Manual for PIP Project Management

Section V Technical Approaches in PIP Management

Section III explains the technical approaches that are required when planning, monitoring and evaluating a PIP project. Technical approaches; Economic / Financial analysis, social analysis and environmental analysis are important to PIP management, and expertise is required to fully understand these aspects. However, for all staff related to PIP management, it is necessary to understand at least the basic knowledge for these aspects.

Basic knowledge required for personnel involved in PIP management are introduced in this manual. By understanding these approaches in the level as described in this manual, it would be possible to understand the outline of analysis results that a person with expertise has compiled. In order to obtain knowledge as to a level that can commit the analysis by its own, it is recommended to study more deeply with specialized books and training.

Contents

REFERENCE MATERIAL FOR SOCIAL ANALYSIS IN PIP PROJECT MANAGEMENT

Section V-1

Reference Material for Social Analysis in PIP Project Management

FOREWARD

This reference material is to be used as a guide to incorporating Social Analysis in project management by those who are in charge of assessing and monitor PIP projects, namely the staff in the Ministry of Planning and Investment (MPI) and provincial Department of Planning and Investment (DPI), hereinafter referred to as MPI/DPI. Social Analysis is expected support staff to assess or monitor whether PIP projects appropriately consider the social issues/impacts and take proper measurements to mitigate adverse impacts caused by projects.

To explicitly explain the main tasks for MPI/DPI staff, this reference document had to clarify the process of inclusion of Social Analysis in the flow of PIP Project Management and tasks to be taken by Project Owners (POs). Therefore, it is expected that manual users will deepen their understandings of this process and tasks of the POs, then understand their own tasks. In addition, this document may be useful for POs in the process of initiating or implementing projects.

It should be noted that the Government of Lao PDR (GoL) has already issued the "Decree on the Compensation and Resettlement of the Development Project (Decree No 192/PM)," dated July 7, 2005. In line with this Decree, Water Resources and Environment Administration (WREA), in November 2005, issued "Technical Guideline on Compensation and Resettlement in Development Project." This is a well constructed guideline, explaining the detailed processes to deal with compensation and resettlement issues in development projects and including a variety of useful tools for project planners.

Therefore, this reference document, complying with these legal documents, will not repeat every issue stipulated in them, but extract some essential points that MPI/DPI staff needs to understand when they assess and monitor projects.

The reference document comprises two parts: Conceptual and Practical parts. The Conceptual part will explain the basic concept and confirm the significance of Social Analysis in development projects including PIP projects. The Practical part will touch upon the steps of conducting Social Analysis according to the project flow of PIP Management and points to be checked when projects are assessed or monitored.

This document is expected to be utilized together with this Manual, and provide technical support to MPI/DPI staff for project assessment and monitoring.

LIST OF ABBREVIATIONS AND ACRONYMS USED

DPI	Provincial Department of Planning and Investment
ECC	Environmental Compliance Certificate
EMDP	Ethnic Minorities Development Plan
F/S	Feasibility Study
ISA	Initial Social Assessment
LACR	Land Acquisition and Compensation Report
MPI	Ministry of Planning and Investment
MPI-DOE	Department of Evaluation, MPI
PIP	Public Investment Program
PM	Prime Minister
PO	Project Owner
RP	Resettlement Plan
SDP	Social Development Plan
SIA	Social Impact Assessment
SPAS	Simplified Project Assessment Sheet
WREA	Water Resources and Environmental Administration

TABLE OF CONTENTS

I. CONCEPTUAL PART

This part will provide the concept of Social Analysis in project management, touching upon the significance of incorporating social aspects in the project management. There are many cases that projects confronted many difficulties due to exclusion of Social Analysis from project design and management. It is expected that this conceptual part will make readers aware of importance of Social Analysis in project management.

1. Basic Concept of Social Analysis

1.1 Introduction

Analyzing the social requirements of the project beneficiaries is critical as it will ensure that the beneficiaries within the project area obtain all the benefits from the planned project and that the people would not suffer any negative social impacts. If Social Analysis is not performed on the planned project, there is a high possibility that the project can do more harm than good to the beneficiaries.

1.2 Relationship with Poverty Reduction

PIP Projects within Laos mostly emphasize the aim of economic development and poverty reduction. In order to effectively reduce poverty, Social Analysis must be performed at the initial stages of the project, since the Social Analysis examines the issues centering around the people and their livelihoods.

Poverty is not just a state of having little or no money and few or no material possessions. People in these situations also lack human development, are not taken into consideration in decision making and are vulnerable to any form of change. Due to such status, they also face discrimination, exploitation, have a lack of power and are fearful. From the viewpoint of poverty reduction, Social Analysis is also essential elements to be taken into consideration.

1.3 Issues Considered under Social Analysis

A good strategy to deal with social issues for projects is to ensure that beneficiaries and disadvantaged groups have **inclusion** in the project activities; there must also be a sense of **empowerment** and **security**. Appropriate analysis of these issues ensures that the project has the capability to benefit the people and contributes to the development.

Inclusion of the poor and empowerment

The inclusion of the poor is critical as it allows them to improve their livelihood as follows;

- to gain access to goods and services in order to improve their financial and economic opportunities,
- to participate in decision making activities, familiarize themselves with institutions and processes that they might previously have had no access to,
- to improve their financial situation and their social networks, and,
- to provide them with a sense of empowerment as they have the opportunity to make decisions on projects that can influence their lives.

Risks and Security

Provision of security to the poor and exposing them to minimal risks and vulnerability also lead to the success of projects. Projects have many derived benefits. On the other hand, there are also adverse impacts which must be minimized not to affect the beneficiaries, especially the poor.

The people tend to be vulnerable when risks are introduced into their lives. Risks introduced through projects could include resettlement, loss of assets, or contamination of farming land. Shocks such as these will affect them most as they have few assets, savings and/or opportunities to lessen its impact on their lives. Analyzing the social impacts on the beneficiaries and the concerned social issues, and action plans to counter the effects of the negative impacts will be properly mitigate impacts from projects.

2. Social Analysis in Projects

2.1 Introduction

The primary objective of incorporating Social Analysis in projects is to help projects ensure its success, meaning that project will benefit the targeted groups and contribute to the sustainable and equitable development[1] in a country or regions.

[1] Equitable development involves leveling the playing field so that intended beneficiaries and other key stakeholders can express their opinions and participate in the development opportunities created by the project.

Social factors which influence a project need to be analyzed throughout the entire life of a project, from the stages of planning until operation and maintenance. Among project stages, the high priority of Social Analysis should be put on the planning stage. When the project is formulated, thoroughly examining relevant social factors and incorporating the necessary measures to enhance effects or minimize the adverse impacts into project design, the project will take one step forward to its success. Without examining or incorporating social factors when project formulation, no appropriate action will be planned or taken in latter project stages.

2.2 Significance of incorporation of Social Analysis into project

There are some projects which have minimal consideration on Social Analysis in project formulation; thus this creates inequality in society or makes the project effects unsustainable. To avoid this, the design of projects should be improved by analyzing the characteristics of beneficiaries, their needs, and social measures to be taken place, and by proposing the mitigation plans/actions for adverse impacts on the people.

Case of Education Project

A project was initiated to improve access to education. In order to achieve this, the project committee has decided to construct a school and design a curriculum. Since the project did not conduct Social Analysis on the project, many key issues were missed. Those are the followings:

- ***Accessibility for girls.*** Traditionally education for girls is seen as a waste of time. Girls within the provinces are expected to marry early and go live with their husband. As such there is no return on investment for the parents. Therefore, not many girls attended the school established and the education gap between boys and girls were seriously concerned.

  <Social Analysis>
  Social analysis will provide an insight into this fact and offer such schemes as, educating parents and encouraging them that girls have the ability to learn and education can improve their lives. It could also suggest that as part of the projects, female teachers are hired and will therefore act as role models for girls in the area.

- ***Accessibility to ethnic minorities.*** Many ethnic minority groups do not have a good grasp of the Lao language. Therefore, they hesitate to attend the school.

  <Social Analysis>
  Social Analysis can determine that school curriculums need to cater for this fact to encourage enrolment amongst the ethnic minorities. To overcome the language barrier multi-lingual teachers could also be employed which could further improve access for these groups.

By taking these issues into consideration, Social Analysis will actually improve the design of the project and will ensure that equality in the opportunities and benefits are taken by many people.

There is a perception that Social Analysis needs considerable expense. In conducting Social Analysis, experts need to be hired to perform the work which could take months to complete. This is understandably costly and locally funded projects cannot afford such luxuries. There is also a belief that altering the project design for social reasons will add further costs to the project.

If the social aspects of the project are not taken into consideration, it will be more costly in the long run in terms of money and social welfare of the beneficiaries. Taking a look at a project conducted in Laos as an example, the consequences of not performing Social Analysis will be further understood.

Case of Social Analysis in Theun-Hinboun Hydropower Project
Theun-Hinboun Hydropower Project had the objective of supporting economic growth in the Lao PDR by enhancing foreign exchange earnings through export of electricity to Thailand. Although environmental and social impacts were identified, no action was taken to mitigate those impacts. As a consequence, the beneficiaries of the project faced production losses as the project affected riverbank gardens, fisheries, water supply, hunting/gathering, land and some tree. As impacts were not mitigated and taken into consideration when forming the project design, the adverse impacts were seen on the beneficiaries. There was a further cost in terms of finance since more money was required to rectify the problems caused by the project, as a 10 year Environment Management Plan (EMP)[2] has now being implemented.

2.3 Generic Points to be considered for Social Analysis

Social Analysis covers various issues, depending on the contents of projects: that is, the type of projects, sectors, scale of project, or characteristics of the people that project targets. In general, Social Analysis may include to examine and identify (1) the groups who are expected to benefits from projects, (2) the groups who may be adversely affected by projects, and (3) the necessity of measures to mitigate or compensate adverse impacts.

When it is found that any measures to mitigate or compensate adverse impacts to affected people are needed as a result of survey during the project preparation, mitigation plans are commonly prepared by the POs. This will be more touched upon in the latter section.

[2] Refer to Theun-Hinboun Project Completion Report (pcr_lao27325.pdf in www.adb.org) for more details.

2.4 Legal Framework on Compensation and Resettlement in Lao PDR

The concerned legal documents are already issued by Prime Minister and WREA to date.

- ✓ ***Decree on the Compensation and Resettlement of the Development Project*** (No.192/PM), issued on July 7, 2005
- ✓ ***Technical Guidelines on Compensation and Resettlement in Development Projects*** issued by WREA in November 2005.

Although the title of these documents is likely to focus on compensation and resettlement, the documents comprehensively covers essential process and procedures to include social requirements in projects. Therefore, when not only preparing a plan for resettlement and compensation but also carrying out survey regarding social assessment, a project has to comply with the rules and processes specified in these documents.

Decree on the Compensation and Resettlement of the Development Project (No.192/PM), issued on July 7, 2005

This document specifies principles, rules and measures to mitigate adverse social impacts and to compensate damages that result from involuntary acquisition or repossession of land and fixed or movable assets. The Decree aims to ensure that project affected people are compensated and assisted to improve or maintain their pre-project incomes and living standards, and are not worse off than they would have been without the project[3]. The Decree also define key terminologies important for Social Analysis, such as compensation, replacement cost, project affected people, resettlement, or vulnerable groups.

According to this Decree, the main responsibility and duties regarding compensation and resettlement should be taken by the POs. The Decree also specifies in "Article 18 Implementation" that supervising authorities of development projects needs to comply with the Decree: MPI and DPI, therefore, are obliged to do so as supervising authorities of PIP Projects.

Definition of technical terms specified in the Decree No.192/PM

The following terms are extracted from the definition specified in the Decree No.192/PM.

Compensation: payment in cash or in kind for an asset to be acquired or affected by projects at

[3] This statement is extracted from Article 1 of the Decree No.192/PM.

replacement cost

Replacement Cost: the amount in cash or in kind needed to replace lands, houses, infrastructure or assets on the land (crops, fruit trees) and other assets (income) affected by projects.

Project Affected People: this includes any person, entity or organization affected by projects, who in the context of acquisition of assets or change in land use before the project commencement date, would have their:

i) standard of living adversely affected

ii) right, title or interest in all or any part of a house, land (including residential, commercial, agricultural, plantations, forest and grazing land) water resources or any other moveable or fixed assets acquired or possessed, in full or in part, permanently or temporarily adversely affected;

iii) business, profession, work areas or residential areas adversely affected with replacement or no replacement;

iv) community resources adversely affected.

Rehabilitation: assistance provided to seriously affected persons due to the loss of productive assets, incomes, employment or sources of living that require to be compensated in order to improve, or at least achieve full restoration of living standards to pre-project level.

Resettlement: it refers to all measures taken by the project proponent to mitigate adverse social impacts of a project, fully or partially, on the affected persons, including compensation for loss assets and incomes and the provision of other entitlements, income restoration assistance, and relocation, as needed.

Vulnerable Groups: distinct groups of people who might suffer disproportionately from the loss of fixed and movable assets, other assets and production base or face the risk of being marginalized from the effects

Technical Guidelines on Compensation and Resettlement in Development Projects issued by WREA in November 2005.

This guideline aims to provide detailed guidance to the POs, private and public sector, as well as all concerned in addressing social issues in development projects specifically in planning and implementation of resettlement plans, ethnic minority development plan, where necessary. It also provides guidance for conducting social assessment in projects which indirect impacts on population within or beyond the project boundaries.

This guideline includes the details of processes and procedures necessary for data collection, survey, and preparation of various documents in accordance with the provisions of Decree 192 on Resettlement and Compensation. Moreover, the guideline equips the useful formats to promote the various and necessary analysis on social aspects as extracted in the table below.

No	Title

No	Title
Annex 1	Initial Social Assessment Check List of Information on Resettlement
Annex 2	General List of Information Required for Resettlement Plans
Annex 3	Outline of Resettlement Plan
Annex 4	Preliminary Screening of Ethnic Minorities
Annex 5	Social Assessment for Ethnic Minorities
Annex 6	Sample Schedule for Ethnic Minority Consultation
Annex 7	Proposed Action Plan
Annex 8	Suggested List of Data for Census Survey
Annex 9	Suggested List of Data for Inventory of Losses
Annex 10	Suggested Data for Baseline Survey
Annex 11	Inventory of Project Affected Assets (Sample)
Annex 12	Sample Format for Socio-Economic Household Data Sheet
Annex 13	Gender Checklist: Addressing Gender in Data Collection for Resettlement
Annex 14	Entitlement of Project Affected People (Sample)
Annex 15	Compensation Matrix (Sample)
Annex 16	Categories of Structures (Sample from Cambodia)
Annex 17	Unit Price for Structural Components by Type of Construction (Sample from Cambodia)
Annex 18	Compensation Rates for Trees and Crops (Sample from Cambodia)
Annex 19	Gender Checklist: Entitlements and Eligibility
Annex 20	Gender Checklist: Income Restoration
Annex 21	Categories of Affected Peoples and Income Restoration Measures
Annex 22	Gender Checklist: Relocation Issues
Annex 23	Gender Checklist: Consultation and Participation in Resettlement
Annex 24	Public Consultation and Participation in Project Cycle
Annex 25	Sample Public Consultation and Disclosure Plan
Annex 26	Gender Checklist: Grievance Redress Mechanisms in Resettlement
Annex 27	Gender Checklist: Monitoring and Evaluation in Resettlement
Annex 28	Sample Terms of Reference for External Monitoring of Resettlement Plans Implementation
Annex 29	Generic Outline for External Monitoring Report
Annex 30	Format for Resettlement Cost
Annex 31	Gender Checklist for Resettlement Budget
Annex 32	Eligibility for Resettlement Cost under the Loan
Annex 33	Resettlement Activities and Targets
Annex 34	A sample of sequence of activities determined for a waterways project in Vietnam

These formats are especially useful for the POs who will propose a project. Since MPI and DPI are the organizations in charge of assessing and monitoring the projects proposed or implemented, it can also refer to the guideline and the sample formats included in annex, and simultaneously promotes that the POs follow the guideline.

2.5 Role of MPI and DPI

MPI and DPI are relevant authorities of managing PIP project and their significant task is to assess proposed PIP projects. When social impact, especially required resettlement or compensation, is significant to the people due to project implementation, social assessment will be supervised and approved by WREA according to the Decree No.192/PM. In this case, MPI and DPI will be responsible to make sure that proposed projects appropriately comply with appropriate procedures within stipulated rules and obtain the approval before MPI and DPI assess projects.

When the proposed projects do not induce significant adverse social impacts on the people and are citified by WREA that projects do not have to go through comprehensive social assessment, MPI and DPI will have responsibility to check whether projects will not induce other adverse social impacts: for example, gender disparities, girls' education, changing livelihood of affected people, etc.

In sum, MPI and DPI will be the last relevant organizations to ensure to lessen the possibility that PIP projects would induce adverse impacts due to project implementation.

II. PRACTICAL PART

This part will present the practical process of incorporating Social Analysis in PIP Project Management. It is mostly true that better project planning lead to better project outcome. This also applies to Social Analysis. When social aspects are carefully analyzed at the planning stage and the plans to minimize the adverse effects on the peoples or their livelihood are well prepared, the project will be implemented smoothly and generate intended benefits. In this practical part, the major social points to be incorporated in projects will be explained based on the stages of project management.

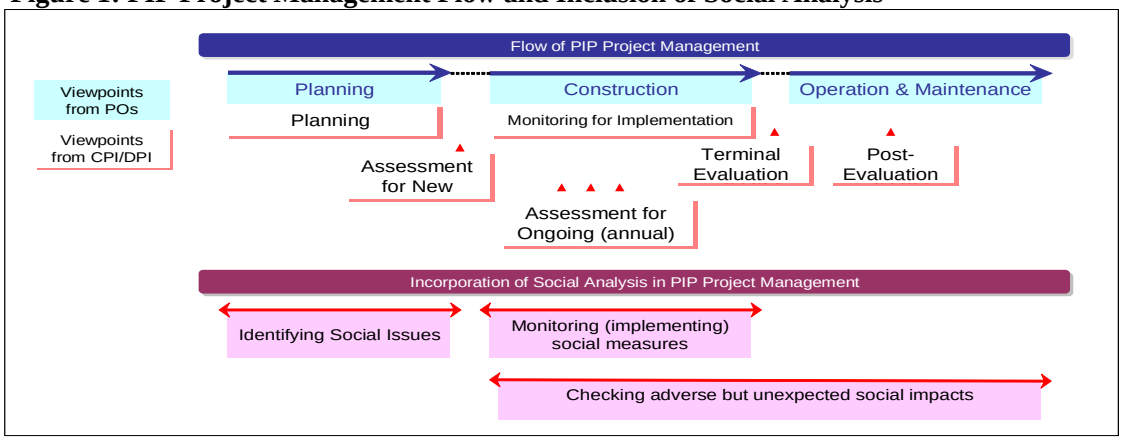
1. Social Analysis in the Flow of PIP Project Management

All PIP projects will go through every project stage, beginning from planning, assessment, monitoring for implementation, evaluation and to operation and maintenance. The degree of inclusion of Social Analysis and major analysis points vary among stages. This section will briefly summarize the activities necessary for Social Analysis in each stage based on the description in "Technical Guidelines on Compensation and Resettlement in Development Projects (hereafter referred to as "the Guideline)," since it is a legally authorized document in Lao PDR.

However, noting that the Guideline mostly targets those who initiate PIP projects, namely the POs, this section will apply the stages and steps of PIP Project Management proposed by "Manual for Public Investment Program (PIP) Project Management (hereafter referred to as "the Manual")." This manual targets the staffs in charge of project assessment and supervision, namely MPI and DPI staff; therefore the stages and steps applied in the Manual enable MPI and DPI staff easier to follow the project flow and to identify what necessary activities they should take. Those stages are Planning, Assessment, Monitoring for Implementation, Evaluation, and Operation and Maintenance.

The figure below explains the project stages based on the viewpoints from POs and MPI/DPI, and the inclusion of Social Analysis in the project management flow.

Figure 1: PIP Project Management Flow and Inclusion of Social Analysis



1.1 Social Analysis at Planning Stage

As mentioned, incorporation of Social Analysis into project formulation is considerably crucial for projects to ensure the better quality of project design. This section will explain what actions have to be taken for Social Analysis, applying three steps[4] of (1) Project Identification, (2) Project Formulation, and (3) Technical Detailed Plan, as defined in the Manual.

(1) Project Identification

The major focus in this step is finding project ideas or identifying needs or demands for projects. The activities carried out are generally fact-finding survey, or review of census or available secondary data. The information regarding social factors should be collected through these data collection or review activities, so called **Initial Social Assessment**.

The Guideline explains **Initial Social Assessment** in "2.2.2 Initial Social Assessment" as follows.

> ***Initial Social Assessment*** *involving identification of potential social issues and impacts and key stakeholders is undertaken during the project identification. The exercise includes screening of available information for assessment of the types, scale, and degree of impacts and to determine the need for various documents that may be necessary for project process.*

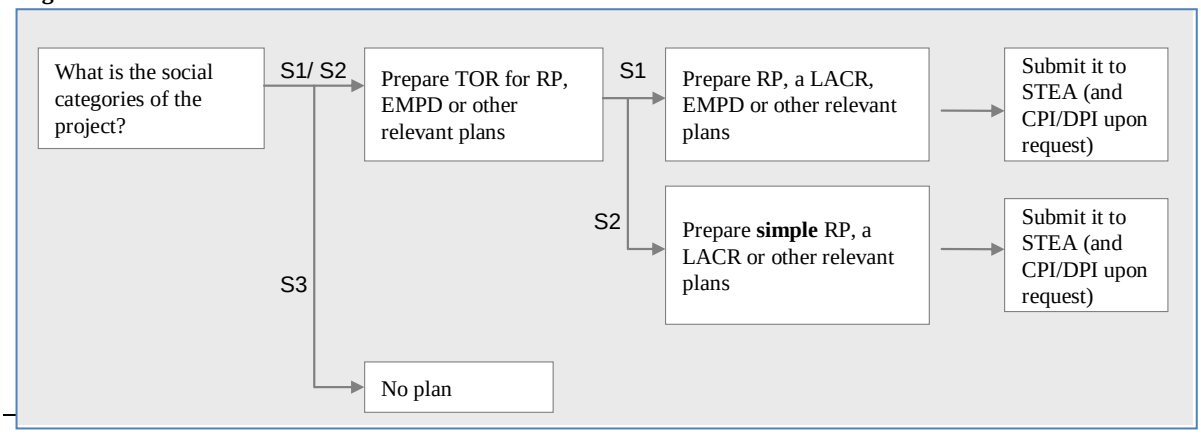
Therefore, based on the result of Initial Social Assessment, POs need to assess whether resettlement effects are likely to be significant and determine whether any plans including documents such as Resettlement Plan (RP), Ethnic Minorities Development Plan (EMDP), or Land Acquisition and Compensation Report (LACR), need to be prepared.

[4] The detailed definition and explanation of each step in planning stage are provided in Section II of this Manual.

Chart 1: Definition, Criteria and Classification of Social Analysis in the Guideline

Criteria for screening defined in the Guideline
The Guideline specified that the criteria to determine the scale of social impact would be the number of people affected in a project and the degree of impacts. **Scale:** the number of affected people, vulnerable groups, or ethnic minorities, or indigenous people. **Degree:** significant (severe) or marginal
Classification and Measures defined in the Guideline[5]
Social Category "S1": Projects with significant impacts a. 200 persons or more severely affected b. 200 or more persons belonging to vulnerable groups severely affected due to the project Projects categorized as S1 are required to prepare a full scale Resettlement Plan. **Social Category "S2": Project with insignificant impacts** Impacts are marginal although the number of people affected may be more than 200 in case of loss of productive assets or for vulnerable groups Projects categorized as S2 are required to prepare a simple resettlement plan or Land Acquisition and Compensation Report (LACR). **Social Category "S3": Project that does not need or induce** acquisition of assets, displacement, loss of incomes and employment, restricted access to community resources, etc. Projects categorized as S3 does not need any further studies on resettlement.

Figure 2: Brief Flow of Submission of Plans



[5] This is a brief classification explained in the Guideline. Since the Guideline has more detailed and specific social categories, it is strongly recommended to refer to the Guideline when projects are categorized.

(2) Project Formulation

This is a step to formulate project framework, meaning that project purpose, outputs, necessary activities or inputs to accomplish the project purpose will be identified by the end of this step. It is advisable that projects conduct feasibility studies for construction projects. In parallel with the feasibility studies, Social Development Plan (SDP) including RP, EMDO, or LACR, or any other necessary plans, is to be drafted.

Moreover, Social Assessment, where necessary, may be carried out. According to the Guideline, Social Assessment study is recommended when Initial Social Assessment indicates complex array of social issues including indirect socio-economic impacts on population within or in the vicinity of project areas. The Guideline explains it as follows.

> ***Social Impact Assessment***[6] *study includes identification of the types and scale of social impacts, stakeholder analysis and institutional analysis. The studies help in formulation of appropriate mitigation measures and instruments necessary to address social issues in the project. Social Assessment generally covers macro level social issues and provides a framework for more detailed survey and for planning and implementation of mitigation measures to address specific issues.*

(3) Technical Detailed Plan

This step includes technical design for construction project, namely Basic Design, or Detailed Design (or Detailed Engineering Design). In this step, social issues to be considered or measures to mitigate adverse impacts are finalized and complied in documents, such as SDP or other social-related plans.

When any plans to mitigate the adverse social impacts of projects are prepared, POs have to submit the prepared plans attaching with the project proposal to WREA, in addition to the responsible government authorities as stipulated in Article 15 of the Decree No.192. Once all social issues are cleared, WREA issues Environmental Compliance Certificate (ECC) to proposed projects.

1.2 Social Analysis at Assessment Stage

This stage will focus on the project assessment on newly proposed projects and ongoing projects. The main responsibilities for project assessment are taken by MPI and DPI for PIP projects. The Manual introduced SPAS (Simplified Project Assessment Sheet) for new proposed

[6] For further details, refer to the Guideline (2.2.2, 4.1.1).

and ongoing projects as project absolute assessment tools, and necessary assessment points in terms of Social Analysis are incorporated in these formats.

(1) Assessment for newly proposed projects

The relevant authorities to assess the PIP projects, namely MPI and DPI, review the plans regarding social matters, which should be attached with project proposal. Those plans include RP, Compensation, Rehabilitation, EMDP, LACR, or other plans submitted by PO. If necessary, MPI and DPI obtain the report of ISA, SIA, or SDP to support the review of proposals.

MPI and DPI integrate the results of review of the plans on social issues into project assessment applying SPAS Formats for new Projects (Series I). SPAS establishes three specific questions to be asked for social issues.

Chart 2: Social Issues in Project Assessment for new PIP projects

Evaluation items	Evaluation items	Questions
1) Relevance	1)-2 Beneficiaries	(i) Are the beneficiaries identified?
		(ii) Does the project meet the beneficiaries' needs?
3) Feasibility of Efficiency	3)-4 Action taken for Social and Environmental issues	(iii) Is there any action plan for social issues

Evaluation Item: Relevance – Beneficiaries

(i) Are the beneficiaries identified?

"Beneficiaries" means those who benefit from the project and use the services generated by the projects.

As the relevant authorities of assessing projects, MPI and DPI can ask the specific question as follows.

- ***Are the beneficiaries clearly identified/ stated in proposal?***
  - First of all, MPI/DPI has to check whether the proposed project clearly identifies and states beneficiaries in the project proposal.
  - If not, the rest of the items in the proposal cannot be assessed appropriately, since beneficiaries are the core to assess the projects.

  "Clearly identified/ stated" means the following points are described in the proposals:
  - ✓ size of beneficiaries in number

- ✓ characteristics of beneficiaries
- ✓ location where beneficiaries reside

❑ ***Does the Project set up the beneficiaries appropriately?***

- The definition or interpretation of "appropriate" may vary, depending on the context of the project, and it is also difficult to have standardized criteria to assess the degree of "appropriate."
- Therefore, this reference document proposes that to assess the degree of appropriateness, MPI/DPI can look at whether the reasons of selecting beneficiaries are rationale or reasonable.
- If the reasons of selecting beneficiaries are very clear and based on the specific data or information, it can be judged that project sets up the beneficiaries appropriately.

(ii) Does the project meet the beneficiaries' needs?

MPI and DPI can ask the specific question as follows.

❑ ***Does the proposal state what the beneficiaries' needs or demands are?***

- Check what needs or demands the beneficiaries have.
- Also check whether project can satisfy or meet their needs and demand.

❑ ***Are the project purpose and project contents likely to satisfy the beneficiaries' needs?***

- To assess this point, check the balance among project purpose, size of beneficiaries in number, project input (total cost, period, etc.). If the size of beneficiaries is obviously larger than the scale of the project purpose, MPI/DPI may recommend that PO revise the size of beneficiaries.
- Since it is difficult to have specific standard, it may be good to refer to the cases of similar projects in the same sector.

Evaluation Item: Feasibility of Efficiency - Action taken for social and environmental issues

(iii) Is there any action plan for social issues?

"any action plan" means the plans above-mentioned such as RP, Compensation, Rehabilitation, EMDP or other plans related to social mitigation.

"social issues" means issues identified through Initial Social Assessment, Social Assessment, or any other field survey. More specifically, these include the loss of assets, change in land use, replacement that affect the livelihood or income of the people.

MPI and DPI can ask the specific question as follows.

❑ ***Does the project proposal attach Environmental Compliance Certificate (ECC)?***

- Check whether the project proposal attach the ECC issued by WREA

- If ECC is not attached although it is supposed to do so, send back project proposal to POs.

❑ ***If ECC mentioned that projects have to go through Social Assessment, are the necessary plans prepared?***

- If projects need to prepare any social plans, make sure if the plans are prepared. If necessary, request POs to submit the plans.

❑ ***If ECC mentioned that projects do not have to go through Social Assessment, do the projects still need to make plan to mitigate social negative impacts?***

- In the case that project does not need develop SDP, check whether any social measures have to be taken in projects.

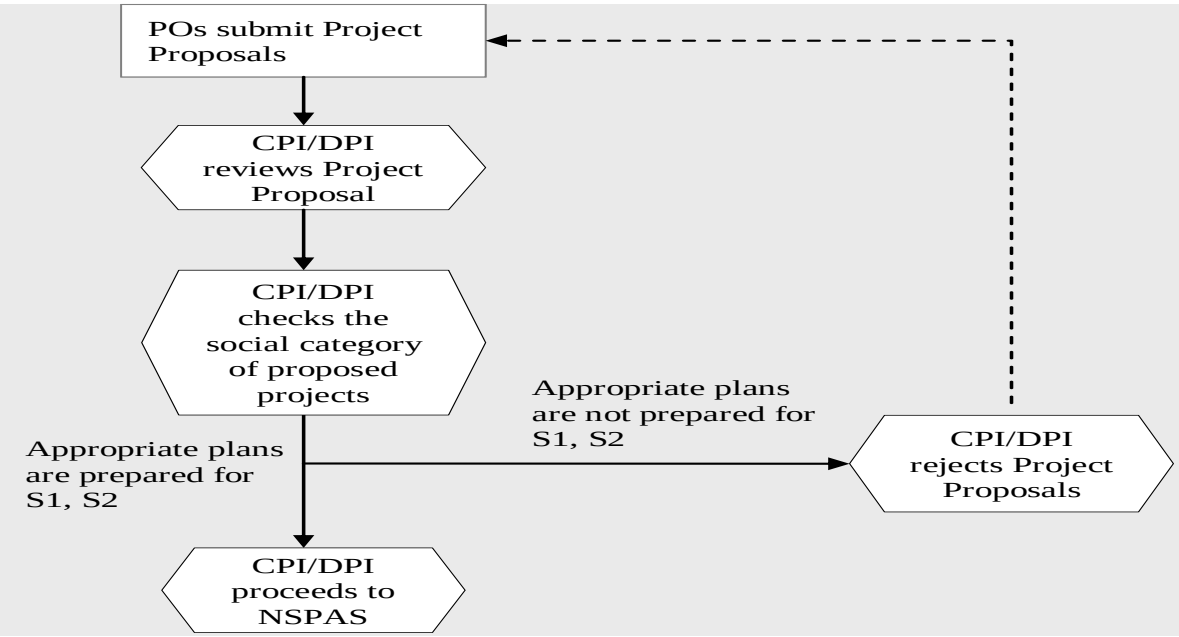


Figure 3: Brief flow of Acceptance of Plans

(2) Assessment for Ongoing Projects

MPI/DPI reviews the quarterly progress reports submitted by POs and checks how the plans to mitigate adverse social impacts have been implemented. If necessary, MPI/DPI obtains the details of monitoring information on concerned plans from POs to assess its progress.

MPI/DPI integrates the results of progress of social mitigation in project assessment applying SPAS Formats for ongoing projects (Series II)[7]. SPAS for ongoing projects are the assessment

[7] Detailed explanation of SPAS formats is included in Section IV of the Manual.

tools to evaluate the ongoing projects, which establishes three specific questions to be asked for social issues.

Chart 3: Social Issues in Project Assessment for Ongoing PIP Projects

Evaluation items		**Questions**
1) Relevance	1)-1 Relevance with the annual development plans and needs	(i) Is the project still consistent with beneficiaries' needs?
3) Efficiency	3)-4 Countermeasures for social aspects	(ii) Are activities of social and environmental countermeasures taken as planned?
4) Impact	4)-1 Unexpected Social and Environmental Impacts	(iii) Are there any unexpected negative impact?

Evaluation Item: Relevance – Relevance with annual development plans and needs

(i) Is the project still consistent with beneficiaries' needs?

