Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

Environmental Impact Assessment Guidelines

November 2011

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Prepared by: Environmental Management Support Programme (EMSP)

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List of Acronyms

ADB	Asian Development Bank
ALARP	As Low as Reasonably Practicable
AS	Australian Standard
AS/NZS	Australian Standard/New Zealand Standard
CA	Concession Agreement
CGM	Complaints and Grievances Mechanism
CIA	Cumulative Impact Assessment
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
ECC	Environmental Compliance Certificate
EIA	Environmental Impact Assessment
EMDP	Environmental Minorities Development Plan
EMMP	Environmental Management and Monitoring Plan
EMS	Environmental Management System
EMSP	Environmental Management Support Program
ESD	Environmental and Social Department
ESMMP	Environmental & Social Management and Monitoring Plan
ESMU	Environmental and Social Management Unit
EU	European Union
GIS	Geographic Information System
GOL	Government of Lao PDR
HIA	Health Impact Assessment
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IEE	Initial Environmental Examination
IFC	International Finance Corporation
ISO	International Standard Organization
L_{Aeq}	Equivalent Continuous Sound Level A-weighted
MOU	Memorandum of Understanding
NGO	Non Governmental Organization
NTFP	Non Timber Forest Product
PCDP	Public Consultation and Disclosure Plan
PM	Prime Minister
PMO	Prime Minister's Office
PWREOs	Provincial Water Resources and Environment Offices
OHSAS	Occupational Health and Safety Standard
RAP	Resettlement Action Plan
RU	Resettlement Unit
SDP	Social Development Plan
SI	Système International d'unités (International Standard System of Units)
SIA	Social Impact Assessment
SMMP	Social Management and Monitoring Plan
STDs	Sexually Transmitted Diseases
TOR	Terms of Reference
USEPA	United States Environmental Protection Agency
UXO	Unexploded ordnance
VEC	Valued Ecosystem Component
WB	World Bank
WHO	World Health Organisation
MONRE	Water Resources and Environmental Administration

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Preface

The EIA Guidelines have been developed by the Ministry of Natural Resources and Environment (MONRE) of Lao PDR in consultation with Line Ministries Agencies and Provincial Governments, Developers, EIA Consultants and with technical assistance from a team of experts from the international consulting company Grontmij and the Finnish Environment Institute (SYKE).

The aim of these guidelines is to help and guide developers and their consultants to conduct and report environmental impact assessment studies of projects in Lao PDR and ensure that these studies include adequate project descriptions, impact assessments and mitigation measures using sound, professional and scientific tools and methods. The guidelines pay special attention to providing guidance on preparing easily understandable EIA reports.

These guidelines have been prepared based on many years of practical experience in preparing and reviewing EIA in Lao PDR and Developing Countries as well as Industrial Countries. The EIA Guidelines are in line with the Lao PDR Decree of Environmental Impact Assessment (No 112/PM, 16 February 2010) for project of Category 2 (project having significant potential impacts) (Article 2), the recent guidelines prepared in relation to this Decree and other legislations and guidelines in Lao PDR. The EIA Guidelines will be useful for the EIA Consultant during the preparation of the EIA Report and they will facilitate the review and approval process by the Government Authorities.

The EIA Guidelines will be revised after a trial period of 2 years in order to integrate new development in EIA sector, modification of the environmental legislation and comments from the EIA practitioners and Governmental Authorities.

MONRE strongly emphasizes the importance for the Project Developers and EIA Consultants of following these EIA Guidelines for the preparation of EIA Report.

Definition

Adaptation – adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation.

Adverse impact – any adverse environmental, social, socio-economic, health, occupational safety and health effect suffered or borne by any entity or natural person, or suffered or borne by any natural resource including without limitation the environment, flora and fauna, and in any such case attributable in any degree or extent to, or arising in any manner from, any action or omission of the Project Developer, or from the Project or any activities related thereto

Applicable Laws – all laws, regulations, treaties and other international obligations of the Lao PDR applicable to the Project Developer's activities or to the Project which have been promulgated on or before the date of the preparation of the Scoping Report or the EIA Report (ESMMP)

Assessment – analysing and evaluating the potential impacts of proposed actions on the environment.

Baseline – existing baseline conditions are the current conditions of an area potentially affected by a proposed project. Existing baselines are established prior to pre-construction, construction and operation of proposed project in order to evaluate the effects of the environment.

Best Practices – means those practices which the Project Developer will commit to which, although not yet required by Applicable Laws, nonetheless are recognized by a consensus of relevant stakeholders (including without limitation government, industry, labour, financiers, and academia) as being practices which have been adopted by leading, reputable companies of international standard and which, when carried out by the Project Developer, can be expected further to reduce the adverse Impacts arising from the Project and activities related thereto.

Biodiversity – refers to the variety of life on earth: the number of plants and animals and other organisms that exist on our planet and the variety within these species and the ecosystems they inhabit.

Biophysical – that part of the environment that does not originate with human activities (e.g. biological, physical and chemical processes); pertaining to the natural environment.

Climate change – a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods

Compensation measures – monetary payment or replacement in kind for losses resulting from a development project; the re-creation of lost or damaged habitat

Competent Authority: is any person or organization that has the legally delegated or invested authority, capacity, or power to perform a designated function.

Complicated project – refers to an investment project which has substantial impacts on the environment and society, including impacts beyond the border or accumulative impact on other investment projects, and in which complicated technology is applied.

Construction phase – refers to specific period, stipulated in a contract (beginning from the date stated in the notice to proceed) during which the contractor must complete construction, subject to the conditions of the contract.

Cumulative impact assessment – is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions person undertake such other actions"

Direct impact – (primary impact) (first order impact) is an impact which follows as a direct cause effect consequence of a project activity.

Ecosystem – is a community of interdependent plants, animals and other living organisms (including humans) together with the environment which supports them and with which they interact.

Effects/impacts (synonymous) – are a reaction to a change in the environment as a result of a project action. Effects can be ecological (such as the effects on components of natural resources, the structure and/or functioning of affected ecosystems), aesthetic, historic, cultural, economic, and social, whether direct, indirect or cumulative.

Emission Limit Values: Legally enforceable limit on the physical, chemical or biological characteristics of a point source of emission to water or air, normally expressed as a maximum permissible concentration of a specified substance.

Environment – is the complex web of inter-relationships between living and non-living components which sustain all life on earth, including the social/health aspects of human group existence. The physical, biological, social, spiritual and cultural components which are interrelated and affect the growth and development of living organisms

Environmental compliance certificate – means a legal document which approves a report on initial environmental examination or a report on environmental impact assessment, an environmental and social management and monitoring plan (ESMMP).

Environmental and social management and monitoring plan (ESMMP) – means a plan formulated in a report on environmental impact assessment which defines main environmental and social activities, measures on prevention, minimisation and mitigation of environmental and social impacts, as well as organisational structures and responsibilities, schedule and sufficient budget for implementation of the environmental and social management and monitoring activities, during a project's construction, operation and termination period.

Environmental impact assessment (EIA) – means studying, surveying, researching-analysing and estimating of possible positive and negative impacts on the environment and society, including short and long term impacts on health created by the investment projects classified in Category 2, Article 2 of the Lao PDR Decree of Environmental Impact Assessment (No 112/PM, 16 February 2010), as well as offering appropriate

alternatives, environmental management and monitoring plan (EMMP), and social management and monitoring plan (SMMP) to prevent and mitigate possible impacts which are likely to happen during construction and operation of the investment projects.

Green-house Gases – are defined to be carbon dioxide (CO_2), carbon monoxide (CO), nitrous oxide (N_2O), oxides of nitrogen (NOx), methane (CH_4), and non-methane volatile organic compounds (NMVOCs). The Kyoto Protocol also addresses hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6)

Indirect Impact – (secondary impact) (higher order impact) is an environmental effect that is at least one step removed from a project activity in terms of cause-effect linkages. those caused by an action that are later in time or farther removed in distance, but that are still reasonably foreseeable (e.g. development in undisturbed areas as a result of access road building.)

Initial environmental examination (IEE) – means studying, surveying, researching and analysing data to estimate initial environmental and social impacts, including impacts on health which may arise from investment projects in Category 1, as provided in Article 2 of the Lao PDR Decree of Environmental Impact Assessment (No 112/PM, 16 February 2010), as well as identify measures to prevent and mitigate possible environmental and social impacts.

Involvement – means process of consultation, dissemination of information on an investment project to collect comments from those who are likely to be affected by or gain benefits from the investment project, as well as from those who are interested in the investment project, to be used as references in preparing and deliberating a report on initial environmental examination (IEE) or a report on environmental impact assessment (EIA), an environmental and social management and monitoring plan (ESMMP). Involvement can be in the form of participation in all level meetings of the stakeholders, as well as of those who are (likely to be) affected by the investment project, during the project construction and operation period.

Hazard – a source of potential harm, or a situation with a potential for causing harm, in terms of human injury; damage to health, property, the environment, and other things of value; or some combination of these.

National Ambient Environmental Standards – refers to the Agreement on the National Environmental Standards of Lao PDR (2010) or updated versions.

Mitigation – an activity aimed at reducing the severity, avoiding or controlling environmental or social impacts of a project, through design alternatives, scheduling or other means.

Project affected people – means a natural person, legal entity, or organisation who/which are directly or indirectly affected by the investment project (or are likely to be affected) due to legally requisition of lands or real estate, changes of land category, and impacts on the ecological and environmental system in the their settlement areas.

Project developer (or Developer) – means any person, legal entity or organisation, from the public or private sector, who/which is licensed to undertake study, survey, design, pre-construction, construction, operation and decommissioning/closure/post closure of an investment project.

Project screening – means study and analysis of data contained in an investment project to determine whether the proposed investment project requires initial environmental examination (IEE) or environmental impact assessment (EIA) or not.

Residual impact – those predicted adverse impacts which remain after mitigating measures have been applied.

Risk – means the likelihood that harm will actually be done by the realization of the hazard during the work being carried out or by the way something is used. Risk = Hazard x Exposure

Risk assessment – the scientific method of confronting and expressing uncertainty in predicting the future. (ADB, 1997)

Scoping – means the process to determine the scope of the environmental impact assessment (EIA) and the data needed to be collected and analysed, to assess the impacts of the investment project on the environment, in which, such study requires terms of reference (TOR) to prepare a report on environmental impact assessment.

Stakeholders – mean any person, legal entity or organisation who/which are interested in, involved in or have interests in an investment project, in an activity or a matter (related to the project) because they are involved in or (are likely to be) affected by the investment project.

Terms of reference – means description of all works needed to be done when carrying out environmental impact assessment (EIA), in accordance with the scope of the study for assessing environmental impact.

Valued ecosystem component (VEC) – any part of the environment that is considered important by the proponent, public, scientists or government involved in the assessment process. Importance may be determined on the basis of cultural values or scientific concern.

Vulnerability – the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is the function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.

1 Introduction

The introduction aims to define the main characteristics of an environmental impact assessment as well as the requirements from the Lao PDR Environmental Authorities that should be fulfilled in the EIA report.

1.1 Characteristics of an EIA

EIA is a legal requirement for all projects that may have a significant adverse impact on environment and/or society. EIA is therefore a regulatory tool to identify and minimize adverse environmental and social impacts and ensure proper management and mitigation measures are implemented.

The EIA aims to consider the environmental issues at all phases of a project implementation from the project concept to the operation including decommissioning, closure and post closure. The EIA helps the Project developer to prepare a project in considering its consequences on the environment without threatening its technical and economic feasibility.

The EIA takes into consideration all biological, physical, social, economic, health cultural and visual components of the environment that could be affected by a project. It gives the possibility to analyse and define the relations and interactions between the factors having an influence on the ecosystems, the resources and the quality of life of the population and communities.

The EIA has for objectives to identify the environmental components that will be impacted, as well as the risk and opportunities for the environment and the communities affected that may arise because of the project. The significance of the impacts will help to define the main factors to be considered for the decision regarding the project.

The EIA should consider the views, concerns and perceptions of the stakeholders, the communities and the individuals that could be affected by the project. In this regard, the EIA should integrate the results of public consultations and negotiations with affected population regarding the environmental and social issues. Public concerns should also be taken into account in the assessment of the impacts, design of mitigation measures and selection of monitoring parameters.

1.2 Lao PDR Environmental Requirements

The Lao PDR Decree of Environmental Impact Assessment (No 112/PM, 16 February 2010) describes the environmental impact assessment (EIA) as the 'mean of studying, surveying, researching-analysing and estimating of possible positive and negative impacts on the environment and society, including short and long term impacts on health created by the investment projects as well as offering appropriate alternatives, environmental management and monitoring plan (EMMP), and social management and monitoring plan (SMMP) to prevent and mitigate possible impacts which are likely to happen during construction and operation of the investment projects. Projects subject to EIA are classified in Category 2, Article 2 of the Decree (Appendix 1).

The EIA should be prepared according to a scientific method and should satisfy the requirements from the Government regarding the project analysis, the public consultation and the decision-making process. The EIA allows the understanding of the project implementation. More specifically, the EIA:

- Presents the characteristics of a project and its justification;
- Describes the environmental and social baseline data of the study areas as well as the changes that will occur during and after the project implementation;
- Demonstrates how the project will integrate in its environment with the presentation of the different project alternatives and the definition of the measures aiming to minimize the negative environmental, social and health impacts and to maximize the benefits to the communities;
- Proposes environmental, social and health management and monitoring plans to ensure that the requests from the government and the commitments of the Project developer are implemented

1.3 Objectives of the EIA Guidelines

The objectives of the EIA Guidelines are to provide a common framework for EIA reporting, to present project developers and their environmental consultants with clear guidance on structure, content and scope of EIA reports and to ensure that EIA reporting is consistent with legal requirements, good practices and professional standards.

Furthermore, by following these guidelines the quality of EIA reports will be improved, which will also facilitate a smooth and timely review by the concerned agencies.

1.4 Scope of the EIA Guidelines

The EIA Guidelines are applicable for all Category 2 projects as defined in the Decree on Environmental Impact Assessment (No 112/PM, 16 February 2010).

These EIA Guidelines address how EIA reports should be structured, what the reports should encompass, how data and information should be presented and the level of detail and comprehensiveness required or recommended in EIA reports. Thus, the EIA Guidelines are predominantly about reporting and less about how EIA studies shall or should be carried out

The EIA reports will cover all environmental, social, economic, health, cultural and visual issues that should be addressed to assess the impact of the project during the pre-construction, construction, operation and decommissioning/closure/post closure phases. Resettlement issues should be detailed in a separate report but summarized in the EIA report. EIA reports include the preparation of the Environmental and Social Management and Monitoring Plan.

The EIA Guidelines are divided in four main sections:

Section 1: EIA Process

Section 2: Scoping Report and TOR for EIA:

Section 3: EIA Report

Section 4: Environmental and Social Management and Monitoring Plan

2 EIA PROCESS

2.1 Introduction

The EIA Process in Lao PDR is determined by the Decree of Environmental Impact Assessment (No 112/PM, 16 February 2010). Investment projects are divided in two categories (initial environmental examination (IEE) or environmental impact assessment (EIA)) according to the scale of the project. The EIA Guidelines cover large scale investment projects which are complicated or create significant environmental and social impacts, for which environmental impact assessment is required. The list of projects subjects to EIA (Category 2) is presented in Appendix 1.

This section of the EIA Guidelines introduces the EIA Process in regard to the normal project planning cycle. Also, this section presents the duties and responsibilities of the Project Developer and Government Agencies for the preparation, review and approval of the EIA.

2.2 EIA Process and the Project Planning Cycle

The current project planning cycle includes generally the following phases:

- Pre-Feasibility;
- Feasibility;
- Design and Procurement;
- Pre-Construction;
- Construction or Survey-Exploration;
- Operation;
- Decommissioning/Closure/Post Closure

During each of these technical phases, environmental and social activities should be carried out in order to minimise the environmental and social impacts of a project. It is recognised that the integration of environmental and social aspects as early as possible in the project cycle will reduce significantly the project impacts and the cost for mitigation.

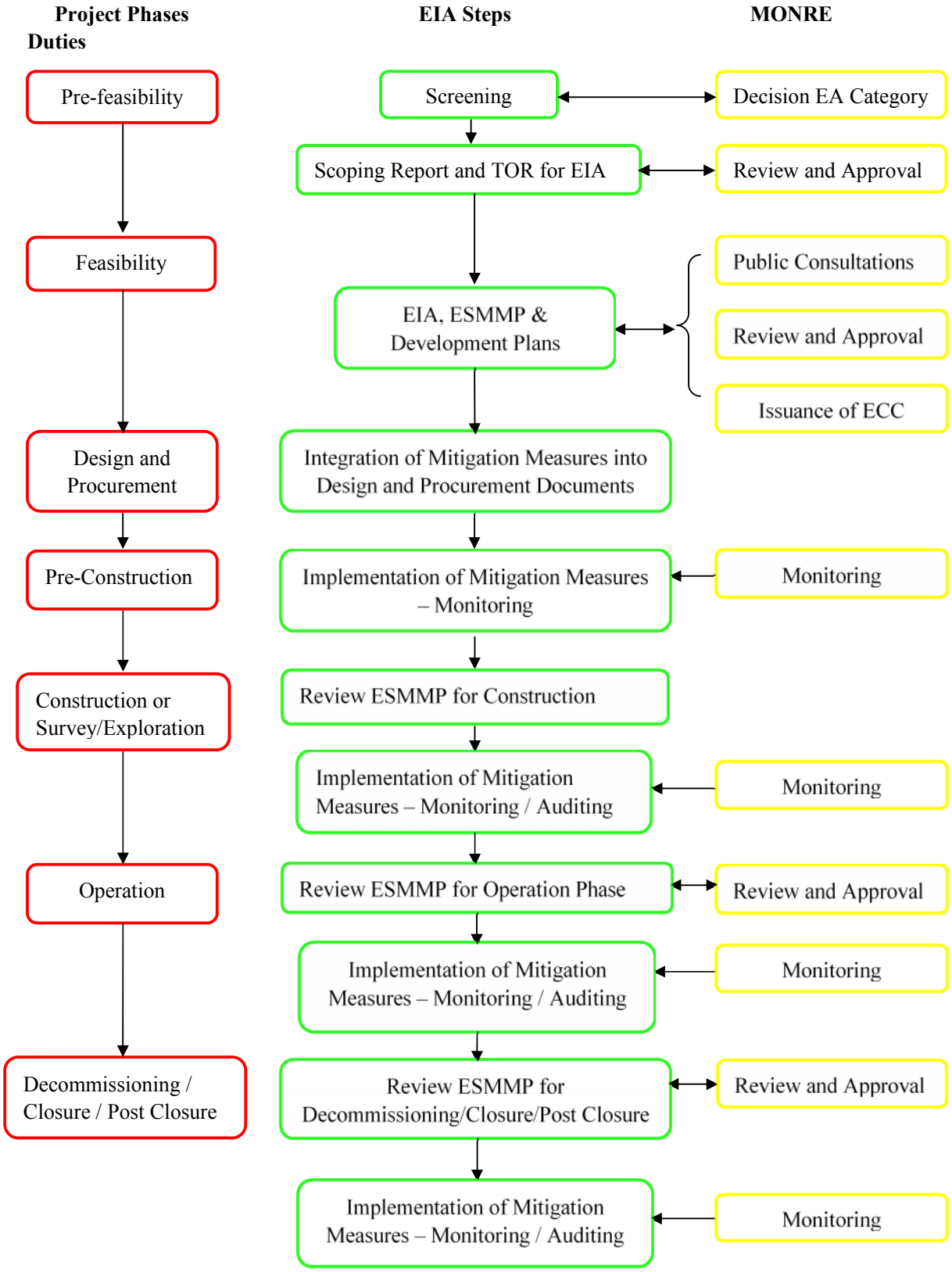
Figure 2.1 presents the project planning cycle in relation to the EIA Steps that need to be implemented by the Project Developer and duties of MONRE for reviewing, monitoring and approving the documents and activities carried out by the Project Developer.

The main responsibilities of the Project Developer are to:

- Send investment application form to MONRE to allow MONRE identifying the scale of the project;
- Prepare Scoping Report and TOR for EIA;
- Prepare EIA Report, Environmental and Social Management and Monitoring Plan (ESMMP) and Development Plans;

- Conduct Public Consultation meetings during the preparation of the EIA;
- Integrate the mitigation measures into the design and procurement documents;
- Improve frequently the ESMMP and implement the mitigation measures during the pre-construction, construction, operation and decommissioning/closure/post closure phases;
- Carry-out monitoring and auditing activities as stipulated in the ESMMP.

Figure 2.1: Project Planning Cycle and Environmental/Social Activities



2.3 EIA Process and the EIA Guidelines

The EIA Process requires the completion of the Screening and Scoping and TOR for EIA activities before the preparation of EIA Report and the issuance of Environmental Compliance Certificate.

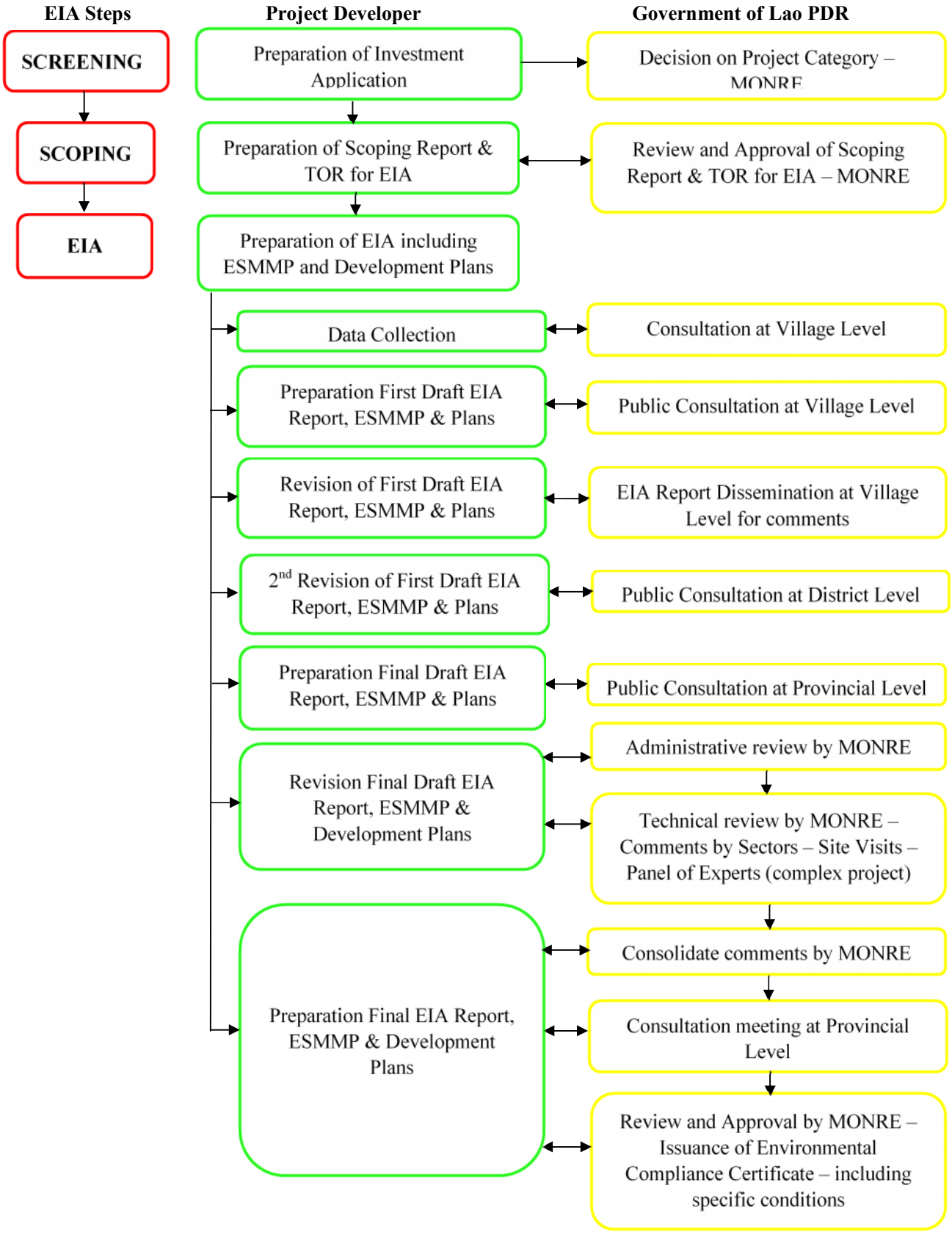
For the project screening, the Project Developer must submit an investment application to the MONRE (Decree 112/PM, Article 6). The Project Developer shall utilise the list of projects subject to EIA as well as consider the significance of the potential impacts of the project. MONRE should take a decision based on the information provided by the Project Developer whether the proposed project will have to undertake an IEE or an EIA.

During the project scoping, the Project Developer will prepare a Scoping Report and detailed terms of reference for the preparation of the EIA as requested in the Decree 112/PM (Article 11). The EIA Guidelines provides guidance in section 3 on how to prepare the Scoping Report and the TOR. MONRE will revise, comment and approve the Scoping Report and TOR before the Project Developer will start the preparation of the EIA.

The preparation of the EIA Report, ESMMP and Development Plans will necessitate the consultations of local authorities and affected peoples. The Public Involvement Guidelines describe this consultation process. Figure 2.2 indicates the most important steps to undertake during the preparation of the EIA, especially in regard to public consultation. MONRE will conduct an administrative and technical review of the EIA Report, ESMMP and Development Plans. The Project Developer will be required to revise the EIA Report, ESMMP and Development Plans in order to comply with the consolidated comments provided by MONRE.

Once MONRE is satisfied with the EIA Report, ESMMP and Development, the Environmental Compliance Certificate will be issued with specific conditions, if required.

Figure 2.2: Responsibilities during the preparation of EIA Report for project of Category 2



3 SCOPING & TERMS OF REFERENCE FOR EIA

3.1 Overview

Scoping is the first phase in carrying out EIA studies. The Project Developer is responsible for preparing the Scoping Report and Terms of Reference (TOR) for the preparation of the EIA Study. When completed, these documents shall be sent to MONRE for comments and approval (Decree on EIA, Article 11).

During scoping, the likely key environmental (including social, health...) impacts and risks of the project are preliminarily identified. In this way, the scoping phase establishes the framework of activities and impacts requiring further investigation during the EIA study.

