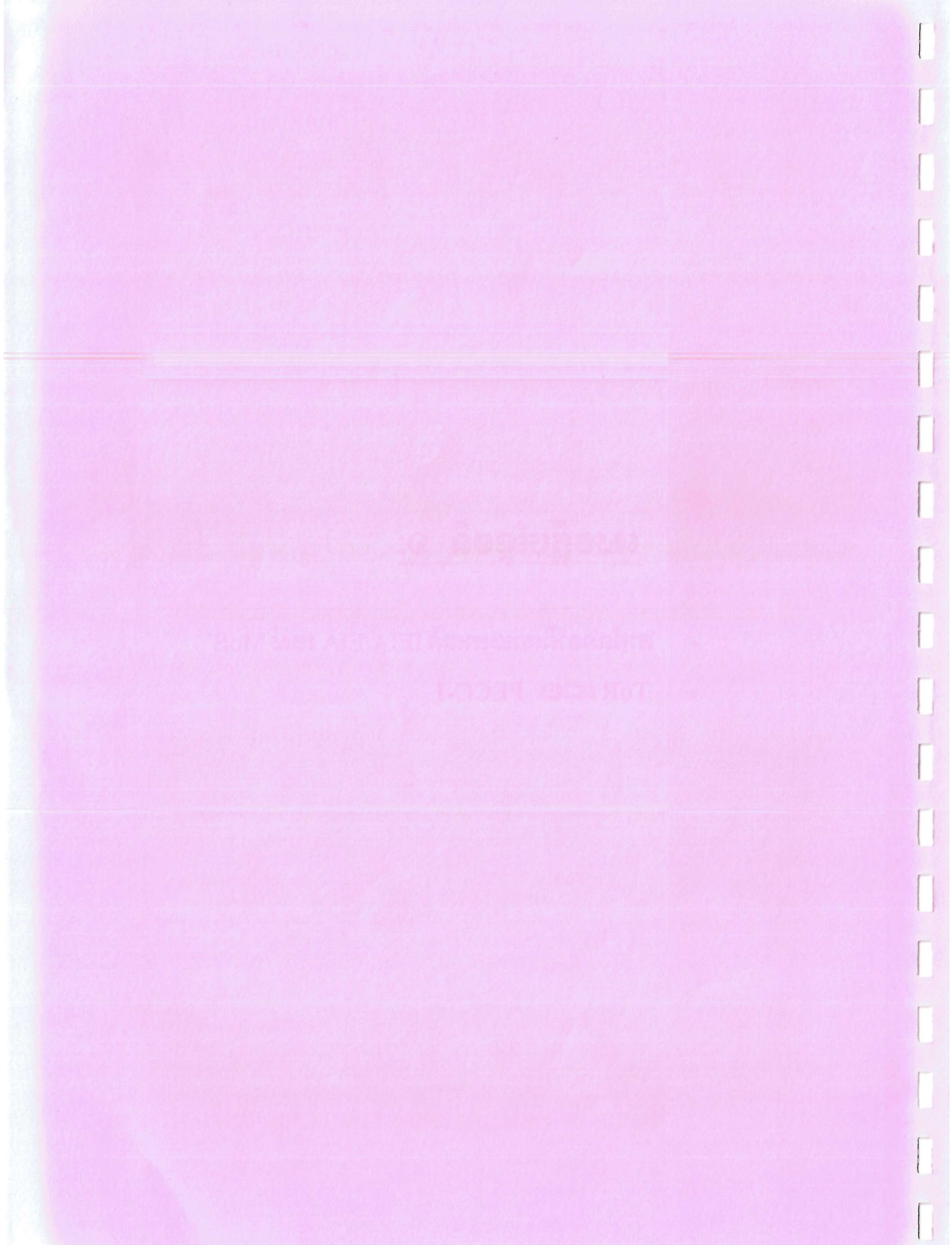


សេចក្តីបន្ថែមទី ១:

- ការណែនាំពីរបាយការណ៍ IEIA/EIA របស់ MoE
- ToR ដោយ PECC-1



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KINGDOM OF CAMBODIA
NATION-RELIGION-KING

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MINISTRY OF ENVIRONMENT
DEPARTMENT OF ENVIRONMENTAL
IMPACT ASSESSMENT REVIEW AND
MONITORING

Phnom Penh,.....