MPI and DPI can ask the specific question as follows.

- ***Are the project purpose and project contents still likely to satisfy the needs of targeted beneficiaries?***
  - Since Social Analysis deals with the issues concerning around the people, it should include the examination of the beneficiaries' needs. The questions on beneficiaries are once examined by NSPAS. For ongoing projects, MPI/DPI again has to confirm that the project is on the right track toward providing the intended benefits to beneficiaries.

Evaluation Item: Efficiency – Countermeasures for social aspects

(ii) Are activities of social and environmental countermeasures taken as planned?

MPI and DPI ask the specific question as follows.

- ***When the project prepared Resettlement Plan, Compensation, Rehabilitation, Land Acquisition and Compensation Report, Ethnic Minorities Development Plan or other plans, are these plans including social measures being carried out as planned?***
  - Check what kinds of plans concerning social issues were prepared and implemented to date.
  - Check the progress of the plans.

- If some problems are identified which affects the project progress severely, make recommendations to POs.

Evaluation Item: Impact – Unexpected Social and Environmental Impacts

(iii) Are there any unexpected negative impact?

MPI and DPI can ask the specific question as follows.

- ❑ ***Are there any adverse but unexpected social impacts caused by the project?***
  - Check if any adverse social impacts which have not been expected to occur before are identified.
  - If there are adverse and unexpected social impacts, check if POs have already taken any measures to mitigate them. If not, make recommendations to POs.

1.3 Social Analysis at Monitoring for Implementation Stage

Implementation of the project and any social plans are responsible for POs and MPI/DPI, as relevant governmental authorities, has the responsibility of monitoring whether these activities are appropriately carried out; then make recommendations or provide the supports when necessary. The progress of social measures will be checked on the progress reports submitted by POs quarterly or Social Development Plan (SDP), when it is required to prepare. The specific question that MPI/DPI can ask regarding monitoring is as follows.

- ❑ ***When the project prepared the resettlement or compensation, or any other concerned plans, are there plans being carried out as planned? Specifically, are the social measures planned to be taken place being carried out as planned?***
- ❑ ***Is there any adverse but unexpected impacts caused by the project?***

Basic points regarding these questions are the same as explained under "Efficiency," and "Impact," of "(2) Assessment for ongoing projects," "1.2 Social Analysis in Assessment Stage."

1.4 Social Analysis at Evaluation Stage

As specified in the Manual, Evaluation Stage has two important evaluation works: Terminal Evaluation and Post-Evaluation.

(1) Terminal Evaluation

Terminal Evaluation is carried out at the completion of the project, namely before actual operation of the facilities are commenced especially for construction projects. The main focus of Terminal Evaluation is whether the project purpose is accomplished. The organizations in

charge of Terminal Evaluation are MPI or DPI. From the viewpoint of Social Analysis, MPI/DPI can ask the following questions.

- ***Are all necessary social measures planned to be taken place carried out appropriately?***
  - Check whether there are any social issues remained to be carried out even at the end of project implementation?
- ***Is there any adverse but unexpected impacts caused by the project?***
  - Check whether any adverse social impacts which have not expected before are identified due to the project implementation.

(2) Post-Evaluation

Post-Evaluation is carried out in three, five or more years after the completion of project: that is during the operation period. It aims to examine whether the intended impacts resulting from operating facilities constructed by the projects are emerged. The organizations in charge of Post-Evaluation are MPI or DPI. From the viewpoint of Social Analysis, MPI/DPI can ask the following questions.

- ***Are there any positive social impacts influenced by the project?***
  - Since Post-Evaluation focuses on Impact and Sustainability of the project, the evaluation needs to check the positive expected/unexpected impacts generated by the project.
  - Therefore, check whether any positive/negative and expected/unexpected social impacts generated by the project are identified.

- ***Is there any adverse but unexpected social impacts caused by the project?***
  - Also check whether any adverse social impacts, which were not expected to occur before, were identified.
  - When the complaints from the residents were observed, check whether the following points occurred due to the project intervention:
    - ✓ Widening the income gaps
    - ✓ Widening the gender disparities
    - ✓ Widening the opportunities of access to the market, education, employment, or drinking water.

1.5 Social Analysis at Operation and Maintenance Stage

Although Post-Evaluation is carried out during operation period, the various issues have to be carefully and regularly monitor in Operation and Maintenance (O/M) Stage. When any adverse impacts occur due to the operation of the facilities constructed by the projects, there is no reason

to wait until post-evaluation. The relevant organizations not only the one in charge of O/M or concessionaires but also other concerned organizations such as responsible departments, provincial authorities including DPI, or MPI, have to take prompt actions to mitigate the adverse impacts or solve the problems. As the concerned organizations, MPI/DPI can ask the following questions to check the situation from the viewpoints of Social Analysis.

- ***Is there any adverse social impacts caused by the operation?***
- ***Are there any plans to take care of adverse social impacts caused by the operation?***

2. Summary of Responsible Organizations and Actions to be Taken

Following table summarizes the responsible organizations and their actions to be taken and outputs to be produced in each stage of PIP Project Management. For reference, respective project management stages defined in the Guideline and the Manual are stated.

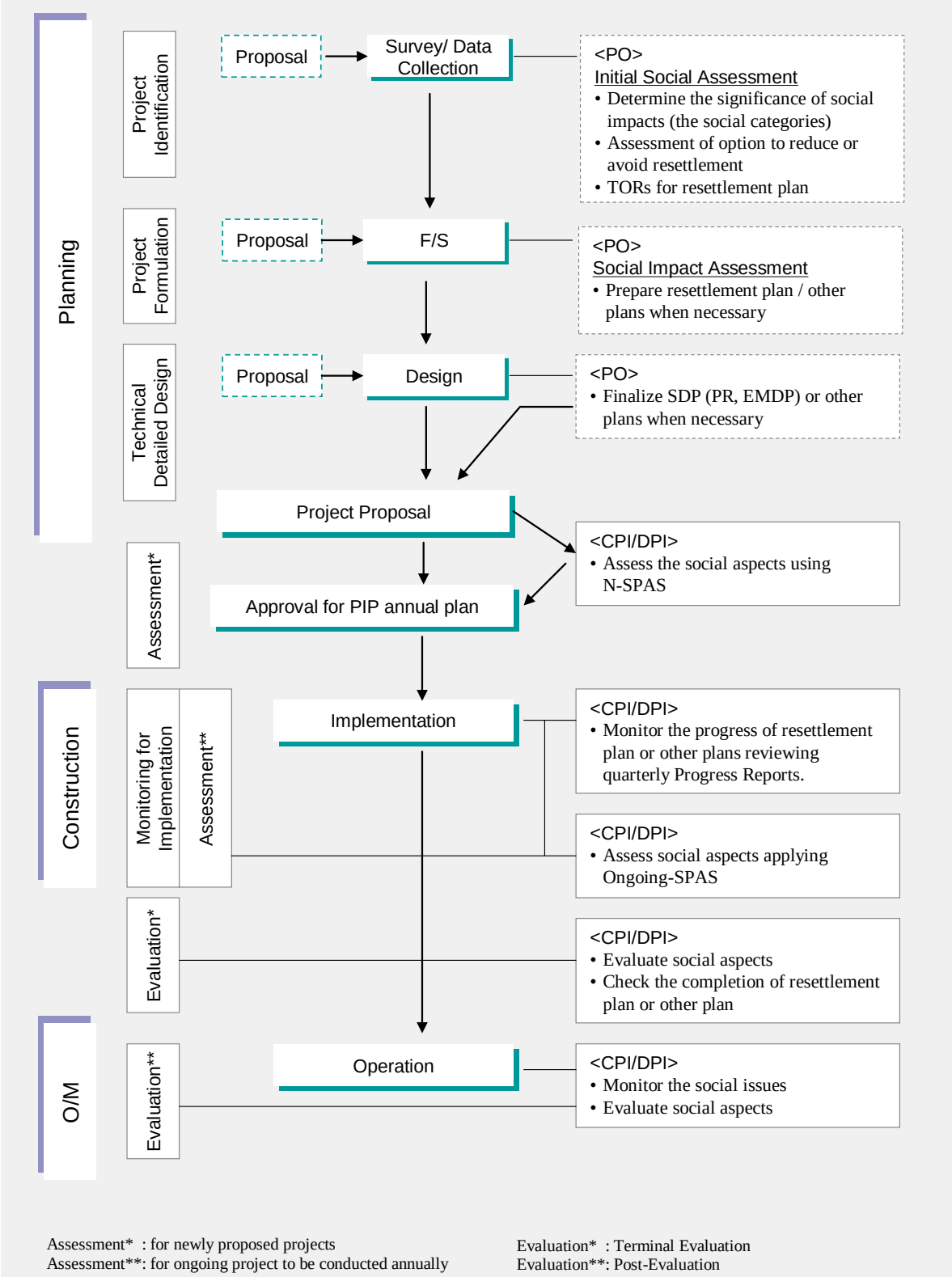
Chart 4: Tasks of Responsible Organizations in the Stages of PIP Project Management

Stages			Respon-sibilities	Key Action Point and Outputs
Guideline	**Manual for PIP Project Management**			
Steps in Project Process	**Stages**	**Steps**		
	Planning			
Project Identification		Project Identification	PO	• Conduct Initial Social Assessment • Determine if consultation with affected people is needed • Determine whether resettlement effects are likely to be significant. • Assess options to reduce or avoid resettlement or social issues • Prepare TORs for Resettlement Plan (RP), if resettlement is likely, Ethnic Minorities Development Plan (EMDP), or other necessary plans. • Prepare Land Acquisition and Compensation Report (LACR) where necessary.
Pre-feasibility Studies Feasibility Studies		Project Formulation	PO	• Conduct Social Assessment, if necessary • Prepare RP, EMDP, or other necessary plans
Detailed Technical Design		Technical Detailed Plan	PO	• Adjust and finalize RP, EMDP, or other plans as necessary • Submit plans with project proposal to MPI/DPI. Plans should be submitted to the relevant agencies as stipulated in the Guideline.
	Assessment			
		for newly proposed projects	MPI/DPI (WREA)	• Review RP, EMDP or other plans submitted by PO • Integrate the results of review into project assessment

Stages			**Respon-sibilities**	**Key Action Point and Outputs**
Guideline	**Manual for PIP Project Management**			
Steps in Project Process	**Stages**	**Steps**		
				applying NSPAS[8] • Make recommendations if necessary
		For ongoing projects		• Check the progress of implementation of RP,EMDP or other plans concerning social issues • Integrate the results of progress review into project assessment applying on-going SPAS[9] • Make recommendations if necessary
Implementation	Monitoring for Implementation		PO	• Implement arrangements for plans and include social measures taken in progress presorts
			MPI/DPI (WREA)	• Monitor and supervise the implementation of plans
	Evaluation			
		Terminal Evaluation	MPI/DPI (WREA)	• Check all activities of social measures were taken place as planned
		Post Evaluation		• Check if there are any positive /negative social impacts influenced by the projects
	Operation and Maintenance		MPI/DPI (WREA)	• Monitor if there are any adverse social impacts caused by the operation.

[8] In "3-4. Actions taken for Environmental and Social Issues" under "3. Feasibility of Efficiency" is the relevant part to check the social issues for project assessment.

[9] In "3-4. Countermeasures for Social Aspects" under "3. Efficiency," and "4-1. Unexpected Social and Environmental Impacts" under "4. Impact," are the relevant parts to check the social issues for project assessment.


Planning
Project Identification
Proposal
Survey/ Data Collection
<PO>
Initial Social Assessment
• Determine the significance of social impacts (the social categories)
• Assessment of option to reduce or avoid resettlement
• TORs for resettlement plan
Project Formulation
Proposal
F/S
<PO>
Social Impact Assessment
• Prepare resettlement plan / other plans when necessary
Technical Detailed Design
Proposal
Design
<PO>
• Finalize SDP (PR, EMDP) or other plans when necessary
Project Proposal
Assessment*
Approval for PIP annual plan
<CPI/DPI>
• Assess the social aspects using N-SPAS
Construction
Monitoring for Implementation
Assessment**
Implementation
<CPI/DPI>
• Monitor the progress of resettlement plan or other plans reviewing quarterly Progress Reports.
<CPI/DPI>
• Assess social aspects applying Ongoing-SPAS
Evaluation*
<CPI/DPI>
• Evaluate social aspects
• Check the completion of resettlement plan or other plan
O/M
Evaluation**
Operation
<CPI/DPI>
• Monitor the social issues
• Evaluate social aspects
Assessment* : for newly proposed projects
Assessment**: for ongoing project to be conducted annually
Evaluation* : Terminal Evaluation
Evaluation**: Post-Evaluation

3. Checklist of Actions for Social Analysis

Practically, social aspects and analysis have to be taken places when projects are formulated at the planning stage, when projects are assessed, when projects are implemented, or operated. That is, Social Analysis is always important for project management at any stages. The table below briefly summarizes the main social points to be taken into consideration at respective stages.

Planning (PO is responsible. This is reference for MPI/DPI staff)	
❑ Are the beneficiaries identified or explicitly stated?	PO[10]
❑ Will the proposed project definitely benefit the targeted beneficiaries? • Check the balance among project purpose, size of beneficiaries, project input (total cost, period, etc.)	
❑ Will the project not adversely affect non-beneficiaries?	
❑ Does the project have to consider the vulnerable groups listed below? • Gender disparities, Women/Girls • Ethnic minorities • Children • Elderly • Disadvantaged groups • Disabled ❑ If so, is it necessary that the project needs to propose appropriate measures for vulnerable groups[11]?	
❑ Does the project require the resettlement of the residents in the project site? ❑ If so, does the project propose resettlement plan?	
❑ Will the residents lose their properties because of the project, such as land, house, trees, cultivation field, etc. ❑ If so, does the project prepare the compensation[12] plan?	

Assessment	
Assessment for newly proposed projects	
❑ Are the beneficiaries clearly identified/ stated in proposal? ❑ Does the Project set up the beneficiaries appropriately? • Are the reasons of selecting the beneficiaries rationale/reasonable?	MPI/DPI
❑ Does the proposal state what the beneficiaries' needs or demands are? ❑ Are the project purpose and project contents likely to satisfy the beneficiaries' needs? • Check the balance among project purpose, size of beneficiaries, project input (total cost, period, etc.)	
❑ Does the project need to prepare the resettlement plan or compensation plan?	

[10] For further details, refer to the Article 4 in Decree on the Compensation and Resettlement of the Development Project (No. 192/PM), issued on July 7, 2005. It specifies "task of Project Owners to address adverse social impacts."

11 Inclusion of vulnerable groups to the project is one of common measures taken place.

12 According to Decree on the Compensation and Resettlement of the Development Project (no 192/PM) issued on July 7, 2005, Article 3 defines Compensation as "payment in cash or in kind for asset to be acquired or affected by projects at replacement cost."

Assessment		
	❑ If so, are the necessary plans prepared? Is prepared plan adequate to mitigate the adverse social impacts?	
	Assessment for ongoing projects	
	❑ Are the project purpose and project contents still likely to satisfy the needs of targeted beneficiaries?	MPI/DPI
	❑ When the project prepared Resettlement Plan, Compensation, Rehabilitation, Land Acquisition and Compensation Report, Ethnic Minorities Development Plan or other plans, are these plans including social measures being carried out as planned?	
	❑ Are there any adverse but unexpected social impacts caused by the project?	

Monitoring for Implementation		
	❑ When the project prepared the resettlement or compensation, or any other concerned plans, are there plans being carried out as planned? Especially, are the social measures planned to be taken place being carried out as planned?	MPI/DPI
	❑ Is there any adverse but unexpected impacts caused by the project?	

Evaluation		
	Terminal Evaluation	
	❑ Are all necessary social measures planned to be taken place carried out appropriately? • Are there any social issues remained to be carried out even at the end of project implementation?	MPI/DPI
	❑ Is there any adverse but unexpected social impacts caused by the project?	
	Post Evaluation	
	❑ Are there any positive social impacts influenced by the project?	MPI/DPI
	❑ Is there any adverse but unexpected social impacts caused by the project?	

Operation and Maintenance		
	❑ Is there any adverse social impacts caused by the operation?	PO MPI/DPI
	❑ Are there any plans to take care of adverse social impacts caused by the operation?	

REFERENCE MATERIAL FOR ENVIRONMENTAL ANALYSIS IN PIP PROJECT MANAGEMENT

FOREWARD

Those who are in charge of assessing and monitoring PIP projects, namely the staff of MPI/DPI, use this reference material as a guideline to incorporate Environmental Analysis in PIP project management. These staffs are expected to assess or monitor whether PIP projects appropriately consider the environmental issues and its impacts, and take proper measures to mitigate adverse impacts caused by projects.

To explain the main tasks of MPI/DPI staff, this reference document has to clarify the process of including Environmental Analysis in the flow of PIP Project Management. The tasks of Project Owners (POs) of the PIP project are also deeply involved in this issue. Therfore, MPI/DPI staffs are expected to deepen their understanding of this process and tasks of the POs, and then come to understand their own tasks. This document may be useful for POs in the process of initiating or implementing projects.

This reference document complies with legal documents. It will not include every issue stipulated in them, but extract some essential points that MPI/DPI staff needs to understand when they assess and monitor projects.

The reference document comprises two parts: Conceptual and Practical parts. The Conceptual part will explain the basic concept and confirm the significance of Environmental Analysis in development projects including PIP projects. The Practical part will touch upon the steps of conducting Environmental Analysis according to the project flow of PIP Management.

LIST OF ABBREVIATIONS AND ACRONYMS USED

B/D	Basic Design
D/D	Detail Design
DPI	Provincial Department of Planning and Investment
DLM	Department of Line Ministry
EA	Environmental Assessment
ECC	Environmental Compliance Certificate
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management System
F/S	Feasibility Study
IEE	Initial Environmental Examination
LM	Line ministries
MAF	Ministry of Agriculture and Forestry
MEM	Ministry of Energy and Mining
MPI	Ministry of Planning and Investment
MPI-DOE	Department of Evaluation, MPI
MPI-DOP	Department of Planning, MPI
MPWT	Ministry of Public Works and Transportation
PCAP	Project for Capacity Building in PIP Management
PCAP2	Project for Enhancing Capacity in PIP Management
PIP	Public Investment Program
PM	Prime Minister
PMO	Prime Minister's Office
PWREO	Provincial Water Resource and Environment Office
PO	Project Owner
RP	Resettlement Plan
SIA	Social Impact Assessment
WREA	Water Resources and Environment Administration

TABLE OF CONTENTS

I. CONCEPTUAL PART

This part will provide the concept of Environmental Analysis.

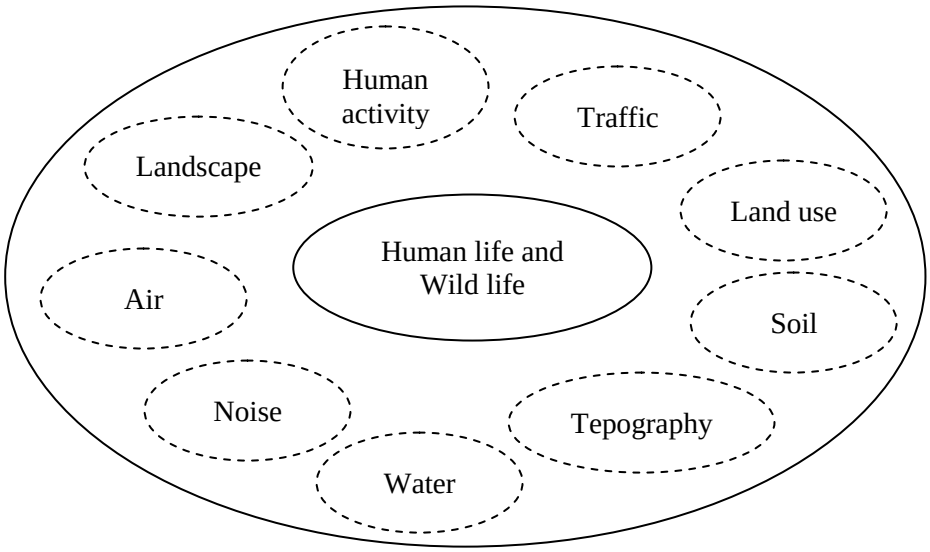
1. Basic Concept of Environmental Analysis

1.1 Introduction

(1) What is the environment?

The environment is the surroundings or conditions in which a person, animal, or plant lives or operates. The environment is not only the physical condition but also social condition. For example, air, noise, water, topography, soil, land use, traffic, human activity, landscape and so on. If the environment of a human life or wildlife has changed significantly, quality or quantity of human life or wildlife are feared to change.

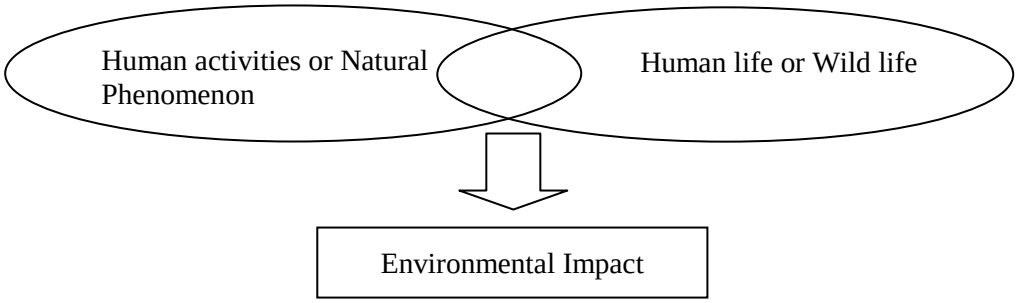
Figure 1 What is the Environment?



(2) What is an environmental impact?

An environmental impact is a phenomenon of changing the environment of human life or wild life. There is both negative and positive environmental impact. The causes of the environmental impact are human activities or natural effect including disasters. An environmental impact will happen where the causes (stressors) and people or wildlife (receptors) are in the same place, and when the magnitude of the effect exceeds the threshold. Then if the causes happen where no one is living, or if the magnitude of the effect does not exceed the threshold, no Environmental impact occurs.

Figure 2 Where environmental impacts may happen



(3) What is Environmental Impact Assessment?

Environmental Impact Assessment (EIA) is a way of the estimation for the significance of the environmental impact. EIA consists of research for the current Environment, identification of the proposed activities and estimation of the impact. EIA can be used for not only project appraisal but also program planning or policy planning. The merit of EIA is as follows.

- It tells us what social and environmental impact might occur.
- It tells us some ways to reduce the social and environmental impact.
- It helps decision maker by showing the result of simulations from many aspects.

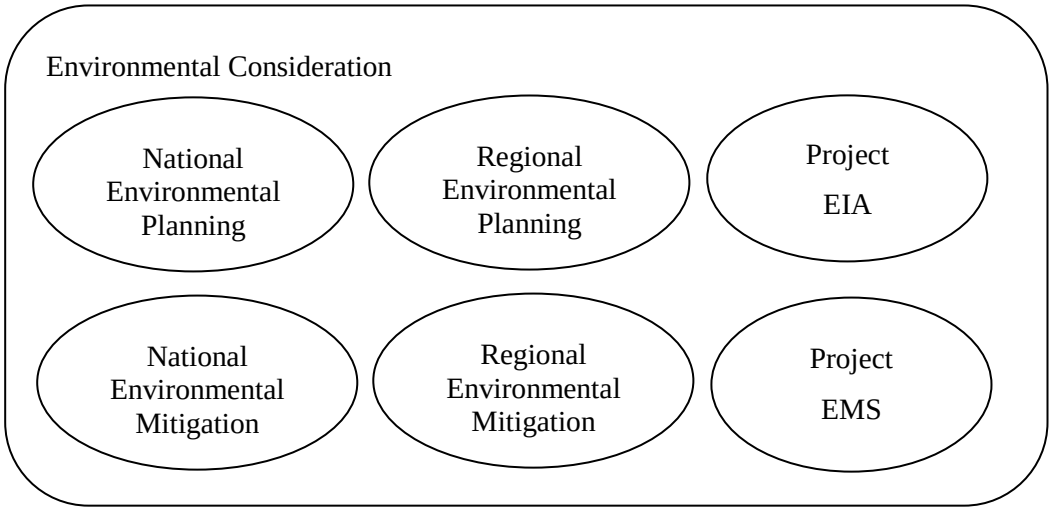
(4) Why EIA has come out?

EIA has come out from the lessons and learnt by the environmental failure. For example, many rivers in the world have lost their precious fishes for many years because of water pollution from factories or mining. Then people realized that if we had started the project environmental friendly, we might not have lost our precious nature. Then if we will not learn from their failures, we might follow same failures and lose our nature.

(5) Environmental Consideration and EIA

EIA is a one of the environmental consideration activities. Some ones are for region or nation and EIA and Environmental Management System (EMS) are for respective projects. Furthermore the environmental legal framework, the environmental check system, the environmental education will help the achievement of the environmental consideration.

Figure 3 Environmental Consideration and EIA



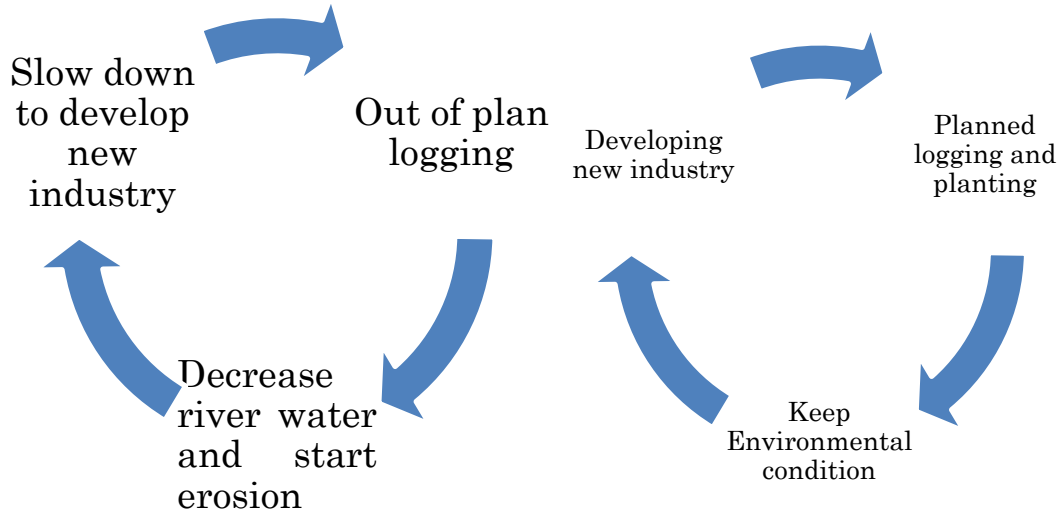
1.2 Relationship with Sustainable Development

Environmental Consideration has very close relationship with sustainable development. Without natural resources it is difficult to keep developing. Many developing countries lost their precious environment in order to get short-term benefit by losing their natural resources. After losing the natural resources, they cannot only keep developing but also cannot keep their food. In order to keep developing the environmental consideration must be necessary.

(1) Sustainable cycle and unsustainable cycle

The following figure shows unsustainable cycle and sustainable cycle of land use. When the country enter the unsustainable cycle, it is very difficult to escape the cycle. For example, Nepal has entered in unsustainable cycle and lost their precious soil. Water, soil and forest have closely relations with each other and it gives us a lot of benefit. In order to enter sustainable cycle we have to see long-term benefit and select wise ways.

Figure 4 Unsustainable cycle and sustainable cycle



(2) Environmental cost and mitigation measure

Many developers think that we can consider the environment in the end of planning. However, their thinking is wrong. If we consider the environment in the beginning of the planning, the environmental mitigation would be very effective and the environmental cost would be very cheap. As shown in next figure there are three kinds of mitigation. One is ***Avoidance***, second is ***Minimize***, and third is ***Compensation***. Avoidance is most effective and Compensation is worst effective. Avoidance is the cheapest and Compensation is most expensive. Only in the beginning of the planning, we can select the Avoidance and in the end of planning, we have no choice other than Compensation. In order to select wise ways we had better consider the Environment as early as possible in the planning.

Figure 5 Avoidance, Minimize and Compensation

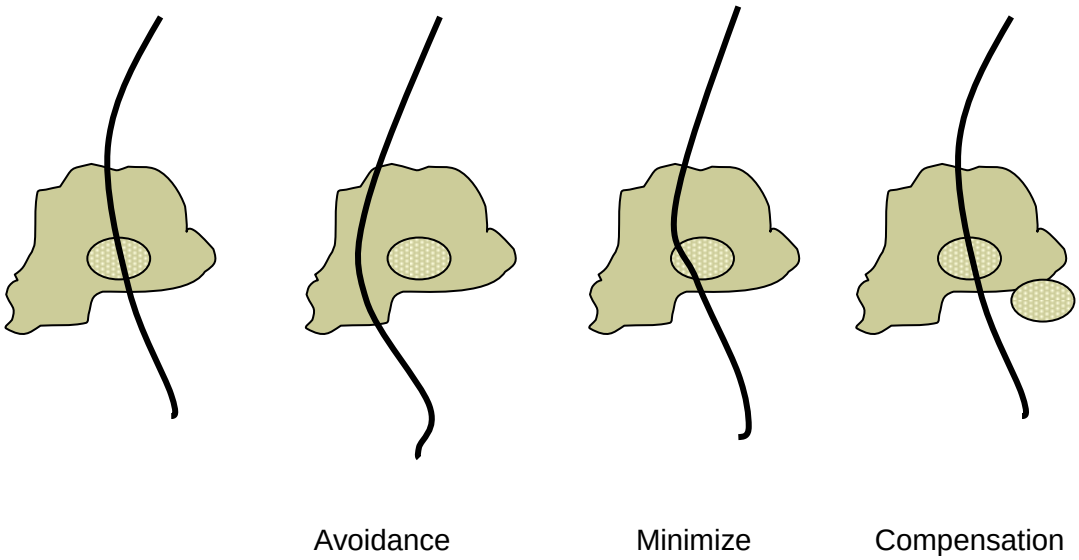
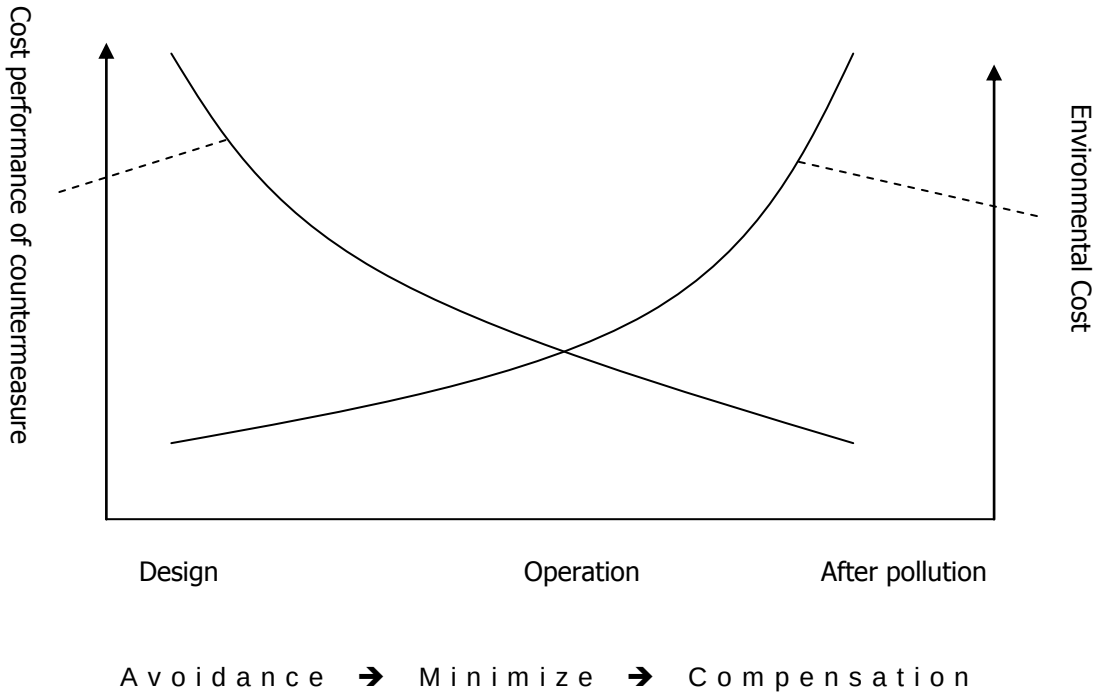


Figure 6 Environmental cost and project stage

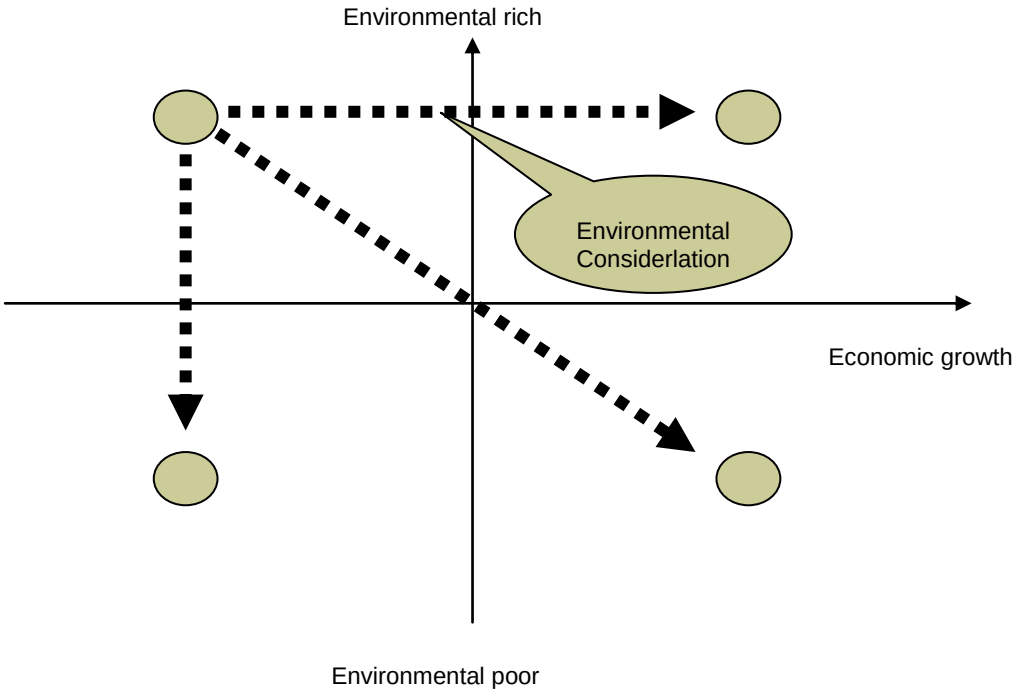


A v o i d a n c e ➔ M i n i m i z e ➔ C o m p e n s a t i o n

(3) A way for win-win

Have you ever heard of ***win-win***? Win-win means the condition where we can obtain both economic success and environmental success. Europe and China has gained economic success with sacrifice of the precious environment. Some countries lost both economic growth and the environment. In order to make a win-win situation, development with Environmental Consideration must be the key. MPI and DPI has the key for this country's future.

