Comparative Study on Strategic Environmental Assessment System in Selected Countries

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Abstract: Recently, Strategic Environmental Assessment (SEA) is recognized as one of the best environmental policy tools to support environmental friendly and sustainable decision making. Back to 1970, the National Environmental Policy Act (NEPA) of USA was introduced as a world first national EIA system including SEA concept. Up to now, many developed countries as well as developing countries including Asian countries have already successfully introduced national SEA systems. General concept of SEA is widely accepted in academics and practitioners. However, there is no widely recognized SEA definition. Although many presented several SEA definitions, they are not recognized as world standard. This study conducted the comparison of SEA systems from 11 countries with referring to 8 SEA definitions from existing literatures, and identified decisive factors for SEA definition by additionally utilizing the AHP (Analytic Hierarch Process) analysis. In conclusion, one of the basic decisive factors of SEA definition assumed to be the application for policies, plans and programs. Also there were other important factors: The employment of systematic process; Stakeholder involvement; Economic, social and cumulative effects assessment; and Alternative development, which were in some cases included in SEA.

Keywords: Strategic Environmental Assessment, Europe, North America, Asia, AHP

1. INTRODUCTION

For the last several decades, Strategic Environmental Assessment (SEA) systems have been introduced in many countries. SEA systems in European and North American countries have been promoted starting from the National Environmental Policy Act (NEPA) of USA in 1970. Then several international SEA regimes have introduced such as the SEA directive of EU in 2001 and SEA protocol of United Nations Economic Commission for Europe (UNECE) in 2003. As for Asian countries, South Korea, China and Hong Kong have already implemented their own SEA systems. In addition, SEA is required in the process of development assistant projects conducted by World Bank, Asian Development Bank, etc.

Although SEA is becoming common in the world as a tool to achieve sustainable development, there is no widely recognized SEA definition.

In this study, international experiences of SEA systems were widely reviewed and the comparative study of each SEA system was conducted from the perspective of what are decisive factors for SEA definition. Then a preliminary survey by the AHP (Analytic Hierarch Process) analysis was conducted to clarify the priority of the factors for SEA definition.

2. STUDY METHODS

This study employed three step approaches. First, major SEA definitions, in total 8 definitions, were collected from existing literatures and compared them with each other from the perspective of the potential factors for SEA criteria in Table 1. Second, SEA systems from 11 leading countries/economies (Denmark, Germany, Finland, Ireland, England, USA, Canada, New Zealand, South Korea, China and Hong Kong) were widely reviewed and compared them with the potential factors for SEA criteria in Table 2. Thirdly, the AHP analysis was employed to study the priority of the SEA decisive factors by pairwise questionnaire survey.

3. RESULTS OF THE STUDY

3.1. Major SEA definitions

As shown in the Table 1, major SEA definitions from existing literatures as well as the SEA concept by [3] were reviewed. As a result, several important factors were identified. First, applying PPPs (policies, plans and programs) and employing systematic process were two most critical factors which all SEA definitions included. Second, there were also other important factors like, stakeholder involvement, economic, social and cumulative effect assessment and alternative development, which are in some cases included in SEA.

3.2. Historical overview of SEA implementation

[2], [3], [4], [6], [7], [11] and [12] have studied on international experiences of SEA systems. [14] compared SEA guidelines in selected European Countries, namely, England, Scotland in the UK, Iceland, Lombardia region in Italy and Portugal. Then [5] was a comparative study on SEA practices in land use and transportation planning. In addition, there are many literatures on SEA systems. [11] summarized the historical evolution of SEA in three stages. First is characterized as the Formative stage of SEA in 1970-1980s and then 1990s to 2000 periods is called as the Formalization stage. Next is the Extension stage from 2001 to now.

In the Formative stage, SEA implementation was started from NEPA and the Netherlands, Australia, etc. followed. In the Formalization stage, SEA introduction became diversified in many countries, for example, Canada, Denmark, England, the Netherlands, New Zealand, and Australia. In the Extension stage, SEA implementation in developing countries was accelerated by

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the introduction of international regimes, namely, SEA directive of EU, SEA protocol of UNECE, SEA guidance of OECD-DAC (Organisation for Economic Co-operation and Development-Development Assistance Committee).