One of the main reasons for scoping is to limit further EIA investigation to only those issues most important for decision-making and efficient, sustainable project execution.

Scoping is therefore a fundamental phase in the EIA process. It:

- Defines the study area, area of influence, time boundaries, project phases, potential stakeholders;
- Starts the process of understanding regulations and standards and their context for project design and completion of the EIA;
- Makes a provisional identification of impacts and thereby enables clear focus to be given on which environmental and social issues need to be addressed in subsequent EIA studies;
- Provides an indication of what baseline data and information are required and how to get it (although at this phase there is no need to collect it);
- Provides an opportunity for consultants, relevant authority, project developer, interested parties and affected parties to express their views and concerns regarding the proposal before an EIA proceeds;
- Facilitates an efficient assessment process that saves resources, time, cost and delays;
- Identifies communities potentially affected and other stakeholders with an interest in the project.

The Scoping Report shall include the following key sections (proposed table of content for the Scoping Report is presented at Appendix 2):

- Executive Summary
- Context of the Project
- Overview of the Policy, Legal and Institutional Framework
- Project Description and Alternatives
- Description of the Environment
- Key Environmental Impacts and Mitigation Measures
- Public Consultation and Disclosure
- Conclusions and Recommendations

3.2 Executive Summary

The Executive Summary shall summarize the significant findings and recommendations of the Scoping Report and the TOR for EIA preparation. The Executive Summary shall present all necessary information in order to provide a clear picture of the project, its environment, the key impacts and associated mitigation and management measures, the significant issues included in the TOR for the EIA Study. The Executive Summary shall be written in Lao and English.

3.3 Context of the Project

The Context of the Project provides the background to the EIA and the overall context of the project, including the key findings of previous technical, economic, environmental or social studies.

This section of the Scoping Report should be divided in the following sub-sections:

- Presentation of the Project
- Related Projects and Developments
- Presentation of the Project Developer and the EIA consultant

3.3.1 Presentation of the Project

The Developer shall present the status of the project (planning, pre-feasibility and feasibility phases), a brief description of the intended project, the main phases of the project (design, pre-construction, construction activities, operation, decommissioning/ closure/post closure), a brief history of the project, expected investment and revenues (taxes, royalties, etc.), the actual status of the existing infrastructure related to the project, the need for the project including a brief justification and the project objectives.

3.3.2 Related Project and Developments

Projects or developments related to the construction and/or operation of the proposed project should be presented. These projects or developments may be for example the operation on forest lands (as plantation, maintenance, harvesting, transportation) in case of pulp and paper factory project; the improvement of energy network in case of hydropower project; ...

3.3.3 Presentation of the Project Developer and the EIA consultant

The Project Developer shall introduce its company in term of experience and activities in Lao PDR and overseas, volume and capacity of production, experience in relation to environment and social integration into its activities and projects...

The Project Developer shall provide the following contact details:

- Name of the Company
- Main postal address, telephone, fax and e-mail details for the company.
- Name of the main contact person and direct postal address, telephone, fax and e-mail details.

The EIA Consultant shall present the team of experts participating in the preparation of the Scoping Report, including permanent and freelance staffs, and associated organisations.

3.4 Overview of the Policy, Legal and Institutional Framework

The current Lao PDR environmental and social policy, legal and institutional framework applicable to the project shall be briefly summarised. This section of the report shall also indicate and briefly summarise applicable international or regional conventions and treaties signed or ratified by Lao PDR. The project developer shall present its corporate environmental and social policies, if such policies exist. In case, the project is supported by funding from international financial agencies, their policies, guidelines and standards shall be identified and listed.

If applicable, the status of concession agreements or MOUs between the Project Developer and the Government of Lao PDR should be presented.

This section 'Overview of the Policy, Legal and Institutional framework` should include the following sub-sections:

- Corporate Environmental and Social Policies
- Lao PDR Policy and Legal Framework
- International Conventions and Treaties
- Lao PDR Government Institutional Framework
- International Policies, Guidelines and Standards (if applicable)

3.5 Project Description and Alternatives

The description of the project is a crucial part of the Scoping Report. Scoping is often done at a stage in project development where certain key decisions e.g. on choice of technology or location are still under consideration. Therefore, the Scoping study shall assess relevant and realistic alternatives to ensure that appropriate decisions are made.

The section 'Description of the Project and Alternatives` should include the following sub-sections:

- Project description (and if relevant project alternatives for each project phase);
  - Pre-Construction
  - Construction
  - Operation
  - Decommissioning/Closure/Post Closure
- Comparison and selection of project alternatives

3.5.1 Presentation of the Project and Description of Alternatives

The description of the project shall give enough details to allow the preliminary assessment of the project alternatives and their key impacts. In this description, uncertainties should be highlighted.

The structure and type of content in a project description will vary from project type to project type. However, in general the structure and content of the project description should follow the guidelines presented below:

Table 3.1 Generic structure and content of a Project Description

Brief Presentation	Guidance Notes
1. Sector and subsector	E.g. Energy production, Hydropower
2. Size	Size can be expressed in terms of area (or length if it is a road or other linear project), production,

	category/type, number of employees, project investment
3. Location	Overview map typically scale 1:200 000 for linear project and 1:20 000 for punctual project. The map should include main natural features, like water bodies, forest, etc. existing infrastructure (roads, bridges, etc.) and human settlements in the proximities of the project. In case of an urban development, sensitive areas (schools, markets, sites of monument or cultural importance, commercial areas, etc.) should be clearly indicated.
4. Project components	Main production facilities Internal infrastructure Ancillary infrastructure and facilities
5. Overall time schedule	Present a diagram with the planned timing of: - Studies (incl. the EIA study) - Permitting/licensing - Concession agreements - Detailed design, contracting - Pre-construction activities - Construction activities - Operations - Decommissioning/closure/post closure
6. Project Organization	Organization chart, management, roles and responsibilities, etc
Pre-construction and Construction Phases	
7. Activity schedules	Diagram with the main components and their respective main construction activities and related mitigation measures
8. Location of project components	Site map (1:50 000 for linear project and 1:10 000 for punctual project) with location of project components such as roads, camps, mine, processing plant, storage areas, tailing dam, reservoir, power house, transmission line, bridges, etc.
9. Project Characteristics	Description of each of the main characteristics of the project: - Materials (amounts, types, sources) - Equipment, machinery - Conceptual design drawings List the alternatives considered and assessed. Only

	consider realistic and reasonably feasible alternatives
10. Labour	Expected workforce, if possible short description of workforce per job type) Expected origin of workforce
Operational Phase	
11. Overview of operations	Brief description of project components including production processes and technologies, facilities and infrastructure. Visual presentation of the completed project (e.g. a freehand drawing, layout) Presentation of production data: - Input materials (amounts/year, types, qualities and characteristics, sources) - Water and energy consumption and sources - Outputs: Products (amounts, characteristics) by-products, waste and other emissions)
12. Operations schedule	Time diagram presenting the main components and the main operations/processes and their respective mitigation measures
13. Site layout maps	Site layout maps (1:5 000 or better scale) showing the location of the main operational components
14. Components	Description of each component: - Facilities, technology, processes with simplified flow diagram - Location and visual presentation - Conceptual design drawings - Flow diagram: Materials, water, energy, waste and other emissions - Materials handling, storage - Waste and wastewater management - Transport (means, timing, loads, routes)
15. Labour	Expected workforce (if possible workforce per job type) Expected origin of workforce
Decommissioning / Closure / Post Closure Phase	
16. Overview	Closure Plan Requirements (Strategy, Policy, Main Objectives, time schedule, budgets, etc)

As shown in Table above, the Project Description shall include a listing and short presentation of alternatives considered. The detailed analysis of the alternatives is best presented in a separate subsection.

The Scoping Report shall describe each alternative in reasonable detail to enable all major potential environmental, economic, social, health, cultural and visual impacts to be identified/predicted and evaluated.

In describing the reasonable alternatives, the use of maps, plans, drawings and figures to provide effective visual presentations of the alternatives is required.

3.5.2 Comparison and Selection of the Project Alternatives

Alternatives are essentially, different ways in which the project developer can feasibly meet the project's objectives, for example by carrying out a different type of action, choosing an alternative location or adopting a different technology or design for the project. At the more detailed level, alternatives merge into mitigating measures where specific changes are made to the project design or to methods of construction or operation to avoid, reduce or remedy environmental effects. Therefore, alternatives contemplated in this connection should only include significant, realistic and reasonably feasible alternatives to location, design or choice of technology. It also follows that such alternatives are seen from the perspective of the project developer.

The "No Project" alternative shall always be considered as the baseline against which the environmental impacts of the project should be considered.

The process of identifying alternatives and selecting the optimal alternative should include an assessment of:

- The capacity to satisfy the demand (i.e., objectives, problems and needs);
- The legal and technical feasibility (e.g., land tenure, zoning, topography, civil engineering works, and availability of human resources);
- The economic benefit of the project;
- The capacity to limit the significance of the negative impacts on the natural and human environment and to maximize the positive impacts (including local employment).

As much as possible, the comparison between proposed alternatives should be based on quantitative data.

One common method is to apply weights and ranks to the various impacts and then to aggregate the result by assigning numerical values to the expected impacts on each valued environmental and social component. Then, each alternative is compared based on a single overall measure of impacts. The greater the aggregate value for an alternative, the more serious the environmental or social impact. Numeric weights can be assigned by using the informed opinion of stakeholders.

3.6 Description of the Environment

To understand how the project might affect the environment, and in particular, how important such impacts could be, it is necessary to describe the physical, biological, social, economic, cultural and visual characteristics of the environment. This can be done by using secondary information available from government offices (national, provincial, district and village) and from NGOs involve in the project area. It is required in each case to use recent satellite imagery. With this information, it is possible to make a preliminary identification of environmental, social, cultural and visual sensitive areas in the study area.

Direct information on these sensitive areas as well as the social context of the study area will be collected by carrying out field visits.

The section 'Description of the Environment` of a Scoping Report should include the following sub-sections:

- Setting the Study Limits
- Physical characteristics
- Biological characteristics
- Socio-Economic characteristics
- Cultural characteristics
- Visual characteristics

3.6.1 Setting the Study Limits

The Scoping Report shall delineate the study areas and justify those limits. The area(s) — there may be more than one study area — identified will include all the direct and indirect anticipated impacts, as well as all project–related activities such as access roads.

The study area should be presented on a map at scale 1:200 000 for linear project and 1:20 000 for punctual project (or larger scale when possible). The information illustrated on the map shall include the project location, the administrative boundaries, the infrastructure and main resources of the area (roads, watercourses, industrial parks, residential areas...), the sensitive areas and all high potential components of the environment identified during the scoping.

3.6.2 Physical Components

The physical components of the study area should be briefly described according to their importance for the identification of the project impacts. Physical components may include a brief description of the climate, topography, geology, geomorphology, soil, seismology, surface hydrology, surface water quality, etc of the study area. For example, for a project that will discharge contaminated water in a river, more accurate data will be needed on water flow and water quality.

Specific reference should be made to the physical components involved in the potential natural hazards of the area (including potential natural hazards due to climate change conditions).

3.6.3 Biological Components

The biological components shall also be briefly described according to their importance for the identification of the project impacts. Environmental sensitive areas may be described to facilitate the integration of these data and rapidly identify areas that should be protected by the project.

3.6.4 Socio-Economic Components

The socio-economic components are very important to consider, especially when resettlement is a key potential impact of a project. It is usually quite easy to get data regarding the population by district, village, the health conditions of the population living nearby the project, the main economic activities of the affected people, the level of education, the presence of vulnerable groups... Data can include name of villages, population, gender and age distribution, ethnicity and languages, main economic activities and means of livelihood of men and women, unemployment levels, access to water, sanitation and electricity, education level, health conditions (mortality and morbidity, malaria, dengue, TB, HIV/STD levels, nutrition) , access to health and social services,. If available data like average income, cost of living, life expectancy and birth rate, average

number of persons per household, vulnerable groups should also be included. These data can be obtained from existing statistics or through the district or village authorities.

The socio-economic components should include reference to potentially vulnerable to natural hazards of the study area.

Visit in the villages will also help to identify the main socio-economic issues facing the affected people and verify information coming from secondary sources. These data will be summarised in this section of the Scoping Report.

3.6.5 Cultural Components

Cultural components that can be affected by the project should be briefly presented in this section of the Scoping Report. Examples of cultural components include, but are not limited to: religions and beliefs, local values and costumes, sites of traditional or historical value, use of natural resources, traditional livelihood, key institutions and organizations.

3.6.6 Visual Components

Features of visual value of the study area should be identified. This may involve landscape, nature, monuments, any natural or cultural feature, tourist attraction, etc... that will be affected or visually disrupted by the project should be listed, shortly described and illustrated by photography and/or presented on a map.

3.7 Preliminary Environmental Impact Assessment and Mitigation Measures

This section shall include a preliminary identification and assessment of key project impacts and risks divided into for all project phases (i.e., pre-construction, construction, operation and decommissioning/closure/post closure). The significance of the impacts shall be determined using appropriate methodology and criteria.

The generic structure of this section is as follows:

- Methodology
- Identification of environmental impacts
- Impacts, mitigation measures and residual impacts

3.7.1 Methodology and Approach

In this section the methodology and approach applied for the preliminary identification of social and environmental impacts, and the assessment of their importance for the scoping report shall be briefly described. There is not a mandatory methodology for impact assessment, but it is recommended to use well recognised, proven methodology, adequate to the complexity of the project and the sensitivity of environmental setting (including social, health, cultural, visual... components). The impact assessment methodology used for the scoping can be different and simpler than the impact methodology used for the subsequent EIA studies.

Scoping is a quick and simple form of EIA in which key impacts and risks are identified and preliminary assessed. The following two elements need to be considered:

- A **basic understanding** of the project and related activities: these include the main characteristics of the project during all its implementation phases and the environmental impacts that these could generate. Some examples of project characteristics during construction of a transmission line project and some

environmental impacts associated with these activities are given in **Error! Reference source not found.**.

- An **initial understanding** of the value of the environment in which the project will be located: these include the physical, natural and socio-economic characteristics of the area likely to be affected by the project and its activities and an idea of their value or importance (e.g. whether the area is home to an endemic species of bird found nowhere else, whether the area is characterized by farmland or primary forest, etc.).

As a result, likely impacts and key issues of potential importance can be identified. Note that the emphasis above is on a "brief" understanding of the project and an "initial" understanding of the environment

Box 3.1 Some examples of project activities from transmission line project and environmental impacts these might cause

Examples of project activities that could affect the environment may include:

- Clearance of land / vegetation;
- Disposal of spoil and vegetation;
- Erection of structures;
- Movements of construction vehicles;
- Employment of construction workers;
- Establishment of construction work camps;
- Provision of sanitation for construction worker, etc.

Some environmental impacts associated with these activities may include:

- Loss of species and biodiversity;
- Generation of dust;
- Soil erosion;
- Changes to local ground and surface water regimes;
- Visual changes to the landscape;
- Noise ;
- Air pollution, etc

One technique that can be used to determine the issues and scope for an EIA is to complete a Preliminary Impact Identification and Assessment Matrix as described in Box 3.2 and illustrated in Appendix 3.

Box 3.2 Developing a Preliminary Impact Identification and Assessment Matrix for Scoping

1. List the project characteristics or activities that could affect the environment down the left hand side of a blank matrix. These characteristics could be broken down into phases (e.g. movement of residents / farmers, clearing of land, disposal of spoil, erection of structures, etc.) or into types, (e.g. emissions to air, emissions to water, generation of wastes, etc.).

2. List the characteristics of the environment in the area likely to be affected by the project including physical, biological and human environmental characteristics along the top of the matrix (e.g. water quality, noise, air quality, aesthetics, cultural property, traditional livelihood, public health, etc.).

3. Taking into account an understanding of the importance of the environmental and social characteristics, for each square marked, determine approximately whether the impact will be positive or negative, and if negative, whether it is expected to be high, medium or low impact significance

The methodology for impact determination shall consider the intensity and significance of the impact by integrating the perturbation extent and environmental value as defined at section 4.6 of these guidelines and Appendix 9.

3.7.2 Identification of environmental impacts

The Project Developer will identify and summarise the major potential sources (project activities) of impacts to the physical, biological, health, social, economic, cultural, visual components of the environment for the following project phases:

- Pre-Construction
- Construction
- Operation
- Decommissioning/Closure/Post Closure

Identification of potential impacts related to Natural Hazards and Climate Change shall also be considered at this stage of the Scoping Report.

3.7.3 Key environmental impacts, mitigation measures and residual impacts

In this section, the Project Developer shall identify the major potential impacts of the proposed project alternatives and summarise their assessment, proposed mitigation measures, and residual impacts by project and by project activities.

Potential impacts on the environment's and society's exposure to natural hazards and potential impacts that could increase the vulnerabilities of the socio-economic components to disasters and/or natural hazard occurrence should be described.

This section of the Scoping Report should be divided into the following subsections:

- Pre-Construction
- Construction
- Operation
- Decommissioning/Closure/Post Closure

The methodology used by the Project Developer to determine the significance of the impact shall be systematically used for the identification and description of each major project impact. Preliminary Impact Matrix used for scoping, results of map overlay exercises, etc, shall be presented in the chapter or in appendix of the Scoping Report.

3.8 Public Consultation and Disclosure

Involving the public in the EIA preparation is fundamental to increase the understanding and acceptance of the project, to understand how the project may affect their living conditions and also to identify impacts and issues that are not immediately obvious to the EIA preparation team. The earlier in the project preparation process the public can be involved the more likely that a trusting relationship can be built and useful recommendations made.

In Lao PDR, the project developer shall undertake a process of consultation during the EIA study involving the affected communities and the project stakeholders. This consultation should be done on a continuous basis starting as early as possible in the EIA process.

The following sub-sections should be included in this section 'Public Consultation and Disclosure`:

- Methodology and Approach
- Summary of Consultation Activities Undertaken
  - Overview of consultation activities
  - Summary of the opinion of the persons consulted
- Results of Consultation during Project Scoping
  - Issues identified by stakeholders and project affected groups
  - How these issues were taken into account
- Recommendations for Consultations to be undertaken during the EIA studies

3.8.1 Methodology and Approach

The methodology and approach for stakeholder identification and conducting public consultation shall be described in this section of the Scoping Report. The methodology and approach use for public consultation will vary according to the Project Developer and the magnitude of the project. In general, the following consultation activities should be undertaken to understand and integrate the opinion of the affected people:

- Identification of Stakeholders and Project Affected Groups
- Conducting Public Consultation
- Disclosure

3.7.1.1 Identification of Stakeholders and Project Affected Groups

In this section, the stakeholders and project affected groups should be preliminary identified and listed.

There are three main groups of organizations and individuals who it may be appropriate to consult during scoping. These are:

- Government authorities
- Other interested organizations
- The general public.

Types of organizations to be included in these three groups are listed in Box 3.3.

Box 3.3 Checklist of Consultees for Scoping

1. Government Authorities
   - National, provincial, district and local authorities;
   - Authorities responsible for pollution control including water, waste, soil, noise and air pollution;
   - Authorities responsible for protection of nature, cultural heritage and the landscape;
   - Health and safety authorities;
   - Land use control, spatial planning and zoning authorities;
   - Authorities in neighbouring countries where transfrontier impacts may be an issue
2. Other Interested Parties
   - Local, national and international environmental, social and development interest groups[1];
   - Sectoral government departments responsible for agriculture, energy, forestry, fisheries, etc. (whose interests may be affected);
   - International and transfrontier agencies whose interests may be affected eg Mekong River Commission;
   - Local employers' and business associations such as Chambers of Commerce, trade associations, etc.;
   - Civil society organisations such as Lao Women Union, Lao Front for Reconstruction, etc.
   - Employees' organisations such as trades unions;
   - Groups representing users of the environment, eg farmers, fishermen, walkers, anglers, tourists, local wildlife groups;
   - Research institutes, universities and other centres of expertise
3. The General Public
   - Landowners and residents;
   - Elected representatives and community figures such as religious leaders or teachers;
   - Local community groups, resident groups, etc.;
   - General members of the local and wider public.

3.7.1.2 Conducting Public Consultation

Public consultation is recognised as a crucial step to prevent or minimise environmental and social impacts. According to the Decree on Environmental Impact Assessment (112/PM, Article 12), public consultations should be conducted at different times during the preparation of the EIA.

At the scoping stage, village dissemination meetings should be organized by the Project Developer and the local administration to inform the villagers of the development plan of the project and the possible environmental and social impacts as well as to collect opinions of the project affected people by the investment project. Information coming from the Scoping Report should serve as a basis for the preparation of these meetings. Only the population from project affected (directly or indirectly) villages should be consulted.

Summary of the public consultation meetings shall be enclosed in the Scoping Report. All summary reports shall be signed by the chairperson and main officers. According to the EIA Decree 112/PM (Article 12 (4. h)), the minutes of each meeting must also be signed by the Project Developer and the consultant which prepare the report. The name of the

[1] For organization in Lao PDR, the following web site can be consulted: www.directoryofngos.org

participants and the information regarding the organisation of the meetings shall be provided in the Scoping Report. A summary of the results of each public consultation shall be presented including the opinion of the participants, the comments from the stakeholders, and the response from the project developer.

3.7.1.3 Disclosure

To facilitate meaningful consultation with project affected groups and civil society organizations and NGOs active in the project area, it is required by the Decree on EIA (112/PM) to make suitable information available to stakeholders in a language and form that is understandable to them. The developer must provide stakeholders sufficient time to review and understand the project and its issues to enable them to participate effectively during consultation.

For the public consultation meetings, the project information provided to the project affected peoples and the stakeholders shall include the Scoping Report, and the presentation materials. This information shall be provided in Lao and English.

3.8.2 Summary of Consultation Activities Undertaken

3.7.2.1 Overview of consultation activities

Public consultation and disclosure should start at the planning phase and continue throughout the preparation of the Scoping Report. In case consultation activities have started before the preparation of the Scoping Report, these activities should be described in this section.

The Project Developer shall present the methodology and approach used during the planning phase. The consultation process should be described in term of activities, schedule, participants, and results.

3.7.2.2 Summary of the opinions of the persons consulted

The list of the persons consulted during the planning activities, should be summarised in this section of the Scoping Report. The full list of participants including details like organization, phone number... should be included in appendix of the Scoping Report.

3.8.3 Results of Consultation during Project Scoping

3.7.3.1 Issues identified by stakeholders and project affected groups

Environmental, socio-economic or cultural issues identified by stakeholders during the scoping phase should be presented in terms of opinions raised during discussions, meetings and workshops. It is appropriate to present these opinions from the participants in table with the name of the participants and the response from the project developers in term of solution or action proposed. In case the people are reluctant to register their name, the list may indicate only the sex and age of the participant(s).

The minutes of meetings and workshops including the opinions raised by the population and the responses by the Project Developer and other stakeholders should be presented in appendix of the Scoping Report with the signature of the chairperson and some of the participants.

3.7.3.2 How these issues were taken into account

The Project Developer shall explain how the issues raised by the stakeholders during the scoping phase have been integrated to the project. In some case (e.g. resettlement and compensation), the responses to these issues may be the responsibilities of the government authorities.

3.8.4 Recommendations for Consultation to be undertaking during the EIA

Consultation process is a continuous activity that will go on all along the project implementation cycle. The Scoping Report shall define the future consultation process in terms of:

- Objectives of the consultation during the preparation of the EIA Report
- Participants involve in future consultation
- Disclosure of information

3.9 Conclusions and Recommendations

The Project Developer shall present the conclusions and recommendations that will serve as the basis for the preparation of the TOR for the EIA Study.

The following sub-sections should be included in the section 'Conclusions and Recommendations`:

- Key issues to be examined in more detailed studies;
- Key project alternatives that should be taken into account in these studies;
- Spatial and temporal scale over which impacts should be assessed;
- Stakeholders that should be consulted; and
- Data gaps or restrictions of importance

3.10 Terms of Reference for the EIA Study

The Terms of Reference constitute a key result of the Scoping Report. They will serve as the basis for the determination of the scope of the EIA Report and the ESMMP. They should be as detailed as possible to minimise the presence of any gap in the preparation of the EIA. This information is also required to ensure that the Project Developer will have allocated enough time for the preparation of the EIA.

In case any specific baseline study (e.g. biodiversity research, socio-economic survey, health survey) and/or impact study (e.g. water quality modeling, air quality modeling, hazard, exposure and vulnerability assessments) are required, they shall be described in the TOR.

The structure of detailed TOR is presented in Appendix 4. This structure should be adapted to the results of the scoping for each project, but in general most of these items (sections; subsections, components, etc) should be integrated in the EIA Report.

The resettlement and compensation issues as well as the preparation of Development Plans are not fully covered by these TOR since they may be integrated into specific studies carried out in parallel to the preparation of the Scoping Report.

3.11 Reporting

The Scoping Report will:

- Form the basis for agreeing the scope of the EIA with MONRE;
- Allow stakeholders to see how their views will be taken into account during the preparation of the EIA
- Provide the basis for the information to be supplied to the responsible authorities;
- Provide input into the EIA report; and
- Present the TOR for the EIA study and give advice on a suitable budget and time schedule for this and/or any other necessary studies.

The presentation of the Scoping Report shall integrate visual material (photos, maps, figures…) that will facilitate the understanding of the information presented in the report. It is usually requested to present the project description (location) on topographic maps and the environmental sensitive areas on thematic maps at the scale of 1:200 000 for a linear project and 1:20 000 for a punctual project (or larger when possible).

3.12 Approval

Once the Scoping Report and TOR are completed, the Project Developer shall send the documents to MONRE for review and approval. MONRE will complete the review within 15 public workdays and inform the Project Developer of any comments. The Project Developer shall obtain MONRE's approval of the scoping/TOR before commencing the actual EIA studies.

It is advisable that the Scoping Report/TOR for EIA is made available to project affected/local people and local NGOs. In case of a complex project, MONRE may undertake public consultation to make sure that the stakeholder opinions have been fully considered.

Although scoping can be considered as a discrete phase in the EIA process which ends with issue of the terms of reference for the EIA, the activity of scoping should continue throughout, so that the scope of work can be amended in the light of new issues and new information. The scope of an EIA should be flexible enough to allow new issues which emerge during the course of the environmental studies, or as a result of design changes or through consultations, to be incorporated. It is important to remember that the Decree allows competent authorities to request additional information at a later phase in the EIA process, even if this information was not requested by them when they issued a formal Scoping Approval. Keeping the EIA scope under review is therefore important in avoiding delays caused by such requests.