Guideline for conducting Environment Impact Assessment (EIA) Report

- Reference to Sub-decree on EIA Process, N^o 72 ANKR.BK Dated 11th August 1999,
- Reference to Prakas on Guidelines for preparing EIA Report, N^o 49 BST.SSR Dated 09th March 2000.

Department of Environmental Impact Assessment prepared a format of guideline for conducting EIA report. The Project's owner should prepare EIA Report to abide by this guideline; at least, EIA Report should be described as follow:

1. Project Summary

The project's owner should describe in short form with identification of project's goals and main objectives, methodologies, and key measures for reduction of environmental impact in EIA report.

2. Introduction

- Type, size, and location of the project
- Background of the project's location
- Within the framework of national and international laws and legislation standards.

3. Purpose of the Project

Project owner's should clearly explain about purpose of the project for recent and future.

4. Project Description

- Briefing alternatives: size, location, timeframe (stages of project construction, project operation, and project abandon or closure) and sources of labor forces.
- The production process: sources and quantity of raw materials to be used and finished products.
- Machinery requirement to run the project.
- Methodologies of wastes disposals in order to determine any environmental impacts.
- Description about the quantity and quality of solid and liquid waste to be disposed and discharged, sources of noise and vibration resulting from the process of this project (construction, operation) and the emission of particles into the atmosphere.
- Project planning.

5. Description of Environmental Resources

This part should be described all environmental resources needed such as:

5.1 Physical resources:

- Air (speed, quality, regime, climate,...)
- Water (surface and ground water quality, currents and quantity, ...)
- Land (soil quality, relief, geology,

5.2 Ecological resources:

- Bio-diversity
- Fauna
- Flora
- Forest, etc....

5.3 Socio-economical resources

- Population and their settlement
- Infrastructure
- Land use
- Public health and welfare
- Condition of economic (livelihood, professional, and community)
- Custom, tradition and other group ethnic, etc.....

6 Public Participation

All opinion given by the public in EIA process should be addresses for all which can be contributed to the decision making process. Public participation includes:

- Local authorities and institutional approval
- Opinion of the public towards the developmental project
- Consultation
- Company interpretation.

7 Environmental Impact Analysis

All significant environmental impacts resulting from the project should be described in this part which includes:

- 7.1 Methodologies to identify the scope of the environmental impacts (by using the Matrix table).
- 7.2 Environmental impact during project construction
- 7.3 Environmental impacts during project operation
- 7.4 Environmental impacts after the project abandon or closure stage.
- 7.5 The extent and kinds of significant accumulative environmental impact.

8 Environmental Impact Mitigation Measures

Of the all environmental impacts stated above should be assessed by the project's owner in order to define a specific environmental impact mitigation measures.

9 Economical Analysis and Environmental value

In this part, the project's owner should indicate the benefits of the project comparing to the value or cost of the local environmental damages.

10 Environmental Management Plan

The environmental Management Plan is an important programme implemented by the project's owner and other institutional involved. These plans include:

- The Environmental Protection Measure in the stage of:
 - Project construction
 - Project implementation
 - Project abandon or closure.
- The Environmental Monitoring Programme in the stage of:

- Project construction
- Project implementation
- Project abandon or closure.
- Training programme