### 3.3. Major national SEA systems

NEPA was the world first EIA and SEA legislation implemented in 1970. NEPA only prescribes basic principles conducting environmental impact assessment. Then CEQ (Council on Environment Quality) made the Regulations for Implementing the Procedural Provisions of NEPA which describes the detailed procedure of EIA. The target of procedural requirement of NEPA is set on major federal action for PPPs and projects.

Canadian federal government sets up dual systems of EIA requirements. For projects the EIA law (CEAA^11^) was introduced and for cabinet and/or ministerial decisions the SEA cabinet directive is applied. The SEA cabinet directive is accompanied by the SEA guideline, which stipulates simple procedural requirements. Public involvement process and the development of an environmental impact statement are not required by both the cabinet directive and the SEA guideline. The cabinet directive is targeting on the high level of decision making
which needs careful treatment for the secrecy of the governmental information. Then the cabinet directive seems to be an inner governmental process. However, each ministry has own environmental assessment section in its ministry, which acts as environmental specialists although there is no requirement for participation of environmental authority, such as environmental agency.

The SEA directive of EU is the basis of SEA systems in European countries. The SEA directive was introduced in July 2001 and the member countries were required to implement national systems until 21st July 2004. The SEA directive applies to plans and programmes, which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning land use, etc. Also the SEA directive provide minimum requirements for SEA procedures including, scoping, development of environmental impact statement, public and/or environmental authority involvements.

Before the introduction of the SEA directive, there were several countries which had SEA systems, such as the Netherlands and the UK. In the Netherlands, the government introduced EIA systemxvi for projects and plans and E-test for submitted draft legislations. But a new SEA system which fulfills the SEA directive requirements has developed. Then England previously institutionalized environmental appraisal however they introduced the SEA regulationxvii fitting for the requirements by the SEA directive. Now others, such as Austria, Belgium, Denmark, Germany, Ireland, Finland, have SEA systems.

In Asia SEA is now widely recognized however SEA implementation in Asian countries/economies is lagging behind other advanced regions, such as, Europe and North America. Asian SEA practices are limited to a few nations/economies. Hong Kong is one of the leading economies implementing SEA system in their planning processes. Some nations like South Korea, China, etc, have recently made advancement in this field.

Among all the Asian economies, Hong Kong is one of the few places that have established some actual practices and examples of SEA since 1990s. The EIA Ordinance includes a statutory requirement for EIA to be conducted for the feasibility study of major development plans. The recent completion of several major SEA examples of strategies or policies has fueled greater recognition and acceptance of the importance and usefulness of SEA in Hong Kong.

In China new Law on Environmental Impact Assessment which was effective in 2003 includes SEA concept. The EIA law covers both plans and projects. The plan is further divided into two categories plans for land use, regional, watershed and offshore development, and specific plans, such as, agriculture, industry, livestock, breeding, forestry, natural resources, cities, energy, transportation, tourism.

In South Korea the Prior Environmental Review System (PERS) was introduced in 1993 and restructured in 2005 to identify and minimize environmental impacts at an early stage for specific plans and programs. The target of the PERS is PPPs affecting determination of projects required by EIA.

Vietnam has already and Thai land is just developing SEA systems.

3.4. COMPARATIVE STUDY OF SEA SYSTEMS

Table 2 summarized SEA procedural requirements of major countriesxviii. According to this, the following five points were identified.

First screening procedures have been introduced in all countries except Korea. In this process public involvement is included in only one country and one region, and three countries and one region involve environmental authorities (such as, Ministry of the Environment, etc.). Second scoping procedures have been introduced in all countries except China. The public and environmental authority involvements are more required than screening. However, not all countries require conducting environmental authority involvement at this stage. Thirdly, about half of countries take into consideration social, economic aspects. Then most countries consider cumulative and synergistic effects. Fourthly, review of environmental statement is one of the important processes and most countries employ public and environmental authority involvements. However, there is no requirement for public and environmental authority involvement in the Canadian SEA cabinet directive because of treatment of government secrecy. Fifthly monitoring and follow-up are in place in the SEA systems of most countries, which do not have public involvement or involvement of environmental authorities.