Figure 7 A way for win-win



(4) Unsustainable case

- **Deforestation in Madagascar**

Madagascar is the one of the most beautiful countries in the world. In addition, the country is famous for its rich flora and fauna. However, the country lost their precious soil day by day because of deforestation. Deforestation is the result of slash-and-burn agriculture, logging for timber, and fuel wood and charcoal production. Although Madagascar relies on agricultural production for the foundation of its economy, they are losing their economic base. It seems very difficult for the country to get win-win.

Figure 8 Deforestation-induced lavaka (erosion) in Madagascar[1]

Figure 9 The previous river before severe deforestation, June 1983[2]

[1] (http://photos.wildmadagascar.org/images/lavaka_0091.shtml)

[2] Erosion in Madagascar (http://www.wildmadagascar.org/conservation/erosion.html)

Figure 10 The river changed red, March 2004[3]

March 25, 2004 (ISS008-E-19233)

- **Polluted river in Papua New Guinea**

Failure of mining maintenance might cause not only temporally losing of fish but also damaging all the downstream farmland for more than 50 years.

- **Desiccation of Aral Sea**[4]

The Aral Sea is disappearing even faster than previously thought, with a new study of the southern part of the sea slashing its life expectancy by decades.

Since the 1960s, the sea has been drying up as result of poor management of irrigation channels that steal water from rivers feeding it. Once the area of Ireland, it is now a quarter that size and broken into two fragments - the North Aral Sea and South Aral Sea (see map). Because of the costs involved, only the smaller North Aral has been earmarked for rescue (New Scientist print edition, 4 January 2003), and several dams to stem water loss from it have been build since the mid-1990s.

Meanwhile, the South Aral has been abandoned, and as it dries up it is wreaking havoc on the environment. It is leaving behind vast salt plains, transforming the climate with hotter summers and colder winters, destroying what remains of local fisheries, and producing massive dust storms that spread disease.

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[3] Erosion in Madagascar (http://www.wildmadagascar.org/conservation/erosion.html)

[4] Exclusive from New Scientist Print Edition. Subscribe and get 4 free issues.(http://www.newscientist.com/article.ns?id=dn3947)

There are projects in place to mitigate these effects, such as planting vegetation in the exposed seabed to prevent desertification. To their organizers, the sea's rapid decline is an urgent call to action.

Figure 11 The shrinking Sea[5]

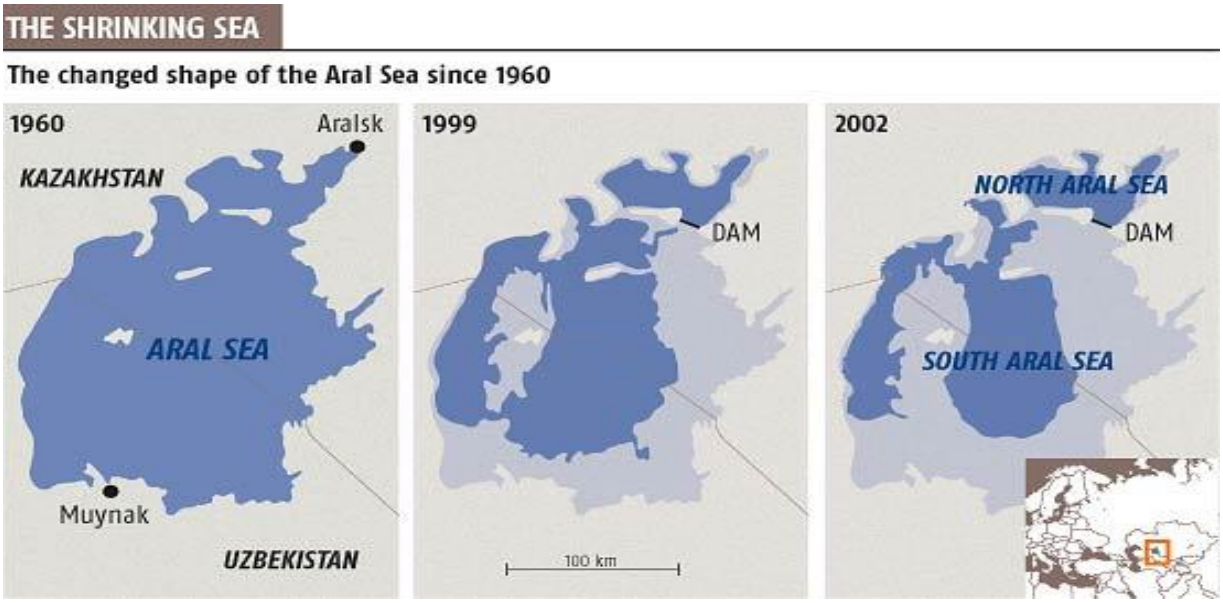


Figure 12 abandoned fishing boats dot the dried-up seabed[6]

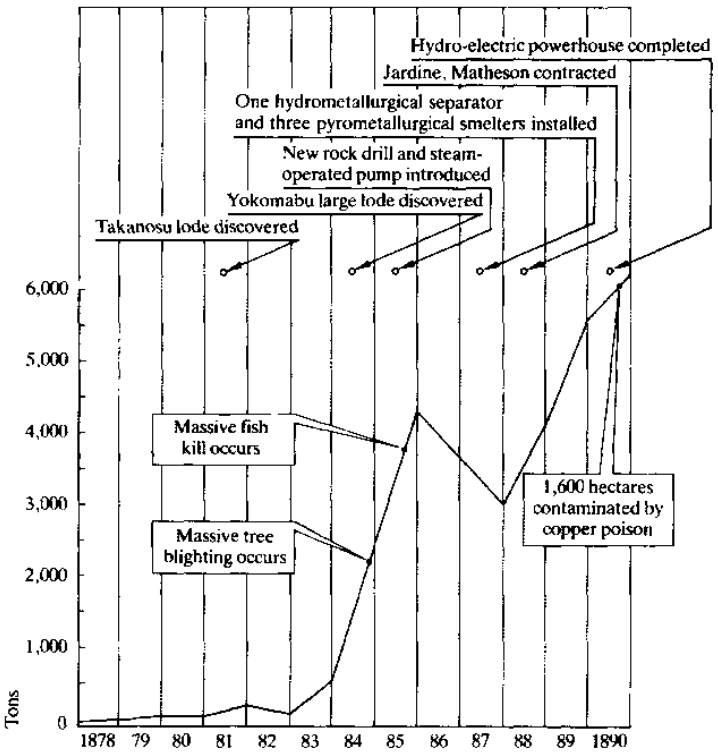
- **Polluted river and land in Japan**

[5] Exclusive from New Scientist Print Edition. Subscribe and get 4 free issues (http://www.newscientist.com/article.ns?id=dn3947)

[6] Mismanaged (Inappropriate) Irrigation (http://www.virtualglobe.org/en/info/env/06/desert08.html)

A mining company exhausted toxic gas and discharged toxic water. Then the trees and weeds for more than 100ha died by the gas, and farmland was polluted, villagers of one whole village had to abandon their land. We have kept planting trees for more than 50 years but still cannot get the forest back until now.

Figure 13 Process of Environmental Destruction around Ashio Copper Mine



(Source: K. Shoji, production figures from Furukawa Kogyo sogyo 100 nenshi, p. 82)

Figure 14 Farmland damaged by copper-poison contamination

Farmland damaged by copper-poison contamination in a village in Aso-gun, Tochigi-ken, taken by Sen Tsuda (from T. Matsumoto, ea., Ashio koudoku sanjou gaho, Seinen Doushi Koudoku Chousakai. 1901).

- Polluted sea in Japan

A chemistry factory discharged toxic water, and more than 1,000 people who eat the fish near the factory suffered and many of them died in great agony.

Figure 15 Model of the Minamata disease

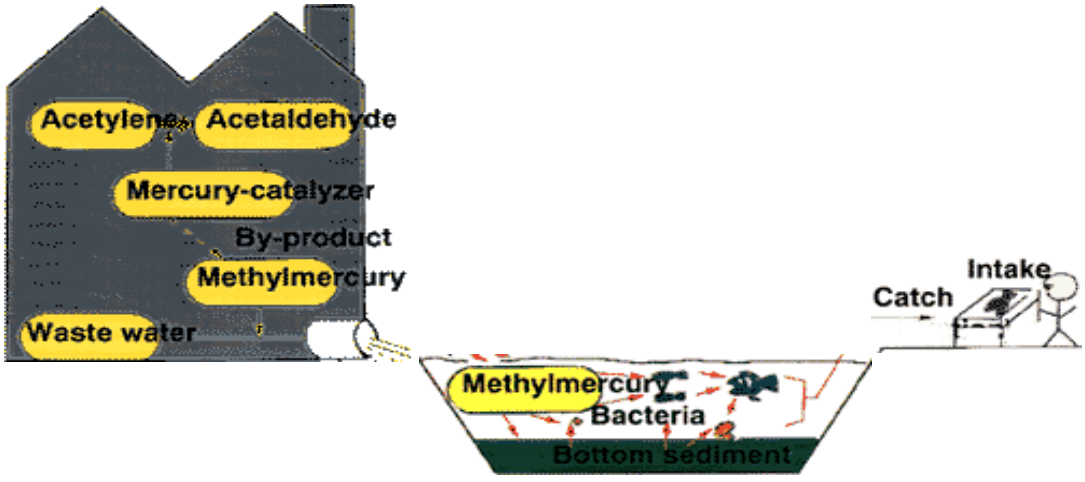


Table 1 The Cost of Damage Created by Minamata disease in the Area Around Minamata Bay to the Cost of Pollution and Control Measure

Cost for Pollution Control and Prevention Measures[1)]	$1,064,000 /year
Damage amount Breakdown:	$109,265,000 /year
Health damage[2)]	$66,358,000 /year
Environmental pollution damage[3)]	$123,452,000 /year
Fishery damage[4)]	$5,960,000 /year

(Source: "Nihon no Kogai Keiken"Japan's Experience with Pollution, 1991)

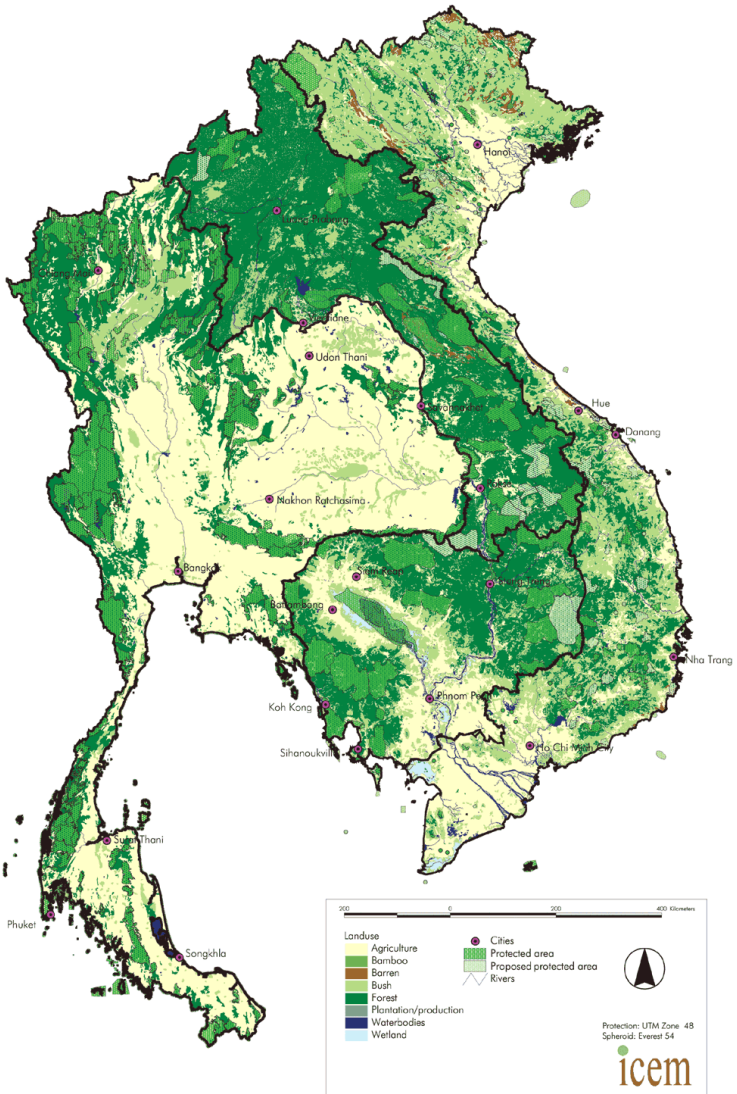
(5) Sustainable case

- Ecology policy in Costa Rica

1.3 The precious natural resources in Lao PDR

The nature of Lao PDR is precious not only for Lao PDR but also for other Asian countries. China, Thailand and Vietnam were rich in natural forests as Lao PDR. However, excessive development lost these forests. Now Lao PDR is the last refuge for the natural rare spices in Mekong basin. In fact in 19** the last new mammal species in the world has been discovered in Lao PDR. Then we have to keep developing together with conservation ecology for the world ecology.

Figure 16 Vegetation map of Mekong Baisin



1.4 Issues Considered under Environmental Analysis

When we encounter with public investment, we have to see many issues. The following table shows the main issues dealt with EIA.

Table 2 Main Environmental Impact dealt with EIA

Direct Impact	Indirect Impact	
	on People	on Wild life
Air pollution	Prevention of respiratory despises Uncomfortable life by odors	Decrease of wild life
Noise pollution	Obstacle for comfortable daily life	Decrease of wild life
Light pollution	Obstacle for astronomical observatory	Increase of vagrant insect
Water pollution	Prevention of waterborne illness	Decrease and change the fauna of fish and insect
Water volume change	Shortage of irrigation water Shortage of drinking water Ground subsidence	Decrease of fish
Land cover change	Involuntary resettlement Damage to cultural heritage Damage to landscape	Decrease of habitat of wild life
Sedimentation or erosion	Decrease of farm land	Decrease of habitat
Traffic change	Increasing of traffic accidents	Increase of road kill
Influx and out flux of people	Increasing of HIV/AIDS	Decrease of habitat
Changing of human activity	Increase of CO2 emission Increase of waste Increase of risk of natural or artificial accidents	

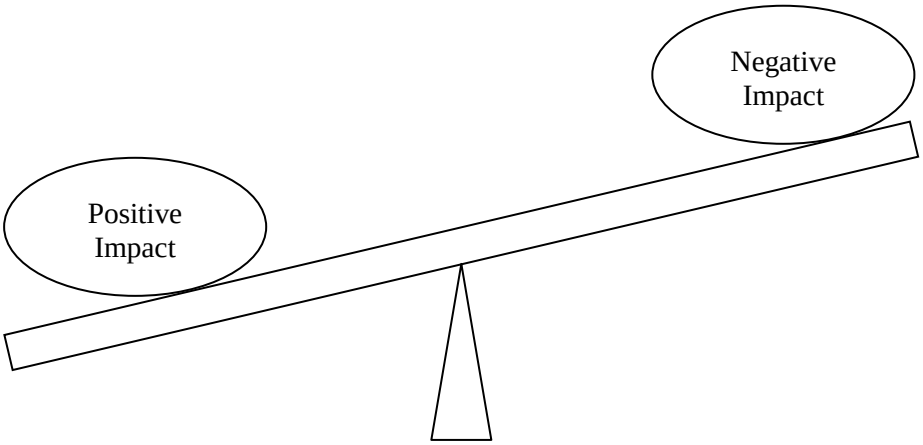
2. Environmental Analysis in Projects

2.1 Environmental Impact by project

(1) Why decision makers have to understand the Environment

All projects have their positive points and negative points. Most project planners emphasize only the positive points of the project. Environmental negative impact, as well as social negative impact, is likely to be ignored. Even if the project may produce a lot of benefit for the people, on the other hand the project might destroy the precious environment. Once we endanger certain species, we never live them back. Even if project seems more beneficial than conservation of ecology in the short time span, it may cost more than 10 times to recover the lost natural resources in the long span, as seen in other countries. As a sensible decision maker, MPI should not lead such projects. MPI must lead to the way the environmentally sustainable development.

Figure 17 The items MPI have to compare



(2) Stressor and Receptor

Environmental Impact on the people never occurs where there is no human being even if the environmental stress of the project is very serious. Once the stressor and receptor was on the same place in the same time, Environmental Impact happens. When we think about the Environmental Impact, we have to be conscious of both stressors and receptors.

Table 3 Samples of stressors and receptors

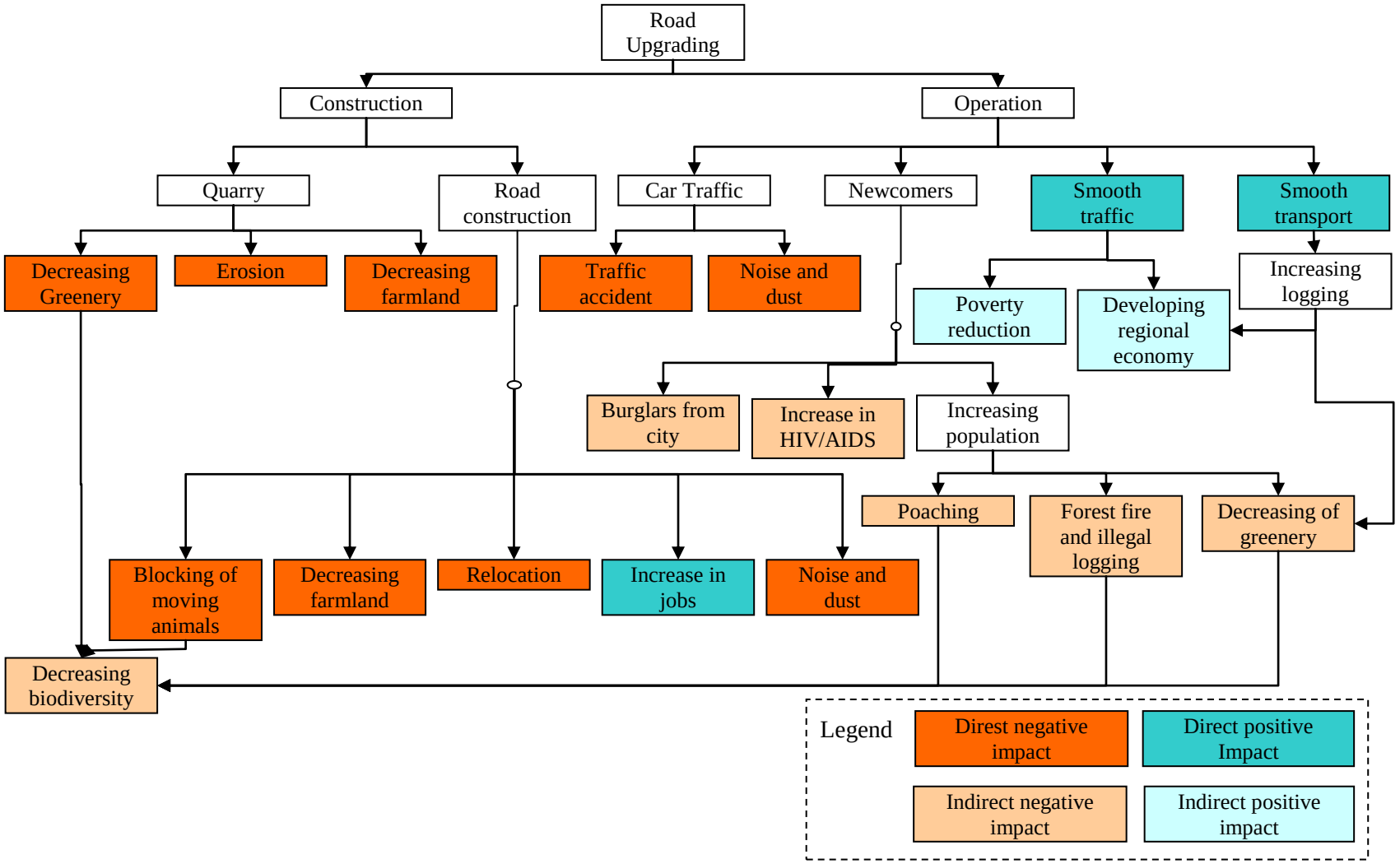
Stressors	Receptors
1-1. Smog emission	1-1 farmland or residential area near the river
1-2. Dust emission	2-1 the trees are blocking wind
1-3. Odor nuisance	2-2 viewpoints or scenic spots
1-4. Noise and vibration pollution	2-3 outside recreation area
1-5. Drainage of waste water	2-4 residential area

1-6. Discharge of solid waste	2-5 farm land
1-7. Cutting vegetation	2-6 cultural assets
2-1. Cutting ground and earth fill	2-7 roads
2-2. Dam and alteration of watershed	2-8 astrophysical observatory or star watching points
2-3. Alteration of water's edge	3-1 forest
2-4. Water abstraction	3-2 meadow
3-1. Movement of cars	3-3 marsh
3-2. Spraying chemicals	3-4 freshwater pond or lake
3-3. Night-time lighting	3-5 rivers in the downstream of the project site
3-4. Emergence of man-made structures	

(3) Direct Impact and Indirect Impact

There are 2 types of Environmental Impact when we see the relationship between stressors and receptors. One type is direct impact. Direct impact means that the stressors affect on the receptor directory. For example the fish lost their habitat by the project. The other type is indirect impact. Indirect impact means that the stressors affect on the receptors indirectly. For example stressors affect on first receptors, then the first receptors affect on second receptors. The stressors indirectly affect on second receptors. When we think about the Environmental Impact, we should not ignore indirect impact. Next figure shows the example of the direct and indirect impact.

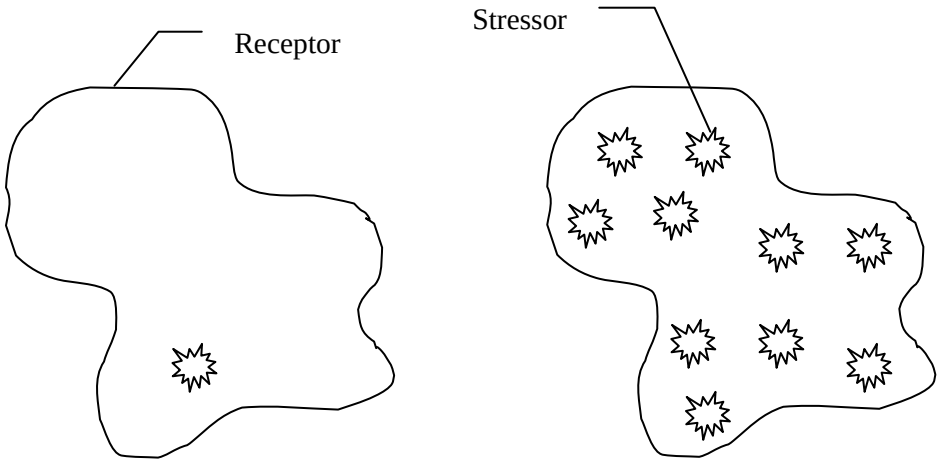
Figure 18 Direct impact and indirect impact


Road Upgrading
Construction
Operation
Quarry
Road construction
Car Traffic
Newcomers
Smooth traffic
Smooth transport
Decreasing Greenery
Erosion
Decreasing farmland
Traffic accident
Noise and dust
Poverty reduction
Developing regional economy
Increasing logging
Burglars from city
Increase in HIV/AIDS
Increasing population
Poaching
Forest fire and illegal logging
Decreasing of greenery
Blocking of moving animals
Decreasing farmland
Relocation
Increase in jobs
Noise and dust
Decreasing biodiversity
Legend
Direst negative impact
Direct positive Impact
Indirect negative impact
Indirect positive impact

(4) Single Impact and Cumulative Impact

On the other point of view, we can classify the Environmental Impact as Single Impact and Cumulative Impact. Single Impact means one receptor and one stressor. Cumulative Impact means one receptor and many stressors. Even if the impact of one stressor can be acceptable, when all the stressors affect on one receptor the impact might not be acceptable. In fact, many factories alongside the Setonaikai Sea in Japan are following effluent water quality standards. However, because of the excess number of the factory, the quality of the seawater was badly damaged. POs are likely to see only one project. Then it is difficult to think about the cumulative impact. However, decision makers such as MPI can easily see the cumulative impact and they are the only organization that can take a precaution before such problems happen.

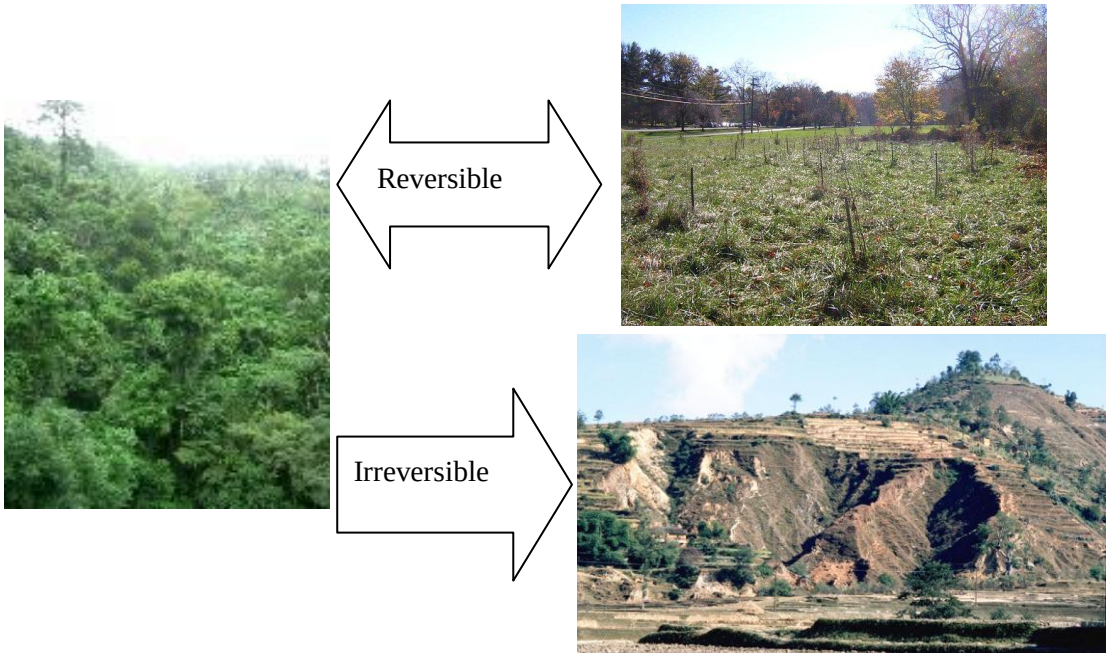
Figure 19 Single Impact and Cumulative Impact



(5) Irreversibility and Reversibility

If we change the point of view again, we can classify the Environmental Impact as Irreversible Impact and Reversible Impact. Reversible Impact means the impact we can restore easily, and sometimes it restores by itself. On the other hand, Irreversible Impact means the impact we can never restore. We must avoid the irreversible impact for next generations. For the excellent Environmental Impact Assessor needs the power to distinguish between the two impacts.

Figure 20 Reversible Impact and Irreversible Impact



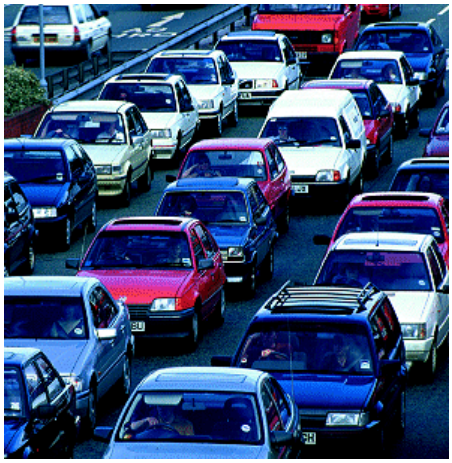
(6) Temporally impact and continued impact

The other point of view we can divide Environmental Impact as temporally impact and continued impact. Temporally Impact means the impact that will occur during construction. Continued Impact means the Impact that keep occurring after completion. For example if we think about road construction, noise impact made by construction machine is temporally impact and noise impact made by cars is continued impact. When we have to compare the extent of the impact, sometimes we need to remember these differences.

Figure 21 Temporally impact and continued impact

Temporally Impact

Continued impact



(7) Acceptable impact and unacceptable impact

Which impact is acceptable, and which impact is unacceptable cannot be stated easily. It depends on region, era, culture, and country policy. For example, it might be unacceptable if we cut the last 10ha forest in Vientiane Capital, but even if we cut 100 ha of forestland in the countryside, it may still be acceptable. It may be acceptable if we discharge 100 t/day 30 years ago, but unacceptable if we do same thing now. Some countries set up an environmental standard for water discharge and polluted air emission in order to decide the line between acceptable and unacceptable impact. In the future, Lao PDR must set up a similar standard.

2.2 Environmental Impact Assessment

(1) What is EIA

EIA is a kind of checking system before project approval. Water Resource and Environmental Administration (WREA) checks the Environmental adequacy of the project and issue the Environmental Certificate. Without Environment Certificate issued by WREA, MPI basically cannot approve any construction projects (see 3. Article5 Decree of WREA, Regulation 918).

(2) Who will do EIA

POs have responsibility in conducting EIA. If WREA decides that the project needs EIA, the PO have to hire environment consultants approved by WREA, for them to prepare an EIA report. Then the consultant will do the actual survey and assessment.

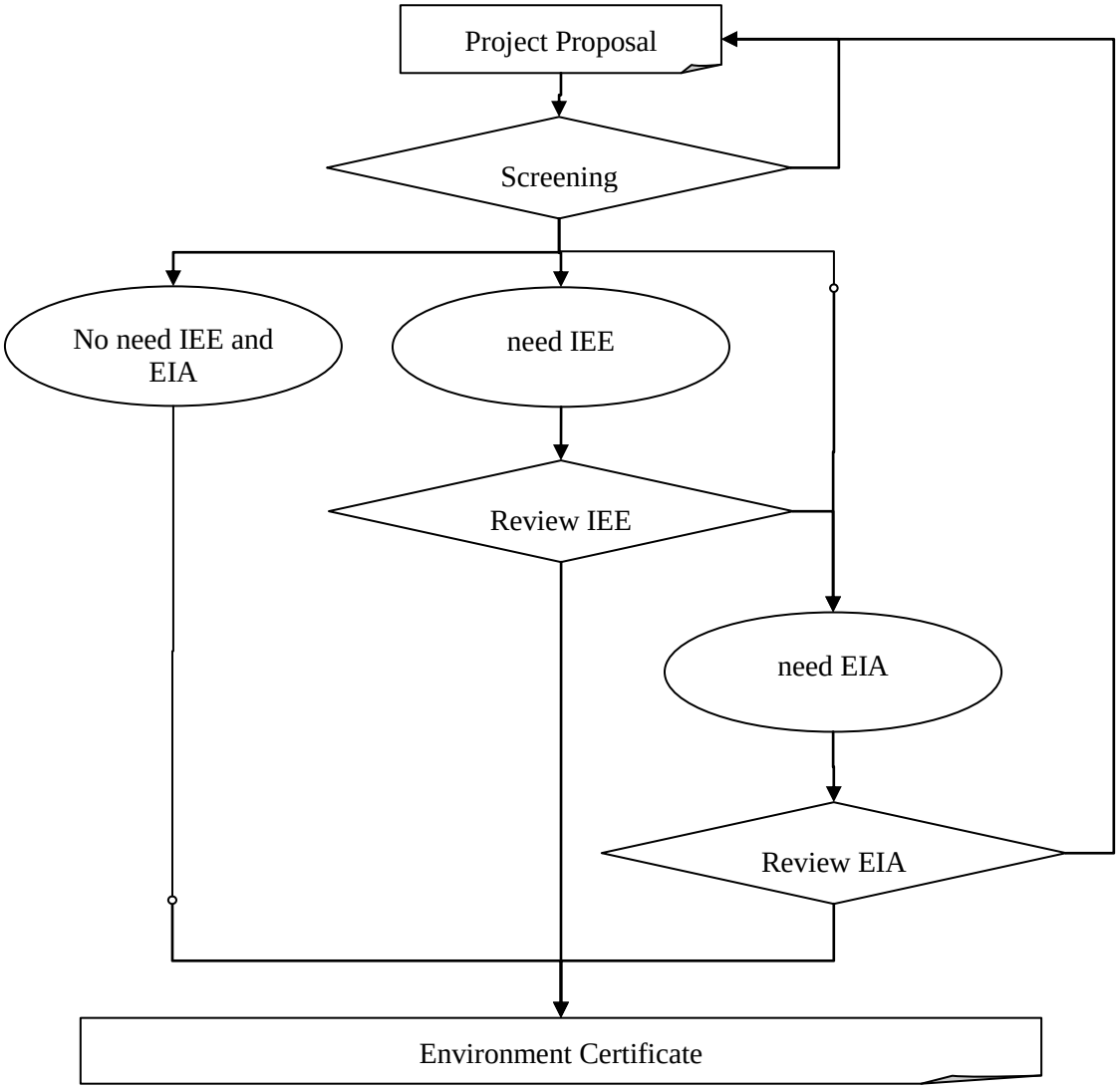
(3) What should be considered in EIA

Ideally, PO have to consider all of the Environmental Impact such as Environmental Impact during construction, during operation, direct impact, indirect impact, impact on human, impact on wildlife, physical impact and social impact. However, not all impacts can be considered in the circumstance of limited budget and limited time. Then PO has to choose the issue of highest concern. The action of choosing issue called scoping.