11 Institutional capacity

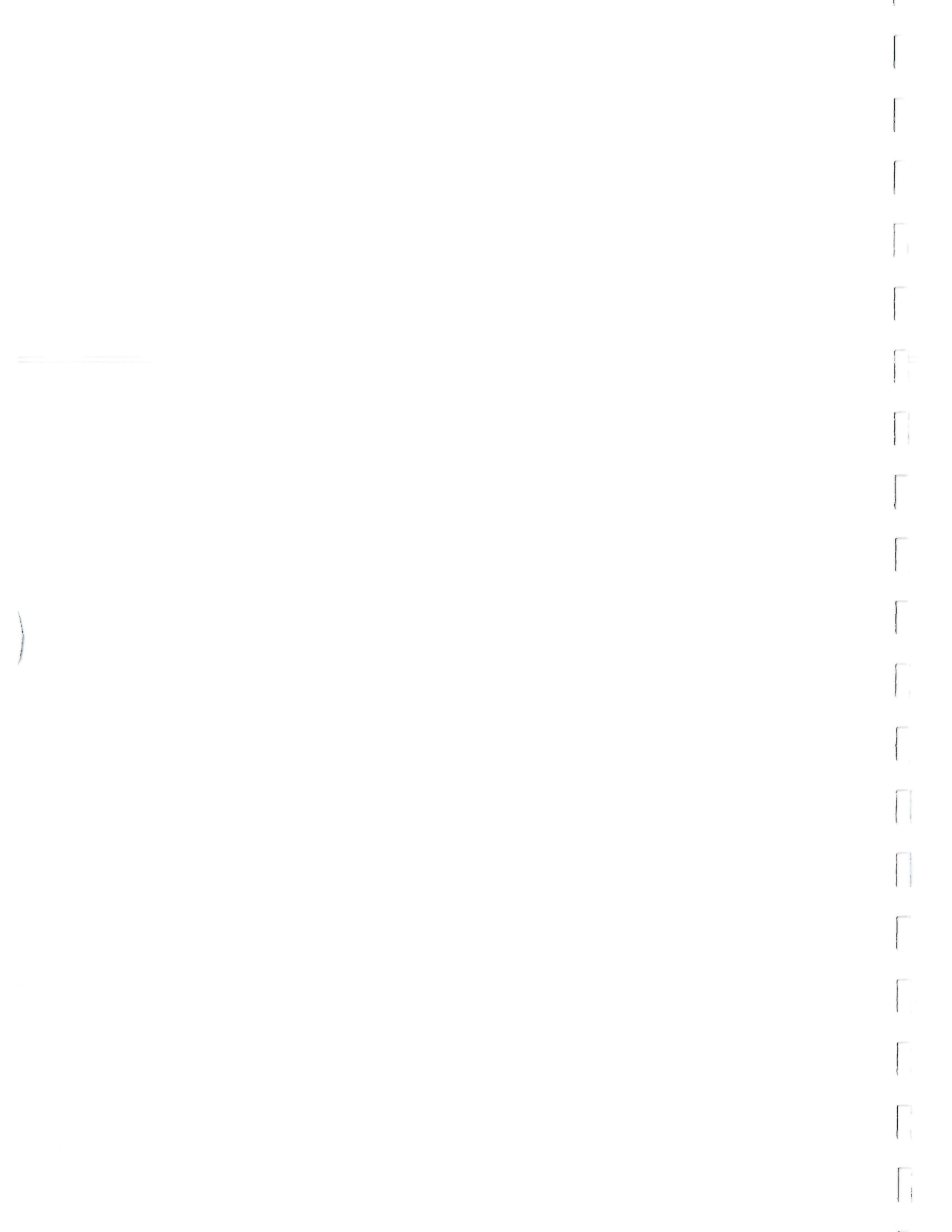
In this part, the project's owner should demonstrate that he has the institutional capacity to carry out the work associated with the execution of EIA, and the implementation of the mitigation measures such as:

- Organization structure
- Budget/ schedule
- Staff skills
- Methodological tool and equipment.

12 Conclusion and Suggestion

In this part, the project's owner has to include over the assessment of environmental impacts both positive and negative aspects with full accountability and responsibility in the process of reporting the EIA as well as addressing some possible suggestions implicated in the project.

13 References



TOR

Environmental impact assessment

I. GENERAL

Lower Se San 2 HPP locates totally on Cambodian territory, the expected project site is about 1.3 km far from the confluence of Srepok and Se San downstream wards. The reservoir mainly locates in the Se San district, Stung Treng province.

Dam site is selected at the relatively flat river part, total length of the dam is about 6km. with the full supply level of 75m, the reservoir will submerge an area of 394 km² and resettlement households number is about 1224.

