

論文 / 著書情報
Article / Book Information

題目(和文)	
Title(English)	Analysis on system and implementation of environmental impact assessment in Thailand
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出典(和文)	学位:博士(工学), 学位授与機関:東京工業大学, 報告番号:甲第10597号, 授与年月日:2017年6月30日, 学位の種別:課程博士, 審査員:村山 武彦,錦澤 滋雄,木内 豪,佐藤 由利子,高橋 史武
Citation(English)	Degree:Doctor (Engineering), Conferring organization: Tokyo Institute of Technology, Report number:甲第10597号, Conferred date:2017/6/30, Degree Type:Course doctor, Examiner:,,,,,
学位種別(和文)	博士論文
Category(English)	Doctoral Thesis
種別(和文)	要約
Type(English)	Outline

Outline of the Doctoral Thesis

Analysis on system and implementation of environmental impact assessment in Thailand

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June, 2017

Contents

	Pages
Chapter 1 : Introduction.....	1
1.1 Background of study.....	1
1.2 Research objective.....	2
Chapter 2 : Research Methodology.....	3
2.1 Comparative analysis of EIA system.....	3
2.2 Evaluation of quality on public participation in EIA reports.....	4
Chapter 3 : Comparative analysis of EIA system.....	5
Chapter 4 : Evaluation the quality of EIA reports in Thailand by focusing on public participation part.....	7
Chapter 5 : Conclusions and Recommendations.....	9

Chapter 1 : Introduction

1.1 Background of study

Worldwide economic expansion has brought about a major environmental crisis and raised wide public concern. Environmental Impact Assessment (EIA) is one of the methods that has been used to establish the appropriate mitigation measures for preventing environmental impacts caused by the projects or activities including addressing the social issues since 1969 with the introduction of National Environmental Policy Act (NEPA) in the United States. Additionally, EIA is the study of forecasting the environmental impacts, both negative and positive impacts from development projects or significant activities. It can be said that EIA is the first step to evaluate all of the possible impacts before projects are built. An effective of EIA system dramatically decreases environmental burdens and as a result this also positively impacts the surrounding communities.

EIA is considered to be a process or a tool for identifying the likelihood of a significant impact resulting from a development project. It is also used as a key decision support tool for evaluating impacts in terms of environmental, socio-economic, cultural and human health effects as well as unplanned events, characterizing both the potential negative impacts and positive benefits of the proposed project. The fundamental components of EIA are quite similar around the world, consisting of these common stages or steps:

- **Screening** to determine whether EIA is needed;
- **Scoping** to identify and narrow down potential impacts;
- **Assessment and evaluation of impacts** to predict and identify the likely significant impacts of a proposed project;
- **Preparing the EIA report** to summarize the impact, which includes environmental management plans for the development project;
- **Decision-making** to review the report and decide whether it should be approved; and
- **Follow-up monitoring** to propose mitigation measures as defined in the environmental management plan included in the EIA report.

Although the main steps of EIA are similar worldwide, the quality of Environmental Impact Statement (EIS) or EIA reporting varies. Improvements to the effectiveness of EIA systems are a top priority that urgently requires attention.

Many countries have already implemented EIA at the project level for many years and

have accumulated a sound basis of knowledge and experience. Although the main EIA procedures are similar worldwide, the quality of Environmental Impact Statement (EIS) or EIA reporting varies from country to country. The EIA approach was established in East and Southeast Asia in the early 1980s. Currently, Asian countries are also confronting the need to increase and improve the effectiveness of their EIA systems.

Additionally, public participation is one of the most important components in the environmental assessment process; it is undertaken by gathering the concerns and opinions from the public in the decision-making process before the project proceeds including reduces the risk of project failure.

Although the EIA procedure in Thailand was established more than 30 years but still fill with controversy. There are some weaknesses of the processes need to be more concerned and others need to revise and improve for increasing the efficiency of the EIA processes and quality of EIA report in Thailand.

1.2 Research objective

The objective of this research is to analyze the EIA system in Thailand in order to improve the EIA procedures and the quality of EIA report on public participation part.

