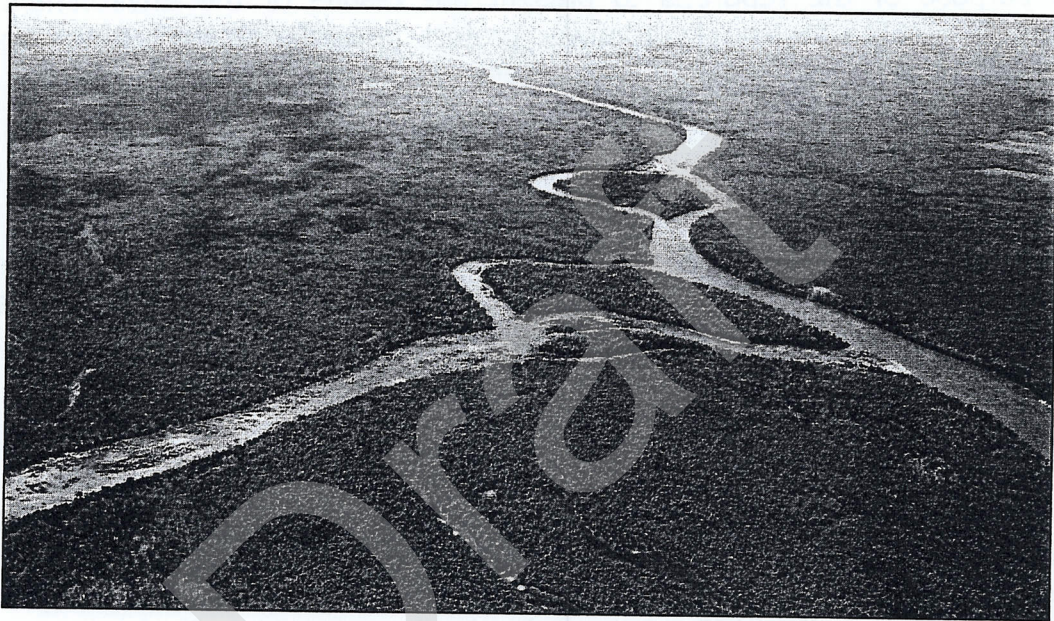


KINGDOM OF CAMBODIA

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REPORT

Environmental Impact Assessment



FOR
FEASIBILITY STUDY OF LOWER SESAN 2 HYDROPOWER
PROJECT, STUNG TRENG PROVINCE, CAMBODIA

Prepared by



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CHAPTER I

1. INTRODUCTION

1.1 Purpose of the report

Based on the Law on Environmental Protection and Natural Resource Management of the Royal Government of Cambodia (24 December 1996) and the Sub-decree on Environmental Impact Assessment Process passed by the Council of Ministers (11 August 1999), the Lower Sesan 2 Hydropower Plant Project is classified as a big scale project and an Environmental Impact Assessment is required.

The purpose of the report is to present the results of the Environmental Impact Assessment (EIA) for the hydropower project in terms of both direct and indirect impacts on the natural and social resources in and around the project area.

The study screens the potential environmental and social impacts and develops mitigation measures for each negative impact during project pre-construction, construction and operation. The assessment is undertaken in accordance with the Royal Government of Cambodia's Environmental Protection and Management Natural Resources Law and Sub-decree on Environmental Impact Assessment, and other related regulations and laws.

1.2 Stage of project preparation

The project is being undertaken by the PECC-1 company of the Socialist Republic of Vietnam. At the moment PECC-1 is undertaking the feasibility study for the Lower Sesan 2 Hydropower Plant. The feasibility study is planned to be undertaken over a 7 seven month period (January to July 2008). As part of the feasibility study, Key Consultants Cambodia (KCC - a local Cambodian consulting firm) was appointed by PECC-1 to conduct the EIA study. The report of the EIA study will be submitted together with the feasibility study report to the Ministry of Environment (MoE) and Ministry of Industry Mines and Energy (MIME) as representatives of the Royal Government of Cambodia (RGC) for approval before continuing to the next stage of the project (Detail Design & Construction, and Operation stage).

1.3 Project environment and socio-economic objectives

The socio-economic objective of the Lower Sesan 2 HPP is to fulfill the medium and long term energy demand of the Kingdom of Cambodia as well as exporting any surplus energy. The project also directly responds to the third mandate of the Royal Government's Rectangular Strategy: "One of the most important aspects of the Royal Government's economic policy is the further development of the energy sector to effectively respond to the increasing needs for low-cost electricity. Thus the Royal Government places high priority on attracting increased private sector investment and participation in electricity production and distribution...." (extracted from *The Rectangular Strategy, side 3: Development of the Energy Sector and Electricity Network*, INTERNATIONAL STRATEGIC DEVELOPMENT PLAN 2006-2010, 27 January 2006, RGC).

