a legal offense. For moderate impacts, it should reduce impacts to a level as low as reasonably practicable (ALARP for As Low As Reasonably Practicable English). This does not necessarily mean that so-called impact "moderates" must be reduced to minor impacts, but they are managed efficiently and effectively.
- A major impact is when the acceptable or allowable standards limits may be exceeded or high intensity impacts can allocate resources / receptors quality / importance / high sensitivity. One ESIA's goals is to get to a configuration where the project is not associated with any major residual impact, or any impact that would remain in the long term long term or a significant extent. However, in some aspects, there may be major residual impacts once exhausted all mitigation options (a level as low as reasonably achievable is then applied). It can be for example the visual impact of an installation. Regulators and stakeholders must then balance these negative factors with respect to the positive aspects such as employment,

### 5.1.5

#### *Reduction measures*

Impact assessment aims to ensure that project decisions take into account the likely impacts on the environment and society, but also to identify measures that could be taken to ensure that impacts are as low as possible from a technical and financial point of view.

For initially measured impacts in the ESIA as Majeure severity, changes in the draft is usually necessary to prevent, reduce or mitigate them, and their severity will then be re-evaluated. For impacts judged Moderate severity, depending on the needs, the proposed mitigation measures, those used and the reason for their selection (eg in terms of technical feasibility and cost / benefit) are exposed. The impacts judged Minor severity are usually controlled through industry best practices, plans and operating procedures.

The ESIA aims to contribute to making project decisions with full knowledge of their likely impacts on the environment and society. As explained below, the residual impacts and their severity,

reported in this report are based on the description of CIPREL 5 expansion project, ie taking into account all mitigation measures.

**Box 5.2**

**Hierarchy of mitigation measures**

**Prevention at source**

Develop the project so that the characteristics of the original impact are eliminated at the stage of the draft (elimination of waste streams for example).

**Source Reduction**

Edit the draft or operating procedures to reduce the impact. For example, measures used to treat effluent and waste fall into this category.

**Reduction at the receiver**

If an impact can not be reduced on-site measures can be applied off-site (eg noise barriers to reduce the impact of noise at a neighboring residential area or fencing facilities to prevent straying of animals on the site).

**Repair or correction**

Some impacts induce unavoidable damage to a resource (eg loss of agricultural land and forest areas in the construction of access roads, remote sites or site areas of storage). Repairs mainly involve such measures restoration and recovery.

**kind compensation**

When no additional mitigation is possible or is completely effective, compensation of losses can be adapted to a certain extent (eg planting to replace the damaged vegetation, financial compensation for damaged crops or put provision of community facilities to compensate for the loss of access to fishing areas, public spaces and recreational).

**5.1.6**

**Severity of residual impacts**

The degree of severity assigned to the residual impacts indicates the level of importance that should be associated with each impact within the project decision process.

**Box 5.3**

**Weight of the residual impacts in the decision process**

The residual impacts of Major severity, whether positive or negative, are considered as having a substantial weight, relative to other environmental costs and benefits, social and economic; conditions should be imposed to control and, where appropriate, monitor the negative impacts and provide benefits.

Moderate severity of the residual impacts are considered to have less importance in the decision process, but requiring special attention on mitigation and monitoring, to ensure that appropriate mitigation measures (from a technical and financial point of view) are implemented and benefits are obtained.

The residual impacts of Minor severity are brought to the attention of policy makers, but identified as having little or no weight in the decision process; they will be mitigated with best practices, and monitoring will be required to confirm that the impacts are as predicted.

### 5.2.1 *Framework and impact assessment*

The first stage of a preliminary identification of the impact assessment process consists of the potential impacts of the project on environmental and social receptors. This exercise is based on:

- project description and activities of each component described in Chapter 3; and
- the identification of the project's area of influence and different potential receptors.

Using a matrix for assessing the potential interaction between the various project activities and the environmental and social components. The framing of the potential impacts of the project is detailed in Chapter 4, Three.

Then, based on the potential impacts identified, Chapter 7 evaluates the severity of the project's impacts on environmental and social environment respectively. Depending on the subject, the assessment may be qualitative, quantitative or based on professional judgments.

Impact assessment is an iterative process to reduce the impact to an acceptable level or as low as reasonably possible. This iterative process involves re-evaluate the intensity of the impacts if changes are made to the characteristics of the project or mitigation.

The determination of mitigation was discussed and coordinated with ERANOVE and the entire project team, through iterations during the ESIA process. The objectives were:

- propose effective measures;
- propose mitigation measures technically and financially feasible by ERANOVE; and
- propose mitigation measures to limit the impact to a level as low as reasonably possible.