Chapter 2 : Research Methodology

2.1 Comparative analysis of EIA system

For the first stage of the study, the main source of data collected was from documentary survey research or desk study. This was applied to examine the current situation about the EIA system of these three countries. EIA legislation and procedures in Thailand were gathered from the EIA guideline book and ministerial notifications. In addition, updates of the EIA system information and processes not only were taken from literature review but were also directly provided by the staff of relevant authorities in the Office of Natural Resources and Environmental Policy and Planning (ONEP), by reviewing the official website of ONEP, by contacting EIA consulting companies by phone, and also by collecting some data from the EIA library at ONEP, Thailand. In the case of Thailand, a quantitative database of EIA implementation was collected, to present a profile of past EIA cases. The only Thai quantitative database was gathered as a case study to demonstrate how much benefit can be gained from these data, in relation to the EIA effectiveness. This was gathered from the official website of the Environmental Impact Evaluation Bureau at www.eia.onep.go.th/index.php. Moreover, EIA projects implemented in 76 provinces in Thailand were individually collected. Then the EIA-case data were analyzed and sorted by sectoral and regional trends. The quantitative EIA case data used in this study were dated January 1991 through August 2014. In addition, information on EIA legislation, systems, and processes in China and Japan were mainly gathered via the official website of the Ministry of Environmental Protection (MEP; People's Republic of China; www.english.mep.gov.cn) and Ministry of the Environment (MOE; Japan; www.env.go.jp/en/) respectively. The quantitative data about China's EIA system had been studied previously by our research group.

The last stage of the study, comparative analysis of EIA systems between Thailand, China, and Japan, was conducted by finding shortcomings in the system to improve the EIA system.

2.2 Evaluation of quality on public participation in EIA reports

Data collection: public participation regulations and procedures in EIA reports in Thailand were gathered from the EIA guideline book and ministerial notifications. In addition, a quantitative database of EIA implementation in the transportation sector was collected to present a profile of EIA cases. Public participation in EIA reports were used in this study for the years between 1992 and 2015. The quality of public participation in EIA reports was then analyzed according to the period of time in which it occurred. There were two periods distinguished: the period between 1992 and 2005, and the period between 2006 and 2015, which included four types of projects (train, airport, road, and port).

Grading method and criteria: the evaluation sheet for this study was created by following the regulations for public participation guidelines in Thailand and it was developed from best practice requirements. Each report was ranked into five grades. Grade A (excellent), Grade B (good), Grade C (satisfactory), Grades D (poor) and F (very poor).

Principal component analysis: the massive amount of data collected and statistical analysis was then used to explore the clustering of data. PCA can help to eliminate some minor data to emphasize how the factors differ by project type and period of time, and to identify the interrelationships.

Chapter 3 : Comparative analysis of EIA system

The objective of this chapter is to update the characteristic and procedures of EIA in Thailand, Japan and China. Then the comparative analysis with Japan and China were implemented to find shortcomings of the EIA procedures in Thailand to streamline them. The key points of this study focused on the EIA system and its implementation. The EIA system refers to the regulation of EIA, basic information such as the authority involved with EIA, and type of EIA report, including EIA processes that comprise a series of steps: screening, scoping, prediction of impacts, mitigation, monitoring, and public participation. Additionally, the implementation refers to the EIA report. Moreover, the information of the overview of hindsight of quantitative data about EIA cases is presented for three countries (Thailand, Japan and China) according to sectorial and regional trends for Thailand, sectorial and provincial trends for Japan and EIA documents trends for China to show the advantage of these data.

The results show that the Thai's EIA system has clear procedures, such as the EIA reporting requirement, which is defined by the significant impacts expected from the project, such as having alternative sections included in the scoping stage, and such that public participation is compulsory. In addition, the type of EIA report used in Thailand, unlike those in China and Japan, is an EHIA, which is concerned with the health impacts that could occur from the project. Additionally, public participation in Thai's EIA procedures that the summary results from public participation have to be included within EIA report (compulsory). On the other hand, the main weakness remaining of the EIA system in Thailand is the lack of local EIA authority in the system. This is needed to empower its EIA system as is done in China and Japan, both of which national and local level authorities.

Moreover, the EIA reports have been made available online as a database in Thailand. The quantitative data of EIA cases could show economic trends and directions of future investment within the country and also the capacity of natural resources. At the same time, analyzing and learning of shortcomings or failures of past EIA reports is useful, especially for project proponents, consulting companies, and the people who will be affected by the projects implemented. They can learn from failures of the past cases to avoid the same conflict. These will be one way to make the improvement of EIA system including the quality of EIA report.

The shortcomings were identified, indicating that regulators in Thailand, Japan, and China, still need to revise their national provisions and EIA regulations to solve a variety of practical problems, even though the EIA system was introduced more than a decade ago. There are still many research studies in progress for finding the best way to streamline the EIA system, and this study is one of them. The comparative analysis, learning and gaining knowledge of the practices in other countries, can be a good method for identifying both the strengths and weaknesses of EIA systems.