4 ENVIRONMENTAL IMPACT ASSESSMENT REPORT

4.1 Overview

The preparation of the EIA Report constitutes the second step requested for the preparation of the environmental impact assessment (Decree 112/PM), the first step being the preparation of the Scoping Report and the TOR for the EIA.

The Environmental Impact Assessment phase is quite similar to the Scoping in terms of approach. However, the level of detail of the EIA study is higher than for the Scoping.

The preparation of a SIA (Social Impact Assessment) Report is required in case resettlement and compensation are important issues (Regulation on Resettlement and Compensation (Article 9)). It is also requested to integrate the social, economic, cultural and health components (Decree 112/PM (Article 3, EIA definition)) into the EIA Report in order to have a full assessment of all project impacts.

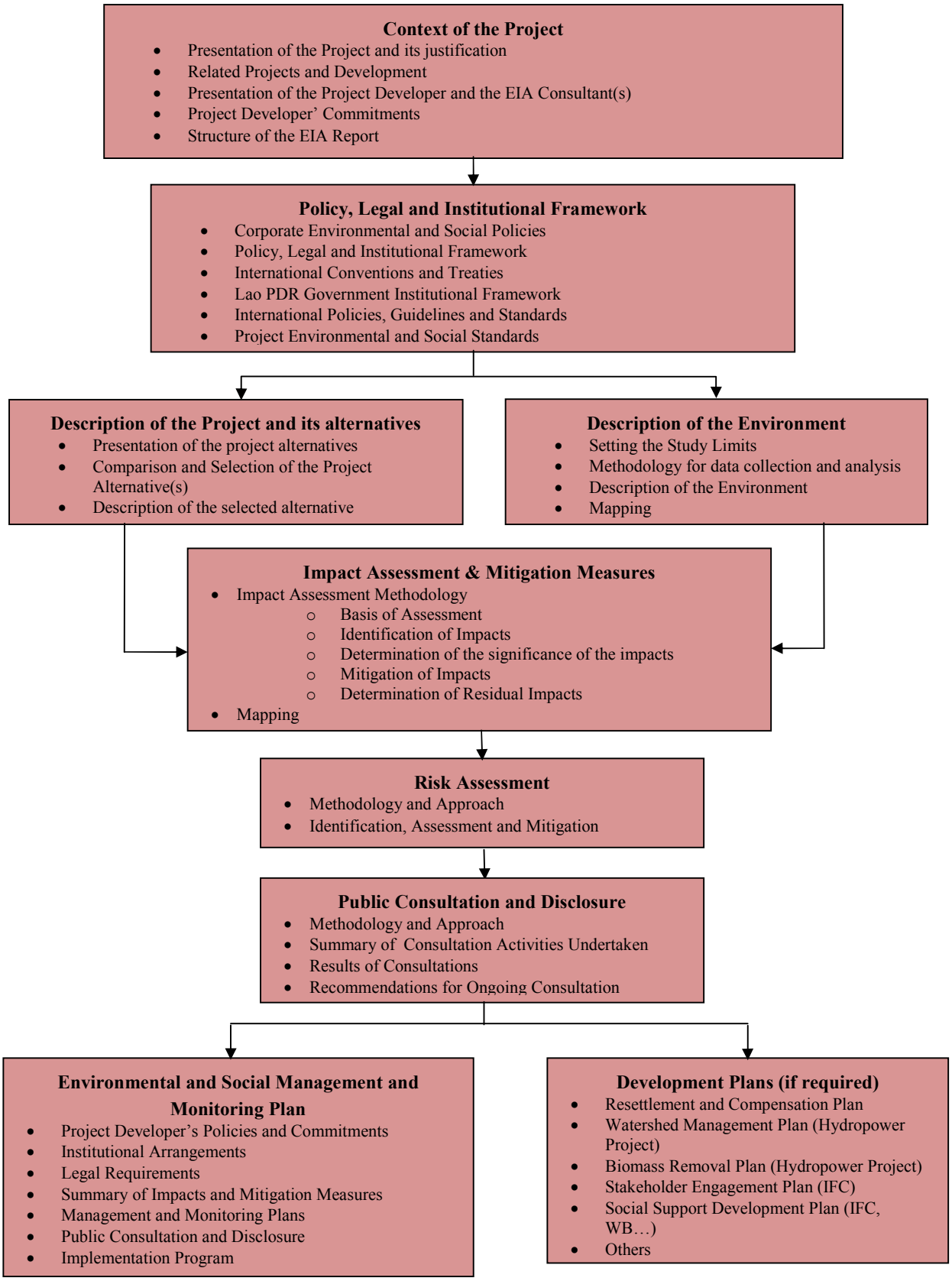
The EIA Report may be presented in a series of volumes and specialist reports according to the complexity of the project. Specific environmental and social studies (e.g. fisheries, resettlement...) may be presented in different reports but shall be summarised and theirs results integrated in the EIA Report.

The EIA Report shall include the key sections presented at Figure 4.1 and summarised as follow:

- Executive Summary
- Context of the Project
- Policy, Legal and Institutional Framework
- Project Description and Alternatives
- Description of the Environment (including social aspects)
- Impact Assessment and Mitigation Measures
- Cumulative Impact Assessment
- Risk Assessment
- Public Consultation and Disclosure
- Development Plans

An Environmental and Social Management and Monitoring Report (ESMMP) shall be prepared for each EIA Report. The ESMMP should be presented in a separate volume annexed to the EIA Report.

Figure 4.1: General structure for the preparation of Environmental Impact Assessment



4.2 Executive summary[2]

EIA report will contain an Executive Summary which summarizes accurately and concisely the significant findings and recommendations of the main reports and appendixes. The Executive Summary will be read as standalone document with all necessary information in order to provide a clear picture of the project, its environment, the impacts and associated mitigation and management measures. The Executive Summary shall be written in Lao and English.

The Executive Summary shall include as a minimum the following information:

- An introduction that will present the purpose and extent of the EIA report and any pertinent background information such as details on the project's history, the project's developers/owners and the consultants;
- Summary of the project's EIA history including any previous studies as scoping and TOR, etc.;
- Summary of the activities undertaken during the EIA;
- The main project alternatives studied, the result of the comparative analysis including the justification for the selection of the preferred alternative and the description of the recommended project alternative;
- The description of the environment to be affected by the project. This will include details on the environmental study areas, baseline information on the physical components, biological components, and the economic, social and cultural components;
- Each significant environmental and social impact of the recommended project alternative including sufficient detail of their importance, their scope, the approach to manage their impacts and the monitoring requirements (including all institutional arrangements). This description shall consider all phases of the project implementation (design, pre-construction, construction, operation and decommissioning/closure/post closure);
- The public involvement process undertaken including a summary of the public events, the results of these events, the main comments received and how they were addressed in the EIA reports. This section should also include any additional public involvement activities that are required to be conducted;
- A summary of the Environmental and Social Management and Monitoring Plans (ESMMP) including the budget for the implementation of the mitigation and compensation measures, the human resources affected by the project developer to undertake the implementation of the ESMMP, the internal and external monitoring requirements;
- The economic assessment (cost/benefits analysis) of the environmental and social impacts and their management;
- The EIA's recommendations
- The Executive Summary shall make use of maps, tables, photographs and figures to provide effective visual presentations of the project and the type and significance of the impacts.

4.3 Context of the Project

The introduction of the EIA Report provides the background to the EIA and the overall context of the project, including the key findings of the previous technical, economic, environmental and social studies.

[2] *Environmental Management Standard, Environmental Impact Assessment for Electricity Projects,* No 585/MIH.DOE (2001) Department of Electricity. Ministry of Industry and Handicrafts, Lao PDR

The section 'Context of the Project' should be divided in the following sub-sections:

- Presentation of the Project
- Related Projects and Developments
- Presentation of the Project Developer and the EIA Consultant (s)
- Project Developer' Endorsement of the EIA Report
- Structure of the EIA Report

4.3.1 Presentation of the Project

The Developer shall present its project including the status of the project (planning, pre-feasibility, feasibility, design phases), the main elements of the project (location, capacity, type of project, length, voltage, time schedule, budget, etc.), a brief history of the project, the actual status of the existing infrastructure related to the project and the need for the project including a detailed justification and the project objectives.

The justification and need of the project should be as detailed as possible including economical, technical, environmental, social and cultural components. The benefits for the country, the province, the district and the affected population should be well demonstrated (not based on general statements). Quantification of the benefits will be very useful in establishing the justification of the project.

The Developer shall summarise the key findings of the Scoping Report, especially the major physical, biological, economic, social, cultural and visual issues and the main concerns of the affected population and communities.

Any other relevant background information (previous technical, economic, environmental, social and cultural studies) should be presented.

A general map showing the project location as well as the sensitive environmental and technical project components shall be included with this presentation.

Box 4.1 presents a summary of the information that is needed to explain the project context and its justification.

Box 4.1 Information needed to explain the project context

- Situation status, including a brief project history, the actual status of the existing infrastructure, available energy supply (quantity and source), etc.;
- The scope of the project and its main components;
- The need for the project (i.e. a detailed justification);
- Constraints due to legally–established protected areas;
- Technical and economic requirements to implement and operate the project (e.g., importance of the project and the schedule of realisation based on the existing plans and programs);
- Alignment with GOL Policies, socioeconomic development plans (national, provincial and district) and sector development plans;
- Opinion of the project-affected people and local communities.

4.3.2 Related Projects and Development

Projects or developments related to the construction and operation of the project should be presented. As example, for a transmission line project, the related projects or developments may include the construction of hydropower plant, thermal power plant as energy source; the distribution of electricity in the country; the establishment of industrial parks or economic zones; the improvement of energy network... Projects that can be in

conflict with the proposed project should also be included (e.g. mining project and hydropower plant) in this presentation.

4.3.3 Presentation of the Project Developer and the EIA Consultant(s)

The contact details of the Project Developer are requested including the name of the Company; the main postal address, telephone, fax, e-mail, website details for the company; the name of the main contact person and direct postal address, telephone, fax, and e-mail details.

The recent experience of the Project Developer (Company) in Lao PDR and/or other countries for similar project should be presented with appropriate references. In case the project is prepared by a consortium, the experience of the consortium should be presented as well as the related experience of each partner.

The experience of the Environmental Consultant and its partner that will carry out the EIA Study should be summarised. The team leader and experts should be introduced including their specific expertise and input to the EIA study, the name of the laboratory that will be performed the chemical or biological sampling and analysis and its accreditation.

4.3.4 Project Developer' Endorsement of the EIA Report(s)

A Project Developer is fully responsible for the accuracy, completeness and soundness of data, information, assessments, measures and budget allocations presented in the EIA Report(s) of the developer's project. The Developer shall clearly state and document his full endorsement of the EIA Report(s) and his full commitment to the implementation of all measures including the provision of necessary funds and human resources. Appendix 5 presents the Endorsement Letter that shall be filled and annexed to the EIA Report(s)

4.3.5 Structure of the EIA Report

This shall include a brief presentation of the structure and content of the EIA Report to help the reader navigate through the document.

4.4 Policy, Legal and Institutional Framework

This section shall provide an overview of the current environmental and social policies, legal and institutional framework including International or regional conventions and treaties signed or ratified by Lao PDR applicable to the Project and the EIA study. The Section should clarify whether the Project (and the EIA) is adhering to donor or other institutional environmental and social policies, standards, directives or guidelines in addition to Lao PDR legislation, standards, directives and guidelines.

The following sub-sections should be included in the Section 'Policy, Legal and Institutional Framework` of any EIA Report:

- Corporate Environmental and Social Policies
- Policy and Legal Framework
- International Conventions and Treaties
- Lao PDR Government Institutional Framework
- International Policies, Guidelines and Standards (if applicable)
- Project' Environmental and Social Standards

4.4.1 Corporate Environmental and Social Policies

The Developer' corporate commitments in term of environmental, social, employment opportunities and health and safety policies should be summarised. This should include

corporate commitments to international standards such as ISO 14001 (Environmental management systems), OHSAS 18001 (Occupational health and safety management systems), AS 8003 (Corporate social responsibility) or industry environmental, social, security and safety codes of practices.

The current environmental, social, health, cultural plans, strategies, systems (EMS), manuals, procedures, forms and registers in force into the developer organisation should be briefly described. Reference to recent project carried out or under implementation by the Project Developer using the environmental and social management system including their procedures should be presented.

Since the Project Developer may request a contractor and subcontractors to carry out some of the construction or operation works, the developer shall indicate how it will ensure that its corporate environmental and social policies will be implemented.

The international recognized environmental and social 'Best Practices' or 'Code' implemented by the Project Developer during the construction and operation periods will be introduced.

4.4.2 Policy and Legal Framework

The Project Developer shall present the present the policies, laws and regulations of Lao PDR applicable to the project or the EIA study. This presentation shall highlight which particular provisions should be taken into account during the project preparation and implementation.

4.4.3 International Conventions, Treaties and Agreements

Lao PDR is a signatory to several international conventions, treaties and agreements. Those potentially relevant to the project should be presented and the main elements to consider during the project preparation and implementation should be summarised.

An **indicative** list of these conventions, treaties and agreements, signed or ratified by Lao PDR (in date of May 2011), is presented below:

- International Plant Protection Convention (1955);
- ASEAN Agreement on the Conservation of Nature and Natural Resources (1985);
- Convention on the Protection of the Ozone Layer (1985);
- Convention Concerning the Protection of World Cultural Heritage and Natural Heritage (1987);
- The Montreal Protocol on Substances that Deplete the Ozone Layer (1987);
- UN Framework Convention on Climate Change (1992);
- International Convention to Combat Desertification (1994);
- Mekong River Commission Agreement on the Cooperation for the Sustainable Development of the Basin (1995);
- Convention on Biological Diversity (1996);
- Kyoto Protocol (2003);
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (2004).

4.4.4 Lao PDR Government Institutional Framework

The jurisdictions involved in the project and the cooperation mechanisms that will be put in place to ensure the success of the EIA and the implementation of its results should be presented. The Project Developer should use organisational chart to facilitate the

understanding of the Lao PDR government institutional organisations involved in the project.

The responsibilities of each organisation during the preparation, review, approval and implementation of the EIA Report will be summarised.

This description shall ensure that the Project Developer understands the requirements of the Lao PDR institutions and that it has been considered during the EIA preparation and implementation.

4.4.5 International Policies, Guidelines and Standards (if applicable)

Project funded by international organisations or funding agencies may request the integration of their own environmental and social safeguard policies, guidelines or standards (e.g. World Bank Safeguard Policies, ADB Safeguard Policies, etc.). In case the project is funded by an international organisation, the Project Developer shall summarise its environmental and social policies, guidelines and standards.

Financial institutions may request the Project Developer to follow the Equator Principles and IFC Performance Standards during the project design and implementation. The Project Developer shall then present the Equator Principles and the IFC Performance Standards that will be used for the project preparation and implementation.

In case the Project Developer makes reference to policies, laws, decrees, regulations, standards from other countries, these documents should be summarised and, if not available on internet, a copy in English of these documents should be provided with the EIA Report to make sure that the reviewing agencies can consider this information.

4.4.6 Project' Environmental and Social Guidelines and Standards

As a general rule, a project shall always follow the Lao National Environment Standards. However, there may be cases where a Project Developer for business reasons, due to membership of an organization or due to contractual provisions is required to follow more stringent or additional standards. In any case, the Project Developer shall specify all of the applicable standards. It should however be noted that the final decision on which standards are applicable lies with the Competent Authority.

It is suggested to present on a table the Lao National Standards that could be used for this project and if needed, on other column(s), any other countries, international agencies (WHO, IFC, EU, USEPA...) standards. The Project Developer shall then identify which standards will be selected for each parameter. In case the selected parameter is not the more stringent one, explanation should be provided for this selection.

For environmental, economic, social and health guidelines, the Project Developer shall indicate which ones will be applied by the project (e.g. in case of resettlement issues, the Project Developer may indicate that he will follow the IFC guidelines rather than the Lao PDR guidelines).

4.5 Description of the Project and Alternatives

The description of the project is a crucial step towards the preparation of an EIA Report. Without detailed information on the project description, it becomes impossible to assess accurately the environmental, economic, social, health, cultural and visual impacts of the project and to propose specific mitigation measures. The technical information from the project will be provided by the engineering team of the Project Developer.

The description of the project presented in the Scoping Report should be improved at this stage of the report since additional technical information and/or new project alternatives are available.

The following sub-sections should be included in the Section 'Description of the Project and Alternatives` of any EIA Report:

- Presentation of the Project and Description of Alternatives
- Comparison and Selection of Alternatives
- Description of the Selected Alternative
  - Technical description of the selected alternative
  - Detailed Design
  - Pre-Construction
  - Construction
  - Operation
  - Decommissioning/Closure/Post Closure

4.5.1 Presentation of the Project and Description of Alternatives

A general presentation of the project should be included in this section of the EIA Report. This presentation shall include the project' objectives, proposed technical components by phases (pre-construction, construction, operation and decommissioning/closure/post closure), implementation schedule, investment cost, etc

The EIA Report shall include the description of realistic alternatives for achieving the basic development objectives of the project. Alternatives that have already been analysed during the scoping phase and the reasons for their rejection should be presented.

The EIA Report shall describe each alternative in reasonable detail to enable all potential environmental, economic, social, health, cultural and visual impacts to be identified/predicted and evaluated. At least two alternatives plus the option of not proceeding with the project should be described. This should include alternatives to the project, for example, alternative transmission line routes, alternative sources of energy, alternative project location, different project size, etc. All alternatives should be considered to the same degree.

In describing the reasonable alternatives, the use of maps, plans, drawings and figures to provide effective visual presentations of the alternatives is required.

4.5.2 Comparison and Selection of the Alternative

The project developer shall select an alternative from the most pertinent to the project, highlighting the critical environmental, social, economic, and technical aspects of the chosen alternative.

This exercise should be a comparative analysis, including three or more alternatives. If there is only one alternative at this phase, the study shall explain the reasons for choosing this alternative and indicate why the other alternatives have not been retained for further comparison. At minimum, the 'no project' alternative is included in the comparative analysis.

The process to select alternatives or to select an optimal alternative shall use a comprehensive comparison method and shall satisfy at least the following criteria:

- The capacity to satisfy the demand (i.e., objectives, problems and needs);
- The legal and technical feasibility (e.g., land tenure, zoning, topography, civil engineering works, and availability of human resources);
- The economic benefit of the project;

- The capacity to limit the magnitude of the negative impacts on the natural and human environment and to maximize the positive impacts;
- The capacity of minimizing the amount of people to be affected and resettled;
- The creation of local employment and training opportunities.

The comparison of the project alternatives should be done based on environmental, social, technical and economic factors. As much as possible, the comparison should be based on quantitative data. The final selected alternative shall be the focus of the EIA, and shall be described in detail in the following subsection.

In some cases, the analysis of alternatives may involve comparing impacts that are not easily quantifiable (i.e., that are not measured using the same criteria) and that vary in time and space. In the analysis of alternatives, biophysical and socio-economic effects are represented numerically or visually (e.g., dots or histograms that vary in size according to magnitude).

One common method is to apply weights and ranks to the various impacts and then to aggregate the result by assigning numerical values to the expected impacts on each valued environmental and social component. Then, each alternative is compared based on a single overall measure of impacts. The greater the aggregate value for an alternative, the more serious the environmental or social impact. Numeric weights can be assigned by using the informed opinion of stakeholders.

4.5.3 Description of the Selected Alternative

4.5.3.1 Technical Description of the Selected Alternative

The selected alternative(s) should be characterized, including describing the activities, the infrastructure, the construction works, the equipment required for all project phases, and the temporary, permanent, and related installations and infrastructure. A cost estimate and a time schedule for the different phases of the selected alternative should be determined.

The description of the selected project alternative should follow the generic structure and content of a project description presented at Table 4.1 for the pre-construction, construction, operation and decommissioning/closure/post closure phases.

Table 4.1 Generic structure and content of a Project Description

Brief Presentation	Guidance notes
1. Sector and subsector	E.g. Energy production, Hydropower
2. Size	Size can be expressed in terms of area (or length if it is a road or other linear project), production, category/type, economic value and number of employees
3. Location	Overview map typically scale 1:20 000 (linear project) and 1:5 000 (punctual project). The map should include main natural features, like water bodies, forest, etc. existing infrastructure (roads, bridges, etc.) and human activities in the proximities of the project. Human sensitive areas (schools, markets, sites of monument or cultural importance, commercial areas, etc.) should be clearly indicated.
4. Project components	Main production facilities

	Internal infrastructure Ancillary infrastructure and facilities
5. Overall time schedule	Present a diagram with the planned timing of: - Studies (incl. the EIA study) - Permitting/licensing - Concession agreements - Detailed design, contracting - Pre-construction activities - Construction activities - Operations (lifespan) - Decommissioning/closure/post closure
6. Project Organization	Organization chart, management, roles and responsibilities, etc
Pre-construction Phase (if required)	
7. Overview	Objectives, main activities, magnitude of the pre-construction activities, duration, etc
8. Pre-construction activity schedules	Diagram pre-construction activities, including proposed measures to protect the environment (e.g. sedimentation basin at the site drainage outflow to reduce effect on water quality)
9. Location of project components	Site map (1:20 000 for linear project and 1:5 000 for punctual project) with location of project components such as temporary roads, workers camps, storage areas, clearing areas, temporary bridges, etc
10. Pre-construction project characteristics	Detailed technical specifications for the pre-construction activities; Topographical survey (e.g. identification of center line, clearance activities) and/or geotechnical survey (location, period of the year, duration, magnitude); Access negotiations; Site preparation and pre-construction activities (deforestation, vegetation clearing, clearing of line debris, dynamiting, borrow material excavation, river crossings, removal of arable soil, use of heavy machinery, removal of old infrastructure, etc.); Temporary infrastructure and related activities (access roads, bridges, heavy equipment storage areas, fuels deposits, material storage and handling areas, labour camps, sanitary facilities, project offices, etc.); Solid and liquid wastes (volume produced and

	storage and disposal areas); Excavation and filling (volume, source, transport, storage and deposition); Material and equipment used characteristic (e.g. trucks, graders, etc)
11. Labour	Expected workforce, if possible short description of workforce per job type); Working hours; Expected origin of workforce
Construction Phase	
12. Overview	Objectives, main activities, magnitude of the pre-construction activities, duration
13. Construction activity schedules	Construction schedule and duration (start and end dates and general sequence)
14. Location of project components	Site map at an appropriate scale, illustrating linear project (1: 20 000) or punctual project (1: 5 000), as well as the planned components —recent air photos (satellite images) of the project area is recommended; Location of project components such as roads, camps, mine, processing plant, storage areas, tailing dam, reservoir, power house, transmission line, bridges, etc.
15. Construction project characteristics	Detailed technical specifications for the construction activities (e.g. for a transmission line project (type of line, pylon structures, voltage capacity, servitude or ROW width) and for a substation (land occupation, project area, voltage, equipment, technical process, type of connection to the electrical network, etc.) ; Site preparation and construction activities (e.g. deforestation, vegetation clearing, clearing of line debris, dynamiting, borrow material excavation, river crossings, removal of arable soil, use of heavy machinery, removal of old infrastructure, etc.); Excavation and filling (volume, source, transport, storage and deposition); Number and type of construction equipment present on the construction site (noise level by mechanical equipment, duration of the construction activities with using mechanical equipment, etc.); (substation) Temporary infrastructure and related activities (access roads, bridges, heavy equipment storage areas, fuels deposits, material storage and handling areas, sanitary facilities, project offices, etc.); Permanent and temporary construction camps

	(location, regulations, best practices, sanitary facilities, shower, food, potable water, solid waste facilities, etc.); Solid and liquid wastes (volume produced and storage and disposal areas); Storm water treatment systems, such as retention ponds or infiltration basins; (substation); Rehabilitation work; Others
16. Labour	Health and safety measures for permanent and temporary employees (heath check, first aid kits, clinic, safety devices, etc.); Expected workforce, if possible short description of workforce per job type); Working hours; Expected origin of workforce
17. Business opportunities	Prioritize the use of local contractor; Business development strategy; Development of partnerships with local businesses; Communication on the requirements of the project regarding business opportunities
Operational Phase	
18. Overview of operations	Project operation activities shall cover the whole project activities including, transportation, reception and storage, production process, management of the waste including storage, transport and elimination of the wastes and any other residues; Brief description of project components including production processes and technologies, facilities and infrastructure; Visual presentation of the completed project (e.g. a freehand drawing, layout); Presentation of production data: - Input materials (amounts/year, types, qualities and characteristics, sources); - Water and energy consumption and sources; - Outputs: Products (amounts, characteristics) by-products, waste and other emissions)
19. Operations schedule	Time diagram presenting the main components and the main operations/processes and their respective mitigation measures

20. Site layout maps	Site layout maps (1:2 500 or better scale) showing the location of the main operational components
21. Description of operation activities	Material and equipment used characteristic (e.g. transformer, noise level, oil types, containment for oil spillage, transport of equipment, etc.); Indicate, describe and quantify all activities producing contaminant in the environment (including air emissions, noise, water discharge, etc.) and the means and mechanisms proposed to reduce the pollution from these sources; Present simplified production process including drawing, sketch... with the identification of inputs, outputs, management procedures and location of point source emissions and pollution (e.g., gases, liquids, solids, noise); Determine and characterise the liquid, solids and gases discharge coming from the production process; Demonstrate the capacity of the project to respect the standards for each source of pollution; Indicate how the project will optimise the management of the waste using the conservation principle for the resources (water, energy, raw materials...); Flow diagram: materials, water, energy, waste and other emissions; Hazardous products (name and quantity, storage facility...); Quantity of hazardous wastes; Materials handling, storage; Waste and wastewater management; Transport (means, timing, loads, routes); Others.
22. Labour	Expected workforce (if possible workforce per job type); Working hours; Expected origin of workforce Employment programme Job Opportunities (recruitment policies, skilled and unskilled jobs, labour intensive work, duration...)
23. Business opportunities	Used of local contractors; Business development training; Development of partnerships with local businesses;

	Communication on the requirements of the project developer in term of business opportunities
Decommissioning / Closure / Post Closure Phase	
24. Overview	Closure Plan Requirements (Strategy, Policy, Objectives, performance objectives and indicators, budgets, etc)
25. Decommissioning / Closure/Post Closure Schedule	Time diagram presenting the main activities of the decommissioning/closure/post closure
26. Decommissioning / Closure/Post Closure Plans	Prepare a conceptual rehabilitation, decommissioning, closure and post closure plan covering all project components
27. Description of Decommissioning / Closure/Post Closure activities	Presentation of the decommissioning/closure/post closure activities for each project component. Presentation of the cost for the implementation of the decommissioning/closure/post closure activities and funding sources
28. Labour	Expected reduction of workers; Social development plan; Time period for lay out

Visual aids such as maps, cross-sections, 3D views, freehand drawings, technical design drawings, and diagrams are very useful and helpful for providing the reader with a good understanding of the project.