Main parameters of Lower Se San 2 HPP (planning document)

No.	I.1 Items	Unit	Quantity
1	Catchment areas	Km ²	49170
2	Mean annual flow	m ³ /s	1315
3	Full Supply Level FSL	m	75
4	Minimum Operating Level MOL	m	74
5	Reservoir surface area	Km ²	394
6	Reservoir volume Gross/ Active	10 ⁶ m ³	2415.4/279.8
7	Installed capacity	Mw	420
8	Mean annual energy	10 ⁶ kwh	2219.6
9	Dam Crest length / dam height	m	6100/24
10	Hydropower house at dam body	MW	420
11	220 Kv Transmission line	Km	250
12	Construction road	Km	5
13	Number of resettlment households	Households	1224

Note: The environmental impact from transmission line is not included in the EIA study in this stage. A separate EIA study for transmission line will be done in next study stage.

The EIA is expected to be prepared including Physical environment, Ecological environment and Social environment. Details studies of key fields and outline of EIA report are as follows:

II. PHYSICAL ENVIRONMENT

II.1 HYDROLOGY

The study team will describe of surface water and groundwater resources that presented in the project area. River flow and flooded level of each river is important information, secondary data and the study result shall be included. Groundwater table, yield, and availability shall be addressed too.

II.2 WATER QUALITY

This study aims at evaluating the water quality at present of surface water resources and underground water as well which are main sources supplying to the future reservoir, and this study is to forecast potential changes in water quality once the reservoir has been created.

The study on water quality will be implemented basin site investigation, sampling and forecasting.

Prepare a report on water quality includes:

- Results of monitoring water quality in recent years
- Results of analyzing surface water samples by properties such as pH, DO, COD, BOD₅, TSS, total N, NO₃, Coli form, total P, PO₄, Chlorophyll.
- Results of analyzing underground water samples by properties such as pH, TDS, NO₂, NO₃, Coliform, total P, PO₄, Alkalinity, Fe, Mn, and As.
- The present status of quality of surface water on Se San and Srepok rivers.
- The present status of quality of underground water at locations surrounding the reservoir area, in the site and resettlement area
- Forecasting the water quality in future reservoir
- Spread pollution along rivers

II.3 CLIMATE

Climate in the project area includes rainfall and temperature shall be described based on the secondary data in the project area.

II.4 AIR QUALITY

This study is aiming at evaluating the present status of the air environment and noises level to be created in the dam construction site, powerhouse location, worker camp, resettlement sites, and potential impacts in the case of project construction.

Studies and evaluation on air quality will be done basing on field investigation, sampling and forecasting.

Basing on results gained from site investigation, sampling, a report on air quality and noise will be prepared which include:

- Results of monitoring air quality in recent years
- Results of analyzing the samples by properties such as CO, SO₂, NO₂, TSP, and noise.

II.5 SOIL AND EROSION POTENTIALITY

Purposes of this study is to assess erosion potentiality of river basin, project area and downstream.

The study on soil quality will be implemented basing site investigation, sampling and forecasting. The report includes following contents:

- Existing status of erosion in river basin, project area and downstream

- Erosion potentiality Map
- Assess erosion potentiality
- Propose mitigation methods

II.6 WATER USE

Purposes of this study are to:

- Evaluate potential impacts by the project construction to navigation on Se San and Srepok rivers and Propose navigation alternative in the case of hydropower project construction.
- Calculate water demand and evaluate water supply possibility of upstream and downstream area of project.

The study on water using will be done based on field investigation, analysis, water balancing and proposing mitigation methods.

On the basis of results gained from investigation, data gathering, a report on water demand and water use includes:

- Navigation demand on Se San and Srepok rivers
- Maximum load of ship, minimum dimension of ship lock and necessary flow for navigation or other solutions
- Estimation on water demand in the long term including:
 - + Water demand of industrial, agricultural and domestic use in upstream areas
 - + Water demand of industrial, agricultural and domestic use and ecological in downstream areas
 - + Water demand of project worker camp.
- Water balancing to the upstream and downstream areas.
- Assessing impact on water use and mitigation methods.

III. BIOLOGICAL ENVIRONMENT

III.1 TERRESTRIAL SPECIES

The task here is studying on terrestrial ecology in the catchments area, reservoir area, resettlement area and downstream area.

The studies on terrestrial fauna will be done basing on field investigation, analysis and proposing overcome measures.