(4) Main procedure of EIA

Main procedure of EIA consists of Screening, Conducting IEE or EIA, and Reviewing. In screening, WREA decide whether the project needs IEE, EIA or not. If the projects need IEE or EIA, the POs conduct IEE or EIA and prepare Environment Report. After that, WREA reviews the report and decide whether they can issue Environment Certificate or not. Then construction projects classified four, such as "no need IEE and EIA", "need IEE only", "need IEE and EIA", and "need EIA only".

Figure 22 Main procedure of EIA



(5) Main documents of EIA

Main documents of EIA are project proposal[7], Screening result, Environment Certification, IEE report, EIA report. Followings are main documents of EIA. SIA, ESIA, EMP are treated same as EIA. After screening, WREA decides which document should be made. In this reference, EIA includes SIA, ESIA and EMP.

Table 4 Main document of EIA

Name of the document	*preparing organization*	*main contents*
Project Proposal	PO	Project purpose, Location of the project, Project design
Screening result	WREA	The decision whether the project need IEE or EIA
Environment Certification	WREA	The sentence that certifies the possible Environmental Impact by the project will not be severe
IEE (Initial Environmental Examination)	PO	Possible brief Environmental Impact caused by the project and mitigation measure
EIA (Environmental Impact Assessment)	PO	Possible detail Environmental Impact caused by the project and mitigation measure
SIA (Social Impact Assessment)	PO	Possible detail Social Impact caused by the project and mitigation measure
ESIA (Environmental and Social Impact Assessment)	PO	Possible detail Environmental and Social Impact caused by the project and mitigation measure
EMP (Environmental Management Plan)	PO	Monitoring, assessment and mitigation plan after construction

(6) Sample Contents of IEE

Form

of Initial Environmental Examination Reports for Development Projects in the Lao PDR

1. Introduction

- Name and address of the PO
- Name, address and agencies of parties involved in the preparation of the report
- The objectives of the report
- The objectives of the project

2. **Project of the description**

- Category, size and location of the project
- Project activities and time table for the project implementation

[7] EIA decree defined the document as project description. STEA and CPI agreed to use project proposal defined in Decree 58 as project description defined in EIA decree.

(1) during the construction
(2) during the project operation
(3) closure period (if known)

- Quantity and characteristics of raw materials to be used in the project
- Quantity and characteristics of waste to be dispose into the air, water way and soil
- Project cost

3. **Description of the project environment**
   - Physical environment
   - Biological environment
   - Economic environment
   - Social environment
4. **Major environmental impacts**
   - Impacts during the construction
     (1) Physical environment (air, water, soil)
     (2) Biological environment (flora and fauna)
     (3) Economic environment
     (4) Social environment
   - Impacts during the project operation
     (1) Physical environment (air, water, soil)
     (2) Biological environment (flora and fauna)
     (3) Economic environment
     (4) Social environment
   - Impacts during project closure phase
     (1) Physical environment (air, water, soil)
     (2) Biological environment (flora and fauna)
     (3) Economic environment
     (4) Social environment
5. **Environment management plan or draft action plan for detailed environmental impact assessment**
   a. In case no detailed environmental impact assessment is deemed necessary
      - Environment management plan
        - Environment prevention and mitigation measures
        - Compensation measures (if necessary)
        - Institutional arrangement, time table and budget for the implementation of environment management plan
        - Environmental monitoring plan

   b. In case detail environmental impact assessment is deemed necessary
      - Draft action plan for detail environmental impact assessment

      The PO shall prepare the draft action plan in such format as it is specified in decisions or instructions on environmental impact assessment issued by sectoral agencies. In the event such requirement is not applicable the PO on his/her own initiatives shall prepare the draft action plan and submit it to the Science, Technology and Environment Agency for consideration and approval.

6. Description of the process of public participation in environmental impact assessment

Conclusions and recommendations

(7) Sample Contents of EIA

Contents and Format of Detailed Environmental Impact Assessment Report for development Projects in the Lao PDR

1. Executive summary
2. Introduction
   - Name and address of the PO and executing agency
   - Name, address and agencies of the authors of the report
   - Objectives of the project
   - Project implementation arrangement, laws, regulations and conventions to be abided by the project
3. Description of the environment of the project
   - Physical environment
   - Biological environment
   - Economic environment
   - Social environment
4. Identification and evaluation of alternatives seen as being feasible to reach the objectives of the project

1. Evaluation of direct and indirect impacts to the immediate project location and surrounding areas in each alternative
   - during the construction and project preparation
   - during the project operation
   - during project closure phase
   - Provisions of laws, regulations and conventions, and land and water shed management plan to be abided by the project
2. Description of the process and procedures of public participation during the environmental impact assessment in the project
3. Selection of the best project alternative and justification for that decision
4. Detailed description about the selected alternative (detailed description of the project)
   - Work plan and time table for the execution of project tasks
   - Project construction and operation
   - Project cost
   - Economic analysis of environmental impacts
   - Potential threats from the project implementation to the social structure, natural resources, health and community safety
5. Environment management plan with protection and mitigation measures (to reduce the levels of potential environmental impacts)
   - Physical, biological, economical and social protection and mitigation measures
   - Compensation methods (if required)
   - Environmental monitoring and inspection plan
   - Training in relation to the implementation of environment management plan
   - Organisational (institutional) requirements, time table and budget for the implementation of environment management plan
6. Conclusions and recommendations
7. Reference sources

appendixes

2.3 Legal Framework on EIA in Lao PDR

(1) MPI

Although MPI must have commitment in total PIP management including environmental issues, current laws, decrees or regulations mention the detailed procedure of EIA for MPI, which is needed to be done in the planning stages of each PIP project (See annex A).

(2) WREA

WREA governs the laws and regulations on Environmental Assessment (EA). The **Environmental Protection Law (EPL: 02-99/NA)** defines the framework for EA. **Decree on the Implementation of the EPL** defines the rules and responsibilities of ministries and agencies concerned with EA. **Regulation on EA (1770/WREA.PMO, Oct. 2000)** define general principles for EIA.

(3) Line Ministries

The Department of Roads in the Ministry of Public Works and Transportation (MPWT), ***Regulation on Environmental Impact Assessment of Road Projects in Lao PDR, 2926/MCTPC, 29 July, 2003,*** and the Department of Electricity in the Ministry of Energy and Mining (MEM), ***Regulation on Implementing Environmental Assessment for Electricity Projects in Lao PDR, No 447/MIH, 20 November 2001,*** each have their own EIA regulations. There are no other ministries and agencies that have regulations on EIA.

2.4 Procedure of EIA

The current ideal EIA procedure for WREA follows the project preparation stage such as F/S, B/D and D/D. However, this procedure is due to change after a revised EIA decree becomes effective in the future.

Figure 23 EA process of WREA

Section V-2

Reference Material for Environmental ct Management

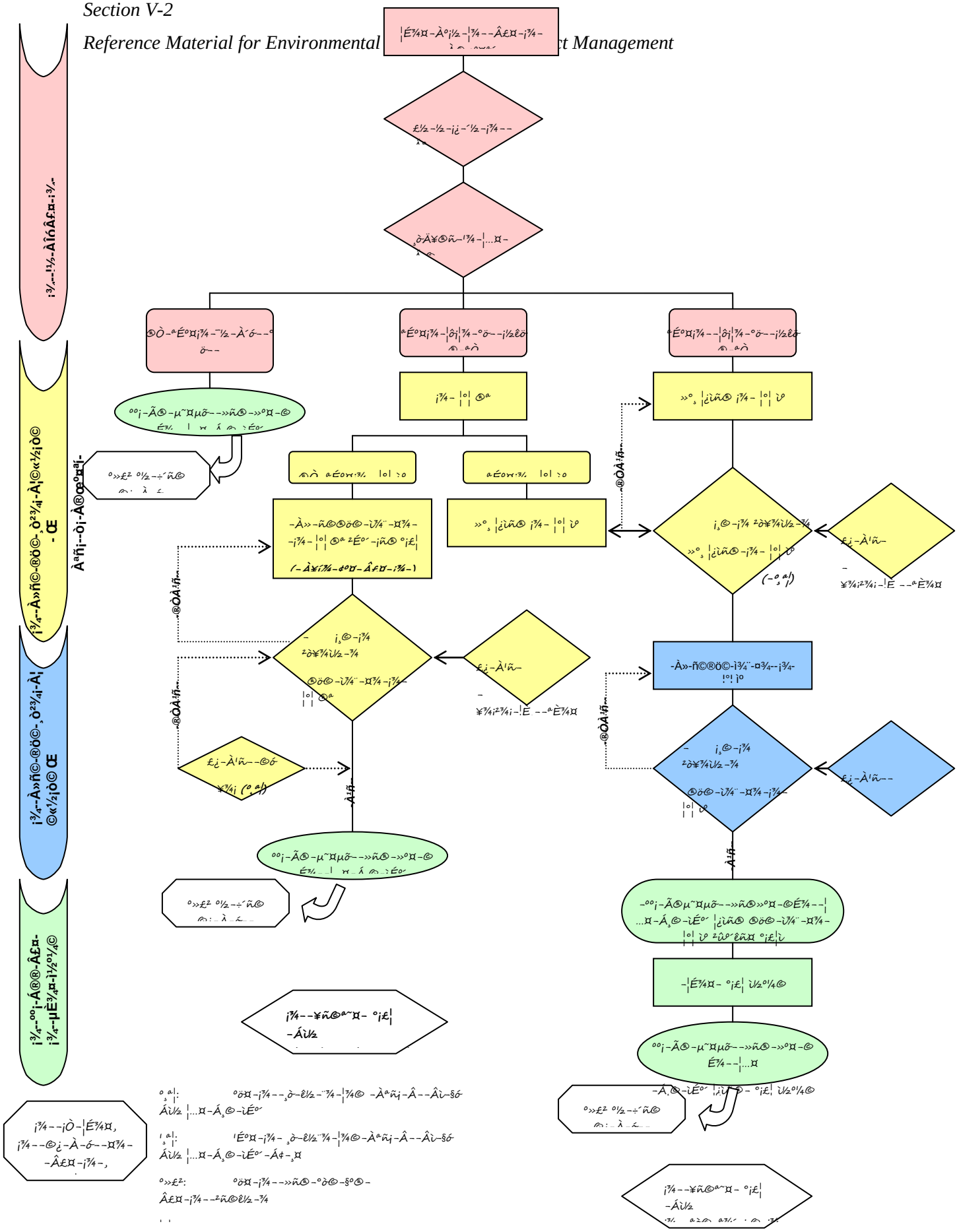


Figure 24 Recommended Procedure for no need IEE or EIA projects

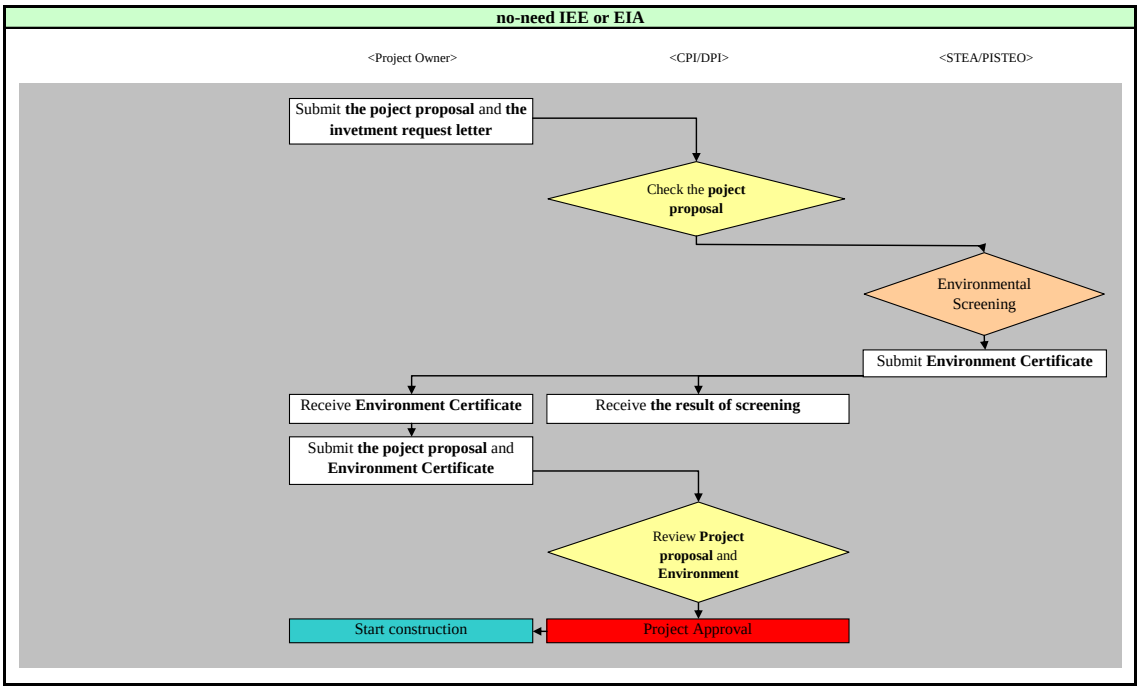


Figure 25 Recommended Procedure for need IEE Projects

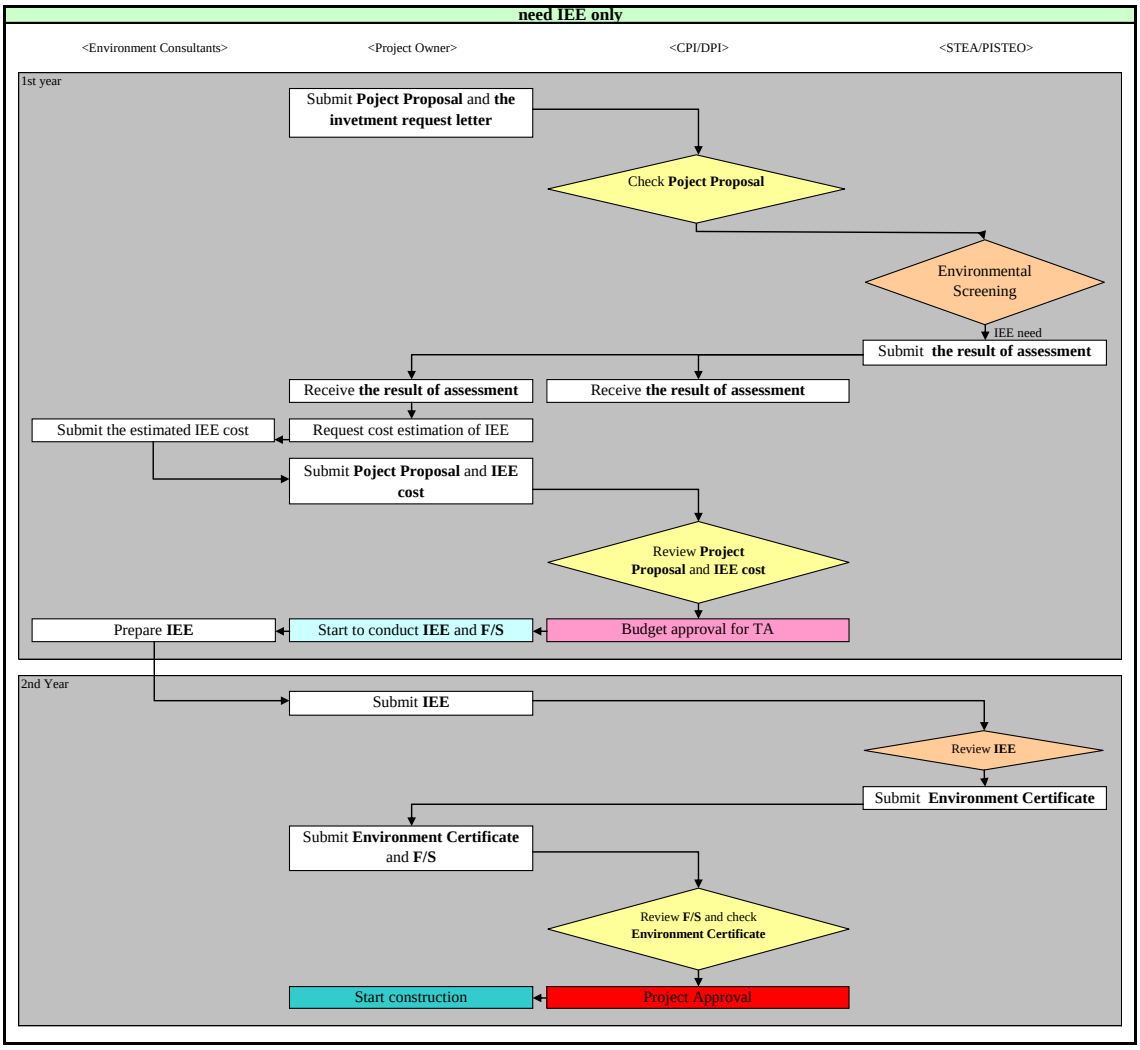
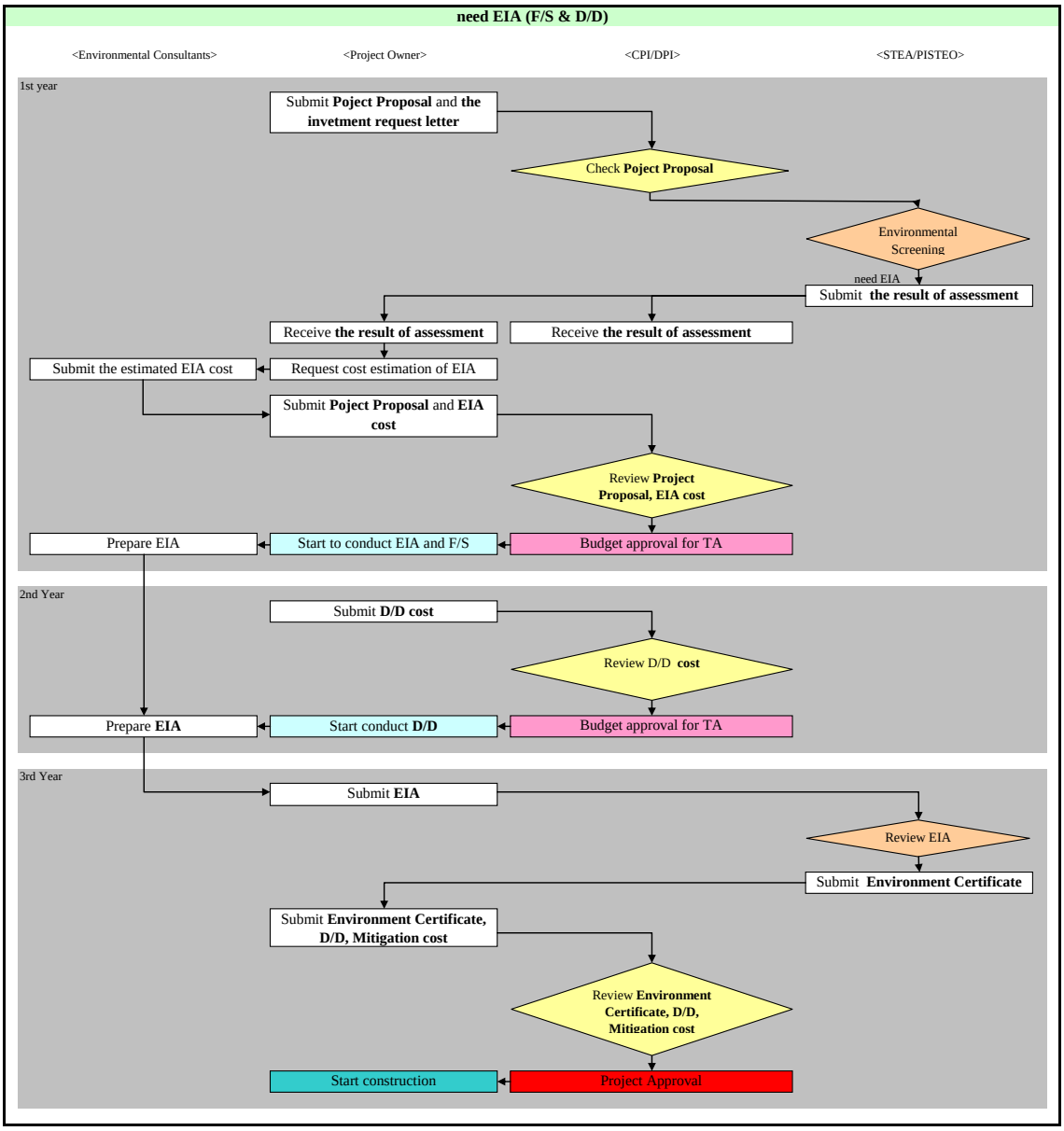


Figure 26 Recommended Procedure for need EIA Projects



2.5 Role of Stakeholders of EIA

There are many stakeholders in terms of EIA. Not only the POs but also people in the project area are one of the important stakeholders. Following is a summarized table of stakeholders and their roles.

Table 5 Role of stakeholders of EIA

Stakeholders	Role
POs	Submit IEE or EIA report to WREA
People in the area	Read IEE or EIA report and submit their opinion to WREA or PWREO

MPI / DPI	Refer project proposals from POs to WREA or PWREO Check Environment Certificate and Environment cost before approval of construction
WREA	Review the IEE or EIA report of all sectors and issue Environment Certificate
LM	Review the IEE or EIA report of the sector and submit them to WREA
Consultants	Hired by POs and prepare IEE or EIA

II. PRACTICAL PART

This part will present the practical process of incorporating Environmental Analysis in PIP Project Management.

1. Environmental Analysis in the Flow of PIP Project Management

The basic rule of Environmental Analysis is that all the POs of construction projects have to get Environment Certificate issued by WREA before project appraisal. The document flow and schedule in a year are as followings.

Figure 27 PIP Document Flow of the project for F/S (Screening and IEE)

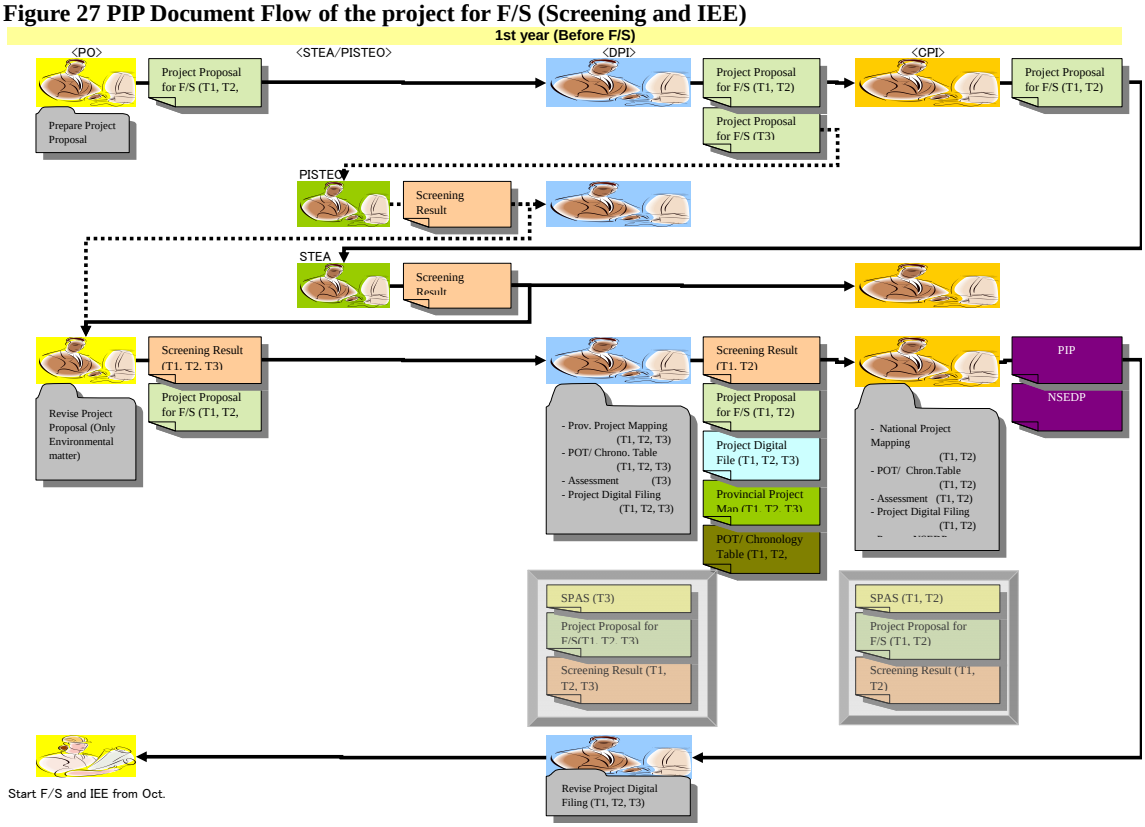


Figure 28: PIP Document Flow of before construction (need IEE)

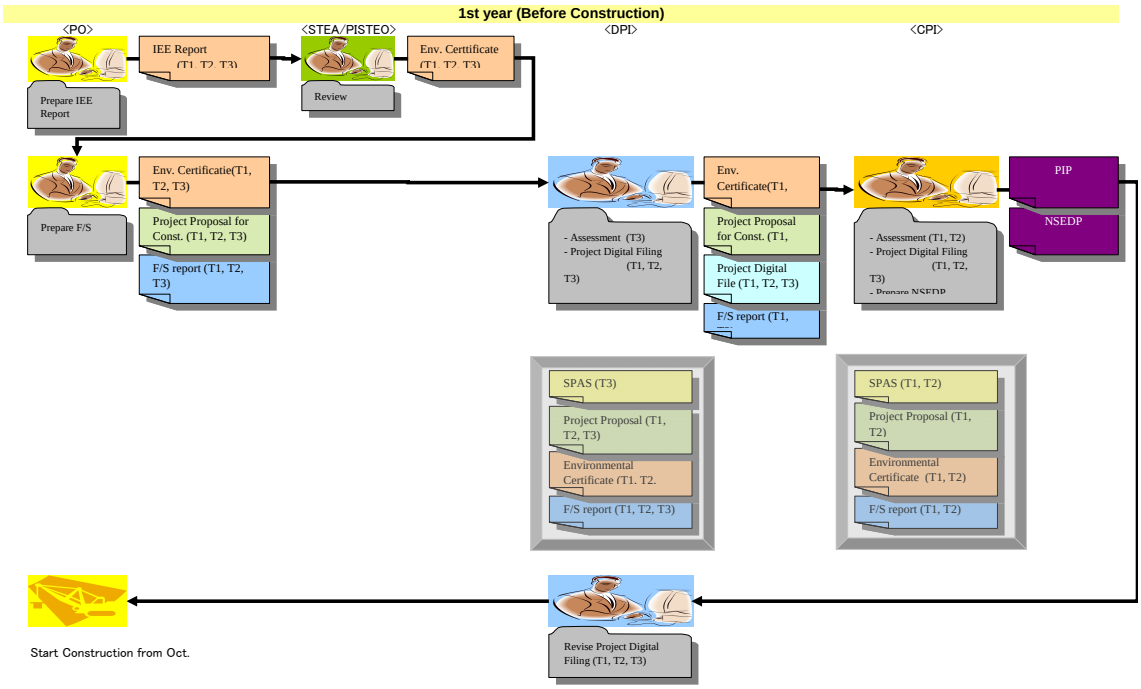


Figure 29 PIP documents and submission schedule (the project for F/S)

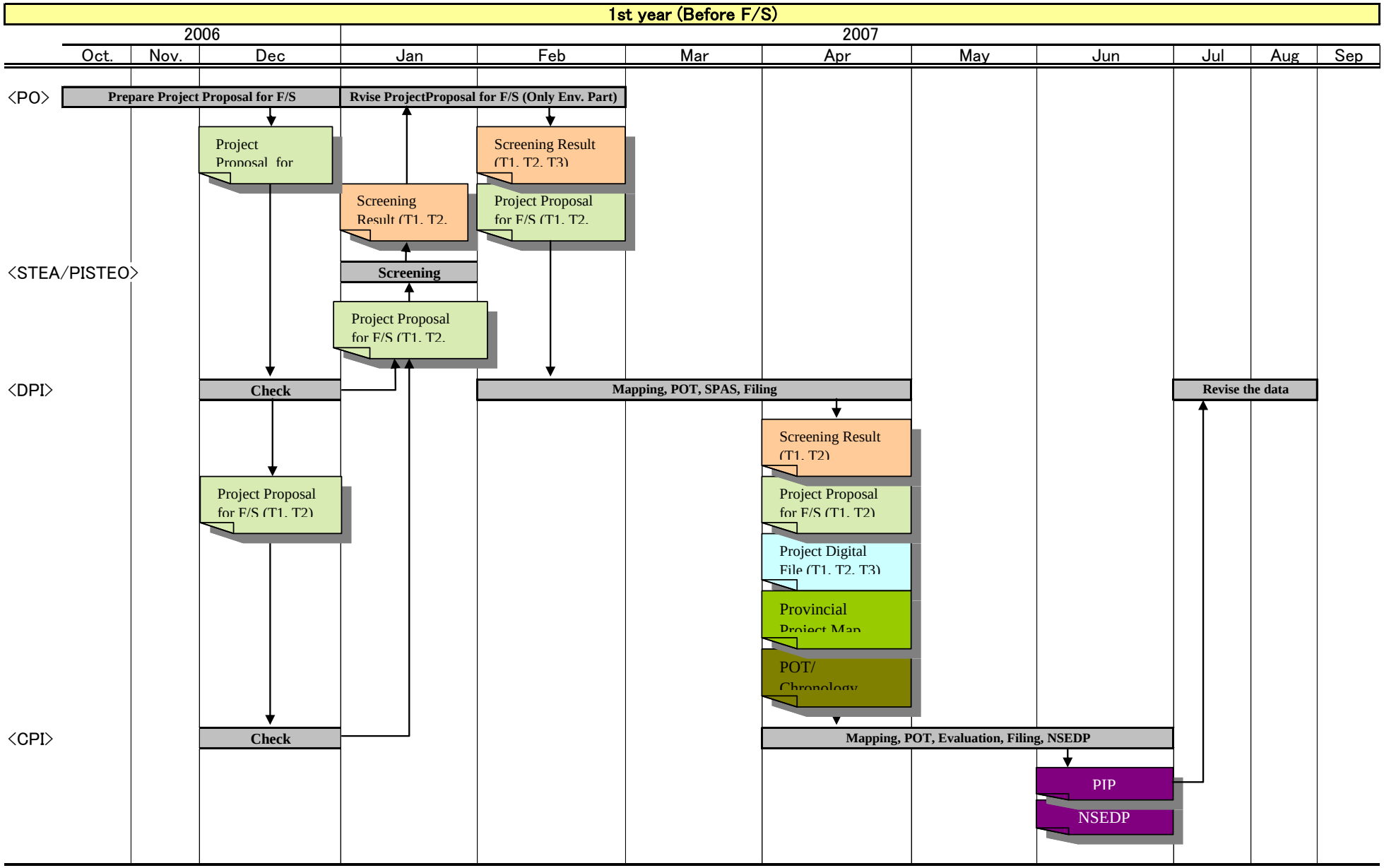


Figure 30 PIP documents and submission schedule (the project for construction)