4.5.3.2 Detailed Design

Usually, an EIA study is carried out during the feasibility study, i.e. before the detailed design phase. On the one hand this means that the results of the EIA can be fully integrated into the detailed design and construction contract specifications; on the other hand it also means that changes made during the detailed design may have significantly different impacts than those foreseen in the EIA. Such changes may require supplementary or even renewed EIA studies. There are no fixed thresholds for when such additional EIA studies would be required, and the best way of avoiding this situation is for the Project Developer to maintain an open dialogue with the Competent Authorities throughout the EIA studies and report all uncertainties and make clear where decisions have yet to be finalized and then come to an understanding with the authorities on how to deal with these cases.

For example it is not uncommon in large projects that the exact design and location of certain facilities will be decided quite late in the detailed design phase. If these facilities have well known, predictable and manageable impacts, then the usual way of managing such situations is to define the design and location criteria in the EIA Report and then include the decided design and location in the subsequent updated Construction Phase ESMMP and/or Operational Phase ESMMP for approval. However, in other cases the design and location may be of high and crucial significance to the impacts and their mitigation and if not clarified and defined this may render the EIA studies incomplete.

4.6 Description of the Environment

The description of the baseline conditions of the existing environment shall detail information on the physical, biological, economic, social, cultural and visual components. This description shall also include details of the interrelationships between the components and the importance of such relationships.

The results of the Scoping Report shall be used to identify the level of detail required for the description of the environment. It is important in this section to describe only the physical, biological, economic, social, cultural and visual components that are needed for this assessment. Description providing general information on the whole country should be limited at the minimum since the EIA is working mostly at the project level.

The following sub-sections should be included in the Section 'Description of the Environment` of any EIA Report:

- Setting the Study Limits
- Description of the Environment
  - Physical Components
  - Biological Components
  - Socio-Economic Components
  - Cultural Components
  - Visual Components
- Mapping

4.6.1 Setting the Study Limits

The EIA shall identify the limits of the study areas and justify those limits. The study areas should be determined in the Scoping Report, but may be adjusted due to project modification during the feasibility study and/or the EIA study. The area(s) — there may be more than one study area — identified shall include all the direct and indirect anticipated impacts, as well as all project–related activities such as access roads.

As example, for a transmission line project, an area of 2 km wide, containing the selected route, is analysed in order to identify the environmental, social, cultural and visual impacts of the line. The width of 2 km is dictated by the visual impact. The level of detail requested is at the level of 1:20 000 or larger if there is any valued ecosystem component. If the transmission line is crossing an urban area (residential area) the level of detail will be studied and presented at 1:10 000 or larger.

For the substation, the study area will be set within a circle of 2 km radius around the substation. The level of detail requested is at the level of 1:10 000 or larger if there is any sensitive environmental or social component.

For an industrial project, the limits of the study area may depend on the impacts of air emission, water contamination and noise. The study area will be presented at different scale according to the information illustrated. For example for air emission, the study area may cover an area of 5 or 10 km around the site, so it will be better to represent the air pollution contour at a scale of 1: 50 000 or 100 000. However, for valued ecosystem component near the factory, the level of detail requested will be at the level of 1:10 000 or larger.

4.6.2 Methodology for Data Collection and Analysis

Baseline environmental and social data will be collected in a systematic and logical way using internationally recognised or national methodology for each specific physical, biological, economic, social, cultural and visual component. Sampling and analysis shall

be done using calibrated and certified equipment and laboratories. The procedures used by the Consultant to ensure adequate quality control shall be detailed.

The source of secondary data will be clearly identified for each physical, biological, socio-economic, cultural and visual sub-component. The value of this information shall be assessed considering the methodology used to collect and analyse these data as well as the date of the sampling or data collection.

The EIA Report shall clearly indicate which information are primary data, and which are secondary data.

For health impact assessment, the Project Developer shall use the methodology proposes in the document 'A Practical Guideline on Health Impact Assessment in Lao PDR' prepared by the Ministry of Health.

Recent high resolution satellite imagery should be used for any project for the description and the presentation of the physical, biological, economic, social, cultural and visual component. This information will improve the accuracy of the data provided in the EIA Report (i.e. soil occupation, vegetation cover...) and will facilitate the assessment of the project impacts.

4.6.3 Description of Environment

The EIA shall describe the state of the environment in the study area before the start of the project construction activities. The current conditions of sensitive physical, biological, economic, social, cultural and visual components that could be affected by the project should be described. These descriptions shall focus only on relevant data for the project and should be supported by quantitative and qualitative data.

The Project Developer shall carry out field surveys to collect relevant data, using state-of-the-art methodologies. In addition, the Developer shall use secondary data coming from government offices, non-government organisations, regional organisations (MRC, ADB…) to complete the baseline data. The sources of the secondary data should be clearly identified.

The information collected shall be summarized on maps to facilitate the understanding of the environmental and social context and the analysis of environmental and social impacts. The scale of the maps at this phase should be at 1: 20 000 in rural areas and 1:5,000 (or more detailed) in urban areas.

4.6.3.1 Physical Components

The physical components selected for study and the extent of their description shall correspond to their importance or their value in the study area(s). The Scoping Report and the TOR will serve as baseline information for the selection of the physical components to be studied and the level of information requested for these components. During the preparation of the EIA study, it is possible that unforeseen project impact be assessed and additional survey needed.

The physical components typically described in an EIA Report are:

- Climate (existing data cumulated on a period of several years)
  - Rainfall (dry and rainy season),
  - Humidity
  - Evaporation
  - Temperature and
  - Wind;
  - Climate change
- Topography;
- Geology (including risk of earthquake);

- Geomorphology;
- Soil: Nature of the soil and surface arable land, sites potentially contaminated, lithology, slopes, areas sensitive to erosion and land movements / landslides;
- Sediments:
  - Metals
  - Sedimentation process (i.e., erosion and accumulation areas).
- Surface water hydrology
  - Bathymetry and hydrodynamic conditions (i.e., water flow at the surface and at the bottom);
  - Runoff, flood flows, low flows, evaporation
  - Flooding areas;
- Surface water: Aquatic and semi-aquatic environments, wetlands, and flood-prone protection areas for each location where a water crossing or encroachment is proposed:
  - Physical, chemical, and bacteriological quality of the surface water;
  - Total suspended solids, pH, conductivity, alkalinity, sulphate, metals, nitrogen compounds
  - Nature of the substratum of the watercourse bed;
  - Use of the watercourse;
- Groundwater
  - Location of groundwater sources (wells, springs...)
  - Quality (pH, conductivity, alkalinity, sulphate, metals, nitrogen compounds)
  - Flows
- Ambient air quality (i.e., in residential areas: emissions and their concentrations due to road traffic and other sources of air pollution, (Particle matter PM_{10});
- Ambient noise
  - Noise level (L_{Aeq} 1 hour, L_{Aeq} 24 hours, L_{90}, $L_{50,}$ L_{10})
  - Location of sampling points in sensitive areas (hospital, school, residential areas, recreation areas...)
  - Isophone contour map illustrating the following three period L_{Aeq} day (7h – 19h), evening (19h – 22h), night (22h – 7h)
  - All detailed information providing the context of the result of the measurement.

The description of the physical components shall include the potential natural hazards of the area (including potential natural hazards due to climate change conditions).

4.6.3.2 Biological Components

The biological components selected for study and the extent of their description shall correspond to their importance or their value in the study area(s). The Scoping Report and the TOR will serve as baseline information for the selection of the biological components to be studied and the level of information requested for these components. During the preparation of the EIA, it is possible that unforeseen project impact is assessed and additional survey needed.

To the extent possible, the description of the natural (physical and biological components) environment will present the relationships and interactions between the different components of the environment so that ecosystems of specific relevance or sensitivity can be identified. For example, the presence and abundance of animal species and relevant aspects of their life cycle (i.e., migration, reproduction, and food supply habits) should be highlighted. The inventories shall reflect the social, cultural, and economic values assigned to the described component.

In some case, the biological components may request the preparation technical report by biological expert (e.g. ornithologist may be required to provide information on bird

migration and the risk associated with transmission line). These technical reports may be annexed to the main EIA report and their content will be summarised in the EIA Report.

The biological components typically described in an EIA report are:

- Forest
  - Type of forest;
  - Phase of development;
  - Distribution;
  - Commercial, traditional and ecological values;
  - Existing and future use, and;
  - Presence of fragile or exceptional forest
- Flora species and their habitats
  - Abundance
  - Distribution
  - Diversity
  - Rare, endangered, or vulnerable species
  - Wetlands
  - Riparian vegetation
  - Species of social, economic, cultural, or scientific interest (i.e. NTFP...)
- Fauna species and their habitats (Mammalians, Reptiles, Amphibians, Aves)
  - Abundance
  - Distribution
  - Diversity
  - Migration
  - Rare, endangered, or vulnerable species
  - Species of social, economic, cultural, or scientific interest (i.e. NTFP...)

4.6.3.3 Socio-Economic Components

The socio-economic components selected for study and the extent of their description shall correspond to their importance or their value in the study area(s). The Scoping Report and the TOR will serve as baseline information for the selection of the socio-economic components to be studied and the level of information requested for this component. During the preparation of the EIA study, it is possible that unforeseen project impact is assessed and additional survey needed.

In case resettlement and compensation constitutes a major socio-economic impact, the results of the Resettlement Action Plan should be summarised and integrated in the EIA Report.

The typical socio-economic components described in an EIA Report are:

- Existing and planned use of the territory according to the Laws, decrees, policies, and national, provincial, and district development plans:
  - Urban sectors, housing concentration, urban areas, residential development projects;
  - Industrial and commercial areas and future developments;
  - Agricultural areas, agricultural activities, irrigation and drainage;
  - Forest areas;
    - Protection Forest;
    - Conservation Forest;
    - Production Forest
  - Areas with recreational, educational, historical, or aesthetic value;
  - Public infrastructure and access to public services
    - Roads;
    - Railways;
    - Navigation;

        - Airport;
        - Transmission lines;
        - Electricity;
        - Aqueduct;
        - Sewers;
        - Pipelines;
        - Hospitals;
        - Kindergartens;
        - Schools; and
        - Temples;
        - Cemeteries
    - Water sources (including private and public wells) and other installations for collecting water;
    - Protected areas around the water-collecting installations.
- Social and health profiles of the affected population (mapping the location of affected population)
    - Demography (presented on including key indicators);
    - Health (including: mortality and morbidity, nutrition levels, malaria, TB, HIV/AIDS and STDs, access to health services, etc. (presented on table with key indicators);
    - Education (Education levels, access to education services, etc);
    - Gender issues;
    - Minority Groups;
        - Demography
        - Composition
        - Interaction between minority groups
        - Socio-economic activities
    - Religion, culture and values;
    - Political and social organizations;
- Local, district and provincial economy
    - Employment sectors and unemployment levels;
    - Traditional production systems, including gender roles;
    - Household income;
    - Cost of living;
    - Land ownership;
    - Local business
- UXO
- Preoccupations and opinions of the local communities, especially the affected population

The socio-economic components should include reference to potentially vulnerable to natural hazards of the study area.

4.6.3.4 Cultural Components

Cultural components should be described in such a way as to facilitate understanding local communities, their use of the different components of the environment, and their views on the project. As for the other components, the relevant cultural components should have been identified in the Scoping Report and TOR.

The cultural components typically described in an EIA report are:

- Cultural heritage
    - Archaeological sites;
    - Potential archaeological areas
    - Sites of natural or cultural value
    - Other elements of heritage interest protected or not by law

- Minority Groups
  - Location
  - History
  - Traditional way of life;

4.6.3.5 Visual Components

Visual components should be described especially in sensitive areas like urban centres, touristic sites, protected areas, etc. Photography of visual components to be affected should be included. Visual analyse should be evaluated through appropriate methodology and by experts.

The visual components typically described in an EIA Report are:

- Local topography;
- Woodland extent and type;
- Other vegetation types;
- Built form;
- Patterns of settlement;
- Land use;
- Details of local materials, styles, etc.;
- Prominent watercourses; and,
- Cultural and religious identity;
- Visual elements; and
- Landmarks

4.6.4 Mapping

Mapping should be presented at two different level of detail. At first, thematic maps at the scale 1: 300 000 showing the major environmental and social components at the district or provincial level should be presented to illustrate the location of these environmental sensitive components within and along the project study area. The thematic map shall locate the most sensitive components to the project (residential areas, historical places, paths of particular landscape value, viewing points, roads, bird migratory corridors, land use, forest conservation areas, natural hazard, etc)

The physical, biological, socio-economic, cultural and visual components will be mapped at the scale of 1:20 000 for linear project. For major development as hydropower or mine project, these components will be mapped at 1:20 000 to 1: 10 000 according to significance of the environmental and social potential issues. The study area for an industrial project will be mapped at the scale of 1: 10 000. The physical, biological, socio-economic, cultural and visual components will be identified with appropriate legend showing all spatial information presented in the EIA report (name of villages, watercourses, roads…).

Mapping example for the preparation of thematic map (project presentation) and the description of the environment (environmental and social baseline data) are presented in Appendixes 7 and 8 respectively.

4.7 Impact Assessment and Mitigation Measures

The Project Developer shall identify the impacts of the project for each project phase (i.e., pre-construction, construction, operation and decommissioning/closure/post closure) and assess the significance of impacts using appropriate methodology and criteria.

The following sub-sections should be included in the Section ‘Impact Assessment and Mitigation Measures` of any EIA Report:

- Impact Assessment Methodology
- Identification of impacts
  - Pre-Construction
  - Construction
  - Operation
  - Decommissioning
- Impacts, mitigation measures and residual impacts
  - Pre-Construction
  - Construction
  - Operation
  - Decommissioning/Closure/Post Closure

4.7.1 Impact Assessment Methodology and Approach

The EIA Report shall describe the approach and methodology applied for identification and assessment of impacts. The methods and techniques used for the identification and determination of the significance of the impacts should as much as possible be objective, concrete, and reproducible. Once the methodology is defined, the developer shall use it systematically for each identified impact.

For Health Impact Assessment, the Project Developer shall follow the methodology presented in the document 'A Practical Guideline on Health Impact Assessment in Lao PDR' prepared by the Ministry of Health.

Transboundary impact assessment will be prepared in case the project may cause impact on neighbouring countries.

4.7.1.1 Scope of Assessment

This section shall identify the context of the assessment. It is important to present any agreement that can affect the scope of the assessment. For example, some impacts may not be included in the assessment since these activities where completed by the Lao PDR Government before the start of the project (e.g. if the resettlement and compensation have been completed before the project start).

4.7.1.2 Identification of Impacts

Generally accepted impact identification tool is presented in Appendix 3. The use of control tools (checklists, matrixes, and/or other available instruments) to identify impacts on the environmental components is highly recommended. These control tools should be presented in the EIA Report to facilitate its review and to ensure that all impacts have been considered carefully.

The source of impact should be clearly identified as well as the environmental, socio-economic, cultural, visual components affected.

4.7.1.3 Determination of Impact Significance

The methodology for the assessment shall consider project-related impacts that are positive, negative, direct, indirect, (and as appropriate) cumulative, synergistic, reversible, and irreversible. Impact significance should be clearly presented. The significance of an impact depends on a number of factors such as:

- The intrinsic value of the affected ecosystem component(s) (i.e., sensitivity, uniqueness, rareness, and reversibility);
- The social, cultural, economic, and aesthetic values attributed to the component(s) by the population — the more the population values a component in an ecosystem, the more likely the impact on this component will be considered important;

- The level of preoccupation of the population on health and security issues or on the protection of their archaeological sites;
- Whether the affected environmental component(s) have already undergone modifications.

The methodology for impact determination should consider the intensity and significance of the impact by integrating the perturbation extent and environmental value. The perturbation extent assesses the magnitude of the modifications to the structural and functional characteristics of the affected components. The environmental value reflects the importance of the intrinsic and social values of the project-affected components. Impact determination should also considers the extent of the impact (distance or relative area impacted, proportion of the component affected) and the duration (temporal) on the project-affected component. The criteria and procedures to establish impact significance are presented in Appendix 9.

In term of presentation, it is highly recommended to present successively for the description of one specific impact, its assessment, then the proposed mitigation measures and finally the residual impact and additional mitigation or compensation measures if required to minimise the residual impact. The separation in different chapters of the assessment of the project impacts and the description of the mitigation measures is not recommended.

The assessment of each project impact should be done systematically. The presentation of the impacts shall clearly including the source of impact (how), the duration (when), the reason for this impact to occur (why), and the intensity and the significance of the impact.

Modeling

Modeling may be required for different kind of projects (industry, mining, hydropower, substation, etc.) to determine the significance of the project impact and to ensure the efficiency of the mitigation measures. Modeling may also be used for the assessment of natural hazards and climate change impacts. Modeling should be done using international model and standard and should be based on quantitative data.

Usually, modeling can be done for hydrology, water quality, noise, air quality and impacts on climate, biology and ecology.

Results from spatial models (e.g. noise contours) should be presented on map at appropriate scale. For example, noise contour along a road will be presented at the scale 1: 5 000 (or larger) to be able to identify and locate the project affected components (number of house, school, hospital, etc.).

Results from dynamic models (producing for example water quality time series) should be presented as curves or bar charts. The temporal resolution shall match the time scale inherent in the system being modelled (e.g. a river catchment model with a 1-day time step should not be used to simulate 100-year scenarios).

Results from models that are both dynamic and spatial can be presented as animated contours. Both temporal and spatial scales used by the models shall match the scales of the system being modelled.

4.7.1.4 Mitigation of Impacts

The purpose of impact mitigation is to reduce the negative effect of the predicted adverse impacts on the environment. Detailed objectives of mitigation measures are described in Box 4.2.

Box 4.2: Objectives of mitigation actions aimed at reducing adverse impacts

Mitigation measures are aimed at eliminating, offsetting, or reducing adverse environmental impacts and could have a range of objectives, such as:

- *Avoidance:* Avoiding projects or activities that could result in adverse impacts; avoiding certain types of resources or areas considered to be environmentally sensitive. This approach is most effective when applied in the earliest phases of project planning.
- *Prevention:* Measures aimed at preventing the occurrence of negative environmental impacts and/or preventing such an occurrence having harmful environmental and social impacts.
- *Preservation:* Preventing any future actions that might adversely affect an environmental resource.
- This is typically achieved by extending legal protection to selected resources beyond the immediate needs of the project.
- *Minimisation:* Limiting or reducing the degree, extent, magnitude or duration of adverse impacts. This can be achieved by scaling down, relocating, or redesigning elements of a project.
- *Rehabilitation:* Repairing or enhancing affected resources, such as natural habitats or water sources, particularly when previous development has resulted in significant resource degradation.
- *Restoration:* Restoring affected resources to an earlier (and possibly more stable and productive) state, typically a 'pristine' condition.
- *Compensation:* Creation, enhancement, or protection of the same type of resource at another suitable and acceptable location, compensating for lost resources. It should be noted that compensation may be a suitable mitigation measure for certain impacts of certain projects, but is often not a sustainable measure to implement.

Source: EMP Guidelines, South Africa, June 2005

For each project phase, the EIA Report shall specify the actions, infrastructure, design corrections, additions, or any other actions required to reduce the intensity of the impact. Mitigation measures can also be used to improve the benefit of positive impacts. Detailed mitigation measures (site specific) shall be defined for each impact identified.

Mitigation measures should be as detailed as possible. Vague or uncertain implementation of mitigation measures (as where possible, if necessary, if required...) will not be accepted. Description of impacts and mitigation measures should be located on a map when possible. The cost for the implementation of mitigation measures should be estimated and presented in the EIA Report. Indicator should be provided to evaluate the efficiency of the mitigation measures.

Incorporate Mitigation Measures into the Design and Procurement Documents

For the results of the EIA to be effectively incorporated into the project design, the environment team shall coordinate with the technical / engineering team during the preliminary and detailed design process. Important mitigation measures should be incorporated into the project technical specifications or the Bill of Quantity. Non–technical measures (i.e. compensation and resettlement) should be dealt with at the appropriate level and with the responsible institutions, and responsibility for the implementation of each mitigation measure should always be clearly defined, and accepted by the responsible agency.

For mitigation measures that are to be incorporated into the design, drawings / maps should be prepared to locate the impacts and define exactly what needs to be done in the design.

4.7.1.5 Determination of Residual Impacts

Where impacts cannot be mitigated (residual impacts), the EIA Report should determinate how these impacts will be addressed. For example, compensation "in kind" is sometimes done by replanting trees in other areas to compensate for deforestation in the project area.

4.7.1.6 Mapping

Impacts that can be located on a map should be presented on an impact identification and assessment map at the scale 1:20 000 for linear project or 1: 5 000 for a punctual project (e.g. factory, mine, etc.).

4.7.2 Identification of Impacts

The Project Developer shall identify all potential sources of impacts to the physical, biological, health, social, economic, cultural, visual components of the environment for the following project phases:

- Pre-Construction
- Construction
- Operation
- Decommissioning

For each subsection below, the project activities should be summarised with their main sources of impacts and the potential affected physical, biological, social, economic, cultural and visual components of the environment on a matrix or table to enable the identification of the project impacts.

4.7.2.1 Pre-Construction

During the pre-construction phase, the main sources of impact generated by the project will depend of the type of activities carried out. Pre-construction activities may include as example:

- Topographic survey;
- Site levelling;
- Resettlement;
- Construction of resettlement site;
- Construction of access road;
- Exploration (drilling, access road, construction of platform, accommodation camps, airport…);
- Presence of workforces;
- UXO detection and clearance; etc.

4.7.2.2 Construction

Impact sources during the construction phase depend on the type of construction activities, the construction methods, construction equipment used, plant equipment fabricated onsite, chemicals/materials used, source/amount of utilities, duration of site work, etc. Construction impacts may be generated at the main construction site but also in different areas that need to be considered.

Project construction activities may include:

- Building access roads;
- Opening and operation of borrow pits, quarry site...;
- Site clearance;
- Topsoil removal
- Earthwork and excavation, including using dynamite and drilling
- Installation of structures

- Pipeline installation
- Cleaning and hydro testing
- Transportation materials
- Power generation
- Painting activities
- Welding and cutting activities
- Presence of workforce
- Air emissions;
- Noise;
- Wastewater discharges;
- Solid wastes;
- Hazardous wastes;
- Accidents;
- Workers' Accommodation;
- In-Migration
- Employment
- Local Business Development; etc.

4.7.2.3 Operation

The sources of impact in the operation phase will greatly vary from a project to another. For an industrial project they may include air emissions, noise, liquid effluents, solid wastes, hazardous wastes, etc. generated from the process units. These sources of impacts may include:

- Maintenance activities (vegetation clearance for a transmission lines or for a road, ...);
- Transportation;
- Air emissions;
- Noise;
- Water supply;
- Wastewater discharges;
- Solid wastes;
- Hazardous wastes;
- Workers' Accommodation;
- Employment;
- Accidents;
- Site restoration; etc.

4.7.2.4 Decommissioning/Closure/Post Closure

The sources of impact during the decommissioning/closure/post closure phase are often difficult to determine since the project life could last for 50 or 75 years. However, it is important to make this exercise to ensure that the major consequences of such project be integrated immediately at the feasibility and design phases. These sources of impacts may include:

- Demolition of buildings, infrastructure (pipeline, access road, water supply sources...);
- Removal and disposal of residues, including hazardous wastes;
- Site decontamination;
- Site rehabilitation
- Maintenance of structures (tailing...);
- Wastewater discharges;
- Transportation;

- Solid wastes;
- Hazardous wastes;
- Accidents

4.7.3 Impacts, Mitigation Measures and Residual Impacts

4.7.3.1 Overview of the Impacts

The description of each project phase should start with an overview of the identified impacts, their causes, significance, mitigation and residual impacts. This overview may be thematic (air, water, waste etc.) and/or site specific.

4.7.3.2 Description of the Impacts, Mitigation Measures and Residual Impacts

The description of the impacts will present the assessment of the impacts, the proposed mitigation measures, and the residual impacts by project phases (pre-construction, construction, operation, decommissioning/closure/post closure).

The detailed description and assessment of the impacts, their mitigation and any residual impacts may be done thematically and/or site specifically. There are no clear and stringent rules for selection of themes, but traditionally the following themes are used: (list)

- **Physical Impacts:**
  - Surface Water Quality;
  - Groundwater Quality;
  - Surface Hydrology;
  - Erosion and Sediment;
  - Air Quality;
  - Noise;
  - Vibration;
  - Climate
  - Others
- **Biological Impacts:**
  - Forest
  - Flora
  - Fauna
  - Biodiversity
  - Terrestrial Ecosystem
  - Aquatic Ecosystem
  - Riparian Ecosystem
  - Others
- **Socioeconomic Impacts:**
  - Economic Development;
  - Employment;
  - Public Health and Nutrition;
  - Occupational Health and Safety;
  - Education;
  - In-Migration;
  - Gender;
  - Minority Groups;
  - Traditional Resources (e.g. NTFP);
  - Land Use;
  - Resettlement;
  - Water Resource Use;
  - Fisheries;

- Agriculture;
- Forestry;
- Industry;
- Transportation;
- Navigation;
- Mineral Resources;
- Tourism;
- UXO;
- Others

- **Cultural Impacts**
  - Cultural Heritage
  - Archaeology
  - Minority Groups
  - Others

- **Visual Impacts**
  - Landscape;
  - Cultural, Traditional or Touristic Site;
  - Others

Large or complex projects

If the project is large in area and includes many sites affecting different ecosystems it is advised to report the impacts both site specifically (e.g. mine, refinery, transportation…) and thematically.

An example of the structure of this section of the EIA report for such site specific large project is presented at Box 4.3.