On the basis of results gained from investigation, data gathering, a report on terrestrial animal will be prepared. The report is expected to describe:

- Present status of terrestrial ecology and level of bio- diversification.
- List of terrestrial species and list of rare species
- Distribution of fauna and diagram

- Status of animal use
- Potential impacts due to project construction.
- Proposing management and protection methods.

III.2 VEGETATION AND FOREST

Implement study on vegetation and forest at the basin, reservoir area, resettlement area, and at the downstream.

Studying on vegetation and forest shall be implemented on the basis of field investigation, measuring standard plots, forecasting and proposing mitigation methods.

On the basis of results of investigation, survey, collecting document, report shall be prepared to assess on vegetation and forest. The report shall comprise of following contents:

- Present status of vegetation and determining forest states at the basin, reservoir area, resettlement area, and downstream
- List of flora species and list of rare species
- Areas of each type of forest
- Biomass of each type of forest
- Wooden reserves of each type of forest
- Present exploitation of forest
- Alternatives of afforesting and forest protection
- Map of vegetation and forest in the basin
- Map of vegetation and forest at the reservoir, resettlement and downstream areas.
- Potential impacts to flora due to project construction.
- Proposing management and protection methods.

III.3 WATER SUBMERGED ECOLOGY

This topic aiming to evaluate ecosystem of natural submerged land and present status of submerged land use and forecast submerged ecosystem in case construct hydropower plant.

Base on investigation, data and sampling, a report will be prepared including evaluation of biodiversity and economic value, potential impacts and proposing mitigation methods.

III.4 FISH, FISHERY AND AQUATIC LIFE

Objective of the study is to evaluate the impact of the Project to aquatic life, fish and fishery.

Study on fish, fishery and aquatic life shall be done on the basis of field survey, sample taken and forecasting.

On the basis of results of field survey, data collection, laboratory analyzed result, report on evaluation on fish, fishery and aquatic life shall be made with following contents:

- Present status of fish species and level of bio- diversification

- List of fishes species and list of rare species
- Movement of fishes and their characteristics
- Fish productivities at wet and dry seasons.
- How is important of fish source to local in term of socio-economic.
- Describing aquatic specimen and evaluating similarity of specimen and relationship to river water quality.
- Potential impact of the project to fish and aquatic life
- Mitigation methods

IV. SOCIAL ENVIRONMENT

IV.1 ETHNICITY

Objective is to study people groups affected due to the project.

The content report for studying and evaluating are as bellows:

- Ethnology, ethnological history and culture, customs, management structure and traditional production.
- Using of land, forest and level of meeting the demand of land, forest.
- Living standard, Economic structure, Income and expense, Poverty and hunger
- Social institution, Community custom law, Community and family festivals
- Present situation of education, diseases and health care

IV.2 HEALTH AND HEALTH CARE

The work is conducted in order to describe situation of local health and health care. From that basis, evaluation on health of local people, workers, replaced people when having the project shall be made.

Study of community health shall be performed on the basis of field investigation, analyzing and forecasting.

On the basis of field survey, collecting information, a report on evaluation of health and care health shall be made. The report shall comprise of following contents:

- Present status of health and health care situation of the community, especially water-related diseases
- Assessing potential impacts
- Mitigating mitigation methods.

IV.3 ARCHAEOLOGICAL RELICS

The study aims at investigating archaeological relics which will be submerged in future reservoir Lower Se San

A report on archaeological relics includes following contents:

- Scheme of submerged archaeological relics

- Scale, scope, characterizes, ages and values of archaeological relics
- Propose mitigation methods.

IV.4 CULTURAL/TRADITIONAL HERITAGE

Traditional and cultural resources of the ethnic shall be preserved as much as, investigation and survey would be done in each village or in each group.

IV.5 ENTERTAINMENT AND TOURISM

The study aims at evaluating on existing status of tourism at project area, tourism development and potential impacts.

Basing on field investigation, data gathering, a report on tourism in the project area. The report will describe:

- Study on existing status of tourism related to the project.
- Flow of tourists at present and forecast for future.

IV.6 PUBLIC CONSULTATION

Public consultation will be conducted at least 2 levels :

1. First level:

- Content of report is information of HPP project
- Objectives : all affected people and local authorities
- Place : affected communes and villages
- The results are opinion about project in written.