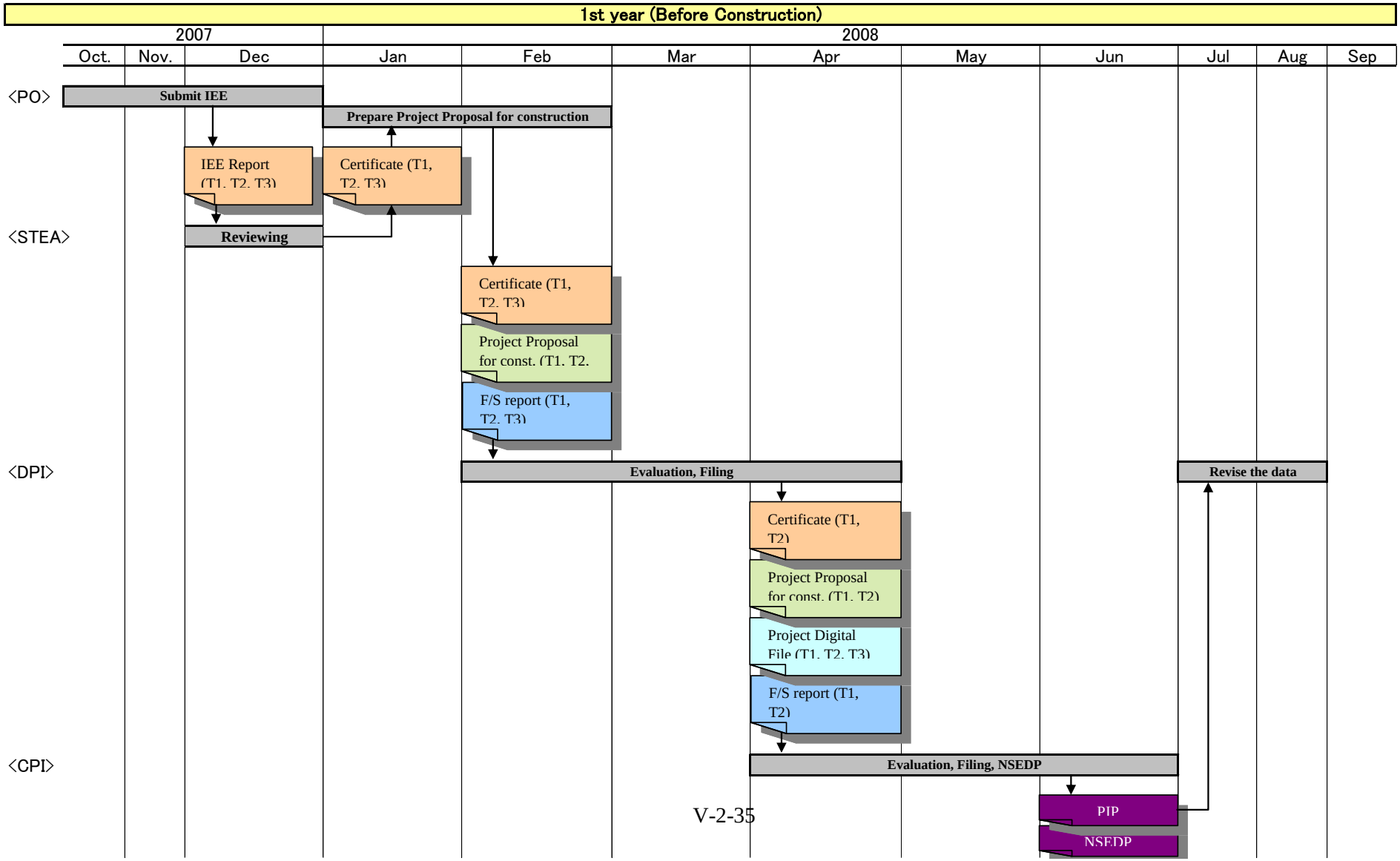
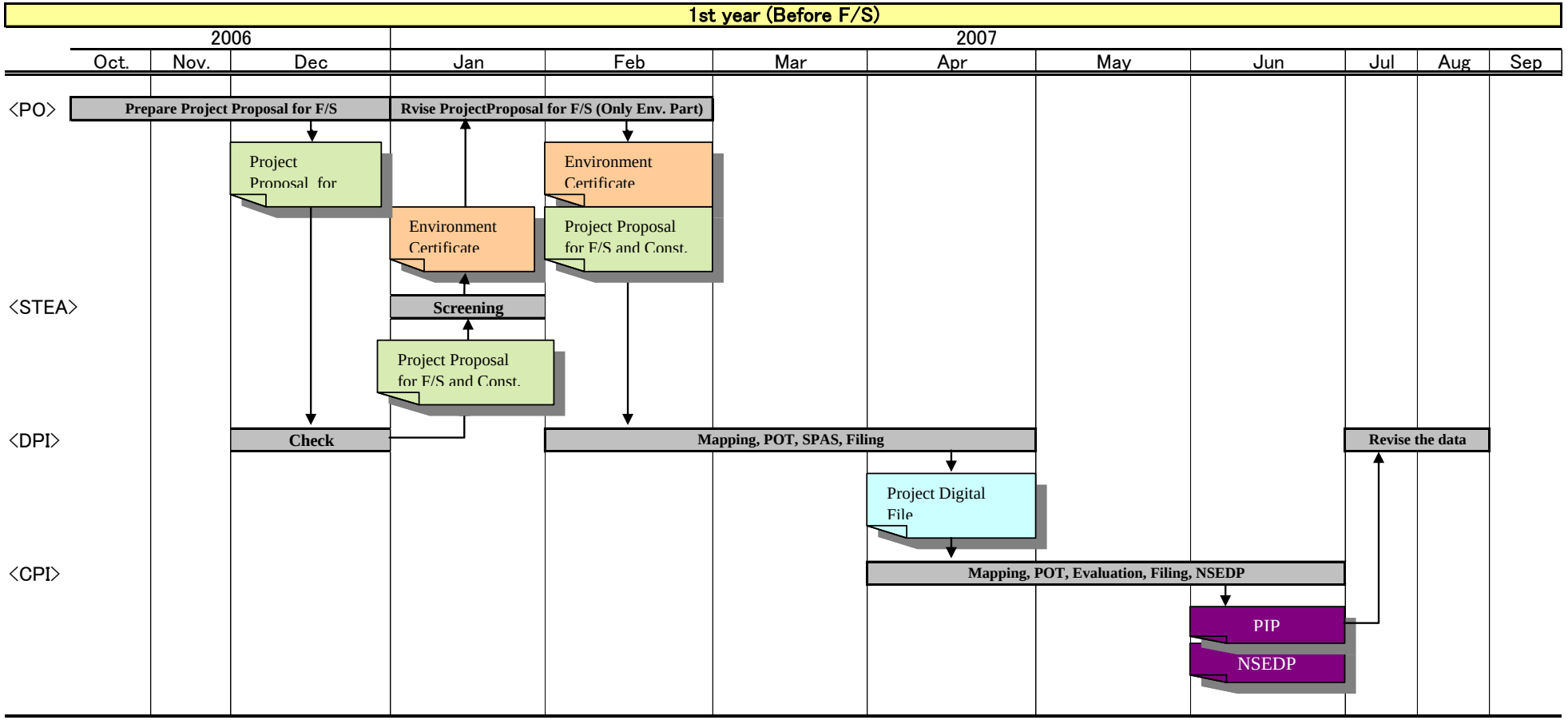

1st year (Before Construction)
2007
2008
Oct.
Nov.
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
<PO>
Submit IEE
Prepare Project Proposal for construction
IEE Report (T1, T2, T3)
Certificate (T1, T2, T3)
<STEA>
Reviewing
Certificate (T1, T2, T3)
Project Proposal for const. (T1, T2,
F/S report (T1, T2, T3)
<DPI>
Evaluation, Filing
Revise the data
Certificate (T1, T2)
Project Proposal for const. (T1, T2)
Project Digital File (T1, T2, T3)
F/S report (T1, T2)
<CPI>
Evaluation, Filing, NSEDP
PIP
NSEDP

Figure 31 PIP documents and submission schedule (the project for F/S and construction, no need IEE or EIA)



1.1 POs' action

(1) Before F/S stage

- Prepare Project Proposal for F/S (Oct. – Dec.)

If the project stage is before F/S, POs shall prepare a Project Proposal for F/S for each project. The format of the proposal should use PIP Format I-2 "Project Proposal for F/S and Design". If possible, it is desirable to mention the following contents in the proposal.

- Estimate amount of waste in the form of liquids, solid materials and gases to be produced during the project construction and operation
- Projected environmental benefits and loses
- Prevention and mitigation measures to be implemented during the project construction, operation and closure (if necessary).

- Submit Project Proposal for F/S to DPI or MPI (Dec.-Jan)

PO shall submit the Project Proposal for F/S to DPI or MPI. At that time Environment cost, such as IEE cost, EIA cost, mitigation cost, resettlement cost, might not be included in the project total cost.

- Receive the screening result from WREA or PWREO (Jan.)

Around January POs receive the screening result from WREA or PWREO. There are 3 types of result. First one is "no need IEE and EIA", second one is "need IEE", and third one is "need EIA". If the result is first one, "Environment Certificate" must be attached.

- Revise the Project Proposal for F/S (Jan. – Feb.)

Depend on the screening result POs have to revise the Project Proposal.

- No need IEE and EIA

If the result is "no need IEE and EIA", POs do not need to revise the proposal. POs can change the project proposal to final project proposal without revising.

- IEE need

If the result is "IEE need", POs have to add IEE activity and IEE cost in the proposal. In order to confirm the cost for IEE, POs have to ask the IEE cost to the Environmental consultants approved by WREA.

- EIA need

If the result is "EIA need", POs have to add EIA activity and EIA cost in the proposal. In order to confirm the cost for IEE, POs have to ask the EIA cost to the Environmental consultants certificated by WREA.

- Submit Project Proposal and Screening Result to DPI or MPI (Feb.)

Depend on the screening result POs have to submit following documents to DPI or MPI.

Table 6 Documents should be submitted before F/S

Screening Result	*Documents should be submitted*
No need IEE and EIA	● Screening result ● Environment Certificate ● Project Proposal for F/S
IEE need	● Screening result ● Project Proposal for F/S ● Environment Cost estimation evidence
EIA need	● Screening result ● Project Proposal for F/S ● Environment Cost estimation evidence

(2) Before construction stage

- Prepare IEE or EIA and F/S (Oct. – Feb.)

If the screening result is IEE or EIA need, POs have to prepare IEE or EIA report concurrent with F/S. If the screening result is "no need IEE and EIA", POs conduct only F/S.

- Submit IEE or EIA report to WREA (Jan.)

When the IEE or EIA report finished, POs submit it to WREA or PWREO. If EIA has not finished until January, POs have to wait submitting until next year.

- Receive the Environment Certificate from WREA (Feb.)

After reviewing by WREA or PWREO, POs receive Environment Certificate by WREA or PWREO. If WREA or PWREO decide further EIA for the IEE report, POs will receive "the reviewing result" from WREA instead of Environment Certificate. At that time POs have to postpone requesting construction budget until receive the Certificate.

- Prepare "Project Proposal for construction" (Jan. – Mar.)

Around January POs prepare Project proposal for construction depend on the result of reviewing by WREA.

  - Project with Certificate

If POs can obtain the Environment Certificate, POs shall prepare the Project Proposal for construction. At that time, the format is PIP Format I-3 "Project Proposal before PIP Construction Projects". Be sure to use same project name and project code as previous year's budget request. If the Environment Certificate has some conditions such as "need mitigation" or "need compensation for the resettlement", POs have to include the activities and their cost. In order to confirm the adequate Environmental cost, POs have to ask Certificated Environmental Consultants for cost estimation.

  - Project without Certificate, because of incompletion of IEE or EIA report

If POs cannot get the Environment Certificate because of incompletion of EIA report, POs cannot request construction. Instead of submitting project proposal for construction, POs have to prepare PIP Format II-2 "Progress Report for F/S and Design". In the progress report, POs do not need to include additional Environmental Activities and Environment cost.

  - Completion of IEE or EIA but need further EIA

If POs cannot get the Environment Certificate because of need further EIA, POs cannot request construction. POs have to prepare progress report for F/S and design. In the Project Proposal or Progress Report, POs have to add EIA activity and EIA cost. In order to confirm the cost for EIA, POs have to ask the EIA cost to the Certificated Environmental consultants.

- Submit F/S, Project Proposal for construction and Environment Certificate to DPI or MPI (Mar. – Apr.)

Depend on the reviewing result POs have to submit following documents to DPI or MPI.

Table 7 Documents submitted before construction

Conditions	***Documents need to be submitted***
Project with Certificate	Reviewing result by WREA (enough IEE or EIA) Environment Certificate F/S report or D/D report Project Proposal for construction Environment Mitigation and/or Compensation cost estimation evidence
Project without Certificate, before reviewing EIA by WREA	Progress report during design (requesting D/D cost, without Environment cost) F/S report (if possible)
Project without Certificate, after reviewing IEE by WREA	Reviewing result by WREA (need EIA) Progress report during design or Project Proposal for F/S (requesting EIA cost) EIA cost estimation evidence

(3) During construction stage

- Prepare Progress Report (Jan. – Feb.)

If there are any activities concerning about the Environment, such as resettlement, construction waste management, mitigation, be sure to mention the implemented extent in the Progress Report. If there is any unexpected Environmental Impact, examine the mitigation measures, and

add the activities and cost to the progress report. As project proposal, Environment cost must be attached evidence.

- Submit MPI or DPI (Feb.)

POs shall submit Progress Report to MPI or DPI. If additional mitigation activities for unexpected Environmental Impact are needed, cost estimation evidence must be attached.

(4) After completion stage

- Prepare Completion Report (Jan. – Feb.)

After completion of construction, POs shall prepare a Completion Report. If there are any activities concerning about the environment, such as resettlement, construction waste management, mitigation, be sure to mention the implemented extent in the Completion Report.

- Submit MPI or DPI (Feb.)

POs shall submit the Completion Report to MPI or DPI. If POs prepare Environmental Management Plan, the plan should also be attached.

1.2 MPI and DPI's action

(1) Technical promotion project for F/S

- Receive Project Proposal for F/S from PO (Dec.)

Around December, MPI or DPI shall receive Project Proposal for F/S from PO. MPI or DPI does not need to check detail, only check whether basic information is stated or not. This document will be use for Environment Screening WREA. Then it does not need to include Environment activities and Environment cost.

- Submit Project Proposal for F/S to WREA (Dec. – Jan.)

After simple checking the Project Proposal for F/S, MPI or DPI refers the documents to WREA or PWREO for screening.

- Receive Project Proposal for F/S and Screening Result from PO (Jan. – Feb.)

After screening by WREA or PWREO, MPI or DPI receives Project Proposal for F/S and Screening Result from POs. POs should submit depending on the screening result. If the documents are not complete, MPI or DPI should not receive the proposal and ask for required documents to the PO.

Table 8 Documents should be submitted before F/S

Screening Result	***Documents should be submitted***
No need IEE and EIA	Screening result
	Environment Certificate
	Project Proposal for F/S
IEE need	Screening result
	Project Proposal for F/S
	Environment Cost estimation evidence
EIA need	Screening result
	Project Proposal for F/S
	Environment Cost estimation evidence

- Review the Project Proposal for F/S (Feb. - Jun.)

Reviewing points differ from screening result as following table.

Table 9 Reviewing Points before F/S

Screening Result	***Reviewing Points***
No need IEE and EIA	Whether the conditions are included in the proposed project, if there are any conditions added to the Environment Certificate?
IEE need	Whether is IEE activity included in the schedule or not?
	Whether is IEE cost included in the requested budget?
	Whether is the evidence of IEE cost estimation made by certificated Environment Consultant?
EIA need	Whether is EIA activity included in the schedule or not?
	Whether is EIA cost included in the requested budget?

	Whether is the evidence of EIA cost estimation made by certificated Environment Consultant?

- Prepare draft PIP and submit to National Assembly

There is no special check from Environmental point of view.

- Prepare final PIP and inform to PO

There is no special check from Environmental point of view.

(2) Construction and newly proposed project

- Receive Project Proposal for construction, F/S report, and Environment Certificate from PO (Mar. – Apr.)

Around March to April, MPI or DPI shall receive Project Proposal for construction from PO. MPI and DPI have to check whether suitable documents are attached or not. MPI and DPI cannot receive the proposal for construction if the Environment Certificate is not attached.

Table 10 Documents submitted before construction

Conditions	***Documents need to be submitted***
No need IEE or EIA	Environment Certificate
	F/S report or D/D report
	Project Proposal for construction
Need IEE only	Environment Certificate
	IEE report
	F/S report or D/D report
	Project Proposal for construction
	Environment Mitigation and/or Compensation cost estimation evidence
Need EIA or SIA	Environment Certificate
	EIA or SIA report

	F/S report or D/D report Project Proposal for construction Environment Mitigation and/or Compensation cost estimation evidence

- Review the Project Proposal for construction (Feb. - Jun.)

After receiving the proposal MPI or DPI reviews the Project Proposal. The points of review from Environment are as follows

Table 11 Reviewing points before construction

Conditions	***Reviewing Points***
No need IEE or EIA	Is the certification made in 2 years?
Need IEE only	Whether is Environmental mitigation activities included in the plan or not? Whether is Environmental mitigation cost included in total cost or not? Do the consultants certificated by WREA make the cost estimation evidence? If the WREA ordered EMP, is it included in IEE?
Need EIA or SIA	Whether is Environmental mitigation activities included in the plan or not? Whether is Environmental mitigation cost included in total cost or not? Do the consultants certificated by WREA make the cost estimation evidence? If the WREA ordered EMP, is it included in EIA ?

- Prepare draft PIP and submit to National Assembly

There is no special check from Environmental point of view.

- Prepare final PIP and inform to PO

There is no special check from Environmental point of view.

(3) Construction and continued project

- Receive Progress Report from PO (Mar. – Apr.)

There is no special check from Environmental point of view.

- Review the Progress Repot (Feb. - Jun.)

MPI or DPIs have to review progress report following points of view. If there are any problems, report to WREA.

  - Whether the mitigation was conducted as planned or not
  - Whether the environmental budget was consumed as planned or not
  - Whether unexpected negative impact occurred or not

- Prepare draft PIP and submit to National Assembly

There is no special check from Environmental point of view.

- Prepare final PIP and inform to PO

There is no special check from Environmental point of view.

(4) Construction and completed project

- Receive Completion Report from PO (Mar. – Apr.)

There is no special check from Environmental point of view.

- Review the Completion Report (Feb. - Jun.)

MPI or DPIs have to review progress report following points of view.

  - Whether the mitigation was conducted as planned or not
  - Whether the environmental budget was consumed as planned or not
  - Whether unexpected negative impact occurred or not

- Prepare draft PIP and submit to National Assembly

There is no special check from Environmental point of view.

- Prepare final PIP and inform to PO

There is no special check from Environmental point of view.

2. Environmental Analysis Tool

It is not MPI or DPI's responsibility to review the IEE or EIA report. However, they are responsible to compare whether environmental issues are properly considered during Comparative Assessment. MPI and DPI may assess the relative magnitude of the Environmental Impact. For such assessment, the excel program for Environmental Assessment is useful. In order to use the program followings information is need.

- Information of Receptor (within 1km of the project area)

Importance for People:

Farmland Productivity	☐ High	☐ To some extent	☐ Low
Population Density of Residential Area	☐ High	☐ To some extent	☐ Low
Fishery Productivity	☐ High	☐ To some extent	☐ Low
Landscape	☐ Famous	☐ Famous to some extent	☐ Not famous
Heritage	☐ Valuable	☐ Valuable to some extent	☐ Not valuable
Forestry Productivity	☐ High	☐ To some extent	☐ Low

Importance for Wildlife:

Forest	☐ Natural vegetation	☐ Semi natural vegetation	☐ Artificial vegetation

Wetland	☐ Natural vegetation	☐ Semi natural vegetation	☐ Artificial vegetation
River	☐ Natural river	☐ Semi natural river	☐ Artificial river
Glass land	☐ Natural vegetation	☐ Semi natural vegetation	☐ Artificial vegetation
Pond	☐ Natural pond	☐ Semi natural pond	☐ Artificial pond

- Information of Stressor

	Negative Impact				
	No	**Minor**	**Major**	**Substantial**	**Mitigation**
Gas emission	☐	☐	☐	☐	☐
Dust emission	☐	☐	☐	☐	☐
Odor nuisance	☐	☐	☐	☐	☐
Noise and vibration pollution	☐	☐	☐	☐	☐
Drainage of waste water	☐	☐	☐	☐	☐
Discharge of solid waste	☐	☐	☐	☐	☐
Cutting vegetation	☐	☐	☐	☐	☐
Cutting ground and earth fill	☐	☐	☐	☐	☐
Dam and alteration of watershed	☐	☐	☐	☐	☐
Alteration of water's edge	☐	☐	☐	☐	☐
Water abstraction	☐	☐	☐	☐	☐
Movement of trains, cars	☐	☐	☐	☐	☐
Spraying chemicals	☐	☐	☐	☐	☐
Night-time lighting	☐	☐	☐	☐	☐

Emergence of man-made structures

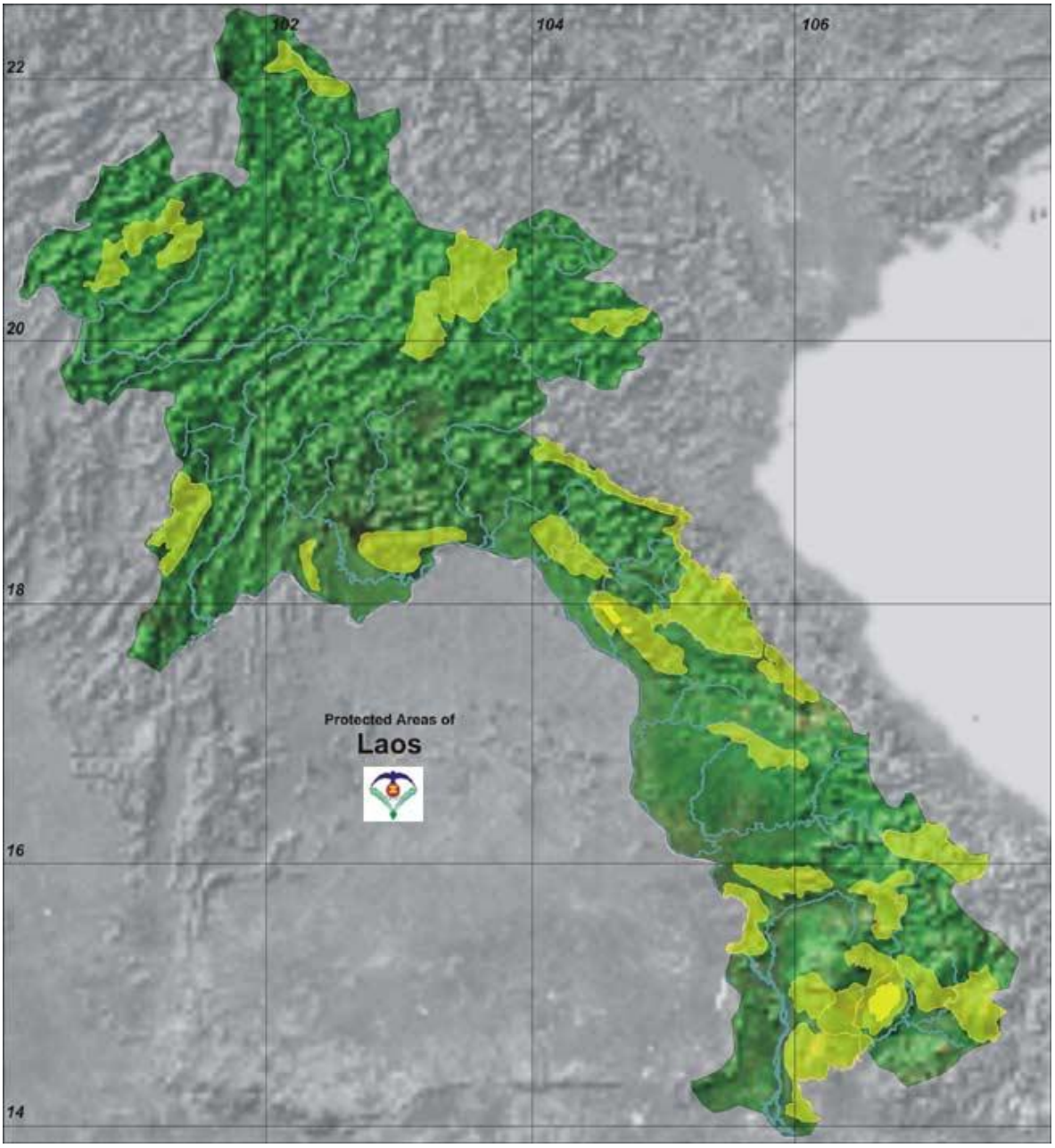
☐ ☐ ☐ ☐ ☐

Stress on environment	During construction	During operation
1. Gas emission	- Use of construction machineries and heavy equipments.	- Automobiles, aircraft, factories, refineries, incinerators, generation facilities, slash and burn
2. Dust emission	- Soil exposure, usage of belt conveyors and crushers, soil deposit, operation of diesel automobiles, handling asbestos.	- Crushing stones, soil deposit, screening, operation diesel automobiles, quarries, soil piles up, mining, and incinerator.
3. Odor nuisance	- Use of volatile chemicals.	- Factories that handle volatile chemicals, waste materials and animals, and factories for processing foodstuffs or animals.
4. Noise and vibration pollution	- Heavy equipment, blasting, drilling and truck movement.	- Automobile movement, train movement, aircraft movement and factory operation.
5. Drainage of waste water	- Discharging underground spring water and water leakage in tunnels, soil exposure uncovered by plants and accommodation facilities.	- Balancing reservoir, dam, factory (including refinery), agricultural land, accommodation facilities, and sewage treatment plant.
6. Discharge of solid waste	- Waste materials include tree felling and root removal, building demolition and hotels and rest facilities.	- Surplus soil can be generated by surface excavation, and industrial waste by manufacturing processes.
7. Cutting vegetation	- Felling trees and cutting down grass.	- Felling trees and cutting down grass.
8. Cutting ground and earth fill	- Cutting ground such as tunnel, hole and getting stone and soil. - Earth fill such as embankment and landfill.	- Cutting ground such as tunnel, hole and getting stone and soil. - Earth fill such as embankment and landfill.
9. Dam and alteration of watershed	- Actions altering or blocking water flow such as dam, water transmission and channel.	- Actions altering or blocking water flow such as dam, water transmission and channel.
10. Alteration of water's edge	- Actions digging up and filling in concrete or stones in border areas between water and land such as bank protection work.	- Actions digging up and filling in concrete or stones in border areas between water and land such as bank protection work.
11. Water abstraction	- Pumpimg up water for home, agricultural and industrial use as well as actions such as discharging spring water during excavation	- Pumpimg up water for home, agricultural and industrial use as well as actions such as discharging spring water during excavation construction.
12. Movement of trains, cars	- Entrance of trucks for inward/outward transportation of materials and cars of commuting laborers.	- New flow of trains and cars.
13. Spraying chemicals	- Spraying of herbicide, insecticide, fungicide, calcium chloride (for thawing snow) etc.	- Spraying of herbicide, insecticide, fungicide, calcium chloride (for thawing snow) etc.
14. Night-time lighting	- Outside lightning for the roads and buildings.	- Outside lightning for the roads and buildings.
15. Emergence of man-made structures	- Large scale artificial construction such as high-rise buildings, smokestacks, high-steel towers, and big windmills.	- Large scale artificial construction such as high-rise buildings, smokestacks, high-steel towers, and big windmills.

APPENDIX: INFORMATION OF VULNERABLE HABITAT

1. BIODIVERSITY INFORMATION in Lao PDR[8]

Figure 32 Protected Areas of Lao PDR



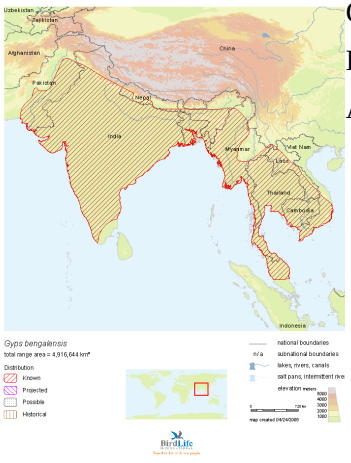
[8] ARCBC-**BIODIVERSITY INFORMATION SHARING SERVICE (BISS) (http://arcbc.org)**

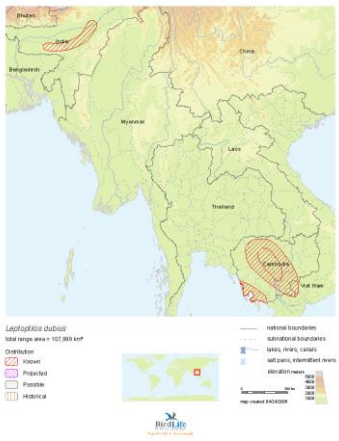
Corridor NNT/HNN	VI	3310
Corridor NNT/PHP	VI	73860

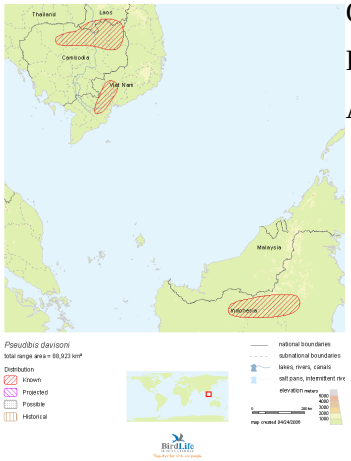
Protected Area Name	IUCN Category	UN Site Code	# of HAs
Dong Ampham	VI	18872	200000
Dong Houa Sao	VI	18887	110000
Dong Phou Vieng	VI		299000
Hin Nam No	VI	71249	86228
Nakai-Nam Theun	VI	10130	353200
Nam Et	VI	61496	170000
Nam Ha	VI	10139	222400
Nam Kading	VI	18896	169000
Nam Pouy	VI		191200
Nam Xam	VI	61497	70000
Phou Dene Din	VI	12182	222000
Phou Hin Poun	VI		150000
Phou Khao Khoay	VI	10192	200000
Phou Loey	VI	61495	143000
Phou Phanang	VI	18869	70000
Phou Xang He	VI	18866	115006
Phou Xiengthong	VI	18893	120000
Xe Bang Nouan	VI	18877	150000
Xe Pian	VI	12176	240000
Xe Xap	VI	71261	133500

2. RDB species

Bird list details

Species name	Picture	Distribution	RDB status
Gyps bengalensis / White-rumped Vulture			Critically Endangered A1ce+2ce

Species name	Picture	Distribution	RDB status
Gyps indicus / Long-billed Vulture			Critically Endangered
Gyps tenuirostris / Slender-billed Vulture	 Asad Rahmani/BNHS		Critically Endangered A4ce
Leptoptilos dubius / Greater Adjutant			EN A2cde, C1

Species name	Picture	Distribution	RDB status
Pseudibis davisoni / White-shouldered Ibis			Critically Endangered A1cd+2cd, C1+2a
Pseudibis gigantea / Giant Ibis	 *Pseudibis gigantea*. Ảnh: Birdlife International		Critically Endangered
Thaumatibis gigantea / Giant Ibis			Critically Endangered C1+2b, D

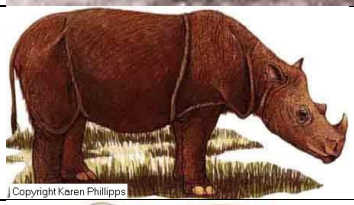
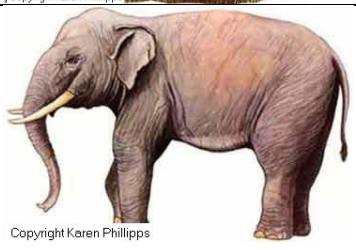
Freshwater Fish list details

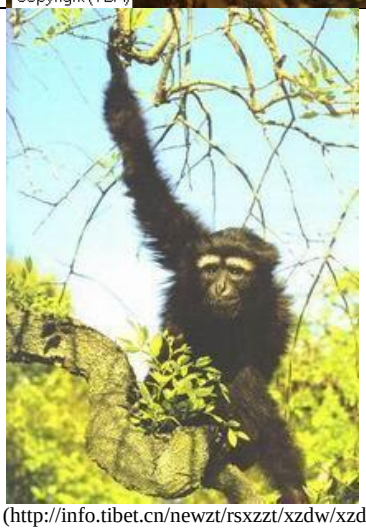
Species name / English	Picture	RDB status

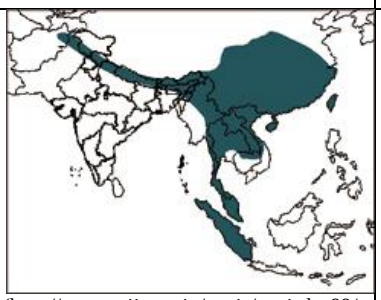
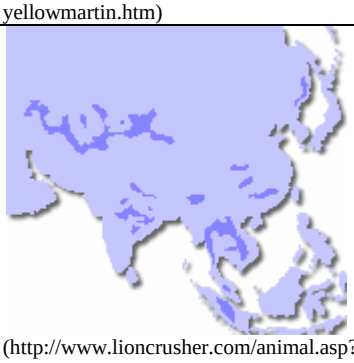
Balantiocheilos melanopterus / Tricolor sharkminnow	 picture (Bamel_u1.jpg) by Reclos, G.J.	EN A1ac
Botia sidthimunki / Dwarf botia	 picture (Bosid_u1.jpg) by Teigler, F.	CR A1c
Chela caeruleostigmata/ Leaping barb	 picture (Chcae_u1.jpg) by Ott, G.	CR A1c
Dasyatis laosensis / Mekong stingray	 picture (Dalao_u1.jpg) by Warren, T.	EN A1cde+2cde, B1+2ce

Mammal list details

Species name	Picture	Distribution	RDB status

Species name	Picture	Distribution	RDB status
Ailurus fulgens / Red Panda			Endangered C2a
Arctogalidia trivirgata / Three-striped palm civet			Endangered
Bos sauveli / Kouprey			CR A2d, C1+2a, D
Dicerorhinus sumatrensis / Sumatran rhinoceros			CR A1bcd, C2a
Elephas maximus / Asiatic Elephant			EN A1cd

Species name	Picture	Distribution	RDB status
Hylobates concolor / Concolor Gibbon			EN A1cd, C2a
Hylobates hoolock / Hoolock(White-browed) Gibbon	 (http://info.tibet.cn/newzt/rsxzzt/xzdw/xzdwwzjs/xzdwprl/t20050816_47795.htm)		EN A1cd
Hylomys suillus / Lesser Gymnure	 (http://animaldiversity.ummz.umich.edu/site/resources/Grzimek_mammals/Erinaceidae/Hylomys_suillus.jpg/view.html)		CR B1+2c
Hylopetes alboniger / Parti-coloured Flying Squirrel	 (http://std.kku.ac.th/4631800138/homepage23.html)		EN A1c

Species name	Picture	Distribution	RDB status
Martes flavigula / Yellow-throated Marten	 (http://www.terrambiente.org/fauna/Mammiferi/carnivora/mustelidae/images/martes_martes2.jpg)	 (http://www.wii.gov.in/envis/envisdec99/yellowmartin.htm)	EN
Panthera tigris / Tiger	 (http://es.wikipedia.org/wiki/Imagen:Panthera_tigris1_sumatran_subspecies.jpg)	 (http://www.lioncrusher.com/animal.asp?animal=71)	EN C2a(i)
Pseudoryx nghetinhensis / Saola	 (http://adb.org/Documents/Periodicals/ADB_Review/2005/vol37-4/snapshot.asp)		EN C1+2a
Pygathrix nemaeus / Douc langur	 (http://www.monkeyland.co.za/content.php?comp=article&op=view&id=9)	 (http://www.zoorasia.org/b/animals/09asian-douc.html)	EN A1cd

Species name	Picture	Distribution	RDB status
Rhinoceros sondaicus / Javan rhinoceros	 (http://www.achimerfriendsofrhino.de/Rhino/Rhino_Species/Javan_Rhino/javan_rhino.html)		CR C2a
Tapirus indicus / Malay tapir	 (http://visindavefur.hi.is/svar.asp?id=5741)		EN A2c+3c +4c
Typhlomys cinereus / Chinese Pygmy Dormouse			CR

Plant list details

Species name	Picture	Distribution	RDB status
Anisoptera costata / Mindanao Palosapis, Balingan (Sul.)	 **(http://www.udomsuksa.ac.th/Latphrao/botanical/botanic10_ne.asp)**		**EN**
Aquilaria crassna			**CR**
Dalbergia bariensis			**EN**
Diospyros mun			**CR**

Species name	Picture	Distribution	RDB status
Dipterocarpus alatus / Hairy-leafed apitong			**EN**
Dipterocarpus costatus			**EN**
Dipterocarpus turbinatu			**CR**
Dipterocarpus turbinatus			**CR**
Hopea pierrei			**EN**
Hopea recopei			**EN**
Hopea thorelii			**CR**
Parashorea stellata			**CR**
Shorea guiso / Guijo			**CR**
Shorea henryana			**EN**
Shorea roxburghii			**EN**
Shorea thorelii			**CR**
Vatica cinerea			**EN**

Reptile list details

Species name	Picture	Distribution	RDB status
Crocodylus siamensis / Siamese Crocodile			CR A1ac
Cuora galbinifrons / Indochinese Box Turtle			CR A1d+2d
Cuora trifasciata / Chinese Three-striped Box Turtle			CR A1d+2d
Hieremys annandalii / Yellow-headed Temple Turtle			EN A1cd+2d
Indotestudo elongata / Elongated Tortoise			EN A1cd+2cd
Pelochelys cantorii / Cantor's Giant Softshell Turtle			EN A1cd+2cd
Platysternon megacephalum / Big-headed Turtle			EN A1d+2d
Pyxidea mouhotii / Keeled Box Turtle			EN A1d+2d

Species name	Picture	Distribution	RDB status
Sacalia quadriocellata / Four-eyed Turtle			EN A1d+2d

REFERENCE MATERIAL FOR ECONOMIC AND FINANCIAL ANALYSIS IN PIP PROJECT MANAGEMENT

FOREWORD

In the field of Public Investment Program (PIP) in Lao PDR, development partners and Non Government Organizations (NGOs) have supported both in financial and technical aspects for development. In many cases, consultants of such organizations played a considerable role in directing the projects by conducting its feasibility studies, making proposals, reporting, and through implementation. However, in order to advance from the status of the Least Developed Country by 2020, which is clearly mentioned in the Socio-Economic Development Plan (SEDP) it is desirable for Lao government staff to implement each PIP with strong ownership and appropriate techniques. More suitable projects should be selected according to the development goals through better appraisal and assessment of the projects by observing its effectiveness and sustainability.