The impact assessment is structured as follows:

- a schematic evaluation for each potential impact has grown into a table showing:
  - the environmental aspect or social consideration (eg soil, air, biodiversity, population, etc.);

- the component of the specific project (eg land use of the plant, atmospheric emissions, transport, etc.);
  - the description of the impact;
  - the intensity of the impact and receiver sensitivity;
  - the severity of the impact;
  - the proposed mitigation measures; and
  - the severity of the residual impact after mitigation.
- Considered the most significant impacts are treated in more detail at the end of each table, by:
    - the severity of the impact; and
    - the complexity of the impact assessment (eg description of modeling).

Once all the identified mitigation measures, a final reassessment of impacts is conducted to determine the intensity and severity of residual impacts. When the severity of an impact is greater after application of all mitigation measures, compensation approach can be considered.

A sample chart impact assessment to be included in each section on different project components is presented in Table 5.3.

**Table 5.3      Example of impact assessment table**

Project Component CIPREL Phase V	Description of the impact	Intensity of the impact (I)	sensitivity receiver (S)	severity the impact	Mitigations	Severity residual
Air quality (QA)		Low	Average	minor		Negligible
		Strong	Low	moderate		minor
Noise and vibration (BR)		Low	Average	minor		Negligible

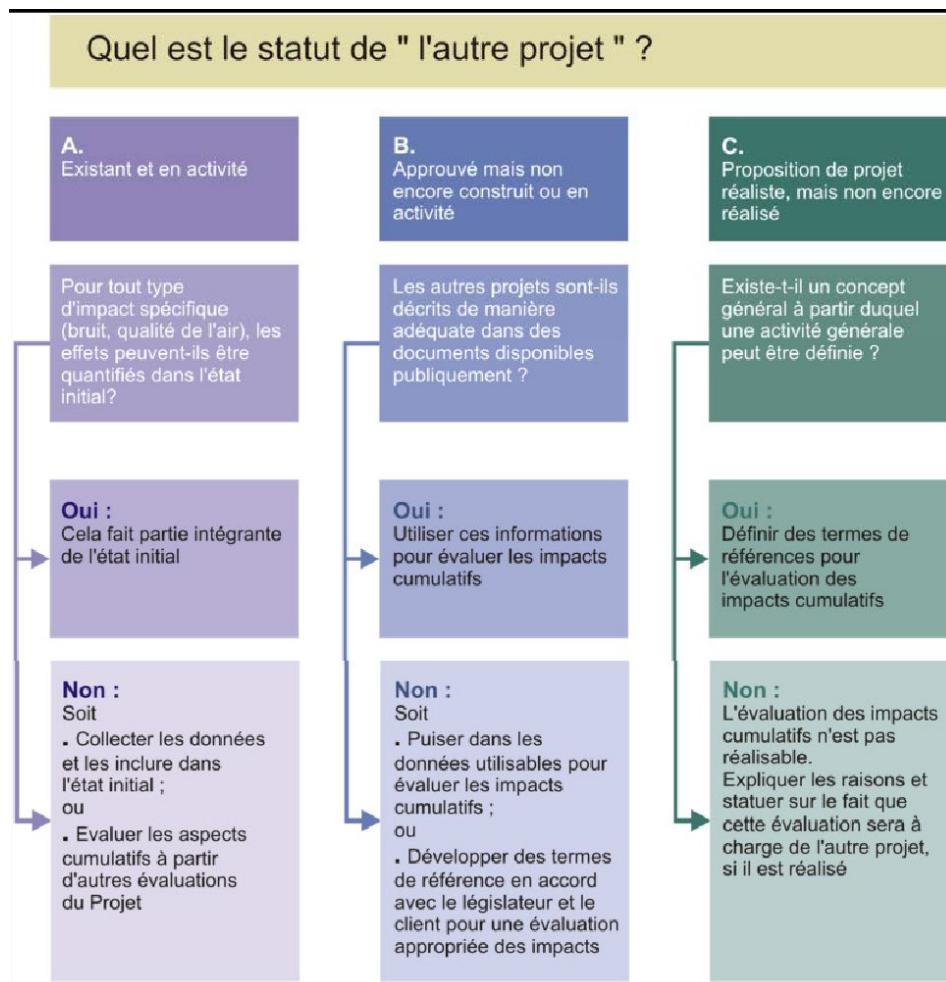
## 5.3.1

*Introduction*

The assessment of cumulative impacts takes into account the direct and indirect residual impacts of the project and studying at the same time that potential impacts from other projects / activities / natural phenomena may affect common resources and receptors (e)s. The objective of this analysis is to identify the total effects of many actions over time that would have been missed by individually evaluating each action.