Review and scoping are recognized more important than screening and monitoring. Regarding the target of SEA, SEA systems which apply for high level of decision making, such as, policy, usually do not require the public and environmental authority involvement such as Canada and Denmark.

Comparing the SEA definitions of literatures with national SEA systems, almost all systems fulfill both “applying PPPs” and “employing systematic process” recognizing that these may be basic factors in SEA definition. On the other hand, “stakeholder involvement”, “economic, social and cumulative effects”, “alternative development” are covered by limited number of systems. These tendencies are similar to the results from those of SEA definition (see 3.1).

4. SEA DEFINITION BY AHP analysis

To prioritize the decisive factors for SEA definition, especially for SEA applied for plans and programs, the AHP was employed in this study. Also the Absolute Measurements of the AHP was applied for weighting decisive factors of SEA definition. Preliminary questionnaire survey, supported by face to face communication, on pairwise comparison with selected criteria was conducted for academics, consultants and government officials specialized in SEA filed in Japan and South Korea. Weighting scale of each pairwise comparison was set 17 levels from equal to absolute importance. Then 15 responses among 28 were effectively utilized for this study and remaining 13 responses were not used because of low Consistency Index (C.I.) and no response. For simplification, this AHP study assumed the setting that there was no inner- and outer- dependence between same level criteria and different level criteria in the hierarchy structure. The results of each pairwise questionnaire were calculated to be a geometric mean.
Fig. 1 shows one result of the AHP analysis on priority of SEA decisive factors. According to this, “Applying PPPs” is the most important factor among the SEA decisive factors. “Alternative development” is secondary important factor. Then “Economic, Social and cumulative effects”, “Stakeholder involvement” and “Employing sys-

Table 2. SEA systems in the world

<table>
<thead>
<tr>
<th>Legal basis</th>
<th>Employment system process</th>
<th>Screening</th>
<th>Scoping</th>
<th>Economic, social and cumulative effects</th>
<th>Alternative development</th>
<th>Review</th>
<th>Monitoring</th>
</tr>
</thead>
</table>
REFERENCES

5. DISCUSSIONS

Many countries have already introduced SEA systems in their own way. Variety is necessary for wide application of SEA in the world. However, now it is a time to clarify what are the decisive factors for SEA definition. This study focused on the definition of SEA as a preliminary analysis and provided new foothold for future survey on SEA definition.

Results showed that one of the basic decisive factors of SEA assumed to be the application for policies, plans and programs. Then there were also other important factors: The employment of systematic process; Stakeholder involvement; Economic, social and cumulative effects assessment; and Alternative development, which were in some cases included in SEA definitions. In addition, SEA systems for policies were different from SEA for plans and programs. For example, E-test of the Netherlands, which applies for draft legislations, employs simplified checklists without public involvement and alternative development rather than utilizing systematic process and detailed research.

One interesting point was that existing SEA systems and literature definitions recognized the importance of employing systematic process as well as applying PPPs. However, according to the AHP analysis, the importance of employment of systematic process was lower. It will need a detailed survey for this point and this is the future research challenge for the next full survey by AHP analysis on SEA definition.

In this study, SEA systems were focused. However, practical experiences in each case should be paid more attention and combined with the SEA system survey.

REFERENCES

ADDITIONAL NOTES


ii Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context.

iii Prior Environmental Review System (PERS).

iv Law on Environmental Impact Assessment.

v Schedule 3 of the EIA Ordinance (EIAO) and Circular on environmental assessments for large scale development project.

vi AHP is one of the decision making system which can evaluate alternatives by utilizing hierarchy structure since “Saaty, T.L. (1977) A scaling method for priorities in hierarchy structures. Journal of Mathematical Psychology, 15 (1977) 234-281”.


x Administrative Order of the Prime Minister’s Office for bills and other governmental proposal NO. 159 16/09/1998.

xi The Environmental Assessment of Plans and Programmes Regulations 2004: 2004no.XXXX.

xii Resource Management Act.


xiv Canadian Environmental Assessment Act.

xv EIA decree.

xvi The Environmental Assessment of Plans and Programmes Regulations 2004.

xvii This table was developed in [8], which was drafted by the author as a commissioned project by the MOE-J.

xviii Detail survey will be conducted to send questionnaire to many specialists for this AHP analysis.