The project also aims to draw benefits from environmental resources, especially the water resources of the Sesan and Srepok rivers in Cambodia. Already in the upstream areas of the Sesan and Srepok rivers in Vietnam there are many hydropower plant projects which have either been constructed or are planned. According to the document 'Hydropower Project in Lower Mekong Basin-Existing, Under Construction and Considered (Over 10MW)', (MRC Feb. 2008), these dams include Yali HPP and Dray H' Linh 1 (existing dams); Plei Krong, Sesan 3, Sesan 3A, Sesan 4 (under construction), Dray H' Linh 2, Buon Kuop, Buon Tua Srah; upper Kontum, Srepok 3, Srepok 4, Duc Xuyen (planned dams).

A key environmental and socio-economic objective is also to ensure that a fair balance is struck between energy generation with its positive impacts to the nation and the negative environmental and socio-economic impacts it causes particularly on the local area and its communities. Where significant local negative environmental and socio-economic impacts are identified adequate compensation measures must be provided if the project proceeds.

1.4 Project background

Cambodia has a potential for development of about 10,000MW of hydro-electric power, of which 50% can be derived from main rivers, 40% from tributaries and 10% in coastal areas, but only 13 MW has so far been developed through the Ochum Hydropower Plant (1MW) and Kirirom I Hydropower Plant (12MW), (source: extract from National Water Resources Policy (Jan. 2004), section 4.2.2 "Water for Energy").

North-East of Cambodia has high potential for hydropower development too, especially in the Cambodia Mekong river and its tributaries. The Sesan river is one of the Mekong's tributary rivers with potential for hydropower plant development. Based on the results of initial development study for the Sesan river in Cambodia, it was agreed by the Cambodian and Vietnamese Governments in the 9th session of the Cooperation Committee on Economy, Culture, Science, and Technology in Phnom Penh on August 21st, 2007 (see Annex 1A), that Electricity of Vietnam (EVN) would invest in the construction of the Lower Sesan 1/ Sesan 5 and Lower Sesan (Lower Sesan 2) hydropower projects on the Sesan River (source Project Inception Report of Lower Sesan 2 Hydropower, Hanoi, September 2007, PECC-1).

An MoU signed by Electricity of Vietnam (EVN) and Ministry of Industry, Mines and Energy (MIME) on June 15th, 2007 reflected this agreement and EVN contracted PECC-1 to prepare a feasibility study for the Lower Sesan 2 HPP (see Annex 1A). Key Consultants Cambodia (KCC) was then contracted by PECC-1 to carry out an EIA study for the Lower Sesan 2 HPP as part of the feasibility study.

1.5 Scope and Brief outline of the contents of the report

The scope of the EIA study covers the environmental and social benefits and impacts stemming from all aspects of the project within broadly defined categories of environmental resources and values: the physical environment comprised of soil, water

and atmosphere; the biological environment comprised of terrestrial and aquatic flora and fauna and their habitats; the social environment inclusive of physical infrastructure, welfare services and utilities, employment, education, and general economic development; and cultural sites, artifacts and quality of life values.

The outline of the report comprises ten chapters as follows: Project background is described in chapter 1. Legislation and regulations framework which related to the project type and activities are provided in chapter 2. General description of the project components are described in chapter 3. Baseline conditions concerning to existing environmental resources are described in Chapter 4. The project alternatives are provided in Chapter 5 that arose from the justification for the proposed project profile in comparison with other possibilities. In chapter 6 the Environmental impact assessment and mitigation measures are described. Public meetings and consultations with project stakeholders and affected people is described in chapter 7. An environmental management plan (EMP) is provided in Chapter 8 and the economic assessment for the project is provided in chapter 9. Finally chapter 10 describes the conclusions and recommendations for the whole EIA study.

1.6 Methodology

The contents of the EIA are in conformance with the Sub-decree on Environmental Impact Assessment Process of the Royal Government of Cambodia (No.72 ANRK.BK, August 1999) and Guideline for conducting environmental impact assessment report of MoE, and outline of an EIA report format of EIA Guidelines (ADB, August 2003).