Chapter assessment of cumulative impacts (Chapter 8) describes the results added or synergistic project with other projects, existing, confirmed or potential, of the study area. The assessment of cumulative impacts is strongly influenced by the status of projects (existing or approved / planned or proposed), and the amount of data available to characterize the intensity of their impacts. This process is illustrated in Figure 5.2.

**Figure 5.2** *Evaluation of cumulative impacts*



### **5.3.2**

#### *Process of evaluation of cumulative impacts*

The assessment of cumulative impacts should focus on the significant issues of impacts, rather than all possible relationships between impacts.

Under the CIPREL 5 project, the location area is a weakly built rural location. However, several development projects are planned in the area west of the center and the various routes proposed power line. The construction of a military base is planned west of the junction with the Azito online - Akoupé. The cumulative impacts of these developments are assessed in Chapter 8.

### **5.4**

#### **PLAN MANAGEMENT SOCIAL**

The expected environmental and social impacts of the project and the measures proposed to reduce to an acceptable level, are presented in Chapter 7.

Chapter 8 describes the Management Plan and Environmental and Social Monitoring and (PGESS) project. This is intended for use throughout the life cycle of the project, as the basis for sizing and implementation of mitigation measures to be implemented by ERANOVE in collaboration with external providers.

The PGESS should be regarded as a record of the mitigation measures proposed by ERANOVE in the ESIA to guide their application, as the project evolves. It aims to be a "living" document, to be updated periodically as part of a continuous improvement process, and adjusted to the changing context of the project, such as in case of change ahead -project, project extension or occurrence of unforeseen environmental conditions or other unexpected phenomenon.

Its objectives are:

- ensure project compliance with Ivorian law, international law and international standards, relevant policies ERANOVE and industry best practices;
- help ensure that mitigation measures and all commitments ERANOVE and identified in the ESIA report are taken into account during the planning and execution phases of the studies; and
- establish an environmental monitoring and surveillance program (e) so that the PGESS can be updated and improved as the project evolves.

Even with a final project description and an unchanged environmental context, the prediction of impacts and effects on resources and receptors may be uncertain. Predictions can be made using qualitative judgments (expert judgments), to quantitative techniques (eg numerical modeling of air emissions). The accuracy of predictions depends on the methods used and the quality of the input data on the project and the environment.

When uncertainty affects the assessment of impacts, a penalizing approach (worst case scenario reasonably possible) to assess the likely residual impacts is adopted and mitigation measures are developed accordingly. To verify predictions and treat areas of uncertainty, monitoring plans are offered.

In the context of this impact study, it is noted that the timing allocated to the ESIA was very small, between late October and late December 2018. The date of the ESIA constraints limited the ability to integrate certain parameters Project design (which evolved in parallel to the ESIA) and the time and resources available to achieve certain technical studies. The main limitations specific to this study are:

- Studies of natural environments and biodiversity corresponding to a level of preliminary analysis, with a limited level of inventory effort, where a description of the initial state of the environment deserve to be thorough, especially in regarding the presence (or absence) of certain sensitive species whose presence is deemed possible in the study area (of chimpanzee in West western chimpanzee, Ghana Phrynobatrachus particular frog).

The limited level of knowledge of any populations of susceptible species in the zone permits a definitive assessment of critical habitats as defined in the Performance Standard 6 IFC.

To complete the study, ERANOVE undertook to commission further studies in the area, especially to improve the state of knowledge on these sensitive species and critical habitats and deepen the analysis.

- Limited information on the characteristics of the aquifers at the site right, and the ability of ground water to meet the water requirements of the Project. insufficient level of information to finalize the evaluation of the impacts of the Project by groundwater pumping on the piezometric level of the aquifer, the risk of saltwater intrusion, and impacts on underground water resources in third.

To complement these studies, ERANOVE launched the construction of a drilling and well testing to the website of law. The information from these studies will be used to complete the analysis of the impacts on the resource and groundwater use by third parties. This study, including the depth and location of the drilling is done in connection with the ONEP (National Organization for Potable Water). ONEP has issued the permit and issue, in light of the study results, the license to exploit (s) necessary well (s) operation.

- Limited information on the uses of the lagoon for fishing pumping point and rejection of the Project cooling water lagoon. If ERANOVE modeling study that was carried out as part of the ESIA demonstrates no significant impact of the release on the water quality (temperature rise lagoon far below health guidelines, safety and environment World Bank), the presence or absence of fishing sites at the discharge point is not precisely known.

ERANOVE plans to complete this analysis in the context of the action plan for the resettlement and rehabilitation plan livelihoods, currently under development by the National Bureau of Technical Studies and Development (BNEDT) Ivory Coast in order to mainstream "fishing" for studying the impacts of the Project on local community resources and consider measures for clearing and restoring livelihoods, if any.