Box 4.3 Example of Site Specific Presentation of Impacts, Mitigation Measures and Residual Impacts for a Bauxite Mine and Refinery Project.

1. Bauxite Mine	**2. Refinery**
1.1 Pre-Construction Phase	2.1 Pre-Construction Phase
1.1.1 Physical Impacts	2.1.1 Physical Impacts
1.1.1.1 Erosion • Project Activities • Potential Impacts • Mitigation Measures • Residual Impacts	2.1.1.1 Noise • Project Activities • Potential Impacts • Mitigation Measures • Residual Impacts
1.1.1.2 Others	2.1.1.2 Others
1.1.2 Biological Impacts	2.1.2 Biological Impacts
1.1.2.1 Fauna • Project Activities • Potential Impacts • Mitigation Measures • Residual Impacts	2.1.2.1 Fauna • Project Activities • Potential Impacts • Mitigation Measures • Residual Impacts
1.1.3 Socioeconomic Impacts	2.1.3 Socioeconomic Impacts
1.1.4 Cultural Impacts	2.1.4 Cultural Impacts
1.1.5 Visual Impacts	2.1.5 Visual Impacts
1.2 Construction Phase	2.2 Construction Phase
1.3 Operation Phase	2.3 Operation Phase

1.4 Decommissioning/Closure/Post Closure Phase	2.4 Decommissioning/Closure/Post Closure Phase

Description of the Impacts, Mitigation Measures and Residual Impacts

Each impact will be described in detail with the description of the project activities that is the source of impact; the reasons this impact is occurring; its intensity, duration, extent and significance. When possible the impacts will be quantified. The mitigation measures for each impact will define exactly which actions need to be done. The responsible authority for implementation of the mitigation measures will be identified. The mitigation measures will be budgeted where possible. The result of the proposed implementation measures determined and the residual impact assessed.

The description of the each impact will include the following sub-sections:

- Project Activities;
- Potential Impacts;
- Mitigation Measures;
- Responsibility for Implementation;
- Responsibility for Monitoring;
- Residual Impacts

The methodology used by the Project Developer to determine the significance of the impact should be systematically used for each project impact.

4.8 Risk Assessment

4.8.1 Overview

The Project Developer is requested to conduct a qualitative hazard and risk assessment to identify and assess the key risks of each major project component and associated facilities, during the construction, operation and decommissioning/closure/post closure phases, to people (both project-related personnel and the general public) and the environment. Hazard and risk identification and hazard and risk operations workshops should be conducted during the detailed design and initial site mobilisation phase, to refine the assessment and incorporate further controls into final project design as necessary.

The following sub-sections should be included in the Section ‘Risk Assessment` of any EIA Report:

This section of the EIA Report should present the following sub-sections:

- Context of the Qualitative Risk Assessment
- Methodology and Approach
- Results of the Qualitative Risk Assessment
    - Construction
    - Operation
    - Decommissioning/closure/post closure
- Quantitative Risk Assessment (if needed)

4.8.2 Context of the Qualitative Risk Assessment

The external, internal and risk management context in which the rest of the process will take place should be determined. Criteria against which risk will be evaluated should be established and the structure of the analysis defined.

4.8.3 Methodology and Approach

The hazards and risks (including natural hazards and climate change) to humans and facilities are defined as those which are considered to be possible, but unlikely to occur during the normal course of the project implementation.

The methodology used for identification, assessment and mitigation of hazards and risks that should be considered during the preparation of the EIA should be presented by the Project Developer.

The hazard and risk assessment should be based on experience of the Project Developer, the engineers and the environmental consultant in the development and operation of similar projects in similar environmental and social settings. This identification should be done in close collaboration between the project engineers and the environmental and social consultants.

The risk assessment should be conducted by examining the potential consequences (i.e., a measure of severity of the impact) and the likelihood that those impacts will occur. The assessment of 'likelihood' applied specifically to the resulting impact. Often a final impact results from a chain of events, each with an associated likelihood. These 'conditional likelihoods' should be considered when determining the final likelihood of the impact occurring.

The risks should be qualitatively evaluated, whereby a number of categories were used to describe the consequence of each impact and the likelihood of that impact occurring. Appendix 10 presents an example of methodology used for qualitative risk assessment.

In case extreme risks are identified and assessed qualitatively, the Project Developer shall undertake specific quantitative risk assessment to better evaluate and manage the risk.

4.8.4 Results of the Qualitative Risk Assessment

The results of the risk assessment should be presented for the project life-cycle phases:

- Pre-Project
- Construction
- Operation
- Decommissioning/closure/post closure

For the Pre-Project period, the EIA Report shall present the existing risk (i.e. before the project start) as for example the risk of bush fire.

All risk assessment shall include a description of the risk, its assessment (likelihood, consequence and significance of the risk), the proposed mitigation measures, and the residual risks.

Based on the impact and the risk assessment, the Project Developer shall adopt design, operating and control measures with the specific aim of preventing accidents associated with development and operation of the project. In addition, the Project Developer shall adopt the general safeguards during the life of the project:

- Develop and implement emergency response plans (including spill response) and procedures for accidents and hazardous events;

- Coordinate and communicate emergency response plans to local authorities and involved institutions, and inform local society;
- Develop and implement corporate and operational risk management plans;
- Conduct induction training and periodic refresher training for all employees and contractors on all aspects of safety and site-specific regulations concerning safety;
- Attend to government statutory compliance, notification and liaison requirements and procedures.

These control measures shall be integrated into the ESMMP as specific Management and Monitoring Plan. The requirement for these specific management plans shall ensure that the risk for each of the key environmental and social factors is reduced to ALARP (As Low as Reasonably Practicable).

4.8.5 Results of the Quantitative Risk Assessment

The Project Developer shall undertake specific quantitative risk assessment in case significant residual risk is identified. This quantitative risk assessment should be done by specialist following international recognised methodology. The quantitative risk assessment should be presented in a separate volume and a summary should be presented in this section of the EIA Report. The ESMMP shall integrate the Management and Monitoring Plan resulting from this analysis.

4.9 Cumulative Impact Assessment

The preparation of a Cumulative Impact Assessment is required for project that can affect other investment project (Decree 112/PM, Article 4 (5). International Institutions as IFC request the preparation of cumulative impact assessment for any project.

The Project Developer should be required to carry out a Cumulative Impact Assessment if critical cumulative environmental or social issues have been identified during the Scoping Report or during the preparation of the EIA Report or upon the request of MONRE.

The following sub-sections should be included in the Section 'Cumulative Impact Assessment` of any EIA Report:

- Methodology and Approach
- Determination of Valued Ecosystem Components
- Determination of a Spatial and Temporal Framework
- Cumulative Impact Assessment
- Development of a Management Framework

4.9.1 Methodology and Approach

4.9.1.1 Definition

Cumulative impacts can be defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions person undertake such other actions".

In the context of an ESIA, cumulative impacts refer to the combined impacts of different projects or activities, in conjunction with the proposed project, within a defined spatial and temporal context.

4.9.1.2 Methodology

A simple methodology for determining cumulative effects is proposed as follows:

- Step 1: Identify incremental effects of the proposed project on selected Valued Ecosystem Components (VECs) within the area affected by the project. In this case VECs are defined as valued ecosystem components or "any part of the environment that is considered important by the Project Developer, public, scientists and government involved in the assessment process. Importance may be determined on the basis of cultural values or scientific concern";
- Step 2: Identify other past, present and reasonably foreseeable actions (projects and activities) within time and space that have been or could contribute to cumulative impacts on each VEC or their indicator. Establish appropriate temporal and spatial boundaries;
- Step 3: Assemble information on VECs and assess historical to current conditions. Should include any consideration of thresholds or limits;
- Step 4: Connect the proposed project and other projects or activities in the defined cumulative impact assessment area to the VECs. This activity could involve a range of tools and techniques (e.g. air emission modeling for each industrial source in the project area). Emphasis should be given to the aggregation of impacts on each VEC;
- Step 5: Assess the significance of cumulative impacts on each VEC over the time frame identified. It is suggested to use the same methodology to define the significance of the impact than the one of the environmental impact assessment. The significance of the residual cumulative impact should be determined after considering the implementation of the mitigation measures (Step 6);
- Step 6: For each VEC identify mitigation or management actions, including joint cumulative impacts management mechanisms.

4.9.2 Determination of Valued Ecosystem Components

The first step in the cumulative impact assessment of the project is to determine a list of Valued Ecosystem Components (VEC). VECs are those elements of the environment that are considered important by the Project Developer, the public, the scientific and academic community, non-government organizations and government involved in the EIA process. They are defined through a consultative and iterative process to produce a list of valued environmental and social concerns to the society that could be affected by the project and other project actions

Once the VECs have been identified by the Project Developer and confirmed by stakeholders, they should be evaluated in terms of their trends from historical to current conditions. This should also include the identification of any thresholds or limits which indicate their sensitivity to disturbance.

This list of VECs should be validated and discussed with project stakeholders through a detailed and comprehensive consultative process throughout the affected area. The outcome should be to determine a focused list of key issues and concerns to stakeholders in the project area.

4.9.3 Determination of a Spatial and Temporal Framework

The Project Developer shall define the spatial and temporal boundaries to establish a frame of reference for assessing cumulative environmental impacts and facilitates their identification. Such boundaries can also influence the assessment in a variety of ways. If large boundaries are defined, only a superficial assessment may be possible and uncertainty will increase. If the boundaries are small, a more detailed examination may be feasible but an understanding of the broad context may be sacrificed.

The Project Developer may perceive assessments with large boundaries as onerous or unfeasible, whereas the public may think small boundaries do not adequately encompass all of the project's environmental impacts. Also:

- Different boundaries may be appropriate for different cumulative environmental effects. For example, the boundaries selected for cumulative environmental effects on air quality might be quite different than those chosen for effects on a particular wildlife species;
- Spatial boundaries should extend beyond a project's immediate site to include the area likely to be affected;
- Temporal boundaries may extend beyond the timing of construction and operation to include the period of occurrence of the effects.

Spatial and temporal boundaries should be established using the following criteria (listed in order of importance):

- The size and nature of the project and its potential effects;
- The availability of existing data and knowledge about the project and its environmental effects and the feasibility of collecting new data and knowledge if there are data or knowledge gaps;
- The size, nature and location of past and future projects and activities in the area, and the significance of their adverse environmental effects;
- Relevant ecological boundaries, including physiography, vegetation, land use, habitat, soil and surface materials and climate;
- Relevant aquatic boundaries, including watersheds, sub-watersheds, drainage basins, and hydrogeological discontinuities; and
- Relevant jurisdictional boundaries, including village, district or province boundaries.

4.9.4 Cumulative Impact Assessment

Once VECs and a spatial and temporal framework for the CIA have been developed, the Project Developer shall determine the contribution of each project/activity can be made. The determination of cumulative effects could involve the following approach:

- Finalize spatial and temporal boundaries.
- Finalize list of included projects and activities.
- Identify trends for each VEC and their sensitivity to disturbance.
- Identify environmental aspects for each project/activity and potential environmental and social impacts
- Link the projects/activities and their impacts to each VEC and try to understand the aggregated impact of projects/activities on each VEC. This could involve a range of modified tools including:
    - Checklists
    - Matrices
    - Linkage diagrams
    - Overlays/GIS analysis
- The aim of this exercise is to determine the aggregation of anticipated cumulative effects on each VEC
- Assess the significance of effects on each VEC over the identified time frame.
- Identify action specific mitigation or management actions to address negative incremental effects of the proposed project and other projects or activities.

4.9.5 Development of a Management Framework

The Project Developer shall develop a Management Framework to manage cumulative effects arising from various interests present in the Project Area. The intent of the Management Framework is to identify a number of coordinated management actions to address key impacts on each identified VEC in the CIA process. The Management Framework should be coordinated through MONRE, the Provincial Authorities, other stakeholders and the Project Developer.

4.10 Public Consultation and Disclosure

Involving the public in the EIA preparation is fundamental to increasing the understanding (e.g. on how the project may affect or improve their living conditions) and acceptance of the project, and also to identify and act upon impacts and issues that are not immediately obvious to the EIA preparation team. The earlier in the project preparation process the public can be involved the more likely that a trusting relationship can be built and useful recommendations made.

In Lao PDR, the project developer shall undertake a process of consultation during the EIA study involving the affected communities and the project stakeholders. This consultation should be done on a continuous basis starting as early as possible in the EIA process.

The following sub-sections should be included in the Section 'Public Consultation and Disclosure` of any EIA report:

- Introduction
  - Background and Objective of the Project
  - Purpose of Consultation in EIA Preparation
  - Lao PDR Requirements
- Methodology and Approach
- Summary of Consultation Activities Undertaken
  - Overview of how consultation undertaken, when, with whom and by whom
  - Summary of the opinion of the persons consulted
- Result of Consultation during Project Scoping
  - Issues identified by stakeholders
  - How these issues were taken into account
- Result of Consultation on the preparation of the EIA Report
  - Issues identified by stakeholders
  - How these issues were taken into account
- Result of Consultation on the First Draft of the EIA Report
  - Issues identified by stakeholders
  - How these issues were taken into account
- Result of Consultation during EIA Review
  - Issues identified by stakeholders
  - How these issues were taken into account
- Recommendations for Ongoing Consultation
- Appendixes:
  - Summary of Project presented during the public consultations (should provide project description in brief, potential impact of project, and mitigation measures for some significant impact)
  - Detail proceedings / minutes for each consultation activity
  - Complete list of participants for each consultation activity

4.10.1 Introduction

4.10.1.1 Background and Objective of the Project

The Project Developer shall briefly introduce the project background and objectives that have been used to define the public consultation and disclosure process. The administrative limits of the study area should be described with the name of province and district affected.

The Project Developer effort to carry out the Public Consultation and Disclosure activities should be presented in term of specialists involved and time schedule.

4.10.1.2 Purpose of Consultations in EIA Preparation

This section shall present the methodology and purposes of consultations conducted during the EIA studies. In general the purposes of consultation can be summarised as follow:

- Collect information for identification of stakeholders and potentially affected persons
- Collect baseline social and environmental data and information
- Inform stakeholders and potentially affected persons about the project and its likely impacts;
- Record public concerns about the project; and
- Record public ideas for impact mitigation and maximizing any environmental/social benefits of the project.

4.10.1.3 Lao PDR Requirements

The developer shall describe Lao PDR and funding agency requirements for public consultation and disclosure that have been followed during the preparation of the EIA report.

These requirements shall include at least the Decree on Environmental Impact Assessment (No 112/PM. Lao PDR on 16 February 2010) defines in Part II (Environmental Impact Assessment Procedure), the involvement process (Chapter 2) during the preparation of an EIA study, by given detailed on the rights and duties of project affected people and other stakeholders (Article 7), and the participation process (Article 8). This enables reviewers and stakeholders to examine the extent to which the public has been involved in the EIA process and whether their views and values have been adequately addressed.

The Decree on Compensation and Resettlement of People Affected by Development Projects (No. 192/PM. Lao PDR. 7 July 2005) describes (Article 12 and 13) additional requirements that should be integrated into the project in case resettlement and compensation are considered as an issue..

The Public Involvement Guidelines (WREA, 2011) provides information on the dissemination, participation and consultation activities to be carried during the EIA process.

4.10.2 Methodology and Approach

The methodology and approach use for public consultation will vary according to the Project Developer and the magnitude of the project. The following consultation activities should be undertaken to understand and integrate the opinion of the affected people:

4.10.2.1 Identification of Stakeholders and Project Affected Groups

The stakeholders relevant to the Project have been identified early during the project scoping phase. The Project Developer should refer to the information presented for the

Scoping Report regarding the identification of the stakeholders and project affected groups.

The list stakeholders and project affected groups prepared during the Scoping Report should be revised at the start of the EIA study and improved during the public consultation process.

4.10.2.2 Public participation process

The public participation process can be broken down into four key phases, each of which is a prerequisite for the next:

- **Information gathering:** collection of baseline data from the public to feed into impact prediction;
- **Information dissemination:** stakeholders are informed about the project;
- **Consultation:** stakeholders are given the opportunity to voice their views about the project; and
- **Participation:** an extension of consultation, where stakeholders become joint partners in the design and implementation of projects and take part in decision-making.

Different techniques can be used for each phase as described in Box 4.4

Box 4.4 Selection of Techniques for Public Participation

Information gathering	Information dissemination	Consultation	Participation
Questionnaires / surveys	Media (radio, TV, newspapers)	Focus groups / workshops	Village committees
Key informant interviews	Displays, exhibits	Conferences / seminars	Round tables .
Participatory Appraisal techniques	Public meetings	Participatory Appraisal techniques	Consensus building activities

The project developer shall describe the technique that has been used during the public consultation process.

4.10.2.3 Conducting Public Consultation

Public consultation is recognised as a crucial step to prevent or minimise environmental and social impacts. According to the Decree on Environmental Impact Assessment (112/PM, Article 12), public consultations must be conducted at different times during the preparation of the EIA.

At the beginning of the EIA study, village dissemination meetings need to be organized by the project developer and the local administration to inform the villagers of the development plan of the project and the possible environmental and social impacts as well as to collect opinions of the project affected people by the investment project. Information coming from the Scoping Report may serve as a basis for the preparation of these meetings. Only the population from project affected (directly or indirectly) villages will be consulted.

During preparation and review of the report on the EIA, the environmental and social management and monitoring plan (ESMMP), MONRE, the local administration, the development project responsible agencies, and the Project Developer shall organise consultation meetings at village, district, and province level, to use as a forum and give an

opportunity to the project affected people and other stakeholders to share their opinions and give comments on the report and plans, from the first drafts until the final drafts.

Summary of the public consultation meetings should be enclosed in the EIA Report. All summary reports should be signed by the chairperson and main officers. According to the EIA Decree 112/PM (Article 12 (4. h)), the minutes of each meeting must also be signed by the Project Developer and the consultant which prepare the report. The name of the participants and the information regarding the organisation of the meetings should be provided in the EIA Report. A summary of the results of each public consultation should be presented including the opinion of the participants, the comments from the stakeholders, and the response from the project developer.

4.10.2.4 Disclosure

To facilitate meaningful consultation with project affected groups and local NGOs, it is required by the Decree on EIA (112/PM) to make suitable information available to stakeholders in a language and form that is understandable to them. The developer must provide stakeholders sufficient time to review and understand the project and its issues to enable them to participate effectively during consultation.

Stakeholders and Public Consultation

For the public consultation meetings, the project information provided to the project affected peoples and the stakeholders shall include the Scoping Report, the initial and final Executive Summary of the EIA Report and the presentation materials. This information should be provided in Lao and English.

Project implementation

The Project Developer shall define how the project disclosure will be done during the project implementation. According the Decree on EIA (112/PM, Article 31), the EIA Report and the environmental and social management and monitoring plan (ESMMP) will be disclosed in Lao and English within project developer information centres within the area of the investment project and on the related Districts.

4.10.3 Summary of Consultation Activities Undertaken

For the summary of consultation activities undertaken before and during the scoping, the Project Developer shall refer to the sub-sections 3.7.2 and 3.7.3 of the EIA Guidelines. The information provided in the Scoping Report regarding consultation activities should be used for this summary

4.10.4 Result of Consultation during the preparation of EIA Report

4.10.4.1 Overview

During the preparation of the EIA Report, especially during the collection of the baseline data, the Project Developer and its consultant are requested (Decree 112/PM, Article 12 (4. d)) to collaborate *'with local administrations such as the District Water Resources and Environment Offices, the Provincial or Capital Water Resources and Environment Offices, to organise dissemination meetings at village level to explain general situation of the investment project, as well as the benefits, impacts on the environments and society which may arise from the investment project, measures to prevent and minimise impacts on environment and society, and summarise the comments and opinions given in the meetings to incorporate into the report'*.

In this section of the EIA Report, the Project Developer shall present the results of all formal and informal consultations undertaken with key stakeholders, including Central, Provincial and District Government Officials and affected persons and communities, before the preparation of the first draft EIA Report.

Informal consultation shall include regular discussions with local residents and local Government staff. Formal consultation shall include structured meetings with Government authorities and village authorities, as well as individual household surveys.

The information provided during these discussions should be available for former review. The information collected should be registered and reference should be done in the EIA Report. All significant project impacts and proposed mitigation measures should be clearly presented to the participants.

4.10.4.2 Issues identified by stakeholders

The Project Developer shall carry out during the preparation of the EIA several types of consultation with the stakeholders including the project affected peoples. The main issues during these consultations should be identified and presented in the EIA Report.

The issues raised by the stakeholders during these consultations should be summarised in table and by affected components.

The summary of these consultations including questionnaires, opinions raised by the stakeholders... should be available for former review and annexed to the EIA Report. These summaries must be signed by the Project Developer and consultant, and when possible (village meeting, district workshops) by representatives of the participants.

4.10.4.3 How these issues were taken into account

The Project Developer shall explain how the issues raised by the stakeholders during the EIA study have been integrated to the project documents (new design, additional mitigation measures, better compensation rates...). In some case (e.g. resettlement and compensation), the responses to these issues may be the responsibilities of the government authorities.

4.10.5 Result of Consultation on First Draft EIA Report

4.10.5.1 Overview

Decree 112/PM, Article 12 (4. f) requests the developer to collaborate *'with local administrations like District Water Resources and Environment Offices, to organise meetings at villages, with participation of the project affected people by the investment project and other stakeholders to deliberate the **first draft** of the report on the EIA and ESMMP, and then revise the report and the plans in accordance with the resolution of the meetings, and then disseminate them back to the project affected people by the investment project and other stakeholders to revise them before district meetings'*

The summary of these consultations must be written and signed by the Project Developer and consultant (Decree 112/PM, Article 12 (4.h)), and signed by the participants or the representatives from the participants. The participants shall receive a hardcopy of the information provided and should keep it for former discussion with the government authorities. The Project Developer shall attach a copy of the minutes of the meeting to the EIA Report for former review and verification.

4.10.5.2 Issues identified by stakeholders

The Project Developer shall carry out several consultations on the first draft of the EIA report at village level with the stakeholders including the project affected peoples. The main issues raised during these consultations should be identified and presented in terms of opinions and solutions proposed by the project developer or government authorities in the EIA report. These opinions from the participants should be presented in table with the name of the participants and the response from the Project Developers in term of solution or action proposed.

The minutes of these meetings and workshops including the opinions raised by the population should be presented in annex of the report with the signature of the chairperson, some of the participants as well as the developer and the consultant.

4.10.5.3 How these issues were taken into account

The Project Developer shall explain how the issues raised by the stakeholders during the EIA study have been integrated to the project documents (new design, additional mitigation measures, better compensation rates...). The solutions proposed by the Project Developer or the government authorities should be as specific as possible.

In some case (e.g. resettlement and compensation), the responses to issues raised by the affected peoples may be the responsibilities of the government authorities.

4.10.6 Result of Consultation during MONRE EIA Review

4.10.6.1 Overview

Decree 112/PM, Article 12 (4. g) requests the developer to collaborate *'with the local administrations like Provincial or Capital Water Resources and Environment Offices, to organise district-level meetings, with participation of the representatives of project affected people by investment projects, from each village, the concerned provincial or Capital offices, mass organisations and other district organisations to deliberate the report which was revised in compliance with the resolution of the village meetings'.*

The same article request that the *'district-level-revised report must be made either in Lao or in English in which the abstract/executive summary, the ESMMP shall be made in both Lao and English, before submitting them to the MONRE to review'*;

The summary of these consultations must be written and signed by the Project Developer and consultant (Decree 112/PM, Article 12 (4.h)), and signed by the participants or the representatives from the participants. The participants shall receive a hardcopy of the information provided and should keep it for former discussion with the government authorities. The Project Developer shall attach a copy of the minutes of the meeting to the EIA Report for former review and verification.

4.10.6.2 Issues identified by stakeholders

The Project Developer shall carry out consultation(s) on the final draft of the EIA report at district level with the stakeholders including the project affected peoples. The main issues raised during these consultations shall be identified and presented in terms of opinions and solutions proposed by the project developer or government authorities in the EIA report. These opinions from the participants should be presented in table with the name of the participants and the response from the Project Developers in term of solution or action proposed.

The minutes of these meetings and workshops including the opinions raised by the population shall be presented in appendix of the report with the signature of the chairperson, some of the participants as well as the developer and the consultant.

4.10.6.3 How these issues were taken into account

The Project Developer shall explain how the issues raised by the stakeholders during the EIA study have been integrated to the project documents (new design, additional mitigation measures, better compensation rates...). The solutions proposed by the Project Developer or the government authorities shall be as specific as possible.

4.10.7 Recommendations for Ongoing Consultation

Consultation process is a continuous activity that will go on all along the project implementation cycle. The EIA Report shall define the future consultation process in terms of:

- Objectives of the consultation during
  - Construction
  - Operation
  - Decommissioning/closure/post closure
- Participants involve in future consultation
- Creation and management of Consultation Committee(s)
- Complaints and Grievances Mechanisms
- Disclosure of information

Action Plans design for the project can also involve consultation activities that should be carried out during the project implementation cycle (e.g. Resettlement Action Plans, Social Development Plans, ESMMP...) that should be integrated in that Public Consultation section of the EIA report in order to have an overview of the ongoing consultation process.

4.10.8 Appendixes:

The following information shall be annexed to the EIA Report:

- Summary of project presented during the public consultations (should provide project description in brief, potential impact of project, and mitigation measures for some significant impact)
- Presentation materials used during the discussions, meetings, workshops, etc.
- Dissemination materials (booklet, brochure, etc.)
- Detail proceedings / minutes for each consultation activity
- Complete list of participants for each consultation activity

4.11 Development Plans

Development Plans may be required by the legislation or due to some specific characteristics of the project. For example, in case of Hydropower Project, it can be required to prepare a Watershed Management Plan and/or Biomass Removal Plan. These plans will be prepared in specific volumes attached to the EIA Report. But for each case, they shall be summarised in this section of the EIA Report, to make sure that their integration will have done.

Social (or Community) Development Plans may also be required by International Funding Agency, Financial Institutions or due to the project impacts. In particular, project having major impact on the local population (e.g. resettlement, vulnerable group…) will required the preparation of Social Development Plans as:

- Resettlement and Compensation Plan (Lao PDR Decree 192/PM, IFC, WB, ADB, etc.)
- Stakeholder Engagement Plan (IFC);
- Livelihood Restoration Plan (IFC, WB, etc.);
- Social Support Development Plan;
- Vulnerable Groups Development Plan (IFC, WB, etc.);
- Others

These Social Development Plans should also be presented on a separate Volume attached to the EIA Report, and their content should be summarised in the EIA Report.