The EIA considers interactions between project components and environmental attributes. Interactions give rise to both positive and negative impacts. Benefits are noted and in some cases are included in the environmental economic analysis. Negative impacts are minimized through project design and through the implementation of works. Offsetting measures, or various forms of compensation, will be needed for impacts that cannot be accounted for otherwise. Negative impacts may also figure in the environmental economic analysis. To ensure a good and smooth preparation for the EIA study, the general methodology has been as follows:

1. Data collection and review

- Secondary and primary data collection in Phnom Penh, Stung Treng and Rattanakiri regarding law, policy, regulation, biodiversity, livelihoods particularly reliance on fishing, socio-economic data and other data related to the project; and
- Review of technical and feasibility reports of the project, and other related documents to project investment permission.

2. Meetings and consultation

- Meetings and consultation with important institutions concerning the project in Phnom Penh, Stung Treng and Rattanakiri including Department of Environment (DoE), Department of Industry Mines and Energy, Department of Agriculture Forestry and Fisheries, Department of Public Works and Transportation (DPWT), Department of Tourism (DoT), Department of Planning (DoP), 3S

Rivers Protection Network (3SPN), Culture and Environment Preservation Association (CEPA), WWF, BirdLife International, and others.

- Meetings and consultations with communities/villagers in the directly affected areas of the project site (primarily in the inundation area and downstream of the project site) in four communes (Phluk, Srekor, Talat, and Kbal Romeas commune) of Sesan district in Stung Treng province, and one commune (Sre Angkrang commune) of Kon Mom district in Rattanakiri province.

3. Natural resources survey

- Geology and soil (data from feasibility study report)
- Fish and aquatic species in the project area (detail methodology is described fishery study report in Appendix 2)
- Water quality tests/examinations (field test, sampling and lab examination in Phnom Penh (lab of MoWRAM))
- Ambient air quality examination (field examination, equipment and expert from MoE lab)
- Wildlife habitat and wildlife study (literature review on the previous studies and field survey see Appendix 3)
- Forest study (45 sheets of air-photos were taken in period of study Feb.-Mar. 2008 which area of 1km² per sheet; forest survey for different type of forest; determination of forest biomass; and determine its value in money).

4. Social resources survey

- Land use (JICA map 2003 scale 1:100000, Landsat (TM) year 2000, Aerial photo 2001-2002, and ground data from commune and district in Stung Treng province)
- Population in project area and identification of affected people (field survey and use the result from damaged assessment of Resettlement study report)
- Resettlement (use the result from Resettlement study team of PECC1)
- Economic/development activities of communities in the project area (field survey and literature review were conducted, detail methodology is described socio-economic study report in Appendix 4)
- Human use values and quality of life (field survey and literature review)

5. Analysis and evaluation of potential environmental impacts

- Impacts on natural resources
- Impacts on social resources
- Other impacts
- Cumulative impact

6. Preparation of EIA report

- Report format follows MoE and ADB guidelines, and ToR given by PECC-1, see Appendix 1.
- GIS maps and photos is included
- An estimate of environmental economic and project benefits and costs provided.
- Inclusion of mitigation measures to reduce the magnitude of impacts in site/location, design, construction, and operation project stages
- Preparation of an Environmental Management Plan to be used during both construction and operation phases.