Economic and financial analyses in PIP management are two of the several techniques useful for an appraisal of a project, as they use objective indices and enables fair and accurate judgment of each project. This sub-section is therefore aimed for staff responsible for PIP management at the central, the provincial and the district levels. It will enable staff to understand the concept of economic and financial analyses for utilization in the daily tasks of PIP management.

LIST OF ABBREVIATIONS AND ACRONYMS USED

B/C	Cost and Benefit Ratio
B/D	Basic Design
MPI	Ministry of Planning and Investment
MPI-DOP	Department of Planning, MPI
D/D	Detailed Design
DPI	Provincial Department of Planning and Investment
F/S	Feasibility Study
IRR	The Internal Rate of Return
NPV	The Net Present Value
O/M	Operation and Maintenance
PIP	Public Investment Program
PO(s)	Project Owner(s)
SPAS	Simplified Project Assessment Sheet

Table of Contents

I. CONCEPTUAL PART

1. Basic Concept of Economic and Financial Analysis

Introduction

Both the Economic analysis and the Financial Analysis investigate whether or how the **"benefit"** (or **"profit"** in the case of financial analysis) excesses the **"cost"** (or **"expenditure"** in the case of financial analysis) of the project quantitatively. These analyses seem alike based on the same concept as both appraise the benefit (or profit) of an investment. Strictly speaking, however, the concept of benefit for Economic analysis is not the same as that of financial analysis.

Exercise 1 : Basic Concept of Economic and Financial Analysis

Imagine that there is a certain project which intends to construct an irrigation system in province A, which is to be sustained for a period of five years. The total cost for the investment is 10 billion kip. After the instillation of the equipment, say, irrigation system, there will also be the need for maintenance which will cost an additional one billion kip per year. The user fees collected from the operation of the irrigation system have been estimated at 0.5 billion kip per year.

***Question**: Based on these estimates, do you think that the project is appropriate?*

Cash flow

Year	Revenue	Expenditure	Net Profit
0	0	10 billion	- 10 billion
1	0.5 billion	1 billion	- 0.5 billion
2	0.5 billion	1 billion	- 0.5 billion
3	0.5 billion	1 billion	- 0.5 billion
4	0.5 billion	1 billion	- 0.5 billion
5	0.5 billion	1 billion	- 0.5 billion
Total	2.5 billion	15 billion	- 12.5 billion

***Answer**: No, this project is NOT sustainable because the net Profit is obviously negative, and it is not appropriate.*

Table 1: The Difference between Economic and Financial Analyses

	Financial Analysis	Economic Analysis
Issue to be addressed	➢ Will the project be profitable for the project owners?	➢ Will the project have an impact on society or the national economy? ➢ Will the project worth investing with a limited budget?

Financial analysis is simply comparing the **revenue** and **expenditure** in each project. Financial analysis is rather applied to the project which will generate revenue by its own such as Hydropower electricity project collecting fee from its users. It requires to do Financial Analysis to see whether the fee collected will be enough profitable to manage the facilities. This concept is adequate rather for a private business.

Economic analysis is, on the other hand, conducted to determine whether a project will improve a community's welfare and whether it should therefore be supported. Economic analysis is comparing the **benefit** to the society and the **cost** incurred to the government in each project. Many of PIP projects rather require **Economic analysis** to see whether the project is worth implementing with a limited budget and whether the project could have enough impact to the society.

2. Economic and Financial Analysis in PIP Management

Introduction

MPI/DPI required doing about Economic and Financial Analysis in PIP Management in order to ensure the project can surely be planned and implemented.

- To confirm the economic relevance of the project with adequate information
- To confirm the financial sustainability of the project with adequate information

Based on the information above,

- To ask the POs to recalculate if the figures and criteria are questionable
- To consider which project is more worth investing over other projects

Economic Relevance of the project

The main purpose of an economic analysis is to confirm whether the project contributes to the welfare of the country and whether it is therefore worth implementing. Basically, PIP projects are conducted aiming to increase the welfare of the society. Therefore, PIP projects should be the most efficient means to contribute for public welfare, and be most successfully completed and operated. Specifically, when the resources are limited, economic relevance, and efficiency of the project are all important. Thus, Economic analysis is one of the viewpoints for securing these issues in PIP Management.

Financial Sustainability of the project

Then, Economic analysis will give MPI and DPI officials (hereafter MPI/DPI) another viewpoint of assessing and selecting PIP projects. If there is a PIP project which provides essential public services but is financially weak (as is often the case with PIP projects), the project should be supported anyhow. Thus, MPI/DPI is recommended to confirm its financial feasibility and think over any means possible so that it receives adequate financing. On the other hand, MPI/DPI have to reconsider the project if it has any negative impacts to the society as the result of its implementation, even if a project is profitable in its own right. Seeing the result of economic analysis of the project, MPI/DPI can address a project more in detail.

Inter-sectoral arrangement

Additionally, Economic and Financial analysis give one idea how to select the project among many projects which are from various sectors and which have different project frameworks. The following questions which many concerned officials might have considered during PIP management might be answered somehow with the economic and financial analysis.

- ✓ Will this agriculture project be a best use of limited resources in this province?
- ✓ Will this irrigation project lead to a greater increase in the community's welfare than other water supply projects?
- ✓ Should a new road be constructed in a remote area? Or, should a school be built instead?

This is because MPI/DPI sometimes have to solve issues such as inter-sector resource allocation from an economic perspective. In order to achieve the efficient synthesis of macro development plan and each PIP project, it is essential for MPI/DPI to have the neutral viewpoint enable to compare the importance of projects among various sectors.

Legal Documents on Economic and Financial Analysis in Lao PDR

The legal documents mentioning the economic and financial analysis in PIP management are found in;

- ✓ ***Decree on Public Investment Management,*** (No. 58/PM), 1995
- ✓ ***Regulation on the Implementation of the Decree on Public Investment Management,*** (No. 918/CPC), 2001.

Although there is not much statement in detail how to do the economic and financial analysis, the basic concept is found in these regal documents.

Decree on Public Investment Management, (No. 58/PM), 1995

Decree 58 specifies principles to include the economic and financial perspective into PIP management.

> Article 4: Fundamental criteria
>
> 1. The PIP should be in line with the national socio-economic development plan, the government budget, has socio-**economic effectiveness** and ensures the sustainable environment conservation. …

This statement indicates that it is necessary to reflect the economic effectiveness of the project onto the PIP planning. This means the PIP projects needs the **Economic Relevance** to invest.

> Article 7: Recurrent administrative cost estimation

> The recurrent administrative cost should be estimated for the projects with the total cost of more than 1 Billion kips (for repair and maintenance and operation) and submitted together with the project proposal for approval.

This article mentions that a certain projects should estimate the recurrent cost, namely operation and maintenance cost (O/M cost) for its approval. It can be said that the PIP projects have to be secured with its **Financial Sustainability**.

Article 15: the contents of PIP preparation

- ✓ To define **project size** ⋯
- ✓ To study the **capacity of funding sources** and **investment effectiveness** ⋯

Although there is no specific explanation of defining the project size in which terms (monetary, duration, area, etc), Article 15 implicated that a rough idea of benefit, cost, and framework of the project should be at least mentioned in the planning stage of PIP management. Also, the capacity of funding, namely **financial sustainability**, and investment effectiveness, namely **economic relevance** to invest, are recommended to be studied in the planning stage of PIP management.

Regulation on the Implementation of the Decree on Public Investment Management, (No 918/CPC), 2001

Regulation 918 indicates detail procedure of PIP management to be done by MPI.

Article 4: Implementation Procedures of the PIP project

> Step1: Project preparation. This step involves project conceptualization and information collection. It is to study the feasibility of the project which covers goal attainment, environment issue, **cost-effectiveness**, and **estimation of the project costs.** ⋯

Again, here in planning stage of the project, it requires to include the cost-effectiveness, namely **economic relevance**. Additionally, this regulation specifies the estimation of the project **cost** is another critical factor in project preparation.

As for the requirement of feasibility study, as well as Article 3 in Decree 58, Article 11 and 12 in Regulation 918 mentioned clearly. Specifically the regulation specifies the contents of F/S.

Article 12: Contents of the Feasibility Study

> 6. Preliminary estimation of the **total project cost**, **sources of finance**, **return on equity**, **loans repayment**, **profit and overheads (if relevant)**
>
> 7. Preliminary estimation of the **cost-effectiveness** which related to **economic** and social, and environment aspects.

According to this article, F/S requires including 2 types of information; one is for financial security (total project cost, sources of finance, return on equity, loans repayment, profit and overheads (if relevant)), and the other is for economic relevance (cost-effectiveness). Since this

regulation defines that every PIP project requires conducting F/S regardless of its size (Type 1, 2, or 3), thus, every PIP project has to study a preliminary estimation of both financial and economic aspects.

II. PRACTICAL PART

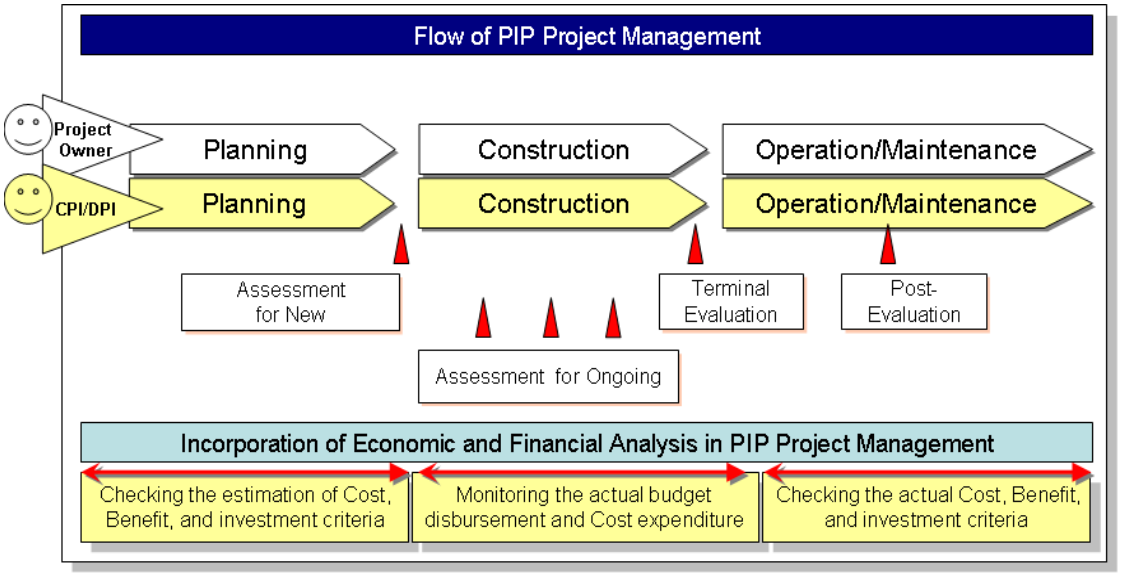
This part will present the practical process of incorporating Economic Analysis in PIP Project Management. It is often true that better project planning leads to better project outcome. An economic analysis is the most useful when it is applied early in the project flow; which is, in **planning stage**. When Economic aspects are analyzed carefully at the planning stage, the project will give benefit most with the limited resources. Also, an economic analysis works well in the **assessing stage**. With the perspective of economic analysis, the project can be assessed objectively whether it is worth investing with the limited resources.

1. Economic Analysis in the Flow of PIP Projects

All PIP projects will go through every project stage, beginning from planning, assessment, monitoring for implementation, evaluation and to operation and maintenance. The degree of inclusion of Economic and Financial Analysis and major analysis points vary among stages. From the general and international viewpoint, this section will briefly summarize the activities necessary for the Analysis in each stage.

However, this section will apply the stages and steps of PIP Project Management proposed by "Manual for Public Investment Program (PIP) Project Management (hereafter referred to as "the Manual")." This manual targets the officials in charge of project assessment and supervision, namely MPI and DPI officials (hereafter MPI/DPI); therefore the stages and steps applied in the Manual enable MPI/DPI easier to follow the project flow and to identify what necessary activities they should take. Those stages are Planning, Assessment, Monitoring for Implementation, Evaluation, and Operation and Maintenance.

Figure __: PIP Project Management Flow and Inclusion of Economic Analysis



1.1 Economic Analysis in Planning Stage

As mentioned, incorporation of Economic and Financial Analysis into project formulation is considerably crucial for projects to ensure the better quality of project design. This section will explain what actions have to be taken for Economic and Financial Analysis, applying three steps[1] of (1) Project Identification, (2) Project Formulation, and (3) Technical Detailed Plan, as defined in the Manual.

1) Project Identification

The major focus in this step is finding project ideas or identifying needs or demands for projects. The activities carried out are generally fact-finding survey, or review of census or available secondary data. The information regarding economic and financial factors should be collected through these data collection or review activities.

In this stage, the perspective of Economic and Financial analysis will be utilized for getting a rough idea of the benefit expected to produce and the cost expected to incur by the project identified. Specific issues as follows have to be clarified by POs.

- ❑ Who and how many the target beneficiary is

Without knowing the target beneficiary, it is impossible to aim any project purpose. Specifically, for economic and financial analysis which is based on cost benefit analysis, it is essential to define the beneficiary. Regarding the identifying the target beneficiary, it could be referred to the result of **Social analysis**.

- ❑ Characteristics and Size of Benefit

POs have to clarify what kind of benefit is hoped to be produced through implementing the project. It can be stated is such as; increasing crop for beneficiaries, saving time for traveling and so on. Also, it is important to guesstimate how much the benefit is hoped to be produced through implementing the project and how long the benefit has to be kept producing.

- ❑ Rough estimation of Cost

Same as Benefit, POs have to estimate the rough amount of cost needed for attaining the expected benefit mentioned above. It might have to be still a guesstimation, yet, it helps to grasp the size of project. Estimating whether it might cost 1 million kip or 1 billion kip or 10 billion kip is still necessary.

2) Project Formulation

This is a step to formulate project framework, meaning that project purpose, outputs, necessary activities or inputs to accomplish the project purpose will be identified by the end of this step. It

[1] The detailed definition and explanation of each steps in planning stage are provided in Chapter 3.1 Planning in the Manual.

is advisable that projects conduct feasibility studies for construction projects. Specific issues as follows have to be clarified by POs.

- ❑ [Data] Whether the all necessary figures and data for economic and financial analysis is reported

As a fundamental data for economic and financial analysis, it is required to prepare both information of cost and benefit. For calculating both appropriately, it is essential to check whether it is accurate estimation of project duration and the life span of the facilities. Whether the appropriate calculation method is used and whether the appropriate discount rate is adopted.

- ❑ [Benefit] Whether the benefit expected to produce by the project is specified

Especially, POs are supposed to clarify in detail how much and what kind of the benefit will be produced which already roughly estimated in project identification stage. → See technical explanation in 1-2 of Chapter III.

- ❑ [Cost] Whether the cost expected to incur to the project is specified

Similarly, cost also needs to be accurately estimated with each item of expenditure such as material, Labor works, and Contingency. → See technical explanation in 1-2 of Chapter III.

- ❑ [Economic analysis]Whether the Economic analysis is conducted

Based on cost and benefit above estimated, it is important to calculate and judge adequately investment criteria, namely, B/C, NPV, and IRR if possible. Also, other optional scenarios for acquiring better economic benefit are required to be considered. → See technical explanation in 1-3 of Chapter III.

- ❑ [Financial analysis] Whether the financial means to cover its O/M is determined.

The means how to financially cover the operation and maintenance of the facilities should be considered by POs prior to implementing. In this stage, it is at least needed to distinguish the methods between Revenue-generating type and Non Revenue-Generating type which is looking for other resources except for revenue-generating system. → See technical explanation in 1-1 of Chapter III.

Plus, in the case of Non-Revenue Generating project, it should be necessary to find the possibility to allocate budget for its OM after the project completion. Also, the plan for collecting fee is needed to be properly prepared and included into the **project proposal**.

All the information above is called the initial (or brief) economic and financial analysis. The result of whole analysis is recommended to be integrated into **project proposal** and submitted to MPI/DPI properly on time.

3) Technical Detailed Plan

This step includes technical design for construction project, namely Basic Design, or Detailed Design (or Detailed Engineering Design). In this step, the brief economic and financial analysis is recommended technically specified more.

1.2 Economic Analysis in Assessment Stage

This stage will focus on the project assessment on newly proposed projects and ongoing projects. The main responsibilities for PIP project assessment are taken by MPI/DPI. As the Manual introduced Simplified Project Assessment Sheet (**SPAS) for new, onging nad revival projects** as project assessment tools, necessary assessment points in terms of Economic and Financial Analysis are incorporated in these assessments.

1) Assessment for newly proposed projects in N-SPAS

The relevant authorities to assess the PIP projects, namely MPI/DPI, review the economic relevance and financial sustainability of the project. With this analysis, it would be clarified whether the project is worth implementing with a limited budget of PIP as the evaluation item of "Relevance", and whether the facilities produced by the project would be sustained from the financial perspective as its "Sustainability".

Main tasks of MPI/DPI supposedly to do in assessment stage are as follows;

1. Confirm whether the all necessary figures and data for economic analysis (i.e., benefit and cost) is reported by PO
2. Confirm whether the figures above and result of economic analysis (i.e., investment criteria) are reliable and adequate
3. Confirm whether the financial plan to cover O/M are properly considered
4. Assess whether the project is worth investing based on the result of the analysis

MPI/DPI integrates the results of economic analysis into project assessment applying **SPAS for new projects**. **SPAS series I are** the assessment tools to evaluate the newly proposed projects, which established three specific questions to be asked for economic perspective.

Evaluation items	Questions
Relevance--- Economic Relevance	Is the necessary info reliable and adequately used the method?
	Is the project B/C over 1.0?
Feasibility of Efficiency, --- Cost	Is the cost estimation of the project appropriate?
	Is the disbursement schedule considered under the current budget estimation
Sustainability, ---Financial Sustainability	Is the any Operation and Maintenance plan clearly stating its financial plan?

Relevance – Economic Relevance

"Relevance" will show you whether a project has a good reason to invest for attaining the benefit, and whether the project matches the priority of the targeted beneficiary, the SEDP, and other national policy of the time of evaluation. Here in the evaluation item of Economic and Financial Appropriateness, the result of the following questions show whether the project is worth investing from the perspective of economic and financial.

Is the necessary information (Cost, Benefit, and Investment criteria) is reliable and adequately used the proper method (Discount rate, with-without, present value)?

In order to assess whether the project is worthwhile investing based on the investment criteria such as B/C correctly, all necessary information is required to be prepared, and then, investment criteria should be calculated adequately. Without these steps, it is impossible to fill in **SPAS**.

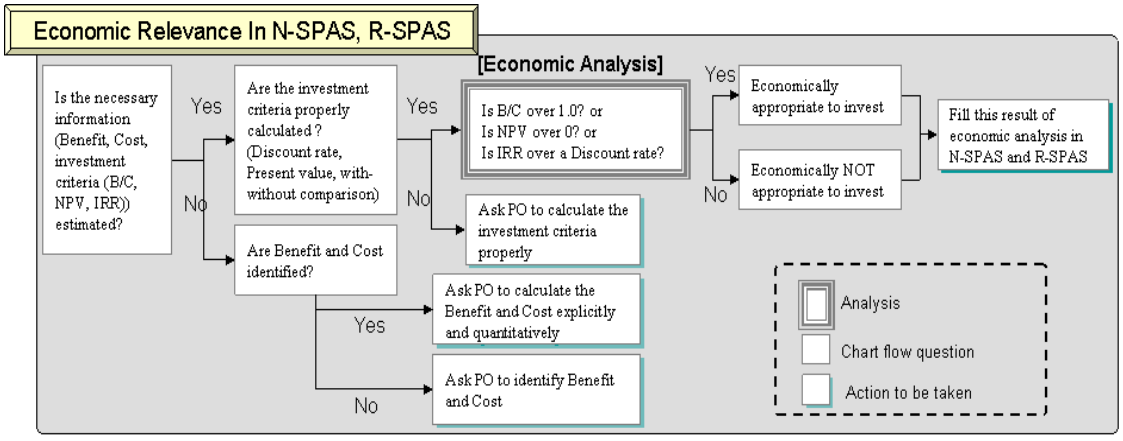
First of all, MPI/DPI has to check whether the project proposal clearly stated the necessary information regarding the economic and financial analysis, namely, benefit, cost, and the investment criteria are properly reported. Also, it should be checked that these figures are properly calculated with a discount rate, with-without comparison, and present value concept. Even if the result of investment criteria is positive, it will be invalid for assessing the economic relevance of the project if the calculation methods adopted is not correct and appropriate.

Is the project B/C over 1?

Next, Based on the enough information, **B/C** ratio is supposed to be calculated. "**B/C**", namely, Cost Benefit Ratio is one of the investment criteria to see the economic appropriateness of the project. → See technical explanation in 1-3 and 1-4 of Chapter III.

Then, MPI/DPI has to judge the rate of Benefit Cost analysis (B/C). If the B/C shows over 1.0, it means the benefit expected to produce through the project is more than the cost to be invested. B/C over 1.0 shows, therefore, the project has its economic appropriateness to implement. In the case that the B/C is not over 1.0, the project cannot produce enough benefit as much as the cost invested. Please be reminded, however, the public investment project is aiming at increasing public welfare, which sometimes needs to be implemented regardless of its economic appropriateness. MPI/DPI is advised to refer the investment criteria as one of the viewpoints to judge relevance of implementing projects. → See technical explanation shown of 3) in 1-4 of Chapter III.

Figure __: steps to check Economic Relevance in N-SPAS



Feasibility of Efficiency - Cost Estimation

"Feasibility of Efficiency" shows whether the project input is expected to convert to the output efficiently. Among the items, "cost estimation" shows how much the project needed cost for its implementation and whether the budget needed for covering its cost is feasible. This financial information contributes for acquiring the better efficiency of the project.

(1) Is the cost estimation of the project appropriate and reliable?

Here in this question, it will be asked whether the cost is appropriately estimated. It means to confirm the reliability and appropriateness of all the basic information such as the estimation of 1) project period, 2) discount rate, and 3) calculation method adopted in the cost estimation.

(2) Is the disbursement schedule considered under the current budget estimation?

This question looks into whether the total amount and disbursement schedule of budget estimated or proposed for the project is solvent under the current resource capacity of the national or provincial government. If the budget estimation is largely beyond the real capacity of the payer namely the provincial or national government, it is hardly to start implementing or completing c the project just due to the lack of resources. It could be saying that it is irresponsible to plan and/or select the unrealistic project in financial terms, and people might think that MPI/DPI is the one who will be to partly blame for this. Thus, it is strongly recommended for MPI/DPI to select the feasible project in financial terms or guide POs to make such a plan.

Sustainability – Financial Sustainability

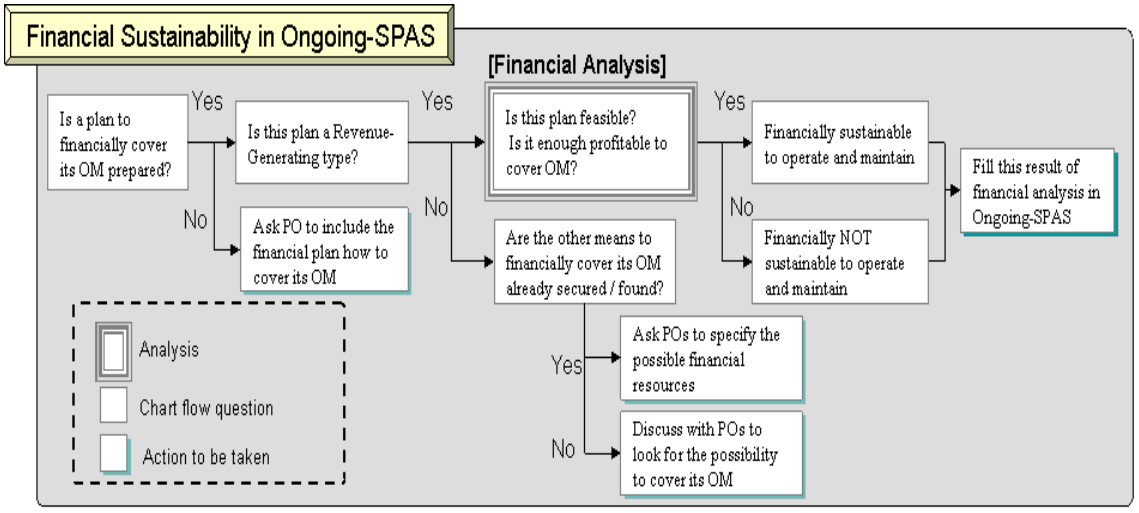
"**Sustainability**" shows us how much and/or how long the outputs and the direct effect produced by the project such as the facilities constructed, the group formulated, and anything produced by the project can be sustained by itself after the project completed. Specifically, **"Financial Sustainability"** checks the means how to financially cover the operation and maintenance of the facilities which is supposed to be set by POs prior to implementing.

Is the any Operation and Maintenance plan clearly stating its financial plan?

In this question, firstly, it is required to check whether there is an O/M plan including financial plan. The financial plans should be clearly determined how to financially cover its O/M. If it does but no clear indication or calculation is stated, MPI/DPI has to ask the POs to prepare in detail of financial means to cover the OM of the facilities.

Then, if it is found that the financial plan is included in OM plan, MPI/DPI at least needs to distinguish the methods between Revenue-generating type and Non Revenue-Generating type which is looking for other resources except for revenue-generating system. If it is Revenue-generating case adopted for operating and maintaining the facilities, MPI/DPI is required to check if it is healthily feasible. In the case of Non-Revenue Generating project, it should be necessary to find the possibility to allocate budget for its OM after the project completion.

Figure __: steps to check Financial Sustainability in N-SPAS



2) Assessment for ongoing projects

Ongoing projects generally consist of 2 types; one is the normal project which is successfully implementing, and the other is the one which has been stopped implementing for a while[2]. Either case requires being supervised of its actual cost expended, but here, the projects which has been kept implementing so far will be assessed as Ongoing projects.

As for SPAS for ongoing projects (Format II), there are no evaluation items directly asking the result of Economic analysis, namely, the investment criteria such as B/C, since the economic analysis should be done in the planning stage and in the evaluation stage after the project completion. However, the actual spending of cost and disbursement of budget should be checked by MPI /DPI.

Related Evaluation items		**Questions**
Efficiency	Cost	Has the total cost been changed from the initially planned cost? If changed, how much would be, and the reason why?

Efficiency –Cost

Has the total cost been changed from the initially planned cost? If changed, how much would be, and the reason why?

Even though there is not direct perspective of economic analysis on Ongoing project, it is necessary for MPI/DPI to at least follow the actual record of cost expended because the actual amount of cost tends to be negatively influenced by inflation, exchange rates, and other external factors. For dealing with such unexpected change of cost which would produce another result of

[2] For detail criteria to decide a project is in the status of "Ongoing" or "Stopped", refer to the main part of project manual.

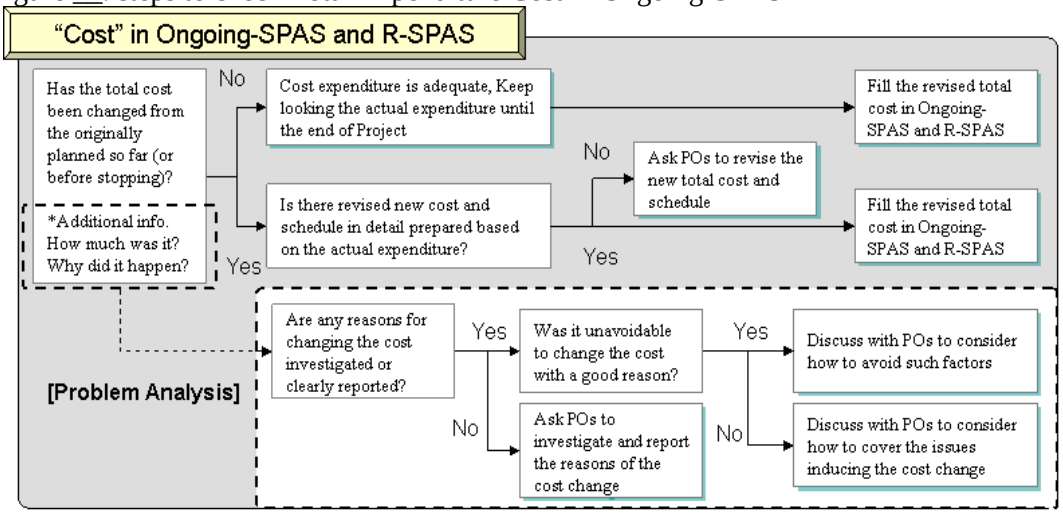
economic analysis, MPI/DPI should realize the actual situation of cost timely and accurately as possible.

Then, MPI and DPI ask the specific question as follows.