5 Environmental and Social Management and Monitoring Plan (ESMMP)

5.1 Overview

The Environmental and Social Management and Monitoring Plan (ESMMP) provides an essential tool for ensuring that the mitigation of negative impacts and enhancement of positive impacts is carried out effectively during the project life-cycle. The ESMMP should be used in the spirit of continual improvement, to assist in promoting best practice in environmental management, in a manner that is pragmatic, efficient and cost-effective.

The EIA Decree requires that the Project Developer prepares an Environmental Management and Monitoring Plan (EMMP) and Social Management and Monitoring Plan (SMMP), however, in practise these two plans should be presented together as one coherent integrated plan and for that reason the management and monitoring plans are here referred to as one plan called Environmental and Social Management and Monitoring Plan (ESMMP). Resettlement Action Plan (RAP) should be carried out, if required, and presented separately to the ESMMP.

The ESMMP '*shall be made in both Lao and English, before submitting to the MONRE to review'* (Lao PDR Decree of Environmental Impact Assessment (No 112/PM, 16 February 2010), Article 12. (4.g.)).

Once the EIA Report has been approved by MONRE, the ESMMP becomes one of the most important documents to facilitate the implementation of mitigation measures as well as the monitoring activities. The ESMMP should be reviewed, revised and updated from time to time during the project life and for that reason the ESMMP shall be prepared as a standalone document.

The general structure of the ESMMP Report should be as followed:

- Introduction
- Context of the Project
- Project Developer's Environmental and Social Policies and Commitments
- Organization Structure, Roles and Responsibilities
- Legal Requirements
- Overview of Impacts and Mitigation Measures
- Management and Monitoring Plan
- Public Consultation and Disclosure
- Implementation Programme

Appendix 11 presents the proposed Table of Content for the ESMMP Report.

5.2 Introduction

This section of the ESMMP shall present the background and objectives of the project including a review of the project justification; a summary of the environmental and social activities implemented before and during the preparation of the EIA Report including

Public Consultation; and the presentation of the Project Developer and its Environmental and Social Consultants.

5.3 Context of the Project

The proposed project and associated processes involved in both the construction and operational phases should be summarised in order to place the ESMMP in context. This information shall include project location, layout plans, project phases (e.g. design, construction, operations and decommissioning/closure/post closure), construction activities, operational processes and activities, employment, directly associated infrastructure, and project schedule.

The key affected physical, biological, economic, social, cultural and visual components of the environment should be summarised, based on the results of the EIA Report.

5.4 Project Developer's Environmental and Social Policies and Commitments

5.4.1 Corporate Environmental and Social Policies

The corporate policies related to health, safety, environmental, economic (employment, business opportunities...), social (gender, vulnerable groups...), cultural matters implemented by the Project Developer should be presented. Experience in implementation of such policies in Lao PDR should be highlighted.

5.4.2 Environmental and Social Management System

The Project Developer shall summarise its experience in implementing international environmental and social management system (ISO 14001, IFC Performance Standards, OHSAS 18001 (Occupational health and safety management systems), AS 8003 (Corporate social responsibility).....). The Project Developer shall also introduce the environmental and social management system that shall be enforced during the project implementation.

5.4.3 Environmental and Social Procedures and Guidelines

The Project Developer shall present the health, safety, environment, economic, social and cultural procedures and guidelines that will be implemented during the project implementation (construction, operation and decommissioning/closure/post closure). The Project Developer may refer to procedures and guidelines already under implementation within its activities, or the ones that the Project Developer intends to follow for this project (e.g. Best Practices for Construction of Transmission Lines, Best Practices for Mine Operation, etc.). These procedures can be annexed to the ESMMP.

5.4.4 Environmental and Social Commitments

In this section of the ESMMP, the Developer shall summarise its commitments in term of environmental protection and social development. These commitments should be based on the results of the EIA Report. It should reflect the significance of the project impacts and the opinions of the affected population. The Developer shall attach the Form of Confirmation and Letter of Undertaking (see Appendix 5) in case the ESMMP is presented as standalone document.

5.5 Organization Structure, Roles and Responsibilities

The roles and responsibilities of the key parties involved in the implementation of the ESMMP (in particular, the management actions and monitoring requirements), and in meeting the conditions of the ECC (Environmental Compliance Certificate) and CA (Concession Agreement), should be clearly defined. The key parties may include:

- Project Developer
  - Presentation of the organisation chart of the Developer for this project including the Environmental and Social Department (ESD)
  - Presentation of the ESD including its roles and responsibilities, the staffs and the relationship with the Contractor and Sub-contractor
  - Clearly define the transfer of responsibilities for the implementation of the ESMMP during the construction and operation phase from the Project Developer to the Contractor and Sub-contractor
- Government Authorities
  - MONRE
  - Sector Ministry
  - Province Authority
  - District Authority
  - Environmental and Social Management Unit (ESMU)
  - Resettlement Unit (RU)
  - Others

A flow diagram should be included showing responsibilities and communication channels. Where specific ESMMP responsibilities are assigned to Contractors or Sub-contractors, there should be clearly stipulated and included in the contract documentation.

Responsibilities of MONRE, Provincial and District Authorities, and ESMU should be described as it is requested by the EIA Decree (112/PM), the ECC and Project CA.

5.6 Legal Requirements

The legal requirements presented in this section of the ESMMP should be in line with the section of Legal Requirements of the EIA Report (see section 4.3.2 to 4.3.6 of these Guidelines). The legal requirements shall include the following description:

- Lao PDR Legislation (Environment, Social, Conservation, Sustainable Development, Sectoral Policies, etc.)
- International Treaties and Conventions signed and or ratified by Lao PDR.
- Project Best Practice Requirements
- Project Standards

These legal requirements may need to be revised from time to time since the Lao PDR legislation will be improved.

Legal requirements and conditions defined in the ECC and CA shall be presented in the updated versions of the ESMMP (e.g. construction, operation and decommissioning/ closure/post closure phases).

Compliance with environmental legal requirements is an essential project consideration and therefore needs attention in the ESMMP. Failure to meet legal environmental requirements could result in the environmental authorization for the project being withdrawn and effectively result in operations having to cease until such non-compliances are addressed.

5.7 Overview of Impacts and Mitigation Measures

The ESMMP shall be based upon the impacts and mitigation measures identified in the EIA Report as well as any additional requirements in the ECC and CA. A summary of the project impacts, the proposed mitigation measures, responsibilities for implementation of these mitigation measures and their cost will be presented for each project life-cycle phase including:

- Design
- Construction
- Operation
- Decommissioning/closure/post closure

An example of a summary of impacts and mitigation measures is presented in Appendix 12.

5.8 Management and Monitoring Plans

5.8.1 Overview

The management and monitoring plans provides the core information of the ESMMP. These plans will be presented for each phase of the project-life:

- Design (to ensure that mitigation measures are included in design)
- Construction
- Operation
- Decommissioning/closure/post closure

Specific requirements to implement the mitigation measures may need to be developed during the detailed design and as part of the bidding and sub-contracting process for the construction phase. These specific requirements shall be integrated in the updated version of the ESMMP and approved by MONRE.

It should be noted that while the EIA may cover the construction, operation and decommissioning/closure/post closure phases of the proposed project, separate ESMMPs will be prepared for each phase (e.g. construction, operation and decommissioning/closure/post closure) and will then only cover impacts associated with that phase.

For each of the project-cycle phase, management plans shall be described by affected components (Thematic Management Plan) or by project activities (Site Specific Management Plan).

For example during the construction phase, the following **thematic management plans** could be proposed to mitigate the project impacts:

- Noise management plan
- Air quality management plan
- Erosion and sedimentation management plan
- Natural hazards management plan
- Climate change adaptation management plan
- Water quality management plan
- Site clearing and landscaping plan
- Rehabilitation and re-vegetation management plan
- Biodiversity and conservation management plan
- Worker accommodations management plan
- In-migration management plan

- Solid waste management plan
- Water use management plan
- Materials handling and storage management plan
- Hazardous material handling management plan
- Leak and spillage management plan
- Wastewater and stormwater management plan
- Traffic management plan
- Communicable diseases management plan
- Occupational health and safety management plan
- Community health and safety management plan
- Archaeological and cultural heritage management plan
- Employment and training management plan
- Investment and procurement management plan
- Visual protection management plan
- Livelihood restoration plan
- Resettlement action plan (summary)
- Compensation framework plan
- Others...

For the same project, it could also be required to prepare **site specific management plans** to address issues that can be located within a particular area (component) of the project as for example:

- Access roads
- Waste disposal or treatment facilities
- Borrow pits
- Work camps
- Mine pits
- Mine refinery
- Others

5.8.2 Management Plans

The description of each management plan shall include the following sub-sections:

- Objectives
- Context
- Legal Requirements
- Management Actions (mitigation measures)
- Monitoring Program
- Performance Specifications
- Implementation Schedule
- Responsibilities

5.8.2.1 Objectives

The objectives of each management plan should be clearly defined and achievable; based on the results of the EIA Report, the project' standards, the opinions raised during the public consultation and the conditions stipulated in the ECC and CA.

5.8.2.2 Context

The background information used during the preparation of each management plan should be presented including a brief description of the baseline data for the affected components and/or project activities.

5.8.2.3 Legal Requirements

This subsection will present the legal requirements that should be followed or reached for the specific management plan. This information should be based on the project standards established in the EIA Report. Additional reference to Environmental Best Practice for this particular Management Plan should be described or identified.

5.8.2.4 Management Actions

Management actions are actions that are feasible, practical and cost-effective, and need to be implemented into order to achieve the objectives described above. These actions are based on the mitigation and enhancement actions identified in the EIA, together with additional information that may become available subsequent to completing the EIA. The Project Developer shall specify a programme for implementing the management actions, including: who, when and how; as well as what resources should be allocated.[3]

Key requirements for determining whether management actions are clearly defined are provided in Box 5.1. Potential negative secondary impacts as a result of management actions should be taking into consideration in the design and implementation of the ESMMP.

Box 5.1: Requirements for determining whether management actions are clearly defined

To determine whether the management actions are adequately defined they need to satisfy the following key requirements:

- *Written*: Management actions should be stipulated in writing, this forces the formulators to think through each action carefully.
- *Dated:* A management action must indicate a specific time by when the action should be implemented.
- *Risk- or impact-specific:* Each management action must link to a specific impact (either positive or negative) or environmental risk, and should be worded in specific terms rather than in general terms.
- *Time and space specific:* An indication must be given as to the conditions under which the management action applies (continuously or only in the event of contingencies). The time (such as the season or time of day) and location of the application of the management action.
- *Measurable:* Management actions must, where possible, be quantitatively defined. A standard with which performance can be compared, must thus be set. Objectives and targets of the management action must be clearly stated.
- *Achievable:* The management action must be realistic, feasible and hence achievable;
- *Reasonable:* The management action must be readily implementable within the time and budget constraints of a project.
- *Timely:* Measures must be put in place to coincide with specific project activities.
- *Understandable:* Management actions must be described simply, using clear, non-technical language where possible.

Source: EMP Guidelines, South Africa, June 2005

5.8.2.5 Monitoring Plan

Monitoring plan should be prepared to determine the effectiveness of the management actions and to understand the actual residual impact of the construction and/or operations

[3] EMP Guidelines-South Africa, June 2005

on the environment. These monitoring plans (e.g. air quality or groundwater monitoring) should be designed by specialists in consultation with the Project Developer and relevant stakeholders, depending on the complexity of the monitoring required. Where monitoring plans are required, these should be designed to be pragmatic and immediate results in order for appropriate management actions to be taken as soon as possible, in the event of an exceedance of guideline values or accepted performance levels.

The monitoring plan could comprise three main aspects:

- **Baseline measurement:** This should occur prior to the start of the project or activity in order to determine the level and status of the environmental and social components prior to any impacts associated with the project or activity.
- **Performance monitoring:** This monitoring should be ongoing throughout the project life-cycle and should be implemented to ensure that environmental and social impacts are within the predicted levels and that specified environmental and social performance targets are being achieved.
- **Compliance monitoring:** This monitoring should be implemented to ensure that the prescribed mitigation measures are having the predicted and desired effect. This monitoring would be conducted periodically, the timing of which will vary from project to project. It should be used to check that the levels of specific environmental and social parameters are compliant with laws, regulations, standards or guidelines, as applicable. The programme shall make provision for remedial measures to be effectively implemented in the event of noncompliance - i.e. when mitigation measures are inadequate or when impacts have been underestimated in the EIA.

The ESMMP should include a description of the means by which final monitoring arrangements will be agreed upon. For example, it must be stipulated that:

- Measuring equipment with their level of accuracy;
- Certified measurement equipment to be used (Certification by accredited laboratory must be provided);
- Environmental specialist(s) require for measurement, sampling, and to ensure quality control;
- Accredited laboratories (for measurement, sampling, analysis...);
- Certified methods of testing; and
- Legal specifications for calibration, testing, measurement and sampling methods.

Detailed monitoring and analytical methods (at least reference to) should be included in the ESMMP.

The following additional aspects, where relevant, should be addressed in the description of the monitoring activities:

- Indication of the linkages between the impacts identified in the EIA;
- Environmental and social parameters to be monitored;
- Indicators to be measured;
- Mitigation objectives;
- Targets for optimum performance (minimum environmental and social impact);
- Thresholds;
- Monitoring methods to be used (where a range of alternative methods exist);
- Sampling locations;
- Frequency of monitoring measurements;
- Detection limits (where appropriate);
- Definition of thresholds that will signal the need for corrective action;
- Responsibility for monitoring;
- Responsibility for corrective action;

- Details of how results will be analysed to determine whether corrective actions are necessary;
- Quality control procedures (e.g. blind sample...);
- Reporting procedures; and
- Opportunities that will be provided for interest and affected parties to contribute input into the revision of the ESMMP and to the design of corrective actions where appropriate

The design of monitoring activities should be based on the type of information required for determining whether objectives and targets are being met. Not all projects, and not all impacts of any one project, need to be monitored. Monitoring will be necessary and appropriate, if

- There are residual negative impacts that could not be avoided through changes to project design or reduced through the implementation of other mitigation measures;
- Secondary negative impacts arise as a result of the mitigation measures;
- There is significant public concern or controversy about an impact;
- Potential impacts are complex and poorly understood, or if there is disagreement, for example, between the specialists employed for the EIA;
- The outcome of the recommended mitigation measure(s) is uncertain.

The management actions and monitoring need to take into account the following three scenarios:

- Normal operations
- Abnormal situations (e.g. planned shutdown to service equipment)
- Emergency situations (e.g. unexpected oil spill).

The Monitoring Plan should be divided in two sections, as requested by the EIA Decree 112/PM (Article 13). The first section shall present the monitoring activities of the Project Developer, and the second one the monitoring activities of the concerned government agencies.

5.8.2.6 Performance Specifications

Performance specifications (e.g. criteria or targets) should be provided for each management action or monitoring activity, in order to assess whether the actions have been effective. Performance specifications could be based on the level at which an environmental condition must remain (e.g. habitat in a part of the site that must not be disturbed), or the level to which the environmental condition should be restored (e.g. habitat rehabilitation), or legislated or agreed limits (e.g. air quality standards), or the level of socio-economic benefits to be realized through the project (e.g. use of local labour and enterprises). Where possible, these performance specifications should be quantitative. These specifications should be revised during the implementation of the ESMMP, in the spirit of promoting continuous improvement.

5.8.2.7 Implementation Schedule

An implementation schedule should be prepared showing the sequence and timing (including frequency and duration) of the management actions and monitoring activities of the ESMMP. Where monitoring reports are produced, the timing of such reports should be indicated. The schedule should be drawn up with the Project Developer, to ensure necessary links are made between the implementation schedule for the ESMMP and the overall project schedule.

5.8.8.8 Responsibilities

Responsibilities shall be clearly identified for the different parties involved in implementing the management actions and monitoring activities.

When identifying the responsibilities, the Project Developer shall ensure that the responsible authorities have agreed to take this particular role, that they have the budget, experienced staff, training, facilities (equipment, vehicle…) and the capacity to respect the time schedule allocated to implement this particular management action or monitoring activity.

The Contractor or/and Sub-contractor are often responsible to implement the management actions during the construction phase. In case the Developer assigns the task to a Contractor or/and Sub-contractor, it shall incorporate the terms and conditions of the ESMMP into the contract to ensure that the Sub-contractor implement the plan comprehensively (EIA Decree 112/PM, Article 13 h, 2). The Developer shall ensure that the Contractor or/and Sub-contractor will implement the management plans within the approved timeframe.

As part of implementing the management actions, Method Statements should be prepared by the Contractor and/or Sub-contractor. These Method Statements should specify how they will manage potential environmental impacts in line with the requirements of the ESMMP, and, where relevant, environmental best practice; and how they will practically ensure that the objectives of the ESMMP are achieved.

MONRE may ask the Developer to revise and re-submit the ESMMP if it finds that problems are not identified and measures to minimise and solve the problems are not sufficiently provided in the environmental management and monitoring plan, as it is actually required, or fail to achieve the goal (EIA Decree 112/PM, Article 13 h, 3)

5.8.3 Emergency Plan

The ESMMP shall include an Emergency Plan as requested by the Decree 112/PM (Article 13 c) to address risks associated with accidents or emergencies during construction and operation. This emergency plan should be linked to other local emergency plans. In general, the emergency plan should include:

- A description of the different potential situations that could arise;
- Pertinent information in case of emergency (e.g., coordinates of the responsible authorities, available equipment, and maps with prioritized routes);
- The command structure in case of an emergency and the mode of communication with the local or regional authorities;
- A list of priority actions in case of emergency (e.g., emergency calls, deviation of the traffic, road signs, and methods of evacuation);
- Methods to update and reassess the emergency measures.

5.9 Public Consultation and Disclosure

Consultation process will continue during the construction, operation and decommissioning/closure/post closure phases. The ESMMP Report should define the future consultation process in terms of:

- Objectives of the consultation during
- Consultation Committee(s)
- Complaints and Grievances Mechanism
- Disclosure

5.9.1 Objectives of the consultation

The objectives of the consultation shall be adapted to the project context and be clearly defined in the ESMMP. Decree 112/PM (Article 7 (6)) stipulates that the project affected people and other stakeholders should participate in discussions on implementation of the environmental and social activities, as well as the ESMMP of the investment project. Decree 112/PM (Article 7 (7)) informs that project affected people and other stakeholders have the rights and duties to make a written proposal to solve the environmental and social problems caused by the investment project to the local administrations, at each level, to solve the environment and social problems, or directly to MONRE, in case the problems have not yet been solved

The consultation process during the construction, operation and decommissioning/closure/post closure phases should focus on the major residual impacts on the affected people. The objectives of the consultation will be to minimise these residual impacts to an acceptable level.

In the same time, the Project Developer should enhance the positive impacts of the project particularly regarding the affected people in term of employment, local development, health and safety, etc.

5.9.2 Consultation Committee(s)

The establishment of Consultation Committee(s) should help to keep continuous link with the public and receive opinion upon the project implementation and current impacts.

The Project Developer may establish for example:

- Project Liaison Committee that will ensure that the communication with all stakeholders is maintained effectively during the construction, operation and decommissioning/closure/post closure phases.
- Project Mediation Committee to help solve environmental and social issues, and especially the complaints and grievances coming from the public and the affected population.

The Project Developer shall indicate in the ESMMP how it will maintain communication with the affected people and the local authorities.

5.9.3 Complaints and Grievances Mechanism

The Project Developer shall establish a Complaints and Grievances Mechanism (CGM) related to environmental and social issues arising during the construction, operation and decommissioning/closure/post closure phases. It is suggested that this CGM be managed by the Project Developer with involvement of local authorities. This involvement may be done through the creation of a Project Mediation Committee that will meet frequently and in case of particular incident.

The Project Developer shall indicate in the ESMMP how it will manage the complaints and grievances.

5.9.4 Disclosure

Disclosure of information materials is an important part of the Project Developer engagement process during construction, operation and decommissioning/closure/post closure. At the start of the construction phase, the Project Developer shall prepare and disseminate information about construction activities. Information disclosure should concentrate at local and district levels.

All information material shall be provided in Lao and English and written in non-technical terms to make it easy to understand by the population. The regular contact with the District and Local Authorities will help to ensure that the information is disseminated to local population. During construction, information should be disclosed on subjects as:

- Construction activities;
- Recruitment policies and job opportunities;
- Supplier opportunities;
- Transport and traffic in the project area including road access restrictions/diversions;
- Health and safety awareness programs;
- Environmental and social issues;
- Local worker training;
- Workers' accommodation camp management including codes of conduct for workers;
- Complaints and grievances process

To facilitate disclosure of information, the presence of a dedicated information centre within the study area and near the affected people is recommended.

5.10 Implementation Program

5.10.1 Training and Capacity Building

Training is essential for ensuring that the ESMMP provisions are implemented efficiently and effectively. Training needs should be identified based on the available and existing capacity of site and project personnel (including the Project Developer, Contractors and Sub-contractors) to undertake the required ESMMP management actions and monitoring activities.

Training Programme shall be presented in this section of the ESMMP. The training programme shall be developed and given by suitably qualified personnel and in a language and medium understood by workers/employees.

5.10.2 Awareness Environmental and Social Program

Environmental and social awareness should be fostered among the project's workforce to encourage the implementation of environmentally and socially sound practices throughout the duration of the project (construction, operation, decommissioning/closure/post closure). The awareness programme ensures that environmental accidents are minimized and environmental compliance maximized. The onus is on the different parties involved in the various phases of the project to be environmentally and sociably conscious. Contractors should forward internal environmental awareness procedures to the Project Developer for comment prior to the commencement of the project.

Environmental and social awareness could be fostered in the following manner:

- Induction course for all workers on site, before commencing work on site.
- Refresher courses as and when required.
- Daily toolbox talks at the start of each day with all workers coming on site, where workers might be alerted to particular environmental or social concerns associated with their tasks for that day or the area/habitat in which they are working.

5.10.3 Supporting Databases

The Project Developer shall develop and maintain computer-based environmental management databases in order to keep track of all data collected or to be during the preparation of the project and its implementation. The databases should include:

- Monitoring information such as:
  - Location code, description (including elevation) and map reference
  - Sampling interval
  - Sampling date and time
  - Variable
  - Unit of measure
  - Result
  - Comparison with relevant guideline
  - Quality assurance / quality control information

The databases should be readily accessible to relevant personnel to allow timely and informed decisions to be made.

5.10.4 Documentation and Report Keeping

A document handling system shall be established to ensure accurate updating of ESMMP documents, and availability of all documents required for the effective functioning of the ESMMP. The document handling system should be devised by the Project Developer and/or Contractor, and agreed upon by all key parties. Responsibilities shall be assigned to relevant personnel for ensuring that the ESMMP documentation system is maintained and that document control is ensured through access by, and distribution to, identified personnel.

Supplementary ESMMP documentation could include:

- ESMMP implementation activity specifications (including Method Statements);
- Standard operation procedures;
- Site instructions;
- Quality assurance reports;
- Emergency preparedness and response procedures;
- Incident reporting and responses records;
- Personnel induction and training records;
- Site inspection reports;
- Monitoring reports;
- Auditing reports; and
- Complaints received and action taken.

The Project Developer Environmental and Social Department shall be responsible for ensuring that the registration and updating of all relevant ESMMP documentation is carried out.

5.10.5 Reporting Procedures

Reporting procedures for conveying information from the monitoring activities should be developed in order to ensure that management is able to take rapid corrective action should certain thresholds be exceeded.

Project-specific ESMMPs shall include reporting procedures for dealing with:

- Internal Monitoring and Inspection
- Incident, Accident and Emergency
- Measuring performance indicators and interpreting and acting on the indicators;

- Training programmes and evidence of appropriate levels/amount of skills/capacities created.

In addition, Monthly and Annual Report should be prepared and send to MONRE for information.

5.10.6 Auditing

A procedure should be developed by the Project Developer for conducting ESMMP audits, and should incorporate processes for scheduling and reporting, as well as the timing and frequency of the audits.

The audit shall assess whether ESMMP implementation has been undertaken according to planned arrangements and that the ESMMP itself is being appropriately updated. The audit shall confirm that identified corrective actions have been undertaken and then assess the effectiveness of such actions. The timing of audits should be included in the implementation schedule in the ESMMP.

The audit shall also assess whether objectives and targets have been met and whether there are variances from the stipulated ESMMP and legal requirements.

5.10.7 Responding to Non-Compliance

The system for dealing with non-compliances (i.e. incentives or disincentives for conformance and non-conformance with the ESMMP requirements) to be employed by the Project Developer will vary depending on the type and specific nature of the project. The system to be used shall be described in the ESMMP, included in the tender documents and contracts, and made clear to all project workers.

5.10.8 Management, Review and Approval of the ESMMP

ESMMPs should be dynamic, flexible and subject to periodic review during and before the start of each project cycle phase. The extent to which ESMMPs should be reviewed will vary depending on the project or activity. Where the major negative impacts are associated with the construction or operation phases, the ESMMP may require revision during the implementation of these phases. Significant changes in the ESMMP shall be submitted to MONRE for review and approval.

The EIA Decree 112/PM (Article 18) requests that *'6 months prior to the completion of the construction phase, the project developer must review and evaluate the implementation of the measures to minimize the impacts on environment and society or the 'ESMMP' during the period of construction of the investment project, as well as improve the measures to minimize impacts on environmental and society or the 'ESMMP' for the operation period of the project and then request the MONRE to approve. During the operation of the project, the project developer must review and improve measures to minimize the impact on environmental and society or the environmental management and monitoring plan, and the social management and monitoring plan in each period, 2 - 5 years (the period for reviewing and improving the ESMMP depends on the complexity of the investment project) and then submit it to the MONRE to consider and approve.'*

Conditions under which the ESMMP would require revision include:

- Changes in legislation;
- Occurrence of unanticipated impacts or impacts of greater intensity, extent and significance than predicted;
- Inadequate mitigation measures (i.e. where environmental performance does not meet the required level despite the implementation of the mitigation measure); and

- Secondary impacts occur as a result of the mitigation measures.