CHAPTER II

2. LEGISLATION AND REGULATIONS FRAMEWORK

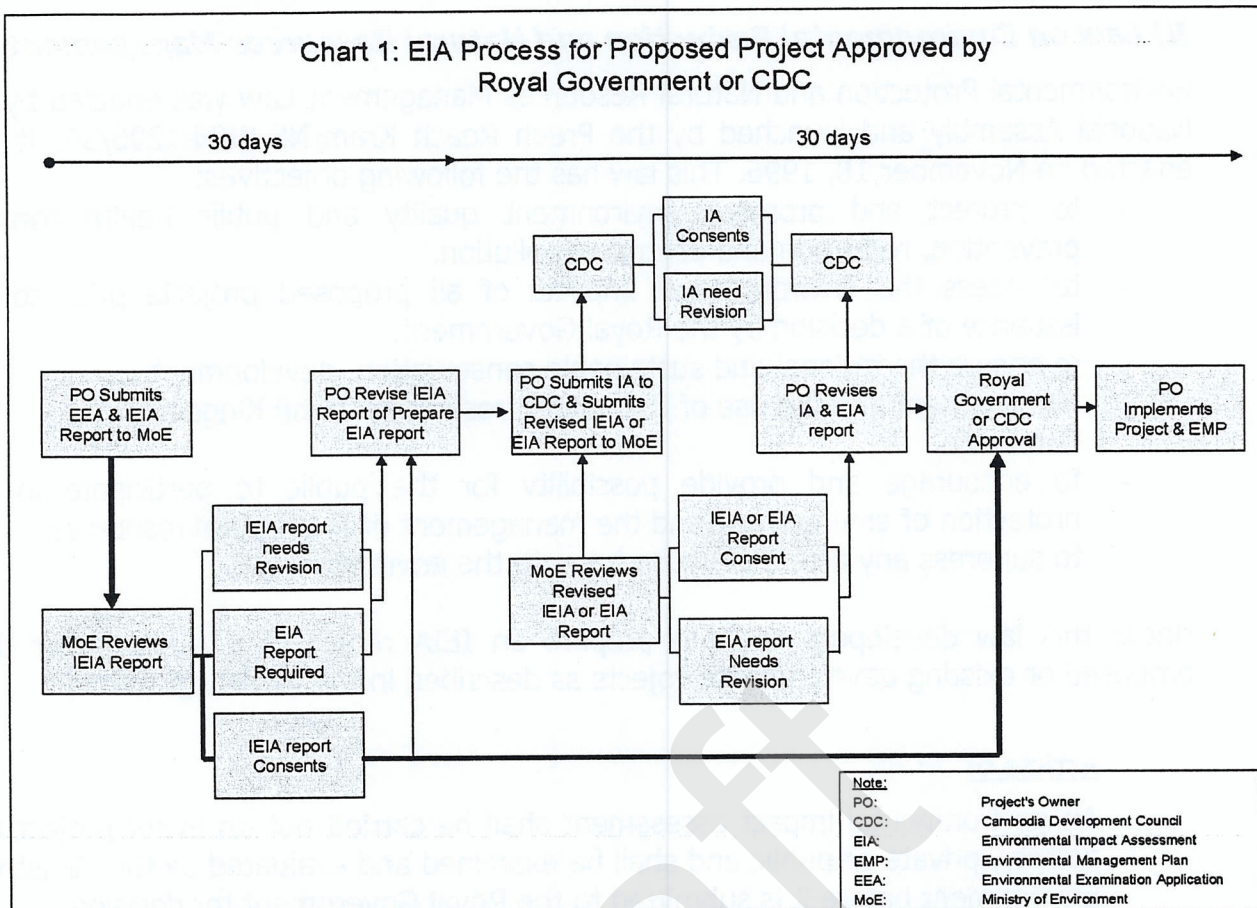
2.1 Key Agencies

The proposed hydropower plant is directly under the control of the Cambodian Electrical Authority and Ministry of Industry Mines and Energy (MIME). Due to the project location in Stung Treng province and concerning the natural resources protection and management within the province, the key agencies include the provincial authorities of Stung Treng, Ministry of Agriculture Forestry and Fishery (MAFF), and Ministry of Environment (MoE). In relation to the relocation and resettlement of the affected people/communities the key institutions are Inter-ministerial Resettlement Committee (IRC) leaded by Ministry of Economics and Finance (MEF) and Ministry of Land Management Urban Planning and Construction (MLMUPC). In relation to water resources, the Ministry of Water Resources and Meteorology (MoWRAM) is the main stakeholder under the recently passed Law of Water Resources Management. As the project is also a large investment project the Ministry of Economic and Finance (MEF) as well as CDC are major institutions for approving the project investment.

2.2 EIA Process in Cambodia

The Law on Environmental Protection and Natural Resource Management and sub-decree on environmental impact assessment process use as an environmental planning tool for development projects in Cambodia by requiring that "an environmental impact assessment shall be done on every project and activity, private and public, and shall be reviewed and evaluated by the Ministry of Environment before being submitted to the Royal Government for decision", (Article 6 of the Law). The Sub-decree on Environmental Impact Assessment Process contains a requirement that an IEIA/EIA report shall be submitted along with the feasibility study documentations of the project to the Ministry of Environment for reviewing and approval. The process being followed with the present project involves the Project Owner "EVN/PECC1" need to submit EIA report with Feasibility Study Report of Lower Sesan 2 HPP Project to MoE.

The bellowing chart is showed the EIA process for proposed project approval by Cambodia Development Council (CDC).



2.3 Legislation and Guidelines

A number of important laws, sub-decrees, and guidelines apply to the Sesan 2 Hydropower Plant Project are as follows:

A) Constitution of Kingdom of Cambodia, 1993

In economic part in chapter 5 of the constitution stimulated that:

- The properties of the state include land, underground resources, mountain, sea, sea bottom, under sea bottom, coastal/beach, atmosphere, island, river, preak, stung/stream, lake, forest, natural resources, economical-culture centre, nation defence base, other structure define as belong to the state, Article 58.