- ❑ [Actual Cost expended] Is the actual cost expended during the project properly reported? If no, did MPI/DPI ask PO to report them? Was it expended as planned so far? If no, how much was it, and the reason why it was changed?
- ❑ [Necessary cost expected]Is the necessary cost for the rest of the project expected to change from the originally planned? If no, how much would be, and the reason why?
- ❑ [Total cost expected]Is the total cost recalculated if the cost largely is expected to change? Will the total cost be changed from the initially planned cost if the project is going on as it is? If so, how much would be, and the reason why? → **SPAS for Ongoing Projects, "Efficiency"**
- ❑ [Economic analysis] Is the investment criteria revised based on the revised total cost? If so, how much is it?
- ❑ [Further utilization] Is the revised total cost reflected in the budget plan to be proposed to National Assembly next year? Are the revised total cost and the revised investment criteria applied for reviewing the project design next year?

The results of monitoring of the total cost and revised investment criteria are recommended to be integrated into project assessment in **SPAS**.

Figure __: steps to check Total Expenditure Cost in Ongoing-SPAS



3) Assessment for restarting projects (Revival Projects)

SPAS for Revival Projects (SPAs Format I-5) is utilized when the project which has been suspended for a while is reviewed its situation whether it is still worth restarting its implementation. The relevant evaluation items to economic and financial analysis are as follows;

Related Evaluation items		**Questions**
Relevance	Economic Relevance	Is the necessary info reliable and adequately used the method?
		Is the B/C over 1?
Efficiency	Cost	Has the total cost been changed from the initially planned cost?

Relevance– Economic and Financial relevance

Is the necessary information (Cost, Benefit, and Investment criteria) is reliable and adequately used the proper method (Discount rate, with-without, present value)?

As stated in the explanation of SPAS Format I-5, it is again necessary all information should be prepared properly. Same as before, MPI/DPI has to check whether the figures and result of re-estimation are adequate and reliable.

Is the B/C over 1?

It is again required to check economic appropriateness to reconfirm if the project has still relevance to invest the resources. For reconsidering the investment criteria, B/C and more, POs have to use the revised total cost based on the actual cost so far. Then, MPI/DPI again is supposed to see the result of investment criteria, preferably B/C. If B/C is over 1.0 even though the project had had been stopped, the project has still its relevance to invest from economic perspective.

Efficiency – Cost

Has the total cost been changed from the initially planned cost? If changed, how much would be, and the reason why?

Same as explained in the ongoing project SPAS section, it is necessary for MPI/DPI to at least follow the actual record of cost expended before its stopping. Additionally, the reasons and the amount of the cost change should be clarified. This information will be the factor to reconsider whether the project can be restarted.

Then, it is required to estimate how much the cost would be if the project is restarted based on the current status. Without proper prediction of the necessary cost after its restarting, it is hard to say that the project can restart. In such a case, MPI/DPI is recommended to ask PO to report them.

1-3. Economic Analysis in Monitoring for Implementation Stage

Basically, Implementation of the project and direct supervising of the project cost are responsible for POs and as relevant authorities. Thus, MPI/DPI has the responsibility of monitoring whether the budget disbursement is appropriately carried out. It is also

recommended for MPI/DPI to make any recommendations or provide any necessary supports regarding the smooth implementation of the project.

The expenditure record of the project is recommended to be checked in **the Progress Reports** submitted by POs. The specific question that MPI/DPI can ask regarding monitoring is as follows.

- ❑ [Budget disbursement]Are the budget disbursement monitored? Are any changes of disbursement schedule appropriately reported by PO in **the monitoring reports**?
- ❑ [Cost] Are the expenditure record monitored? Are any changes of actual expenditure and the cost prediction reported to MPI/DPI by PO in **the monitoring reports?**

1-4. Economic Analysis in Evaluation Stage

As the Manual specifies, the Evaluation Stage has two important evaluation works: Terminal Evaluation and Post-Evaluation.

Terminal Evaluation is carried out at just the completion of the project, namely at the end of civil works for construction projects. The main focus is whether the project purpose is accomplished. The organizations in charge of terminal evaluation are MPI/DPI. From the viewpoint of Economic and Financial Analysis, MPI/DPI can ask the following questions.

- ❑ [Cost] Was the cost of the project appropriately spent as planned?
- ❑ [Benefit] Is the benefit of the project expected to be produced as planned through using the facilities?
- ❑ [Economic Analysis]Did the investment criteria based on the actual cost and possible benefit recalculated?

Post-Evaluation is carried out in three, five or more years after the completion of project (construction was completed): that is during the operation period. It aims to examine whether the intended impacts resulting from operating facilities constructed by the projects are generated. The organizations in charge of terminal evaluation are MPI or DPI. From the viewpoint of Economic and Financial Analysis, MPI/DPI can ask the following questions.

- ❑ [Cost] Was the cost of the project appropriately spent as planned?
- ❑ [Benefit] Is the benefit of the project produced as planned? If different, state how much the actual benefit is and why the actual benefit was changed from the original?
- ❑ [Economic Analysis] Is the investment criteria based on the actual cost and actual benefit recalculated?, Is the actual investment criteria recalculated above over 1.0?

If the actual investment shows its positive result such as B/C is over 1.0, it is proved that the project was worth implementing from the economic perspective. Of course, it is hoped that the originally estimated the investment criteria (i.e., B/C =1.2) is same as the actual investment criteria. However, if the actual one is changed from its original, the reasons why it was not as planned have to be investigated in this evaluation stage.

Based on these evaluations, any lessons-learnt and recommendation from the economic perspective should be made and be utilized for another project planning.

1-5. Economic Analysis in Operation and Maintenance Stage

Although Post-Evaluation is carried out during operation period, the various issues have to be carefully and regularly monitor in Operation and Maintenance (O/M) Stage. It is important for not only PO or facilities owners but MPI/ DPI to supervise the benefit is produced successfully as planned by the facilities. If the actual benefit is not as much as expected, concerned officials should find the reasons why it had not attained the expected benefit level, and try to mend it as much as possible. For taking such prompt actions, MPI/DPI is recommended to keep watching the project even after the facilities transferred to the POs or user association. Also, for making sure to produce the benefit of the project, the operating of facilities should be financially secured.

As the concerned organizations, MPI/DPI can ask the following questions to check the actual situation from the viewpoints of Economic and Financial Analysis.

- ❑ [Benefit] Has the benefit of the project being produced as planned?
- ❑ [for Revenue Generating project] Is user's fee properly collected? Is the collected revenue appropriately spent for its operation and maintenance?
- ❑ [for Non-Revenue Generating project] Are the financial resources to cover its O/M secured?

Following Table summarizes the responsible organizations and their actions to be taken and outputs to be produced in each stage of PIP Project Management. For reference, stages defined in the Manual are stated.

Table__: Tasks of Responsible Organizations in the Stages of PIP Project Management

Stages[3]		**Responsibilities**		**Key Action Point and Outputs**
	Steps		**Documents**	
Planning				
	Project Identification	PO	Concept Paper	• Identify what kind of and how much benefit should be produced to increase the beneficiaries' welfare by the project • Estimate roughly the cost necessary for attaining the benefit expected above
	Project Formulation	PO	Feasibility Studies (If B/D and D/D is not necessary) Project Proposal	• Prepare all necessary figures and data for economic and financial analysis → Determine 1) the project duration and the life span of the facilities, 2) Discount rate to be applied, and 3) the calculation method to be use • Estimate the benefit and cost quantitatively and precisely • Conduct the economic analysis properly (calculate the investment criteria B/C, NPV, and IRR) properly • Determine how the project intends to cover its O/M financially (Revenue generating / Non-Revenue generating) • Report the result of the economic and financial analysis to MPI and DPI in **F/S** and **Project Proposal**
	Technical Detailed Plan	PO	-Basic Design, -Detailed Design -Project Proposal	• Specify in detail the economic analysis done in the project formulation. • Include all economic analysis into **Project Proposal** and submit to MPI/DPI.

[3] All stages referred to in this section are based on "Manual for PIP Project Management"

Assessment				
	For newly proposed projects	MPI/ DPI	SPAS Format Series I	• Confirm whether the all necessary figures and data for economic and financial analysis (project cost, benefit, duration, calculation method adopted) which project owners calculated are properly reported • Confirm whether the necessary information abovementioned are adequate and reliable • Confirm whether the figures and result of economic analysis (the investment criteria, namely B/C, NPV, and IRR if possible) are reliable and adequate • Confirm whether the financial plan to cover O/M are properly considered • If any information not reported, or if the figures and result of analysis are questionable, feed POs back to report them again immediately • Assess whether the project is worth investing based on the result of the analysis. • Integrate the all results of the analysis into **N-SPAS** • Make recommendations if necessary
	For ongoing projects	MPI/ DPI	SPAS Format Series II	• Confirm the actual cost expended during the project and the necessary cost for the rest of the project if it is expected to change from the originally planned • Feed POs back to report them if some information is not reported and / or if the figures and result of analysis are questionable. • Utilize the total project cost for reviewing the project next year. • Apply the revised total cost for proposing the budget plan to National Assembly • Integrate all the information regarding the revised total cost into **Ongoing SPAS**

	For project restarting	MPI/ DPI	SPAS Format I-5 For Revival Projects	• Confirm the actual cost expended before the project stopping. • Check whether the actual cost was changed from the originally planned cost. If changed, clarify how much would be, and the reason why. • Feed POs back to report them if some information is not reported and / or if the figures and result of analysis are questionable. • Revise the total cost based on the actual cost revised above. • Check the result of revised investment criteria such as B/C. • Check whether the necessary cost after the project resuming predicted. Specify how much would be. • Integrate the revised total cost and the result of economic analysis into **R-SPAS**

Implementation				
	Monitoring for Implementation	PO MPI/ DPI	Monitoring report	• (PO) Monitor the disbursement of budget on spending the cost. • (PO) Monitor the expenditure record how the budget was spent appropriately • (PO)Report to MPI/DPI of any change of cost and its prediction. • (MPI/DPI) Supervise if the disbursement of budget, any change of actual cost and its prediction are monitored by POs
Evaluation				
	Terminal Evaluation	MPI/ DPI	Evaluation report	• Check whether the cost of the project was appropriately spent as planned • Check whether the benefit of the project is expected to be produced as planned • Check and/or Recalculate the investment criteria based on the actual cost and possible benefit • Make the recommendation from the economic viewpoint of PIP from the project experience if necessary
	Post Evaluation		Evaluation report	• Check whether the benefit of the project was produced as planned • Check and/or Recalculate the investment criteria based on the actual cost and actual benefit • Make the recommendation from the economic viewpoint of PIP from the project experience if necessary

Operation and Maintenance			
	PO, Facility's owner ?		• Monitor if the benefit of the project has being produced as planned • (In the case of Revenue Generating project) Check whether user's fee is properly collected and whether the collected revenue is appropriately spent for its operation and maintenance • (In the case of Non Revenue -Generating) Check whether the financial resources to cover its O/M secured

III. TECHNICAL PART

1. Technical Method of Economic and Financial Analysis

Only the basic technique will be explained in this chapter. See the attached technical reference of Economic and Financial Analysis (Basic part, Advanced part, and Case studies part) for more detail. Those references can be available for the project owner as well.

1-1. Basic Concept of Financial analysis[4]

Financial analysis is simply comparing the **revenue** and **expenses** recorded by the concerned economic agency in each project, using cash flow and financial return ratios. An organization will undertake a financial analysis of possible investment projects in order to determine whether the project is profitable enough to pay its investment back and to give positive impact to the organization's financial situation.

The financing of a project is crucial for its sustainability. It is important to know how the project is going to be financed and who is going to provide the funds, as well as on what terms. Is adequate financing available for the project? How will the financing arrangements affect the distribution of costs and benefits of the project? It is for these reasons that the cash flow profile is often as important as the overall benefits of the project. Specifically, if the project is planning to financially cover its operation and maintenance by Revenue-generating, it should be confirmed whether the total revenue estimated could cover the total expenses for O/M.[5]

Exercise_ Financial Analysis

Imagine that there is an irrigation facility constructed by a certain PIP project. This facility requires cost for its operation and maintenance. The cost is 3 million kips a year. From the users, 5000 kips per ha as the fee for irrigated water is planned to be collected. Supposedly the irrigated area is 200 ha.

***Question**: Based on these estimates, do you think that the project is financially sustainable?*

***Answer**: No, this is NOT financially sustainable because the collected user fee is not enough for covering the O/M cost of the facilities. In a year, the facility needs 3 million kips for its operation and maintenance. However, the total fee for collecting fee would be 1 million kips only (5000kips X 200 ha =1 million kips).*

Expenditure= 3 million kips (O/M cost) > 1 million kips (collected fee) =**Revenue**

Therefore, Without other support, this facility cannot operate.

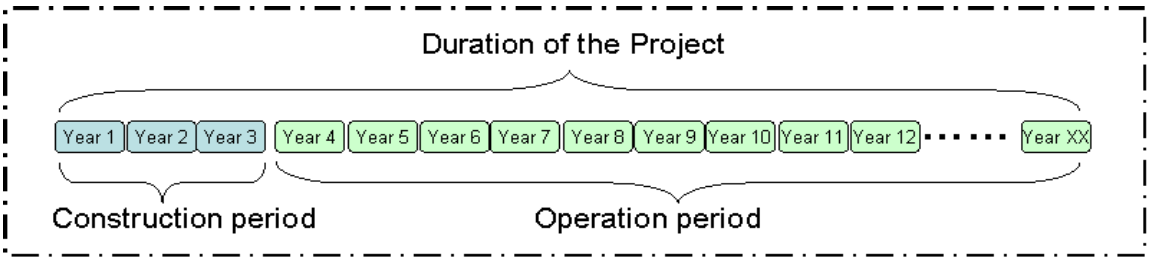
[4] Financial analysis usually needs technical methods same as that of economic analysis explained in the next section. Yet, for simplicity, financial analysis is just focusing the simple comparison of revenue and expenses.

[5] For financial analysis, cash-flow concept is applied which will be explained in section 1-3.

1-2. Basic Concept of Economic analysis

Project Period: The duration of the project entails more than the construction period of the facilities. It is essential to include all the durable years, which are expected of the facilities and equipment after their installation. This is simply because the actual benefits will not result until the equipment or infrastructure is being successfully utilized. Additionally, without including the maintenance costs incurred for their operation during the whole project life, it is not possible to estimate the real net benefit of the project. It is therefore important not to forget the operation period after the completion of the construction period.

Figure_: Duration of the project



Cost: There are 2 types of Cost; 1) Preparation Cost & Capital Investment Cost and 2) Operation and Maintenance Cost (Recurrent Cost)

1) Preparation Cost and Capital Investment Cost: Firstly it is necessary to calculate the costs involved in the preparation and the implementation of the project. If the construction of the facilities takes three years, then the total cost incurred during the three-year period is called the "capital investment cost". Generally, the following items should be estimated:

- ✓ Feasibility studies as well as basic and detailed design costs[6]
- ✓ Equipment
- ✓ Construction materials
- ✓ Labor costs
- ✓ Consultation fees
- ✓ Land acquisition fees
- ✓ Other (compensation for the acquisition of land, resettlement fees, etc)

2) Operation and Maintenance Cost: Next, the total cost which is required for the facility's operation and maintenance after the completion of the construction should also be estimated. Any facilities or equipment require appropriate operation in order to produce benefits. Therefore, the calculation of the facilities or equipment's cost of operation is essential for the whole of the project's life. This figure is referred to as the "recurrent cost" or "operation and maintenance cost", and some of the items to be included have been listed below:

- ✓ Materials and supplies
- ✓ Fuel costs
- ✓ Utilities

[6] In the case of PIP in Lao PDR, Technical studies such as Basic Design and Detailed Design are often regarded as another "project." Yet, it is internationally common that such studies should be counted as one project.

- ✓ Labor costs
- ✓ Training costs
- ✓ Maintenance fees
- ✓ Other (e.g. any indirect costs, fees for new administration staff, etc)

Exercise_ Calculation of Cost

The new irrigation system is expected to be utilized for 20 years after the date of its completion. An annual recurrent cost of one billion kip is required in order for the system to work efficiently.

***Question**: How much does the project have to bear for its total recurrent cost to ensure its operation?*

***Answer**: 20 billion kip. (1 billion kip × 20 years = 20 billion kip)*

Benefit: There Benefits, which are obtained from the project, also need to be calculated. However prior to this calculation, it is necessary to identify the following:

- ✓ The scope of target beneficiaries
- ✓ The area the project expects to benefit
- ✓ The number of beneficiaries

The benefit can then be estimated by calculating the following:

- ✓ The decrease in the amount of time and cost that are saved due to this project.
- ✓ The increase in the amount of goods and services which are produced by this project.

Only the direct results that are produced by the project's facilities or equipment are computed and so this figure excludes the indirect effects, as this estimation is quite difficult. Generally, benefits do not occur during the construction period.

Exercise _ Calculation of Benefit

Suppose that there is an irrigation project in province C (30 households) that has constructed a new system. By using the water from this irrigation system the beneficiaries' paddy fields have increased the amount of rice cropping in the dry season, with an average sale of 1,000,000 kip a year per household. Additionally, the irrigation system allows beneficiaries to save their travel costs by 5,000 kip a day per household, which previously was spent on extracting water from a distant well during the dry season. This year's dry season stretches for a period of 100 days.

***Question**: Given this information, how much do you think the project's total direct benefit is?*

***Answer**: 3,015,000,000 kip = ((1,000,000 kip x 30) + (5,000 kip x 30)) x 100*

The estimation consists of ((the profit from the sale of the crop x the number of beneficiaries) + (the saved travel costs x the number of beneficiaries)) x the average number of days in the dry season.

1-3. Basic Method used for Economic analysis

In order to identify and value the costs and benefits, it is essential to utilize the basic concepts of: 1) **With-Without Comparison**, 2) **The cash flow**, 3) **The discount rate** and time preference and 4) **The present value**.

With-Without Comparison: The principle of economic analysis is "with-without" comparison. This considers what the world would look like without the project and what it would look like with the project. Consider what impact the project will have on various groups in society. In order to visualize its actual impact, the project should be compared with the alternative of not implementing it at all, which is called "without (project) -case". The difference between the benefit with (project)-case and the benefit without-case is called the incremental benefit, namely, the net benefit of the project. The with-case and without-case as well as the incremental benefit should be estimated in terms of cash flow.

The net benefit will be deduced by subtracting the net benefit of the with-project scenario from that of the without-case. See the exercise as follows;

Exercise _ With-Without Comparison

Suppose that there is a 5-year irrigation project in province C. In the without-project scenario, the assumption is that production and sales are in the value of 5 million kip per year. On the other hand, in the with-project scenario, the expectations are for there to be 10 million kip of sales per year, 2 million kip per year in operation costs in addition to 10 million kip in investments.

***Question**: Given this information, could you please calculate the total benefit of this 5-year project. Would you accept this project proposal?*

	WITHOUT project		**WITH** project	
Year	Benefit	Cost	Benefit	Cost
0	--	--		10million kip
1	5million kip	--	10 million kip	2 million kip
2	5million kip	--	10 million kip	2 million kip
3	5million kip	--	10 million kip	2 million kip
4	5million kip	--	10 million kip	2 million kip
5	5million kip	--	10 million kip	2 million kip
Total	25million kip	0	50million kip	20million kip

***Answer**: The project could be acceptable as the total net benefit from this 5-year irrigation project is 5 million kip (Total benefit – Total cost= (50million – 25 million) – 20million =5 million).*

Cash flow: The financial analysis of a project is based on "cash flow analysis". For every period in the expected life of the project, the financial analyst estimates the cash that is likely to

be generated by the project (i.e. the benefit) and subtracts the cash that is likely to be needed to sustain the project (i.e. the cost). The net cash flow, i.e. the difference between the benefit and the cost, results in the financial profile of the project. Due to the fact that the financial appraisal of the project is based on the cash flow, it does omit some items that appear in profit-and-loss statements such as depreciation7. The cash flow does however show this series of amounts of money coming in or going out at a specific point in time, which can be at present or in the future.

Exercise _ Cash-Flow

Imagine that there is a project to construct an irrigation system in province A, which is to be sustained for a period of 10 years. The total cost for the capital investment is 10 billion kip. After the installation of the irrigation equipment, there are additional maintenance costs, estimated at 1 billion kip a year. A total of 0.5 billion kip a year will be collected from user fees.

***Question**: Given these estimates, do you think the revenue of the project is greater than the total cost? How would you decide on this project plan? Would you accept or reject it?*

Yea	**Benefit**	**Cost**	**Net Benefit**
0	0	10 billion	- 10 billion
1	0.5 billion	1 billion	- 0.5 billion
2	0.5 billion	1 billion	- 0.5 billion
3	0.5 billion	1 billion	- 0.5 billion
4	0.5 billion	1 billion	- 0.5 billion
5	0.5 billion	1 billion	- 0.5 billion
6	0.5 billion	1 billion	- 0.5 billion
7	0.5 billion	1 billion	- 0.5 billion
8	0.5 billion	1 billion	- 0.5 billion
9	0.5 billion	1 billion	- 0.5 billion
10	0.5 billion	1 billion	- 0.5 billion
Total	5 billion	20 billion	-15billion

***Answer**: The benefit of this particular project is smaller than the total cost which would mean that the project is NOT financially appropriate, and therefore should be rejected.*

[7] Depreciation: An expense recorded to reduce the value of a long-term tangible asset. Since it is a non-cash expense, it increases the free cash flow while decreasing the reported earnings. Refer to section 4.2

Discount rate: Financially, the decision on a project's suitability hinges on whether the benefits exceed the costs. If all the costs and benefits have occurred in the same year, then the decision would be based on the simple matter of comparing the costs and benefits. Usually, however, benefits and costs occur at different times, with many of the costs preceding and often exceeding the benefits during the first year of the project. This issue arises in both economic and financial analyses. A technique known as "discounting" is used to compare the costs and benefits that occur in different years in both types of analysis.

By comparing the rates of return on alternative projects with your project, acceptance will be based on the project that shows a higher rate of return. For instance, imagine that there is an investment plan that gives us a 2% annual return on our investment. However, in this imaginary country, the annual bank interest rate is 3% and so this means that if you deposit your money in the bank, you would get a 3% return on your money. In this case would you choose to invest or deposit? Clearly the concept of depositing the money in the bank with a 3% return is the best choice for your capital.

Discounting is essentially a technique that enables us to compare the value of, say dollars, in different time periods. A dollar received today is worth more than a dollar, which will be received tomorrow. This is because the dollar received today enables us to increase our present consumption, whereas the dollar which will be received in the future can only increase our future consumption. The fact that we have to postpone consumption makes tomorrow's dollar less valuable than today's, even if tomorrow's dollar has a greater purchasing power than today's dollar. The declining value of money over time has nothing to do with inflation, but only with the postponement of consumption. The idea that presents income is worth more than future income is the "time preference". Time preference means preferring income today to receiving the same income in the future. Economists assume that pretty much everybody has this time preference because of the limited length of our lives.

In theory, if economists wish to generate a standardized rate of opportunity cost of capital (i.e. an average), they would be required to gather and compare all of the alternative development projects in a country. Yet, this is almost impossible, as one would imagine. The discount rate is closely related to the idea of the "opportunity cost of capital". The opportunity cost of capital is the counterfactual cost of the amount of return you would supposedly get if you had invested your capital in other alternatives. So generally we take the interest rate of the national bank or the official discount rate which major international organizations have already adopted in their development projects.

In the case of Donor projects, the discount rates are generally among 10-12%. The figures are various depending on the organization. World Bank and ADB often use 12 % in infrastructure projects in Lao. Many of the governmental officials who have experienced donor projects might have seen the rates in project documents. These figures are for International cooperation projects. As for the domestic public investment projects in other countries, the discount rates are clearly defined in each country as shown in the following table. The discount rate of Japan is calculated based on the market interest rate and Interest rate of National bond. As for that of USA, Bond interest rate of Ministry of Finance is officially adopted.

Discount rate for Domestic PIP	Japan	England[8]	USA[9]	Germany[10]	Sweden
	4%	3.5%	3% or 7%	3%	4%

Source: Comparison list regarding Cost Benefit Analysis, Cabinet Office of the Government of Japan

On the other hand, in the case of domestic PIP in Lao PDR, it could be seen various figures between 7 % and 15% even among the same kind of project such as Irrigation project. Unfortunately, there is no ground explained in written documents for adopting such figures as discount rates. Unfortunately, the standardized discount rate for domestic PIP projects in Lao PDR has not been found due to lack of latest samples. The following table shows the example;

Discount rate in irrigation project	Xe Selalon case (F/S)	Xe Selalon case (Inspection)	Oudomxay case (F/S)
Examples	10%-12% in 1999	7% in 2004	15% in 2004
Basis	No mention	Based on the interest rate of borrowings from the Agricultural promotion Bank for the agricultural production.	No mention

Source: relevant documents for each project

Thus, as for using discount rate, MPI/DPI should be well convinced by POs with a good reason why the figure is adequate to apply in the technical study. Plus, please be reminded that the discount rate should be decided accordingly by the government and adopted to PIP assessment in due course.

Present Value: Once you become familiar with the idea of discounting, it is then necessary to be acquainted with the idea of the present value by applying the discounted rate. The present value means that the value of 100 kip today differs from the value of 100 kip in ten years from now. In the calculation of economic and financial analyses, it is necessary to convert the benefits and costs which will be produced by the project into the present value.

[8] Figures are referred from The Green Book: Appraisal and Evaluation in Central Government, Cabinet Office, UK, 2003

[9] Figures are refereed from Circular A-94 Revised, Office of Management and Budget, USA, 1992

[10] Figures are referred from Macro-Economic Evaluation of Transport Infrastructure Investments, Evaluation Guidelines for the Federal Transport Investment Plan, the Federal Minister of Transport, 1992

Exercise _ Present Value

If you deposit your money in the bank, you will receive a certain amount of interest in the future. So, if you leave 100 US$ in a bank account with an annual interest rate of 10%, you will receive 110 US$ after one year (since 100 x 1.1=110). By the same calculation you would receive 259.4 US$ after a period of ten years (100 x 1.1 x 1.1 x 1.1 x 1.1 x 1.1 x 1.1 x 1.1 x 1.1 x 1.1 x1.1=259.4). In other words, the 100 US$ that one expects to receive after a year is only worth 90.9 US$ today (as 100/1.1=90.9). In the same way the 100 US$ which one expects to receive after ten years is only worth 38.6 US$ today (100 / 1.1 / 1.1 / 1.1 / 1.1 / 1.1 / 1.1 / 1.1 / 1.1 / 1.1 /1.1). This example illustrates that the income one receives in the future is worth less than the income one receives at present. This is because the income you receive now can earn interest and accumulate. Therefore, one needs to convert the estimated costs and benefits to the discounted present value. The interest rate used in this example is generally called the discount rate, which has the following formula:

$$\textit{Present Value} = (\textit{Future Value}) / (1 + \textit{Interest (or Discount) Rate})^{q}$$

***Task**: Please examine the two cash flow below, which compare the future value and its present (discounted) value at the rate of 10% and 15%.*

Unit: US$

Yea	**Benefit** (Future Value)	**Discount rate** @ 10%	**Discounted Benefit** (Present Value)	**Benefit** (Future Value)	**Discount rate** @ 15%	**Discounted Benefit** (Present Value)
0	100	100/(1.1)	90.9	100	100/(1.5)	87.0
1	100	$100/(1.1)^2$	82.6	100	$100/(1.5)^2$	75.6
2	100	$100/(1.1)^3$	75.1	100	$100/(1.5)^3$	65.8
3	100	$100/(1.1)^4$	68.3	100	$100/(1.5)^4$	57.2
4	100	$100/(1.1)^5$	62.1	100	$100/(1.5)^5$	49.7
5	100	$100/(1.1)^6$	56.4	100	$100/(1.5)^6$	43.2
6	100	$100/(1.1)^7$	51.3	100	$100/(1.5)^7$	37.6
7	100	$100/(1.1)^8$	46.7	100	$100/(1.5)^8$	32.7
8	100	$100/(1.1)^9$	42.4	100	$100/(1.5)^9$	28.4
9	100	$100/(1.1)^{10}$	38.6	100	$100/(1.5)^{10}$	24.7
10	1,000	--	614.4	1,000	--	501.9
Total	100	100/(1.1)	90.9	100	100/(1.5)	87.0

***Findings**: As illustrated, if the discount (or interest) rate rises, the denominator increases and so the whole fraction decreases. Therefore, when the discount rate goes up, present*

Exercise _ Present Value
values go down. When the discount rate goes down, present values go up.

Once this analysis has been completed, the analyst will need to adjust the financial flows and prices in order to reflect the net benefits to society. The analyst must ensure that the flows are economically accurate by removing all the subsidies and taxes from the adjusted financial flows and by taking into account the project's externalities, particularly the environmental externalities. In order to assess the project's financial sustainability, it is important to keep track of who receives or pays for such external benefits and costs.

1-4. Step of Economic Analysis

1) Identify Cost and Benefit:

After having identified the with-project and without-project scenarios, and having selected the best of the possible alternatives under consideration, and also having rejected inappropriate project components, the analyst then estimates the costs and benefits of the project. For clarifying the Cost and Benefit, basic concept of economic analysis explained before; namely, 1) **With-Without Comparison**, 2) **The cash flow**, 3) **The discount rate** and 4) **The present value** have to be utilized.

2) Calculate the investment criteria:

As the criteria to judge how the project is economically appropriate to invest, the project should firstly acquire more benefits than the cost invested, and secondly attain the highest rate of return on the investment compared to alternative projects. In order to test these two aspects, you should analyze the project according to the following three investment criteria:

- The Net Present Value (NPV): to assess the real value of the project.
- The Cost and Benefit Ratio (B/C): to assess the gross return of investment (/1 unit).
- The Internal Rate of Return (IRR): to express the return rate as the interest rate.

As for the investment criteria, B/C and NPV will be checked, and preferably IRR, as well.

The net present value (NPV): the converted amount of all net benefits generated over the project's life. Based on the difference between the total benefits and costs in present value, the project can be appraised on its financial effectiveness. The following formula should be applied.

$$\text{NPV} = I_0 + \frac{I_1}{1+r} + \frac{I_2}{(1+r)^2} + ... + \frac{I_n}{(1+r)^n}$$

I represents the amount of income (net benefit) for each year. The subscripts represent the number of years, starting with 0, which is the current year and r represents the discount rate. The number of years the investment lasts for is represented by n.

To appraise the criterion: If the NPV is greater than 0, (NPV>0) the project is theoretically acceptable. It is important to note that the amount of NPV has nothing to do with its value among several alternative projects.

Exercise _ NPV

Please now apply the example of the income stream which has been illustrated above. At the beginning of this income stream consisting of a period of ten years, imagine that you invested 900 US$ for the construction of an irrigation system in the initial year, and that you expected to receive a net benefit of 100 US$ annually for the ten- year period. By simply comparing the total net benefit and the amount of investment over the 10 years, you might think that this project is profitable because the total benefit is greater than the initial cost. However, this is not the case because if you estimate the total income by the discounted present value, you can ascertain – 285.6 US$ as being the total

. (-900+90.9+82.6+75.1+68.3+62.1+56.4+51.3+46.7+42.4+38.6) = – 285.6)

Year	**Benefit**	**Cost**	**Discount Rate Formula**	**Present Value of**
0	0	900	--	-900
1	100	0	$100/(1.1)$	90.9
2	100	0	$100/(1.1)^2$	82.6
3	100	0	$100/(1.1)^3$	75.1
4	100	0	$100/(1.1)^4$	68.3
5	100	0	$100/(1.1)^5$	62.1
6	100	0	$100/(1.1)^6$	56.4
7	100	0	$100/(1.1)^7$	51.3
8	100	0	$100/(1.1)^8$	46.7
9	100	0	$100/(1.1)^9$	42.4
10	100	0	$100/(1.1)^{10}$	38.6
Total	1,000	900	(Unit US$)	Net Present Value= – 285.6

* In the scenario where the discount rate is 10% and 900 US$ had been invested in the initial year (Year 0).

Findings: *This amount, which is the difference between the total amounts of net benefit*

Exercise _ NPV
converted to present value and the cost invested in the project is known as the NPV. In general, as is illustrated in the table below, it is easy to calculate the NPV once you are aware of the discount rate and the duration of the project.

The Cost Benefit Ratio (B/C): This ratio simply shows the ratio of benefit per cost of the project. What the cost benefit ratio (CBR) indicates is the amount of return per unit of currency (kip) incurred through operating expenses. It has the following formula:

$$B/C = \sum_{t=1}^{t=n} \frac{Bt}{(1+i)^t} \Big/ \sum_{t=1}^{t=n} \frac{Ct}{(1+i)^t}$$

To appraise the criterion: If the B/C is over 1.0, the project is theoretically acceptable.

The Internal Rate of Return (IRR): What should one do if there are other alternative investments? How is it possible to compare them? How is it possible to decide which discount rate to use? One way to compare investments is to calculate the internal rate of return (IRR) for each one. The IRR is the discount rate that makes the present value of the project's income stream to a total of zero, and it has the following formula:

$$\sum_{t=1}^{t=n} \frac{(Bt - Ct)}{(1+i)^t} = 0$$

This formula is another way to approximate the IRR.

$$r_1 + (r_2 - r_1) * \frac{NPV(r_1)}{NPV(r_1) - NPV(r_2)}$$

The *r* represents the discount rate. Before calculating the IRR in this way, you should guesstimate the two best discount rates which are closest to NPV=0.