Senior management responsible for a project shall conduct a review of the ESMMP and its implementation to ensure that the ESMMP remains effective and appropriate. A review shall be conducted at each of the following phases, before continuation to the next phase of the project cycle:

- Construction;
- Operation;
- Decommissioning/closure/post closure

5.10.9 Implementation Budget and Schedule

5.10.8.1 Budget

The budget for the implementation of the ESMMP shall include the following costs:

- Project Developer Environmental and Social Department;
- Implementation of management plan (management actions). These cost will be presented by management action plans and by project cycle phase;
- Internal monitoring including the budget for purchasing, operating and maintenance of measurement equipment. These cost will be presented by management action plans and by project life-cycle phase;
- External monitoring;
- Auditing;
- Public Consultation;
- Training
- Awareness

The budget for external institutional monitoring will be presented for:

- Project ESMU
    - Equipment
    - Staff
    - Training
    - Vehicle
    - Office
- MONRE
    - Transportation
    - Accommodation
    - Allowances
    - Monitoring cost

This budget will be updated each year and/or after any revision of the ESMMP as stipulated in the EIA Decree or the ECC conditions.

5.10.8.2 Implementation Schedule

The ESMMP implementation schedule will be described in this section. The implementation schedule should be presented on Gantt Chart (or equivalent). All major activities described in the management and monitoring plan should be presented.

The implementation schedule should be quite detailed for the project start period since it is usually a critical phase of any project development, in particular for:

- Preparation of the internal and external monitoring (measurement and analysis equipment, sampling station, baseline data collection);
- Setting up of the Environmental and Social Developer Office and the ESMU;

- Organisation of the Project Information Centre and Complaints and Grievances Mechanisms

6 Requirements for EIA Reporting

6.1 Methodology requirements

The Scoping Report, EIA Report, Environmental and Social Management and Monitoring Plan (ESMMP), and the Development plans must be presented in a clear and concise way and must be limited to the elements relevant to the understanding of the project and its impacts. What can be schematised or presented on a map, must be; and this at appropriate scale. The methods and the criteria used must be presented and explained in stating, when it is possible, their reliability, their degree of accuracy and their limits of interpretation. Regarding the description of the environment, elements allowing the assessment of their quality (location of the stations of inventory and sampling, dates of inventory, used techniques, limitations) must be provided. Sources of information must be provided in reference. The name, occupation and the function of the persons having contributed to the realization of study must also be indicated.

As far as possible, information must be presented in a synthetic manner in form of tables, figures, drawings, maps and the data (quantitative as well as qualitative) collected or produced during the preparation of the EIA must be analysed.

Any information making easier understanding or the interpretation of data, such the methods of inventory, should be provided in a distinct section in order to facilitate the reading of the text.

International Standard System of Units (SI or Système International d'unités) must be used within the EIA Report, ESMMP and appendixes. In case, other unit system is used, the conversion to the SI must also be presented.

In case there is sufficient evidence to prove that the report is copied from another investment project, the report will be rejected (EIA Decree (No 112/PM, Article 15, f (2) (c)).

6.2 Confidentiality issues

The Lao PDR Decree of Environmental Impact Assessment (No 112/PM, 16 February 2010) defines at Article 32 the management of confidential information during the EIA process. In general, MONRE may consider keeping some information presented in the EIA Report and ESMMP confidential upon written request (enclosed with the information in question) from the Project Developer. This information includes:

- Information on privacy of individual;
- Information on property;
- Information on license

MONRE shall conclude within 25 public working days whether, all or some part of, the information in question is confidential or not. In the case the submitted information is considered confidential, that information should be kept confidential for 4 years. If the Project Developer wishes to extend this period, a request must be submitted to MONRE 60 public working days prior to the expiry date, otherwise the information will not be regarded as confidential information anymore.

6.3 Requirements relating to the report preparation and printing

6.3.1 Scoping Report and TOR for EIA

The Project Developer shall initially send 4 hardcopies and a softcopy (PDF, Portable Document Format) of the Scoping Report and TOR for EIA, including color maps, diagram, layout, etc. to MONRE. After administrative review will be completed and the Scoping Report and TOR accepted for technical review, the Project Developer shall send additional 10 hardcopies and a softcopy of the Scoping Report and TOR for EIA, including color maps, diagram, layout, etc.

For each additional revision, the Project Developer shall prepare 10 hardcopies and a softcopy of the Scoping Report and TOR for EIA.

6.3.2 EIA Report, ESMMP and Development Plans

The Project Developer shall initially send to MONRE 4 hardcopies and a softcopy of the EIA Report, ESMMP and Development Plans, including color maps, figures, diagrams, layout, etc. for administrative review. In case MONRE is not satisfied with the report, additional 4 hardcopies and a softcopy of the revised version of those reports and plans, including color maps, figures, diagrams, layout, etc., should be prepared and send to MONRE for completion of the administrative review. The revised softcopy should be presented in two different files; one with track changes to facilitate the review and one clean version (without track changes).

When this first review step is completed and the EIA Report, ESMMP and Development Plans accepted for technical review, the Project Developer shall send additional 15 hardcopies of those reports and plans, including color maps, figures, diagrams, layouts, etc.

For each additional revision, the Project Developer shall provide to MONRE 2 hardcopies and a softcopy of the EIA Report, ESMMP and/or Development Plans. MONRE will inform the Project Developer if additional copies are required.

When the EIA Report, ESMMP and Development Plans are accepted by MONRE, the Project Developer shall provide to MONRE 15 hardcopies and a softcopy of the final version of those reports and plans, including color maps, figures, diagrams, layouts, etc.

Note that the number of hardcopy may be higher or lower according to the magnitude of the project and number of stakeholders requesting the document. Requirement for disclosure of information (information centre (s)), is not included and should be the responsibility of the Project Developer, under supervision of MONRE.

6.4 Other requirements from MONRE

The EIA Guidelines will be in trial period for a period of 2 years. During this period is this requested to the Project Developers, the EIA Consultants and other EIA Practitioners to strictly follow these guidelines. In case any improvement is required, the Project Developers, EIA Consultants, EIA Practitioners or stakeholders should contact the Department of Environmental and Social Impact Assessment of MONRE.

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Appendix 1: List of Projects subject to EIA

Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

The Prime Minister Office
Water Resources and Environment Administration of Lao PDR

No. 697 /PMO -MONRE
Vientiane Capital, 12 Mar 2010

Agreement on List of Investment Projects subject to IEE and EIA

- Pursuant to Decree of Prime Minister on Nomination and TOR of MONRE, No. 149/PM, dated 10 May 2007
- Pursuant to Decree of Prime Minister on Environment Impact Assessment, No. 112/PM, dated 16 February 2010

Minister of Prime Minister's office

Head of Water Resources and Environment Administration

Article 1: List of Projects subject to IEE and EIA. They are separated into 2 groups: Project classifies under Group I is required to perform IEE and project classifies under Group II is required to perform EIA. The list of project subject to IEE and EIA is hereby promulgated.

Article 2: Individual, entity, public and private sectors must comply with the Decree.

Article 3: DESIA (MONRE) has the responsibility to coordinate with the stakeholders.

Article 4: This decree shall enter into force on the date it is signed.

Minister of Prime Minister's office

Head of Water Resources and Environment Administration

Khampheng Pholsena

List of Investment Projects subject to perform IEE or EIA

The project lists are including of project type, project size. There were separated in to 2 groups: Group I is required to perform FS to IEE and Group II is required to perform FS to EIA. There are 5 types of sectors as follow: (1) Energy Sector; (2) Agriculture and Forestry Sector); (3) Industrial Sector; (4) Infrastructure Sector; (5) Mining Sector

		Category 1	Category 2
Type of investment projects		**IEE**	**EIA**
I. Energy Sector Development Project			
1.1	Hydro power plant project	< 15 MW or reservoir capacity <200 ,000,000 m^3 or reservoir area < 1,500 ha	≥ 15 MW or reservoir capacity > 200,000,000 m^3 or reservoir area > 1,500 ha
1.2	Nuclear power plant project		All
1.3	Natural gas power plant project	5-50 MW	> 50 MW
1.4	Coal power plant project	≤ 10MW	> 1 0MW
1.5	Gas and oil pipeline project		All
1.6	Oil refinery project		All
1.7	High voltage electrical power line project		
1.7.1	High voltage >230 kV	≤ 50 km	> 50 km
1.7.2	High voltage <230 kV	All	In case the transmission line goes through NPAs or urban areas
1.7.3	High voltage transformer substation	< 1 0ha	> 1 0ha
II. Agriculture and Forestry Development Project			
2.1	Forest plantation project	20 –300 ha	> 300 ha
2.2	Agricultural products and herbal flora plantation for supplying to industrial work	20– 500ha	> 500 ha
2.3	Irrigation construction project	100– 2, 000ha	> 2,000 ha
2.4	Cattles farm (e.g. cow, buffalo, horse and others)	> 500 units	
2.5	Poultry farm	> 1,000 chickens	
2.6	Pig farm	> 2 00pigs	
2.7	Fish raising and aquaculture project (fish raising in the pond)	>10 ha	
2.8	Fish raising and aquaculture project (fish cage raising in the	>300 m^3	

	river)		
2.9	Crocodile farm	> 100Ton	
III. Industrial sector development project			
3.1	Meat production, processing and storages and production factory	≤ 20 Ton/day	> 20 Ton/day
3.2	Fish processing, storages and production factory	≤ 20 Ton/day	> 20 Ton/day
3.3	Fruit/vegetable processing and storages and production factory	All	
3.4	Milk manufacturing plan	≤ 40Ton/day	> 4 0 Ton/day
3.5	Tapioca factory	50 – 100 Ton/day	> 100 Ton/day
3.6	Feedstuff factory	All	
3.7	Sugar factory	≤ 50 Ton/day	> 50 Ton/day
3.8	Foodstuff factory	>1 Ton/day	
3.9	Alcohol, wine, beer production factory	≤ 500,000 L/yr	> 500,000 L/yr
3.10	None alcoholic production factory (soda, soft drink, mineral waters production)	All	
3.11	Pure drinking water factory	All	
3.12	Tobacco factory	All	
3.13	Fabric, thread, fibre production factory	All	
3.14	Clothes, decoration and painting, animal hairs production factory	All	
3.15	Animal skin processing factory	All	
3.16	Leather production factory (handbag, luggage, saddle...)	≤ 1,000,000 Pc/yr	≤ 1,000,000 Pc/yr
3.17	Leather shoes production factory	≤ 1,000,000 Pair/yr	> 1,000,000 Pair/yr
3.18	Handicraft Factory (using wood, bamboo, straw...)	All	
3.19	Bamboo production factory	≤ 100,000 m^2/yr	100,000 m^2/yr
3.20	Paper and pulp production plant project	≤ 50 Ton/day	> 50 Ton/day
3.21	Printing service and stationary production plant project	All	
3.22	Petroleum industry		All
3.23	Basic chemical production factory besides chemical fertilizer and production that contained acid	≤ 500 Ton/yr	> 500 Ton/yr
3.24	Pesticide and chemical fertilizer production factory		All

3.25	Medical supplies, equipment and traditional medicine factory	≤ 500 Ton/yr	> 500 Ton/yr
3.26	Soap and detergent, cleansing material, brush, perfume and other cosmetic factory	≤ 10 Ton/day	> 10 Ton/day
3.27	Chemical production factory		All
3.28	Rubber processing factory	100 – 300 Ton/yr	> 300 Ton/yr
3.29	Plastic factory project	≤ 500 Ton/yr	> 500 Ton/yr
3.30	Glass industry and glass production factory	All	
3.31	None metallic ores production factory	All	
3.32	Cement, lime and plaster cement factory	≤ 30 Ton/hr	> 30 Ton/hr
3.33	Steel and iron smelting factory	≤ 120 Ton/day	> 120 Ton/day
3.34	Non-Ferrous metal smelting factory	≤ 50 Ton/day	> 50 Ton/day
3.35	Steel processing factory	≤ 50 Ton/day	> 50 Ton/day
3.36	Non-Ferrous metal processing factory	All	
3.37	Metal frame, tank, basin/sink production factory	All	
3.38	Dynamo production factory	All	
3.39	Domestic appliances production factory	All	
3.40	Office material equipment, accounting stationeries and computer production plant	All	
3.41	Generator and apparatus production factory	All	
3.42	Battery and dry cell battery production factory	≤ 100 Ton/yr	> 100 Ton/yr
3.43	Radio, television and communication device and tool production factory	All	
3.44	Medical equipment, meter and eyesight, watch and clock factory	All	
3.45	Vehicle assembly plant (light truck, heavy truck and semi trailer etc)	All	
3.46	Spare parts and vehicle parts and engine factory	≤ 1,000 Ton/yr	>1,000 Ton/yr
3.47	Bicycle and wheel of disable people	≤ 10,000 Unit/yr	> 10,000 Unit/yr
3.48	Furniture factory	≤ 10,000 products/yr	> 10,000 products/yr

3.49	Storage of solid waste not producing hazardous	All	
3.50	Disposal of solid waste producing hazardous		All
3.51	Solid waste treatments and environment management		All
3.52	Water supply factory	All	
IV. Infrastructure and Service Development Project			
4.1	Lake, river, channel land filling project impacts on public		All
4.2	Dormitories, resettlement construction project	> 50 rooms	
4.3	Golf course construction plant project	9 holes	
4.4	Multi-games sport project		All
4.5	Petrol depot construction project	600 – 60,000 barrels	
4.6	Industrial zone construction and development project		All
4.7	Special economic zone construction and development project		All
4.8	Inland waterway navigation project	All	
4.9	Waste water treatment plant project (waste water from district, hospital and industrial processing factory)		All
4.10	Road construction through national or provincial protected areas		All
4.11	New railway construction project		≥ 100 km
4.12	New road construction project (national, provincial, district, urban, extra construction)		All
4.13	Road improvement project (national, provincial, district, extra road improvement)	All	
4.14	Road rehabilitation or upgrading project (national, provincial road rehabilitation)	All	
4.15	New runway airport construction project	1,000 – 2,500 m	>2,500 m
4.16	Hospital construction project	≤ 100 beds	> 100 beds
4.17	Hotel or resort construction project near the river	≤ 80 rooms	> 80 rooms
4.18	Hotel or resort construction project	≤ 50 ha	>50 ha

4.19	Tourism and resort development project in the National or provincial protected area		All
4.20	Solid domestic waste recycle plant project	All	
4.21	Incinerator for domestic solid waste project		All
4.22	Incinerator for industrial solid waste project		All
4.23	Project using part or whole national or provincial protected area, historical or cultural vestiges, or unique landscape, conservation area of local authorities		All
4.24	Telecommunication network construction project	All	
4.25	River communication (improvement of river channel for boat)	≤ 200 Ton	> 200 Ton
4.26	Port construction project		
4.26.1	Passenger port	≤ 500 Ton DWT	> 500 Ton DWT
4.26.2	General transportation port	≤ 500 Ton DWT	> 500 Ton DWT
4.26.3	Transportation port producing hazardous such as chemical, engine oil		All
4.27	Embankment construction project		> 1 km
4.28	Community solid waste management construction	≤ 50 ha	> 50 ha
4.29	Solid waste management construction		All
4.30	Industrial solid waste landfill site project		All
V. Mining and extractive industry			
5.1	Groundwater usage for industrial, agricultural, and urbanized consumption project	≤ 4,500 m^3/day	> 4,500 m^3/day
5.2	Extraction of stone, gravel and sand from the river	1,000 – 50,000 m^3/day	> 50,000 m^3/yr (per point)
5.3	Rock drilling and processing	≤ 50 Ton/day	> 50 Ton/day
5.4	Dredging draw materials from soil for construction)soil ,stone , sand(	<100,000 m^3/yr	≥ 100,000 m^3/yr
5.5	Metallic minerals ore (without chemical processing(		All
5.6	Metallic minerals ore with		All

	chemical processing		
5.7	Metallic minerals ores processing	≤ 50,000 Ton/yr	> 50,000 Ton/yr
5.8	Groundwater dredging project		> 5,000 m^3/day
5.9	Groundwater usage project		> 10,000 m^3/day
5.10	Mineral waters dredging project (surface and groundwater) for uses and/or consumption		> 1,000 m^3/day
5.11	Mineral waters dredging project (surface and groundwater) for bathing, medical counteraction (skin diseases) and other		> 500 m^3/day
5.12	Extraction of metallic ores using chemical		All
5.13	Dredging petroleum and natural gas project		All

Remark: For Investment Project under Industrial Sector (Please refer to Section III) which are not included in this list, please refer to the list of projects of Ministry of Industry and Commerce.

Appendix 2: Scoping Report – Table of Content

Scoping Report – Table of Content

Appendix 3: Example of Impact Identification and Assessment Matrix

Appendix 4: TOR for EIA – Table of Content

Terms of Reference for EIA – Table of Content

Executive Summary

1.0 Introduction
- 1.1 Presentation of the Project Developer
- 1.2 Presentation of the Environmental and Social Consultant
- 1.3 Presentation of the Associate Organisations
  - 1.3.1 Laboratory (including accreditations)
  - 1.3.2 University
  - 1.3.3 Others
- 1.4 Project Outline
- 1.5 Report Layout

2.0 Policy, Legal and Institutional Framework
- 2.1 Corporate Environmental and Social Policies (if applicable)
- 2.2 Policy and Legal Framework
- 2.3 International Conventions, Treaties and Agreements
- 2.4 Lao PDR Government Institutional Framework
- 2.5 International Policies, Guidelines and Standards (if applicable)
- 2.6 Project' Environmental and Social Standards

3.0 Project Description
- 3.1 Project Rationale and Background
- 3.2 Project Location
- 3.3 Project Infrastructure
- 3.4 Alternatives to the Project
- 3.5 Comparison and Selection of Alternative
  - 3.5.1 Methodology
- 3.6 Description of the Selected Alternative
  - 3.6.1 Technical Description of the Selected Alternative
  - 3.6.2 Pre-Construction Activities
  - 3.6.3 Construction Activities
  - 3.6.4 Operation Activities
  - 3.6.5 Decommissioning/Closure/Post Closure Activities

4.0 Baseline Study
- 4.1 Setting the Study Limits
- 4.2 Outline of Content

  Based on the results from the Scoping Report, the Project Developer shall provide the following details for the each Physical, Biological, Socio-Economic, Cultural and Visual Component that must be described for the preparation of the EIA Report.
  - 4.2.1 Related Environmental Issues
  - 4.2.2 Objectives of Study
  - 4.2.3 Scope of Study
  - 4.2.4 Method of Study
    - 4.2.4.1 Compilation of secondary data
    - 4.2.4.2 Survey for primary data collection (description of activities)
      - e.g. for Physical and Biological surveys the following information shall be provided

- *Sampling and analysis (including parameters)*
- *Field Analysis(including parameters)*
- *Laboratory Analysis(including parameters)*
- *Analytical result interpretation and assessment*

– e.g. for Socio-economic surveys the following information shall be provided
  - *Type of survey (specific socio-economic surveys like household survey, communication leader interviews, collection of data from government organizations at national, provincial, district levels, field survey for land use characteristics, water supply quality (chemical and physical parameters, health survey, collection of diseases data at hospital, clinic centres etc, review nutrition condition for children, etc*
  - *Area of survey*
  - *Field Analysis(including parameters)*
  - *Laboratory Analysis(including parameters)*
  - *Analytical result interpretation and assessment*

4.2.4.3 Mapping

4.2.4.4 Level of Efforts

4.2.4.4.1 Qualification of specialists

4.2.4.4.2 Time for literature review

4.2.4.4.3 Time for field surveys by specialist

4.2.4.4.4 Time for reporting by specialist

4.2.4.4.5 Number of field surveys

4.3 Physical Components

4.3.1 Outline of Content

4.3.2 Climate/Meteorology (including climate change)

4.3.3 Topography

4.3.4 Geology/Seismology

4.3.5 Soils

4.3.6 Natural Hazards

4.3.7 Hydrology

4.3.8 Erosion and Sedimentation

4.3.9 Surface and Groundwater Quality

4.3.10 Mineral Resources

4.3.11 Noise and Vibration

4.3.12 Air Quality

4.3.13 Others

4.4 Biological Components

4.4.1 Terrestrial Ecology/Wildlife

4.4.2 Forest/Vegetation Cover

4.4.3 Aquatic Biota and Habitats

4.4.4 Wetlands

4.4.5 Protected Areas

4.4.6 Biodiversity

4.5 Socio-Economic Components

4.5.1 Outline of Content

4.5.2 Administrative Organizations and Limits

4.5.3 Social Profile

4.5.4 Population and Communities

4.5.5 Economic Activities

4.5.6 Employment

4.5.7 Vulnerable Groups

4.5.8 Health Profile

4.5.9 Land Use (current and planning)

4.5.10 Infrastructure Facilities

4.5.11 Water Use and Water Supply

4.5.12 Transportation

- 4.5.13 Navigation
- 4.5.14 Energy Sources
- 4.5.15 Agriculture
- 4.5.16 Forestry
- 4.5.17 Fisheries/Aquaculture
- 4.5.18 Industries
- 4.5.19 Mineral Development
- 4.5.20 Tourism
- 4.5.21 UXO
- 4.5.22 Others

4.6 Cultural Components
- 4.6.1 Archaeology
- 4.6.2 Temples, Monuments
- 4.6.3 Minority Groups
- 4.6.4 Others

4.7 Visual Components
- 4.7.1 Aesthetic
- 4.7.2 Point of Interests
- 4.7.3 Landscape
- 4.7.4 Others

5.0 Impact Assessment and Mitigation Measures

5.1 Impact Assessment Methodology
- 5.1.1 Scope of Assessment
- 5.1.2 Geographical Scope: Study Area Boundaries
- 5.1.3 Temporal Scope
- 5.1.4 General Methodology
- 5.1.5 Methodology for the determination of Significance
- 5.1.6 Mapping
- 5.1.7 Key Issues and Selection of Valued Ecosystem Components
- 5.1.8 Modeling Requirements
  - 5.1.8.1 Outline of Content
    - 5.1.8.1.1 Methodology
    - 5.1.8.1.2 Model
    - 5.1.8.1.3 Specialist
  - 5.1.8.2 Air Emissions
  - 5.1.8.3 Green-house Gases
  - 5.1.8.4 Surface Water Quality
  - 5.1.8.5 Groundwater Quality
  - 5.1.8.6 Noise
  - 5.1.8.7 Climate Change
  - 5.1.8.8 Natural Hazards
  - 5.1.8.9 Others (as required)
- 5.1.9 Outline of Content

  For each of the following Biophysical Component, the Project Developer will detail the following information:
  - 5.1.9.1 Pre-Construction Phase
    - 5.1.9.1.1 Potential Impacts
    - 5.1.9.1.2 Proposed Mitigation Measures
    - 5.1.9.1.3 Residual Impacts
    - 5.1.9.1.4 Proposed Monitoring
  - 5.1.9.2 Construction Phase
    - 5.1.9.2.1 Potential Impacts
    - 5.1.9.2.2 Proposed Mitigation Measures
    - 5.1.9.2.3 Residual Impacts
    - 5.1.9.2.4 Proposed Monitoring
  - 5.1.9.3 Operation Phase
    - 5.1.9.3.1 Potential Impacts
    - 5.1.9.3.2 Proposed Mitigation Measures
    - 5.1.9.3.3 Residual Impacts

7.4 Cumulative Impact Assessment
7.5 Development of a Management Framework
8.0 Environmental and Social Management and Monitoring Plan
8.1 Context of the ESMMP
8.1.1 Context of the Project
8.1.2 Project Developer's Environmental and Social Policies and Commitments
8.1.3 Institutional Arrangements
8.1.4 Legal Requirements
8.1.5 Summary of Impacts and Mitigation Measures
8.2 Management and Monitoring Plans
8.2.1 Outline of Content
8.2.1.1 By Project Phases
8.2.1.1.1 Design
8.2.1.1.2 Pre-Construction
8.2.1.1.3 Construction
8.2.1.1.4 Operation
8.2.1.1.5 Decommissioning/Closure/Post Closure
8.2.1.2 Methodology for Management Plans
8.2.1.2.1 Objectives
8.2.1.2.2 Context
8.2.1.2.3 Legal Requirements
8.2.1.2.4 Management Actions
8.2.1.2.5 Monitoring Plans
8.2.1.2.6 Implementation Schedule
8.2.1.2.7 Responsibilities
8.2.2 Management and Monitoring Plans
8.2.2.1 Thematic Management Plan
8.2.2.1.1 Noise management plan
8.2.2.1.2 Air quality management plan
8.2.2.1.3 Erosion and sedimentation management plan
8.2.2.1.4 Water quality management plan
8.2.2.1.5 Site clearing and landscaping plan
8.2.2.1.6 Rehabilitation and re-vegetation management plan
8.2.2.1.7 Biodiversity and conservation management plan
8.2.2.1.8 Worker accommodations management plan
8.2.2.1.9 In-migration management plan
8.2.2.1.10 Solid waste management plan
8.2.2.1.11 Water use management plan
8.2.2.1.12 Materials handling and storage (e.g. hazardous substances) management plan
8.2.2.1.13 Leak and spillage management plan
8.2.2.1.14 Wastewater and stormwater management plan
8.2.2.1.15 Transportation management plan
8.2.2.1.16 Communicable diseases management plan
8.2.2.1.17 Occupational health and safety management plan
8.2.2.1.18 Community health and safety management plan
8.2.2.1.19 Archaeological and cultural heritage management plan
8.2.2.1.20 Employment and training management plan
8.2.2.1.21 Investment and procurement management plan
8.2.2.1.22 Visual protection management plan
8.2.2.1.23 Others
8.2.2.2 Site Specific Management Plan
8.2.2.2.1 Temporary access road management plan
8.2.2.2.2 Permanent access road management plan
8.2.2.2.3 Borrow pit management plan
8.2.2.2.4 Workers camp management plan
8.2.2.2.5 Refinery management plan
8.2.2.2.6 Others
8.2.3 Emergency Plan

Appendix 5: Form of Confirmation and Letter of Undertaking for EIA/ESMMP

[Letterhead of Company
(or if Company not yet formed, of the Lead Sponsor)]

Ministry of Natural Resources and Environment
[_____]
[_____]
Vientiane, Lao PDR

Attn: [_____]
[_____ Department]

Re: Environmental Impact Assessment Report in respect of the [_____] Project (the "EIA including ESMMP")

Dear [_____],

We refer to the captioned EIA which was prepared and finalized by [***insert name of Consultant(s) preparing the EIA)***][1] in accordance with the ***[_____ insert name of law / regulation establishing the requirement for preparation / submission of the EIA and the matters it is required to address***] under instruction by [***the Lead Sponsor***], dated [_____] and formally submitted by [_____ ***insert name of entity submitting the EIA***] to [_____ ***insert name of receiving Department at MONRE***] under letter dated [_____].