- Government shall protect environment and balancing natural resources and manage with properly plan on the land, water, air, atmosphere, geology, ecological system, mines, energy, petroleum and gas, rocks and sand, gems, forest and forest by-product, wildlife, fish, and aquatic resources, Article 59.

- Government promote economic development in all sectors and remote areas especially agricultural, handicraft, industrial with attention to water policies, electricity, roads, transportation facilities, modern technology, and credit system, Article 61.

B) Law on Environmental Protection and Natural Resources Management

Environmental Protection and Natural Resources Management Law was enacted by the National Assembly and launched by the Preah Reach Kram/NS-RKM-1296/36. It was enacted on November 18, 1996. This law has the following objectives:

- to protect and promote environment quality and public health through prevention, reduction and control of pollution.
- to assess the environmental impacts of all proposed projects prior to the issuance of a decision by the Royal Government.
- to ensure the rational and sustainable conservation, development, management and the use of the natural resources of the Kingdom of Cambodia.
- to encourage and provide possibility for the public to participate in the protection of environment and the management of the natural resources.
- to suppress any acts that cause harm to the environment.

Under this law developers need to prepare an IEIA report or EIA report for their proposed or existing development projects as described in the following articles:

Article 6:

An environmental impact assessment shall be carried out on every project and activity, private or public and shall be examined and evaluated by the Ministry of Environment before it is submitted to the Royal Government for decision.

Article 7:

Every Investment Project Application and proposed project which is submitted by the State, shall enclose with them a preliminary Environmental Impact Assessment or Environmental Impact Assessment as stated in Article 6 of this law. The Ministry of Environment shall consider and make recommendations on the Initial Environmental Impact Assessment or Environmental Impact Assessment to relevant competent bodies within a period as determined in the Law on Investment of the Kingdom of Cambodia.

Article 8:

The natural resources of the Kingdom of Cambodia, which include land, water, airspace, air, geology, ecological systems, mines, energy, petroleum and gas, rocks and sand, precious stones, forests and forest products, wildlife, fish, and aquatic resources, shall be conserved, developed, and managed and used in a rational and sustainable manner.

C) Preah Reach Kret (Royal Decree) on Natural Protected Areas

The Royal Decree on Natural Protected Areas was enacted by the National Assembly and launched into use by Preah Reach Kret/01 dated Nov 1993.

The Royal Decree stipulates as follows:

Article 1: Responsibility for the protection of natural areas

The Secretariat of Environment shall be responsible for managing and supervising the development and protection of natural areas, including the protection of environment, land, forestry, wetland and coastal areas. The Secretariat of Environment shall have the right to create and chair appropriate committees in order to co-ordinate inter-ministerial activities both at the political and technical level. The management and supervision of the protected natural areas of the nation shall be the responsibilities of the Secretariat of Environment in co-operation with other competent relevant institutions.

The following areas including all land reserves are:

- 1. National Parks:** Areas reserved for nature and scenic views to be protected for scientific, educational and entertainment purposes.
- 2. Wildlife Preserves:** Natural areas preserved at their natural conditions in order to protect wildlife, vegetation and ecology balance.
- 3. Protected scenic view areas:** Areas to be maintained as scenic views for pleasure and tourism.
- 4. Multi purposes areas:** Areas necessary for the stability of the water, forestry, wildlife, and fisheries resource, for pleasure, and for the conservation of nature with a view of assuring economic development.

Article 3: amendment

The protected natural areas may be modified or expanded in the future on the basis of scientific information involved in the conservation of ecology and the maintenance of the existing landscape in the Kingdom of Cambodia.

D) Sub-Decree on Environmental Impact Assessment Process

The sub-decree No 72 ANRK.BK on Environmental Impact Assessment dated 11 August 1999. The key relevant articles are as follows:

Article 1:

This sub-decree has the objectives to:

- Define an EIA for all projects and activities of private or public sector and shall be examined and evaluated by the Ministry of Environment prior to submitting to the Royal Government for decision.
- Define a nature and size of the proposed activities together with the existing and on-going activities of both private and public sector to be assessed the environmental impact.
- Foster public participation in the EIA process in order to take their ideas and comment into consideration for project approbation.

Article 2:

This sub-decree has an expanded implementation on the proposed project and existing activities, under operation of the Private Company, joint-venture or State own Company, Ministry-State Institution, which are decree, except some