2. Second level:

- Content : Main result of project study and EIA study
- Meeting at suitable place in province or district
- Objectives : head of villages, representatives of village, bodies, authorities at district, commune, provincial and governmental levels.
- Results are comments about impacts, mitigation methods....in written.

V. Outline of EIA report

The EIA report shall be formatted as following:

V.1 Executive Summary

V.2 INTRODUCTION

1. Purpose of the report
2. Stage of project preparation
3. Project environment and social objective
4. Project background
5. Extend of study
6. Brief outline of the content of the report

V.3 Legislation and Regulations Framework

V.4 PROJECT DESCRIPTION

1. Type of project
2. Need for project
3. Location
4. Size or magnitude of operation
5. Proposed schedule
6. Description of the project

V.5 BASELINE ENVIRONMENT

1. Physical environment
 - atmosphere (e.g. air quality and climate)
 - topography and soils
 - surface water
 - groundwater
 - geology/seismology
2. Ecological environment
 - fisheries
 - aquatic biology
 - wildlife
 - forests
 - rare or endangered species
 - protected areas
3. Social resources and economic development
 - population and communities (e.g. number, ethnic, employment)
 - health facilities
 - education facilities
 - infrastructure facilities (e.g. water supply, sewerage, power sources)
 - transportation (roads, harbors, airports, and navigation)
 - land use (e.g. dedicated area uses)

- agricultural development
- mineral development
- tourism facilities

- socio-economic conditions
- physical or cultural heritage
- historical, archaeological, or architectural significance.

V. 6 ALTERNATIVE

Comparison of feasible alternatives for proposed project site, technology, and operational alternatives will be considered in the study. Alternatives will be compared in terms of their potential environmental impacts, capital and recurrent costs, suitability under local conditions, and institutional, training and monitoring requirements. For each alternative, the environmental costs and benefits should be quantified to the extent possible, economic values should be attached where feasible, and the basic for the selected alternative should be stated.

V. 7 ENVIRONMENTAL IMPACTS ASSESSMENT AND MITIGATION MEASURE

Review characteristic of each environmental impact follow by mitigation measure to the negative impact in different project phase as below:

- Project location
- Project design phase
- During construction phase
- During operation phase

V.8 Resettlement

Assessment based on the result from Resettlement study.

V. 9 ENVIRONMENTAL MANAGEMENT PLAN

1. Institutional arrangement
2. Potential Environmental Impacts and Mitigation Measures
3. Monitoring Program with monitoring cost

V. 10 PUBLIC CONSULTATION

1. Describe the process undertaken to involve the public.
2. Summarize major comments received from beneficiaries, local officials, community leaders, NGOs, and others, and describe how these comments were addressed

V. 11 CONCLUSION

The EIA report will present the conclusions of the study including: (i) gains which justify project implementation; (ii) explanation of how adverse effects could be minimized or offset, and compensated to make these impacts acceptable; (iii) explanation of use of any irreplaceable resources; and (iv) provision for follow up surveillance and monitoring. Simple visual presentations of the type and magnitude of the impacts may aid the decision-maker.

REQUIREMENTS

1. Methodology to carry out EIA including data collections, surveys, assessing and reporting shall be account of recognized international EIA guidelines and frameworks (WB,ADB, Mekong) and acceptable in Cambodia.
2. Communications KCC and PECC 1 frequently as require
3. Reports:
 - a. Inception report/scoping report presents findings in initial phase of project especially navigation and fish movement and describes an updated work plan shall be submitted not later than 6 weeks since contract signing.
 - b. Progress report (short) shall be submitted every 6 weeks.
 - c. Draft final EIA Report shall be submitted before 20 May, 2008.
 - d. Final EIA report shall be submitted 15 days after receiving last comments from draft final report on 5 June 2008.

PECC-1 Responsible to provide documents as follows:

- a. Result of Topographical study
- b. Result of Geological, Minerals, and Seismic...study
- c. Result of Hydrological study
- d. Result of Resettlement study
- e. Result of Economic analysis
- f. Access road or existing road improvement
- g. Summary of project parameters and location map