Intending to be legally bound hereby and financially liable to [***GOL / MONRE***] hereunder, we:

a. Endorse and confirm to [***GOL / MONRE***] the accuracy and completeness of the EIA,

b. Confirm and undertake to [***GOL / MONRE***] that the EIA has been prepared in strict compliance with applicable Lao PDR law including EIA Decree No. 112/PM and with the Terms of Reference dated [_____] as approved by [***GOL / MONRE***] on [_____] as evidenced by the [_____ ***Certificate / Letter of Approval*** issued on such date], and

c. Confirm and undertake to [***GOL / MONRE***] that the Project Company established by [***the Lead Sponsor***] in respect of the [_____] Project shall at all times comply

[1] NOTE: If more than one Consultant has prepared the EIA (or OP-ESMMP), or if the Lead Sponsor and / or other Sponsors or the Project Company have had any role in the preparation of the EIA, a table clearly and comprehensively outlining the division of work among each shall be attached as a Schedule to this confirmation letter. Note, further, that regardless of who has prepared the EIA, the entity submitting this confirmation letter shall bear full responsibility for the EIA and its contents, completeness and accuracy.

fully with: (i) any and all commitments and obligations as set forth in the EIA, and (ii) any and all plans and the various components thereof including without limitation impact avoidance, mitigation, and remediation measures, and with respect to both (i) and (ii), including but not limited to such commitments, obligations, plans and measures as relate to the development, construction, commissioning, operation and maintenance of the Project, and any circumstance in which work done or to be done, or services performed or to be performed in connection with the Project's development, construction, commissioning, operation and maintenance is carried out or intended or required to be carried out by any contractor, subcontractor or other party.

d. We acknowledge and agree that any failure to so comply shall subject us to liability for breach of this undertaking and that, in addition to making financial compensation to [***GOL / MONRE***] and the payment of any applicable penalties under law or under the Project's Concession Agreement and its appendixes, [***we / Project Company***] shall be responsible to [***GOL / MONRE***] to carry out and to bear all costs of the immediate and proper rectification of the event of non-compliance and any effects thereof.

e. We acknowledge and agree, further, that any failure to so comply may be treated by [***GOL / MONRE***] as a breach by the Project Company under the Concession Agreement which, if not rectified in accordance with the terms and conditions of the Concession Agreement, and may lead to termination or other due exercise by GOL of remedies available to it thereunder.

The issuance of this confirmation and undertaking has been duly authorized by all necessary corporate action and a copy of the resolution of the [***shareholders / Board of Directors***] authorizing it and the Power of Attorney explicitly granting signing authorization to the individual who has signed below are attached as schedules hereto.[1]

[_____ C., LTD.]

By _____
Name: _____
Title: _____

Schedules attach

[1] NOTE: MONRE should require an extract of the shareholders / Board resolution to be certified (by the CEO / General Manager) and attached to this undertaking along with a certified copy of a Power of Attorney properly empowering the named individual who has signed the confirmation and undertaking.

Appendix 6: EIA – Table of Content

EIA REPORT – TABLE OF CONTENT

Volume 1: EIA Report

Executive Summary
1.0 Context of the Project
- 1.1 Presentation of the Project and its justification
- 1.2 Related Projects and Development
- 1.3 Presentation of the Project Developer and the EIA Consultant(s)
- 1.4 Project Developer' Commitments
- 1.5 Structure of the EIA Report

2.0 Policy, Legal and Institutional Framework
- 2.1 Corporate Environmental and Social Policies
- 2.2 Policy and Legal Framework
- 2.3 International Conventions, Treaties and Agreements
- 2.4 Lao PDR Government Institutional Framework
- 2.5 International Policies, Guidelines and Standards (if applicable)
- 2.6 Project' Environmental and Social Standards

3.0 Project Description
- 3.1 Presentation of the Project and Description of Alternatives
  - 3.1.1 Project Rationale and Background
  - 3.1.2 Project Location
  - 3.1.3 Project Infrastructure
  - 3.1.4 Alternatives
- 3.2 Comparison and Selection of Alternative
  - 3.2.1 Methodology
  - 3.2.2 Comparison and Selection of Alternative
- 3.3 Description of the Selected Alternative
  - 3.3.1 Technical Description of the Selected Alternative
    - 3.3.1.1 Pre-Construction Activities
    - 3.3.1.2 Construction Activities
    - 3.3.1.3 Operation Activities
    - 3.3.1.4 Decommissioning/Closure/Post Closure Activities
  - 3.3.2 Detail Design

4.0 Description of the Environment
- 4.1 Setting the Study Limits
- 4.2 Physical Components
  - 4.2.1 Climate/Meteorology (including climate change)
    - 4.2.1.1 Methodology
    - 4.2.1.2 Description
  - 4.2.2 Topography
  - 4.2.3 Geology/Seismology
  - 4.2.4 Soils
  - 4.2.5 Natural Hazards
  - 4.2.6 Hydrology
  - 4.2.7 Erosion and Sedimentation
  - 4.2.8 Surface and Groundwater Quality
  - 4.2.9 Mineral Resources

- 4.5.4 Mapping
- 4.6 Visual Components
  - 4.6.1 Aesthetic
  - 4.6.2 Point of Interests
  - 4.6.3 Landscape
  - 4.6.4 Mapping

5.0 Impact Assessment and Mitigation Measures

- 5.1 Impact Assessment Methodology
  - 5.1.1 Scope of Assessment
  - 5.1.2 Geographical Scope: Study Area Boundaries
  - 5.1.3 Temporal Scope
  - 5.1.4 Methodology
    - 5.1.4.1 Assessment and Mitigation
    - 5.1.4.2 Thematic Presentation
    - 5.1.4.3 Site Specific Presentation
  - 5.1.5 Mapping
  - 5.1.6 Modeling Requirements
    - 5.1.6.1 Air Quality
      - 5.1.6.1.1 Methodology
      - 5.1.6.1.2 Results
      - 5.1.6.1.3 Mapping
    - 5.1.6.2 Surface Water Quality
    - 5.1.6.3 Groundwater Quality
    - 5.1.6.4 Noise
    - 5.1.6.5 Others
- 5.2 Identification of Impacts
- 5.3 Impacts, Mitigation Measures and Residual Impacts
  - 5.3.1 Biophysical Impact
    - 5.3.1.1 Air Quality
      - 5.3.1.1.1 Pre-Construction
      - 5.3.1.1.2 Construction
      - 5.3.1.1.3 Operation
      - 5.3.1.1.4 Decommissioning/Closure/Post Closure
    - 5.3.1.2 Surface Water Quality
    - 5.3.1.3 Groundwater Quality
    - 5.3.1.4 Erosion and Sedimentation
    - 5.3.1.5 Water Resources
    - 5.3.1.6 Fish and Fish Habitat
    - 5.3.1.7 Ecosystem
    - 5.3.1.8 Terrestrial Mammals, Amphibians and Reptiles
    - 5.3.1.9 Others
  - 5.3.2 Social Impact Assessment
    - 5.3.2.1 Communities and Services
      - 5.3.2.1.1 Pre-Construction
      - 5.3.2.1.2 Construction
      - 5.3.2.1.3 Operation
      - 5.3.2.1.4 Decommissioning/Closure/Post Closure
    - 5.3.2.2 Population and Communities
    - 5.3.2.3 Economic Activities
    - 5.3.2.4 Vulnerable Groups
    - 5.3.2.5 Land Use
    - 5.3.2.6 Infrastructure Facilities
    - 5.3.2.7 Water Use and Water Supply
    - 5.3.2.8 Energy Sources
    - 5.3.2.9 Transportation
    - 5.3.2.10 Navigation
    - 5.3.2.11 Public Health and Safety
    - 5.3.2.12 Occupational Health and Safety
    - 5.3.2.13 Agriculture

10.1.5 Livelihood Restoration Plan
10.1.6 Social Support Development Plan
10.1.7 Vulnerable Groups Development Plan
10.1.8 Others
10.2 Reference (Other Volumes)

Appendixes: (as example)

- Appendix 1: Mapping
  - Project Description
  - Description of the Environment
  - Impacts and Mitigation Measures
- Appendix 2: Description of the Project
  - Flow Diagrams
  - Layouts
  - Others
- Appendix 3: Specialist Reports
  - Fisheries Study
  - Sedimentation and Erosion Study
  - Socio-Economic Study
  - Others
- Appendix 4: Modeling Reports (if required)
  - Air Quality
  - Surface Water Quality
  - Groundwater Quality
  - Noise
  - Others
- Appendix 5: Public Consultation and Disclosure
  - Minutes of Meetings

Volume 2: ESMMP

Volume 3: Development Plans

Watershed Management Plan
Biomass Removal Plan
Resettlement Action Plan
Others

Appendix 7: Mapping – Project Presentation

Appendix 8: Mapping – Environmental Baseline Data - Examples

Appendix 9: Impact Assessment Methodology - Example

IMPACT ASSESSMENT METHODOLOGY

The assessment of environmental impacts is carried out in two steps: their identification and their evaluation. The sections 1 and 2 below describe each of these steps.

1. *Identification of Impacts*

The identification of positive or negative impacts caused by the project implementation is based on the analysis of effects resulting from interactions between the affected environmental components and the various equipment or activities to be carried out. The equipment and activities are thus considered as sources capable of producing changes in one or many of the sensitive environmental components.

Every element of the project is examined accordingly to its potential effects on each of the environmental components. The possible interactions between the different environmental components (indirect effects) are equally considered. The elements of the project linked to construction, operation, maintenance and closure phases are all considered.

During construction, the potential impact sources include:

- Building access roads;
- Development of the work site installations;
- Transportation and traffic caused by the moving of labour, machinery and construction materials;
- Deforestation;
- Earthwork and excavation, including dynamiting and drilling;
- Operating quarry and borrow pits;
- Disposal of excavated material;
- Work in watercourse (bridges, dams, port, etc.);
- Construction and development of facilities and the appurtenant structures;
- Waste disposal;
- Management of contaminated products;
- Job creation;
- Workforce accommodations;
- Procurement of goods and services;
- Others

During the operation, maintenance and closure period, activities that are sources of impacts are related to:

- Operation of equipment (noise, atmospheric emission, waste and dangerous goods management, purchase of goods and services, and job creation);
- Equipment maintenance and eventually equipment restoration;
- Equipment dismantling at end of its useful life.

The physical, biological or human environmental components which may be affected by the project are the sensitive elements in the study area, that is, those likely to change significantly because of components or activities linked to the project. They include:

- Air quality;
- Noise;
- Water quality;
- Sediment quality
- Soil Quality
- Terrestrial and aquatic vegetation
- Fauna;
- Threatened species
- Land use;
- Infrastructures;
- Cultural and archaeological heritage;
- Landscape;
- Economic activities;
- Others

2. Impact Assessment

When all the potential effects of a project on an environmental component have been identified, the importance of the predicted modifications of this component is evaluated.

For this second step, the methodological approach followed is adapted from impact assessment methods recommended by Hydro-Québec (1990), by the ministère des Transports du Québec (1990), by the ministère de l'Environnement et de la Faune du Québec (1996), by the Canadian Environmental Assessment Agency (1999) and by the World Bank (1991) and International Finance Corporation (Dec. 1998).

The approach used to assess environmental impacts of the project determines the **Intensity**, **Extent**, and **Duration** of the anticipated positive or negative impact. These three qualifiers are grouped under one synthesis indicator, the **Significance** of the impact. This indicator provides an overall assessment of the anticipated impacts on a given environmental component. Figure 1.1 schematically presents the basic process leading to assessment of the impact Significance.

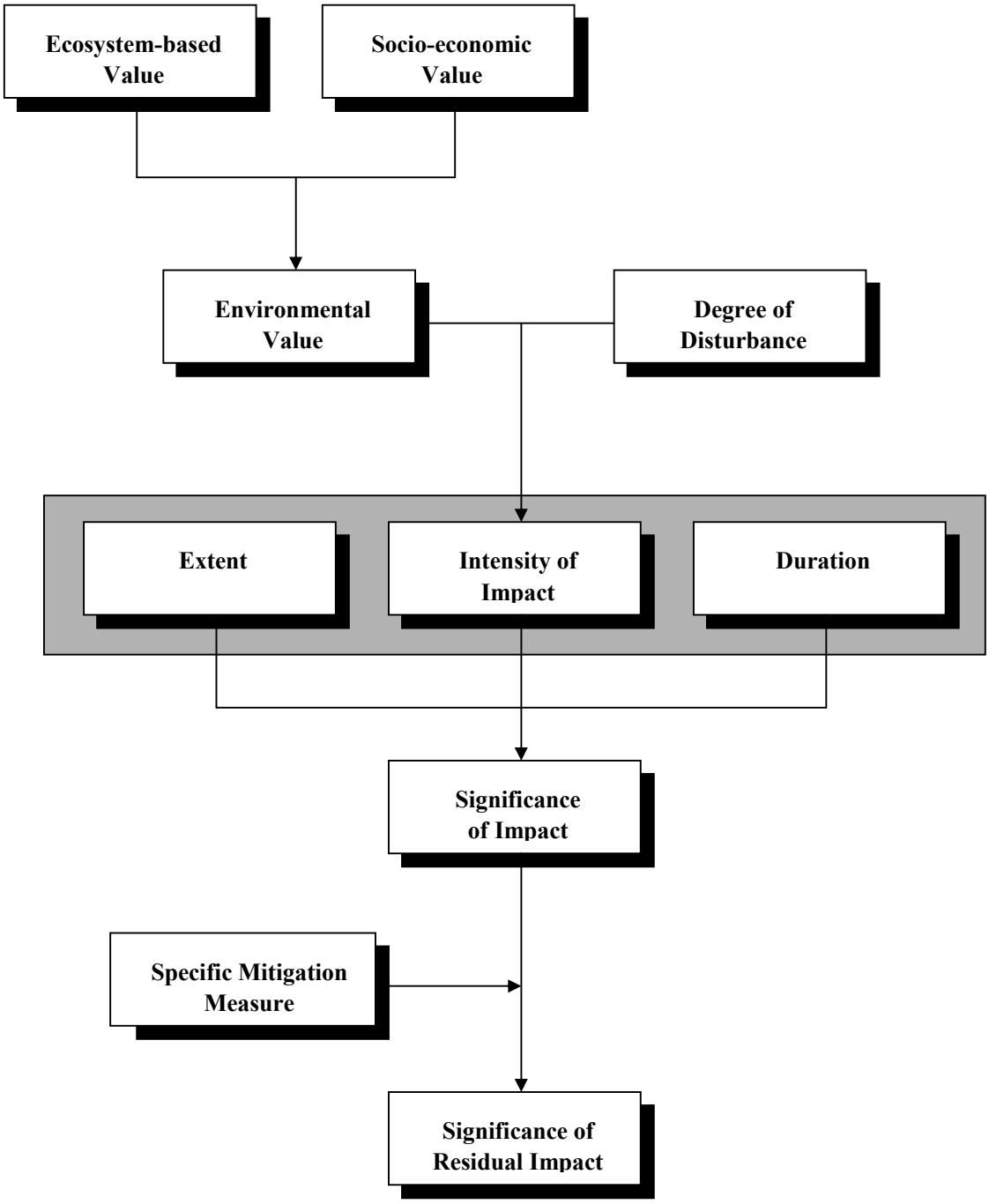
Although the impacts on the physical environment are described and quantified as accurately as possible, they cannot be assigned a value in and of themselves. Impacts on physical components, for example water quality, can only be assessed in terms of their resulting impacts on biological and human components, and not through its intrinsic value. The effects of changes on the physical environment, therefore, serve as input to the assessment of impacts on the biological and human environments.

2.1 Intensity of the Impact

The **Intensity** of an impact expresses the relative importance of consequences attributable to a change in an environmental component. The **Intensity** of impact is an integration of the component's **Environmental Value** with its **Degree of Disturbance** and can be either positive or negative.

The **Environmental Value** of a component is the synthesis of its **Ecosystem-Based Value** and its **Social Value**.

Figure 1: Impact Assessment Methodology



The **Ecosystem-Based Value** expresses the relative importance of a component to the ecosystem as measured by its function or role. It integrates other notions as representativeness, patterns of use, diversity, or rare or unique characteristics. This value is the result of the judgment of specialists based on a systematic analysis of the characteristics of the environmental component.

The **Ecosystem-Based Value** of a given component is considered:

- **High**, when the component is of major interest in terms of its ecosystem-based function, biodiversity, or exceptional qualities and there is a consensus in the scientific community that it should be conserved or protected;
- **Medium**, when the component is of strong interest and recognized qualities, and there is concern, although not consensus, for its conservation or protection; and
- **Low**, when the component holds little interest, has few notable qualities, and there is little concern for its conservation or protection.

The **Social Value** of a component expresses the relative importance attributed to the component by the public, the various levels of government, or any other legislative or regulatory authority. The **Social Value** indicates the popular or political desire or will to conserve the integrity or the original character of a component. This will is expressed through the legal protection that the component is accorded, or by the concern of the local or regional public for the component. The **Social Value** evaluation is based on information gathered during various public consultations in the study zone.

The **Social Value** of a given component is considered:

- **High**, when the component is the object of legislative or regulatory measures (threatened or endangered species, conservation parks, etc.) or is essential to human activities (e.g., potable water);
- **Medium**, when the component is valued or used by a significant portion of the concerned population, but is not legally protected; and
- **Low**, when the component is of little concern or is not used by the population.

The **Environmental Value** integrates the **Ecosystem-Based Value** and the **Social Value** and retains the higher of the two values as shown in Table 1.1.

TABLE 0.1 Grid for Determining Environmental Value

Social Value	**Ecosystem-Based Value**		
	High	**Medium**	**Low**
High	High	High	High
Medium	High	Medium	Medium
Low	High	Medium	Low

The **Degree of Disturbance** for a component defines the scope of the changes that affect the component given its sensitivity to the proposed project. The changes for a given component may be negative or positive and the effect on the environmental component may be direct or indirect. The cumulative, synergetic, or delayed impacts, beyond the simple relation of cause and effect, could amplify the degree of disturbance of an environmental component when the environment is especially fragile. The **Degree of Disturbance** is:

- **High**, when an impact affects the continued viability of the environmental component, strongly and irreversibly impairs the component, or restricts its use in a significant way.
- **Medium**, when the impact changes, either by reducing or increasing, the quality or use of the environmental component affected, without, however, compromising its integrity;

- **Low**, when the impact affects the quality, use or integrity of the environmental component in a way that is barely perceptible; and
- **Undetermined** when it is impossible to assess how and to what extent the component will be affected. When the **Degree of Disturbance** is undetermined, the impact assessment cannot be completed for that component.

The **Intensity** of the impact results from the interaction of the three **Degrees of Disturbance** (High, Medium and Low) with the three classes of **Environmental Value** (High, Medium and Low). Table 1.2 shows the possible combinations of these inputs and the resulting Intensity.

TABLE 0.2 Grid for Determining Intensity of an Impact

Degree of Disturbance	Environmental Value		
	High	**Medium**	**Low**
High	Very High	High	Medium
Medium	High	High	Low
Low	Medium	Low	Low

2.2 Extent of the Impact

The **Extent** of the impact expresses the spatial influence of the effects produced by an intervention on the environment. This refers either to a distance or an area over which a component will undergo changes. It could also refer to the portion of the population that will be affected by the changes.

The three levels of extent are:

- **Regional**, when an impact affects a large geographic area or a number of components located a significant distance from the project, or when it is experienced by the entire population or by a significant portion of the population in the study area;
- **Local**, when the impact affects a relatively restricted area located within, near, or at a limited distance from the project site; or when it is experienced by a limited portion of the population in the study area; and
- **Site-Specific**, when the impact affects only a very restricted area in the proximity of the project site; or is experienced by only a small number of individuals in the study area.

2.3 Duration of the Impact

The **Duration** of the impact describes the period of time during which a component undergoes changes due to the impact. **Duration** is not necessarily equivalent to the period of time during which the direct source of impact is active. It must also take into consideration the frequency when the impact is intermittent. **Duration** is characterized as:

- **Long**, when the effects are experienced continuously for the life of the facility, or even beyond if the effect is irreversible;
- **Medium**, when the effects are experienced over a relatively prolonged period of time, but less than the duration of the life of the facilities; and
- **Short**, when the effects are experienced over a limited period of time, generally corresponding to the period of construction, the start-up period, a single season, etc.

2.4 Significance of the Impact

The interaction between the **Intensity**, **Extent**, and **Duration** defines the **Significance** of an impact on a given environmental component. Table 1.3 presents the grid for

determining **Significance** and differentiates between five levels of significance, ranging from Very High to Very Low.

The relative importance of each impact is assessed, considering the general mitigation measures integrated into the baseline project. For example, if the project states as a general mitigation measure that forests will be protected near water courses, the impact analysis assumes that all forests will be untouched wherever there will be activities near water courses. Here is another example applicable to an industrial project: if it is anticipated that a silencer should be installed on a chimney, the evaluation of noise impacts will take into account the noise reduction attributable to the silencer. However, if no such equipment was anticipated at the beginning of the project and that the noise level is unacceptable, a mitigation measure will be suggested (ex: installing a silencer on the chimney). When the general mitigation measures reduce impacts to the point of rendering them negligible they are excluded from further analysis.

Once the **Significance** of an impact is established as more than negligible, it is described and additional, specific mitigation measures may be proposed to allow optimal integration of the project into the environment.

The final assessment phase consists of determining the residual significance of the impact after all mitigation measures are taken in consideration. The issue here, then, is to clarify how the mitigation measure changes one or several of the inputs in the impact assessment process described above.

- The thought processes leading to the impact assessment are summarized in **Impact Sheets**, which are filled for each significant impact. When required, the uncertainty level that affects the assessment as well as the probability that the impact occurs are indicated on the **Impact Sheets**.

Table 1.3: Grid for Determining Impact Significance

Intensity	Extent	Duration	Significance
Very High	Regional	Long Medium Short	Very High Very High Very High
	Local	Long Medium Short	Very High Very High High
	Site-specific	Long Medium Short	Very High High High
High	Regional	Long Medium Short	Very High High High
	Local	Long Medium Short	High High Medium
	Site-specific	Long Medium Short	High Medium Medium
Medium	Regional	Long Medium Short	High Medium Medium
	Local	Long Medium Short	Medium Medium Low
	Site-specific	Long Medium Short	Medium Low Low
Low	Regional	Long Medium Short	Medium Low Low
	Local	Long Medium Short	Low Low Very low
	Site-specific	Long Medium Short	Low Very low Very low

Appendix 10: Methodology for Qualitative Risk Assessment – Example

METHODOLOGY FOR QUALITATIVE RISK ASSESSMENT

Risk is defined as the product of the potential consequence (or severity) of an event and the likelihood (or probability) of that consequence occurring.

Typically a risk assessment includes:

- Setting the risk context, including objectives and the proposed activities;
- Identification of potential impacts associated with the relevant environmental factors;
- Determination of management measures for each of the identified potential impacts. Depending on the phase of the project, these measures are based on existing controls and standard practice or are additional mitigation controls required to lessen the risk to 'As Low as Reasonably Practicable' (ALARP); and
- Assignment of a severity and likelihood factor for each potential impact to determine the risk rating and its significance as either low, minor, moderate, major or critical.

The risk assessment methodology used to identify and rank the potential environmental impacts associated are compliant with AS/NZS 4360 Risk Management.

The descriptors used in this example are based on the Standards Australia's HB 203:2006 (Standards Australia, 2006b) and the South Australian Guidelines for miners: preparation of a mining lease proposal or mining and rehabilitation program in South Australia (PIRSA, 2009). These descriptors are more appropriate for a mining project (Table 1).

Table 1 Descriptors used to classify likelihood and qualitative measures of impact

Level	Descriptor	Detail of Description
Likelihood		
A	Almost certain	Is expected to occur in most circumstances, or is of a continuous nature, or likelihood is unknown.
B	Likely	Will probably occur during mine lifetime.
C	Possible	Could occur in most mines.
D	Unlikely	Could occur in some mines, but not expected to occur.
E	Rare	Occurs only in exceptional circumstances.
Consequence		
1	Catastrophic	Health – death or widespread health effects, or toxic release off-site with detrimental effect. Environmental – extreme permanent changes to the natural environment (not able to be practically or significantly rehabilitated or alleviated).

		Social – major public outrage. Financial – huge financial loss (greater than A$500 million). Or the consequences are unknown.
2	Major	Health – extensive injuries or significant staff numbers incapacitated resulting in a loss of production capability. Environmental – substantial and significant changes to the natural environment or only partially able to be rehabilitated or alleviated. Social – will attract public concern in wider community. Financial – major financial loss (A$100 to 500 million). Or changes will be substantial if cumulative effects are considered.
3	Moderate	Health – medical treatment required. Environmental – significant local changes, but can be rehabilitated or alleviated with difficulty at significant cost and with outside assistance. Social – will attract concern of adjoining community. Financial – high financial loss (A$10 to 100 million).
4	Minor	Health – first aid treatment required. Environmental – on-site release immediately contained very local consequence with no significant long-term changes or may be simply rehabilitated. Social – not of significant concern to wider community. Financial – medium financial loss (A$1 to 10 million).
5	Insignificant	Health – no injuries. Environmental – negligible environmental impact. Social – unlikely to be noticed by public. Financial – low financial loss (less than A$1 million)

The level of risk for each potential impact was then determined by combining consequences and likelihood using the risk matrix shown in Table 2.

Table 2 Qualitative risk analysis matrix

			Severity of Consequence				
			1	2	3	4	5
			Catastrophic	Major	Moderate	Minor	Insignificant
Likelihood of Consequence	A	Almost Certain	Extreme	Extreme	Extreme	High	High
	B	Likely	Extreme	Extreme	High	High	Moderate
	C	Possible	Extreme	Extreme	High	Moderate	Low
	D	Unlikely	Extreme	High	Moderate	Low	Low
	E	Rare	High	High	Moderate	Low	Low

Appendix 11: ESMMP – Table of Content

ESMMP – TABLE OF CONTENT

Appendix 12: Summary of Impacts and Mitigation Measures – Example