Regarding the summary of the results above mentioned public participation in Thailand that its summary results from the meeting have to be included within EIA report (compulsory) including it plays an important role in the EIA system. Additionally, conflicts from implementation of development projects in Thailand are typically associated with the deficiency of public participation. The Identifying and reporting the deficiencies of its system to find key factors of enhancement the quality of EIA report will be then implemented in the next chapter (chapter 4).

Chapter 4 : Evaluation the quality of EIA reports in Thailand by focusing on public participation part

The aim of this chapter is to analyze and evaluate the quality of public participation part of EIA reports in Thailand in order to identifying tis deficiencies to improve its quality. Transportation sector was selected on this study because it affects our daily lives directly and indirectly and also is one of the most important sectors in society, which produces a huge environmental impact on both individuals and the society. The eighty-two EIA reports were analyzed according to date and project types in the transportation sector in Thailand by using grading system and PCA method.

Regarding to the evaluation on quality of EIA report, the evaluation criteria were created and implemented to assess the quality of public participation chapter in EIA reports. They were evaluated on eight dimensions. The results indicated that 84.6% of total EIA reports in the period between 1992 and 2005 have a low quality of public participation (grade D and F). In contrast, in the period after 2005 the quality of public participation received grades of A and B, which account for 76.7% of total EIA reports in this period.

In order to analyze the set of data from grading system to find the relationships between the individual points in that data set, PCA then was applied. According to the PCA analysis of score plots, the overall data analyzed can be classified into three different groups. The first group corresponds to the EIA reports that contain low quality public participation. It consists of 88% of total EIA reports in the period between 1992 and 2005 and 12% of total EIA reports in the period between 2006 and 2015. This group also consists of 41.7% of total train reports, 81.8% of total airport reports, 46.2% of total road reports, and 66.6% of total port reports that show the majority of EIA reports for all project types apart from road projects. Moreover, the second group corresponds to the EIA reports that contain well-established public participation. However, the EIA reports in this group have a low level of quality in some part. Group two contains 24 EIA reports that are composed of 29% of the total EIA reports of group two in the period before 2006, and 71% of reports in the period after 2005. In addition, the majority of road projects is in this group and consists of 53.8% of the total road reports. It also includes 25% of total train reports, 16.7% of total airport reports, and 26.7% of total port reports. The last group is group three, which shows high quality in the public

participation part of the EIA reports. There are only eight EIA reports in this group, which is composed of 12.5% of total EIA reports in the period between 1992 and 2005, and 87.5% of total EIA reports in the period after 2005. In addition, 33.3% of total train reports, 8.3% of total airport reports, and 6.7% of total port reports are in these groups, which demonstrate high quality on the eight factors evaluated. These can demonstrated that road and train sectors seem to have a higher quality of implementation than other types of projects. The distribution of overall quality performance concerning public participation section in EIA reports of each project type can only be described.

These analyses show that high quality of public participation are belonging in group two and group three. There are 32 reports in these group consisting of eight reports implemented in period between 1992 and 2005 and 24 reports in the period after 2005; 7 reports for train sector, 7 reports for road sector, 3 reports for airport sector and 15 reports for port sector. The analysis of PCA score plot also demonstrates the development processes of quality on public participation in the EIA reports in Thailand.

Chapter 5 : Conclusions

The overall objective of this study is to analyze the EIA system in Thailand in order to improve the EIA procedures and the quality of EIA reports on public participation part. In this study comparative analysis with Japan and China were implemented to find shortcomings of the EIA systems in Thailand to streamline them. Additionally, the evaluation criteria were created and implemented to assess the quality of public participation part in EIA reports by surveying their quality according to the period of time in which they were implemented and their project type in the transportation sector as case study. Corresponding to the research framework and objective, the overall conclusions and findings of the study in order to improve the EIA procedures are as follows. The comparative analysis can be a good method for identifying both the strengths and weaknesses of EIA systems. It is pointed out that local EIA authority of Thai's EIA system is needed to be empowered by implementing a set of laws or ordinance. Additionally, the implementation of quantitative data of EIA cases could show economic trends and directions of future investment within the country including the capacity of natural resources. At the same time, analyzing and learning of shortcomings or failures of past EIA reports is useful. For improvement of the quality on public participation part in EIA report, the evaluation method and criteria implemented of this study is an effective framework on evaluation the performance of public participation. In addition, PCA method can describe the development processes of public participation part in the EIA reports in Thailand. Aforementioned findings are recommended for improvement the EIA procedures and its quality on public participation part in EIA report of EIA system in Thailand, and to build up the consensus between stakeholders and sustainability in the society including environment in the future.