To appraise the criterion: If the IRR of the project is smaller than the other alternative interest rate (i.e. the discount rate), it is unnecessary to invest in the project because there is a more profitable investment. Thus, if IRR is more than the discount rate, the project is theoretically acceptable.

Exercise _ Calculation of IRR
Imagine that project A generates 37.4 NPV at a discount rate of 12% and – 10.1 NPV at a discount rate of 14%. Now, you know for certain that the IRR of this project should be between these two discount rates because the IRR means that the NPV equals to 0. ***Question**: What is the IRR of this project?*

Exercise _ Calculation of IRR
12% + (14%-12%)(37.4 / (37.4+10.1)) =13.6%*
***Answer**: 13.6%*

Please do not be concerned if it appears to be a difficult calculation, as the Excel computer programme facilitates the uncomplicated estimation of the IRR[11].

Exercise _ Judgment of IRR
Suppose that a certain investment plan indicates that its IRR is 15%. In the Lao PDR you usually apply a discount rate of 12%.
Question: If you compare these two rates would you accept or reject the project?
***Answer**: Yes, the project is acceptable since the IRR is over the discount rate in Lao PDR*

3) Judge economic appropriateness of the project with the investment criteria:

So far, we have seen three criteria of investment, namely, NPV, B/C, and IRR. It is preferable that these three investment criteria are applied simultaneously whilst appraising a given project. The NPV informs us about the project's scale, and then the CBR and IRR indicate the rate of return. However, so far it is hardly found that all 3 criteria are properly calculated in the project document of domestic PIP projects in Lao PDR. This might be because it has been difficult for many projects to show perfect information and data in its technical design for calculating these criteria.

Evaluating a project by simultaneously applying all the criteria will result in a more thorough investment decision. However, it is strongly recommended to check at least B/C ratio in assessing projects. The reasons why B/C comes first out of three criteria is that the concept of B/C, namely, whether the project benefit is over the project cost, is easy to understand for everyone. Also, B/C can show how much the project produces the benefit by investing a certain amount of cost. This criteria is applicable to compare with other candidate projects. In the case the budget (resources) is limited, the most efficient project (namely, a project with the highest B/C) should be selected.

For your information, recently, IRR become more common among international organization because it is the more simplified calculation of examining the cash flow rather than using the NPV and CBR which require the discount rate in addition to the cash flow. It can be applicable to use depending on the characteristics of the project. NPV informs us about the project's scale, that is, the absolute size of benefit acquired through the project. IRR is rather adequate for a certain project which has a huge mount of initial investment but small O/M cost.

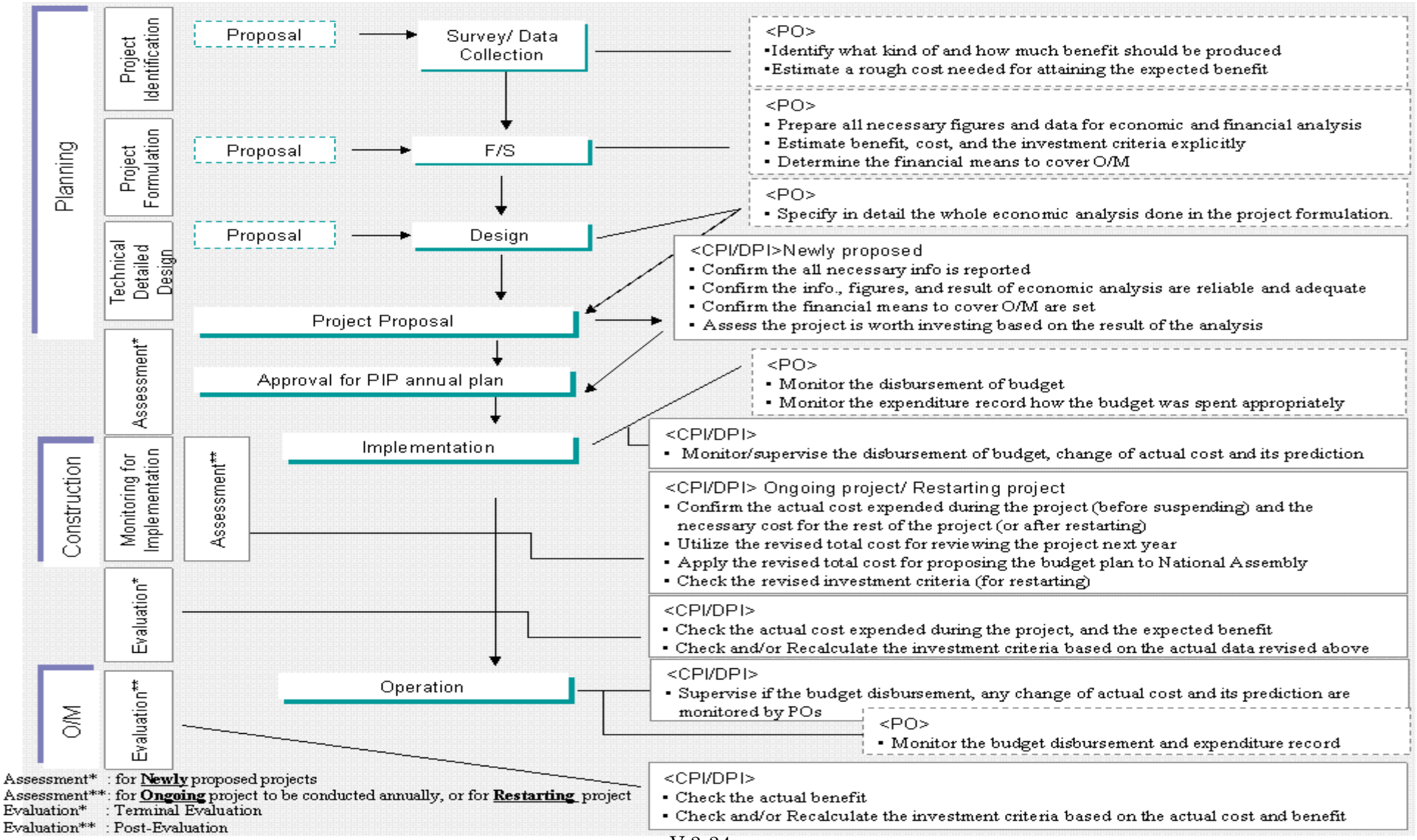
[11] The way how to set IRR function in Excel would be explained in an OJT training session,

Table 7: Three Investment Criteria

NPV	CB Ratio	IRR	Appraisal
NPV>0	CB Ratio>1	IRR>r	Project is economically appropriate
NPV<0	CB Ratio<1	IRR<r	Project is NOT economically appropriate
NPV=0	CB Ratio=1	IRR=r	Appraisal is not possible

*r=Discount rate

Figure __: Flow of PIP Project Management and Activities of Economic Analysis



2. Checklist of Economic and Financial Aspects

Economic and Financial aspects and analysis have to be taken places when projects are formulated at the planning stage, when projects are assessed, when projects are implemented, or operated. That is, Economic and Financial analysis is always important for project management at any stages as well as environmental and social aspects. The table below briefly summarizes the main points of Economic and Financial analysis to be taken into consideration at respective stages.

The tasks in planning stage are not the TOR for MPI and DPI staff but PO. However, the reasons why they are specified in this manual here are to remind MPI and DPI the all information and data regarding Economic analysis should be prepared by PO and reported properly to MPI and DPI. Without knowing what PO is supposed to do in a planning stage, MPI and DPI are not able to assess and guide PO adequately.

Planning	
Project Identification	
❑ Is a rough idea of the benefit expected to produce by the project identified? • Who and how many the target beneficiary is→ for targeting the beneficiaries, refer to the result of Social Analysis • Characteristics and size of Benefit (i.e., What kind of benefit is expected? Increasing crop? Saving time? How much the benefit will be produced? / How long the benefit will be kept producing?) ❑ Is a rough idea of the cost necessary to produce the expected benefit identified? • Rough estimation of Cost (i.e., how much it will cost as a guesstimation)	PO
Project Formulation	
❑ Whether the all necessary figures and data for economic and financial analysis is reported • Are the project duration and the life span of the facilities determined adequately? • Is the discount rate used for calculation appropriate for the project? • Is the calculation method adopted for analysis appropriate? ❑ [Benefit] whether the benefit expected to produce by the project is specified • What kind of benefit is expected? (i.e., Increasing crop? Saving time?) • How much the benefit will be produced? • How long the benefit will be kept producing? ❑ [Cost] Whether the cost expected to incur to the project is specified • What kind of cost is expected? Specify by each item (i.e., material? Labor works? Contingency?) • How much each and the total cost will be needed? ❑ [Economic Analysis] Whether the Economic analysis is conducted • Are investment criteria B/C, NPV, and IRR if possible adequately calculated and judged? • Are other optional scenarios for acquiring better economic benefit considered? ❑ [Financial Analysis] Whether the means to cover its O/M financially is determined in F/S and technical design • Which will be the facilities operated and maintained financially by public budget or donor fund (Non-Revenue Generating) or by generating revenue by own? (Revenue Generating)? • In the case of Non-Revenue Generating project, is any possibility to allocate	PO

	budget for its OM after the project completion already found? Does it include the plan into proposal already? • In the case of Revenue Generating project, is the plan for collecting fee prepared? ❑ Is the whole economic analysis integrated into **project proposal** and submitted to MPI/DPI properly on time?	
	Detailed Technical Plan	
	*If it is not necessary to prepare Detailed Technical plan, skip this step. ❑ Whether the all necessary information studied above in F/S or technical design is specified in detail?	PO
Assessment		
	Assessment for newly proposed projects with SPAS for New Projects (Series I)	
	❑ [Data] Whether the all necessary figures and data for economic and financial analysis reported explicitly in **project proposal** and **F/S** ❑ Whether the necessary information abovementioned adequate and reliable • the Project duration and life span of the facilities • the calculation method used for analysis • the discount rate used for calculation • the Benefit expected to produce by the project • the Cost expected to be incurred by the project → **N-SPAS "Feasibility of Efficiency"(1)** ❑ [Feasibility of budget]Is the budget disbursement schedule considered under the current budget estimation? → **N-SPAS "Feasibility of Efficiency"(2)** ❑ [Economic Analysis] Whether the project has the economic relevance • Is the investment criteria (B/C, NPV, and IRR if possible) calculated? • Are the results adequate and reliable? • How is the economic relevance of the project? ✓ Is B/C over 1.0? → **N-SPAS "Relevance"** ✓ Is NPV over 0 ✓ Is IRR over discount rate? * if possible ❑ [Financial Analysis] whether the project has a financial sustainability? • Is there any plan to financially cover its Operation and Maintenance clearly determined → **N-SPAS "Financial Sustainability"** ❑ Are the results of economic analysis integrated into **N-SPAS**?	MPI/ DPI
Assessment		
	Assessment for ongoing projects[12] with SPAS for Ongoing Projects (Series II)	
	❑ [Cost] • Is the actual cost expended during the project reported? If no, did MPI/DPI ask POs to report them? • Is the actual cost expended as planned so far? If no, how much was it, and the reason why was it changed? • Is the necessary cost for the rest of the project expected to change from the originally planned? If no, how much would be, and the reason why? • Is the total cost recalculated if the cost largely is expected to change? If so, how much would be, and the reason why? → **Ongoing-SPAS "Efficiency"** ❑ [Economic Analysis] • Is the investment criteria revised based on the revised total cost? If so, how	MPI/ DPI

[12]No specific question for checking Economic analysis in Ongoing-SPAS

much is it? ❑ [Further utilization] • Is the revised total cost applied for reviewing the project next year? • Are the revised total cost and the revised investment criteria made for preparing the budget plan for submitting to National Assembly?	
Assessment for suspended projects with SPAS Format I-5 for Revival Projects	
❑ [Economic Analysis] Whether the project has the economic relevance • Based on the revised total cost, is the project B/C recalculated? Is the B/C over 1? **→SPAS for Revival "Relevance"** ❑ [Cost] • Is the actual cost expended before suspending the project reported? If no, did MPI/DPI ask PO to report them? • Is the actual cost expended before suspending the project as planned? If no, how much was it, and the reason why? **→ SPAS for Revival "Efficiency" (1)** • Is the necessary cost after the project restarting predicted? If no, did MPI/DPI ask PO to report them? **→ SPAS for Revival "Efficiency" (2)**	MPI/ DPI
Monitoring for Implementation	
❑ [Feasibility of budget] • Is the budget disbursement of the project appropriately monitored by PO? • Is any change of budget disbursement reported in **monitoring reports** by PO? ❑ [Cost] • Is the expenditure record of the project appropriately monitored and reported in the monitoring reports by PO? • Are any change of cost and its prediction reported in **monitoring reports** to MPI/DPI by PO?	PO MPI/ DPI
Evaluation	
Terminal Evaluation	
❑ [Cost] Was the cost of the project appropriately expended as planned? ❑ [Benefit] Is the benefit of the project expected to be produced as planned through using the facilities? ❑ [Economic Analysis] Did the investment criteria based on the actual cost and possible benefit recalculated?	PO MPI/ DPI
Post Evaluation	
❑ [Cost] Was the cost of the project appropriately expended as planned? → same as of terminal evaluation ❑ [Benefit]Is the benefit of the project produced as planned? If different, how much and why? ❑ [Economic Analysis] Is the investment criteria based on the actual cost and actual benefit recalculated?	PO MPI/ DPI
Operation and Maintenance	
❑ [Benefit] Has the benefit of the project been produced so far as planned? ❑ [Financial sustainability] • (In the case of Revenue Generating project) Is user's fee properly collected? Is the collected revenue appropriately spent for its operation and maintenance? • (In the case of Non Revenue-Generating project) Is the financial resources to cover its O/M secured?	PO Facilities' Owner

IV. A CASE STUDY

1. Ideal Case

This is an Economic analysis case[13] of an irrigation project. In irrigation project, we can find the increments of product goods (vegetable, crop, or fruits) as benefit of the project.

- Data required
  - Irrigation area: 15,000ha
  - Construction period: 5 years
  - Project Life: 15years after completion
  - Total project cost: 250 million kip
  - Collection user fee: No. No charges for users

1-1. Economic Analysis

- Project Cost

	Item	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	Preparation	0	3,104	2,240	1,240	614	7,198
2	Construction	0	41,415	53,337	23,241	15,221	133,214
3	Material	0	5,303	2,520	1,755	0	9,578
4	Equipments	0	28,580	28,570	0	0	57,150
5	Land acquisition	2,878	1,149	1,149	582	0	5,758
6	Construction Admin.	0	3,956	1,763	1,762	1,175	8,656
7	Other Administration	130	1,110	1,477	1,164	1,056	4,937
8	Reserve money	300	8,462	9,105	2,974	1,807	22,648
	Total	3,308	93,079	100,161	32,718	19,873	249,139

- Operation & Maintenance Cost

Cost for;	O/M cost
1) Canals	1,420
2) Pump stations	
- electricity	2,790
- other utility	500
3) Farm road	600
4) Sundry	700
Total	6,010

- Production Cost

[13] In this case study, all analysis is expressed in financial price for its simplification, which needs a factor for converting to economic price.

1) Comparison with and without case (unit: Kip 10^3)

Item	Without-Project				With-Project			
	Rice crop in Rainy Season	Rice crop in Dry Season	Rice crop with small irrigation	Other cereals	Rice crop in Rainy Season	Rice crop in Dry Season	Rice crop with small irrigation	Other cereals
1) Labor cost	438	438	438	213	750	750	0	0
2) Seed	50	50	50	18	58	58	0	0
3) Fertilizer	351	339	0	0	507	555	0	0
4) Agri. Chemical	95	95	0	0	232	232	0	0
5) Weed killer	59	48	0	0	70	70	0	0
6) others	20	20	10	10	30	30	0	0
Total	1013	990	498	241	1647	1695	0	0

- Project Benefit

1) without – project (unit: Kip 10^3)

Item	unit	Rice crop in Rainy Season	Rice crop in Dry Season	Rice crop with small irrigation	Other cereals	Total
1) Crop	Ton/ha	1.8	2	1.3	0.5	--
2) Unit price	Kip/ton	1000	1000	1000	600	--
3) Gross profit 1)x2)	Kip/ha	1800	2000	1300	300	--
4) Production cost	Kip/ha	1013	990	498	241	--
5) Net profit 3)-4)	Kip/ha	787	1010	802	59	--
6) Harvest Area	Ha	2000	2000	10000	1000	15000
7) Total net profit 5)x6)	Kip 10^3	1574	2020	8020	59	11673

In this case, without new irrigation equipment, people continue to use small old irrigation for their crop.

2) with – project(unit: Kip 10^3)

Item	unit	Rice crop in Rainy Season	Rice crop in Dry Season	Rice crop with small irrigation	Other cereals	Total
1) Crop	Ton/ha	4	4.5	0	0	--
2) Unit price	Kip/ton	1000	1000	0	0	--
3) Gross profit 1)x2)	Kip/ha	4000	4500	0	0	--
4) Production cost	Kip/ha	1647	1695	0	0	--
5) Net profit 3)-4)	Kip/ha	2353	2805	0	0	--
6) Harvest Area	Ha	15000	15000	0	0	30000
7) Total net profit 5)x6)	Kip 10^3	35295	42075	0	0	77370

In this project with new irrigation equipment, ex-small irrigation area is covered by the new project, thus people do not need to harvest in this area any more. Also, they do not seed other serials any more.

3) Incremental net benefit

= (Total benefit with project) – (Total benefit without project)

= 77370 x 10^3 - 11673 x 10^3 = <u>65697 x 10^3</u>

- Cash flow

The following table shows the cash-flow. It is supposed that the increments of Benefit is 20% in the 1st year, 40% in the 2nd year, 60% in the 3rd year, 80% in the 4th year, and 100% in the 5th year in this case. Also, supposedly every 10 years, the equipment requires to be changed

where 3) = 1) + 2)

	1)	2)	3)	4)	5)	6)	7)	8)
year	Construction	O/M Cost	Total Cost	Present Value of Cost	Total Benefit	Present Value of Benefit	Net Benefit	Present Value of Net Benefit
1	-3,308	0	-3,308	-3,308	0	0	0	-3,308
2	-93,079	0	-93,079	-83,106	0	0	0	-83,106
3	-100,161	0	-100,161	-79,848	0	0	0	-79,848
4	-32,718	0	-32,718	-23,288	0	0	0	-23,288
5	-19,873	0	-19,873	-12,630	0	0	0	-12,630
6	0	-6,010	-6,010	-3,410	13,139*1)	7,455	7,129	4,045
7	0	-6,010	-6,010	-3,045	26,279	13,314	20,269	10,269
8	0	-6,010	-6,010	-2,719	39,418	17,831	33,408	15,112
9	0	-6,010	-6,010	-2,427	52,558	21,227	46,548	18,800
10	0	-6,010	-6,010	-2,167	65,697	23,691	59,687	21,524
11	0	-6,010	-6,010	-1,935	65,697	21,153	59,687	19,218
12	0	-6,010	-6,010	-1,728	65,697	18,886	59,687	17,159
13	0	-6,010	-6,010	-1,543	65,697	16,863	59,687	15,320
14	0	-6,010	-6,010	-1,377	65,697	15,056	59,687	13,679
15	0	-26,010*2)	-26,010	-5,322	65,697	13,443	39,687	8,121
16	0	-6,010	-6,010	-1,098	65,697	12,003	59,687	10,905
17	0	-6,010	-6,010	-980	65,697	10,717	59,687	9,736
18	0	-6,010	-6,010	-875	65,697	9,568	59,687	8,693
19	0	-6,010	-6,010	-782	65,697	8,543	59,687	7,762
20	0	-6,010	-6,010	-698	65,697	7,628	59,687	6,930
	-249,139	-110,150	-359,289	-232,286	854,061	217,378	494,772	-14908

Discount rate (r): 12%

- Analyze with investment criteria
  - NPV= -14,908 < 0
  - B/C ratio= (PV of Benefit) / (PV of Cost)=(217,378)/((232,286))=0.93
  - IRR= 11.1%

  According to the investment criteria below,

NPV	B/C Ratio	IRR	Judgment
NPV>0	B/C >1	>r	Project is economically appropriate
NPV<0	B/C <1	<r	Project is NOT economically appropriate
NPV=0	B/C =1	=r	Judgment is not available

- Conclusion

  This case shows that Project is NOT economically appropriate as it is. Based on the Economic analysis of this project proposal, we could judge the cost of the construction was too large for its expected benefit, and it is not an efficient use of the limited resources of the country.

2. Actual Case

This project aims to increase the agricultural production to have enough products to meet the demand of the target beneficiaries; specifically, to 2000ha in rainy season and 2000 ha in dry season. The productivity is supposed to be up to 3 tons/ha during rainy season and up to 4 tons/ha during dry season.

- Background information

  - Irrigation area: 2000 ha (existing agricultural area 1275 ha)
  - Construction period: 8 years (originally planned)
  - Project Life: Not clearly defined, but possibly 12years after completion
  - Total project cost: 161, 132, 275, 905 kips (161 billion kips)
  - Collection user fee: Not clearly mentioned. Supposedly 125000 kips/ha collection

2-1. Economic Analysis

- Project Cost

Ideally, the project cost is supposed to be itemized and calculated for every year since the necessary cost might be different by item and by year. In this case, however, the cost was stated as a total by item but not by year. .Without the cost break-down by item as well as by year, it is difficult for MPI/DPI to judge how the cost was estimated appropriately.

	Item	Total
	Intake	67,182,009,963
	Overflow	10,265,303,096
	Inlet pipe of the intake	1,757,505,247
	Management and operation house	500,000,000
	Meter	40,337,970
	Construction of drainage channel	4,911,106,220
	Road for construction	2,499,006,171
	Main channels and secondary channels	41.731,610,083
	Various building along channels	15,725,904,774
	Transportation of heavy machineries	117,600,000
	Insurance for construction 0.7% of the total cost above	1,013,112,685
	Total	**145,743,496,209**
	Administration cost 3%	4,372,304,886
	Contingency for construction 5%	7,287,174,810
	Moving villagers and site clearance	2,278,500,000
	Installation of electrical line to the project	1,450,800,000
	Grand Total	**161,132,275,905**

- Project cost by year

The following table shows the cost estimation by year.

Million kips

Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Total
8,002.46	7,313.22	10,346.14	5,000	35,080	40,000	35,000	20,390.46	**161,132.280**

- Operation & Maintenance Cost

O/M cost means the cost used for only operating and maintaining the facilities. It should be stated by each item such as for "operating Canals" or "maintaining Pump station," and so on. Yet, in this case, it was not stated clearly by item. Also, after the 9th year, it is not estimated any O/M cost even though the operation is supposed to continue. Thus, for convenience, the same amount of O/M cost in the 9th year is set for the rest of years.

Million kips

Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9~ Y20	Total
120.04	109.7	155.19	75	526.2	600	305.86	680	400	**11,496.99**

- Production Cost

In order to calculate the net benefit of project, the cost needed for the production and the benefit produced by the production have to be estimated by "With-Without" method. (→ See Chapter 3, 1-3 Basic method of economic analysis.)

In this project, two cases were compared in calculating the cost of the project; one is the case of hired labor and the other is the case of own labor. However, whoever works for production, the cost is usually counted as a labor cost which should be subtracted from the project benefit. Thus, here in this reference, the labour cost for construction is included as a part of the production cost.

Also, there is no statement in the report about the cost without the project. If it were not for the cost "without a project", it cannot be compared with the cost "with a project". Thus, here for convenient, the same amount "with a project" in rainy season is set as the cost "without a project". Also, the cost in dry season is supposed to be 0 since without this project there is no activity for the production.

➢ Production Cost with the project per ha **(A)**

Kips

	Per ha Item	Quantity	Unit cost	With-Project (A) Rainy	 Dry
	Seed	60 kg	2400	144000	144000
	Soil preparation for seeding (labor work)	600 m2	50	30000	30000
	Hiring labor for seeding	60 kg	150	9000	9000
	Fertilizer	5 kg	1660	8300	8300
	Soil preparation	1 ha	480000	480000	480000
	Withdrawal of seeding	1800bundles	100	180000	180000
	Transportation of seeding	1 ha	50000	50000	50000
	Re-plantation	25work days	15000	375000	375000
	Fertilizing for supporting the rice stalks	100 kg	1660	166000	166000
	Fertilizing for accelerating growth of stalks	25 kg	1660	41500	41500
	Final fertilizing	25 kg	1660	41500	41500
	Weeding	1 ha	50000	50000	50000
	Labor for harvest	25work days	15000	375000	375000
	Labor for bundling and stocking	8 work days	15000	120000	120000
	Felling and transportation to store	50 bags	5000	250000	250000
	Cost of irrigated water	*1 ha*	*0.8* 125000***	**8000*	***125000*
	Total	-	-	2328300	2445300
	Grand Total				4773600

➢ Production Cost without the project per ha **(B)**

kips

	Per ha Item	Quantity	Unit cost	Without- project (B)	
				Rainy	Dry
	Seed	60 kg	2400	144000	0
	Soil preparation for seeding (labor work)	600 m2	50	30000	0
	Hiring labor for seeding	60 kg	150	9000	0
	Fertilizer	5 kg	1660	8300	0
	Soil preparation	1 ha	480000	480000	0
	Withdrawal of seeding	1800bundles	100	180000	0
	Transportation of seeding	1 ha	50000	50000	0
	Re-plantation	25work days	15000	375000	0
	Fertilizing for supporting the rice stalks	100 kg	1660	166000	0
	Fertilizing for accelerating growth of stalks	25 kg	1660	41500	0
	Final fertilizing	25 kg	1660	41500	0
	Weeding	1 ha	50000	50000	0
	Labor for harvest	25work days	15000	375000	0
	Labor for bundling and stocking	8 work days	15000	120000	0
	Felling and transportation to store	50 bags	5000	250000	0
	Cost of irrigated water	--	--	*0*	*0*
	Total	-	-	2320300	0
	Grand Total				2320300

- Project Benefit

In this project case, the revenue from the increased rice production was not concretely stated but just stated as the summation in monetary terms for both dry and rainy season per Ha.

➢ Production benefit with the project per ha **(C)**

Production benefit with the project (C)		Productivity (tons/ha)	Price (kip / ton)	Total
1)	Crop revenue in dry season	4 tons/ ha	1000000 kip	4000000 kip
2)	Crop revenue in Rainy season	3 tons/ ha	1000000 kip	3000000 kip
	Total			7000000 kip

➢ Production benefit without the project per ha **(D)**

Since there is no statement how much the revenue from the rice production "without this project" was, it is assumed that the same amount as the revenue in rainy season "with a project" is the production benefit "without a project". As for the dry season, it is supposed the productivity is 0 since there is no activity for the production.

Production benefit without the project (D)		Productivity (tons/ha)	Price (kip / ton)	Total
1)	Crop revenue in dry season	0 tons/ ha	0 kip	0 kip
2)	Crop revenue in Rainy season	3 tons/ ha	1000000 kip	3000000 kip
	Total			3000000 kip

- Project Net Benefit

The incremental benefit is calculated by (Benefit with project) – (Benefit without project) = (**(A)** – **(C)**) – (**(B)** – **(D)**) = (7,000,000-4,773,600)-(3,000,000-2,320,300) = 1,546,700. This is net benefit per ha a year of the project.

- Cash flow

(Unit: 1,000,000 kips)

1)	2)	3) = 1) +2)	4) = 3) * 16)	5)	6)	7)	8) = 6)−7)	9)	10)	11) = 9)−10)	12) = 8) − 11)	13) = 12) *16)	14) = 12)−3)	15) = 14) * 16)	16)
					With case			Without							
Year	Construction cost	O/M Cost	Total Cost	Present value 7%	Irrigated area (ha)	Production Benefit	Production cost	Total benefit with project	Production Benefit	Production cost	Total benefit without project	Total Benefit	Present value 7%	Net Benefit	Present Value7%	Discount rate 7%
1	8,002	120	8,123	8,123	1,257	8,799	6,000	2,799	3,771	2,917	854	1,944	1,944	-6,178	-6,178	1.00
2	7,313	110	7,423	6,937	1,257	8,799	6,000	2,799	3,771	2,917	854	1,944	1,817	-5,479	-5,120	0.93
3	10,346	155	10,501	9,172	1,257	8,799	6,000	2,799	3,771	2,917	854	1,944	1,698	-8,557	-7,474	0.87
4	5,000	75	5,075	4,143	1,257	8,799	6,000	2,799	3,771	2,917	854	1,944	1,587	-3,131	-2,556	0.82
5	35,080	526	35,606	27,164	1,257	8,799	6,000	2,799	3,771	2,917	854	1,944	1,483	-33,662	-25,681	0.76
6	40,000	600	40,600	28,947	1,257	8,799	6,000	2,799	3,771	2,917	854	1,944	1,386	-38,656	-27,561	0.71
7	35,000	525	35,525	23,672	1,257	8,799	6,000	2,799	3,771	2,917	854	1,944	1,296	-33,581	-22,376	0.67
8	20,390	306	20,696	12,889	1,460	10,220	6,969	3,251	4,380	3,388	992	2,258	1,406	-18,438	-11,482	0.62
9		680	680	396	1,800	12,600	8,592	4,008	5,400	4,177	1,223	2,784	1,620	2,104	1,225	0.58
10		400	400	218	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	1,683	2,693	1,465	0.54
11		*400*	400	203	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	1,573	2,693	1,369	0.51
12		*400*	400	190	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	1,470	2,693	1,280	0.48
13		*400*	400	178	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	1,374	2,693	1,196	0.44
14		*400*	400	166	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	1,284	2,693	1,118	0.41
15		*400*	400	155	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	1,200	2,693	1,045	0.39
16		*400*	400	145	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	1,121	2,693	976	0.36
17		*400*	400	135	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	1,048	2,693	912	0.34
18		*400*	400	127	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	979	2,693	853	0.32
19		*400*	400	118	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	915	2,693	797	0.30
20		*400*	400	111	2,000	14,000	9,547	4,453	6,000	4,641	1,359	3,093	855	2,693	745	0.28
	161,132	7,497	168,629	123,188	NA	238,413	162,584	75,829	102,177	79,027	23,150	52,679	27,738	(115,950)	(95,449)	NA

(dashed) indicates the present value of total cost, the present value of total benefit, and the present value of net benefit of the project respectively from left.

According to the report, the irrigated area is supposed to be increased from the originally existing 1257ha to 2000 ha gradually. As for discounted rate, 7 % was adopted based on the interest rate of borrowings from the Agricultural promotion Bank for the agricultural production. Also, it is not clearly stated when this facility could provide the water for the whole targeted area in both dry and rainy seasons. Therefore, for simplicity, supposedly the facility could provide the water for the estimated irrigated area in rainy and dry season from the 1st year of the project as planned. (From 1st year to 7th year 1257ha, 8th year 1460ha, 9th year 1800 ha, and for the rest of the years 2000ha).

Based on this cash-flow, B/C, NPV, and IRR (if possible) are supposed to be calculated.(See Chapter 3 for technical methods.)

- Analyze with investment criteria
  - NPV= - 95449< 0
  - B/C ratio= (PV of Benefit) / (PV of Cost)=(27,738)/((123,186))=0.225 >1

NPV	B/C Ratio	IRR	Judgment
NPV≥0	B/C ≥1	>r	Project is economically appropriate
NPV<0	B/C <1	<r	Project is NOT economically appropriate
NPV=0	B/C ≡1	=r	Judgment is not available

- Conclusion

This case shows that Project is NOT economically appropriate as it is. Based on the Economic analysis of this project proposal, we could judge the cost for the construction was too large for its expected benefit, and it is not an efficient use of the limited resources of the country. If this project is defined as essential for the Lao PDR from the other perspectives, though, it is important for MPI/DPI to discuss with POs about the project plan for better designing for meeting the current PIP budget capacity.

2-2. Financial Analysis (→ refer to Chapter 3 section 1-1 for technical explanation)[14]

In the case that the project includes the plan to cover its O/M with Revenue-generating method, the feasibility of the financial plan should be checked beforehand. In this actual case, it is not clearly stated whether the facilities will be operated by collecting fee from the users, namely, Revenue-generating or Non Revenue-generating. As a practice, it is supposed that the facilities which the project produced will be covered for its operation and maintenance with the fee collection. User Fee for irrigated water is set as 125000 kips per ha.

Year	Irrigated area	User fee per ha	Total collecting fee (REVENUE)	O/M cost (EXPENDITURE)	+ or −?
1	1,257 ha	125,000	157 million kips	120 million kips	+
2		125,000	157 million kips	110 million kips	+
3		125,000	157 million kips	155 million kips	+
4		125,000	157 million kips	75 million kips	+
5		125,000	157 million kips	526 million kips	−
6		125,000	157 million kips	600 million kips	−
7		125,000	157 million kips	525 million kips	−
8	1460 ha	125,000	183 million kips	306 million kips	−
9	1800 ha	125,000	225 million kips	680 million kips	−
10~	2000 ha	125,000	250 million kips	400 million kips	−

*The calculation basis of the OM cost is not stated in the documents.

- Conclusion

Suppose that the fee for using irrigated water will be collected properly as planned without a delay or any free-rider. By the 4th year, it is fine since the revenue is over the expenditure. However, after the 5th year, the balance is always negative. It means that the facilities cannot be operated and maintained. Without any support from other financial resources, the facilities will have to stop operating eventually. It is recommended, thus, to consider re-estimate the necessary OM cost lower. Or, reconsidering the adequacy of setting the user fee might be another idea.

14 For simplification, the figures do not include the present value, expected exchange rate, inflation, and other factors.46

References

【English】

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