Environmental Impact Assessment Review 29 (2009) 408–420

Contents lists available at ScienceDirect

Environmental Impact Assessment Review

journal homepage: www.elsevier.com/locate/eiar

The development and practices of Strategic Environmental Assessment in Shandong Province, China

Shujun Wang [a], Jian Liu [b,*], Lijun Ren [c], Kai Zhang [d,e], Renqing Wang [a,b,*]

[a] Institute of Ecology and Biodiversity, School of Life Sciences, Shandong University, Ji'nan, PR China
[b] Institute of Environment Research, Shandong University, Ji'nan, PR China
[c] School of Environment Science and Engineering, Shandong University, Ji'nan, PR China
[d] Shandong Province Environment Protection Bureau, Ji'nan, PR China
[e] Shandong Association of Environment Protection Industry, Ji'nan, PR China

ARTICLE INFO

Article history:
Received 22 March 2008
Received in revised form 12 February 2009
Accepted 12 February 2009
Available online 26 March 2009

Keywords:
Environmental quality
Shandong Province
Strategic Environmental Assessment
Sustainable development

ABSTRACT

Strategic Environmental Assessment (SEA), a newly-developed decision-making support tool, has been used in many developed and developing countries for predicting and evaluating potential environmental impact of policies, plans, and programs (PPPs), as well as for providing alternatives to avoid, mitigate, or compensate for these impacts. Unfortunately, due to the complexity and flexibility of SEA, to date there has been no consensus on a system which could be suitable for the contexts of different regions or countries. Different requirements and practices are observed in the different typical stages of SEA. Controversial areas include the appropriate indicators to apply in the early baseline setting stage, suitable methodologies for the impact assessment, and appropriate procedures for the SEA process. Given this, it is important to review and refine the SEA system specific to the context but informed by internationally agreed norms. As an illustration, this study reviews and proposes steps to refine the SEA system in Shandong Province, an economically powerful province of China, aiming to achieve sustainable development. Supported by the Environmental Impact Assessment Law of the People's Republic of China, Shandong Province employed SEA to reform the traditionally economy-oriented decision-making and incorporate consideration of environmental consequences into government deliberation on proposed PPPs. This paper illustrates the developmental process, procedures, and legal support for SEA in Shandong Province. By analyzing five SEA cases carried out by Shandong Province Environment Protection Bureau (SEPB) and Shandong University, problems in the SEA system were identified, and recommendations were made for improving the SEA system not only in Shandong Province but also other similar regions or countries.

1. Introduction

Strategic Environmental Assessment (SEA), a decision support tool, has been applied in many developed and developing countries to predict and evaluate the potential environmental impact of policies, plans and programs (PPPs) promulgated by central and/or local governments and to provide alternatives to avoid, mitigate or compensate for their impacts (Bao et al., 2004; Liou and Yu, 2004; Thérivel, 2004; Chaker et al., 2006; Liou et al., 2006; João, 2007; Zhu and Ru, 2008). Due to the lack of a shared set of indicators, methodologies, and procedures of SEA, to date there has been no uniform SEA system suitable for all regions or countries (Liou and Yu, 2004; Donnelly et al., 2007; Retief, 2007). The lack of congruence is at least in part due to too much complexity and flexibility involved in many countries' SEA requirements. The inevitabilities of context driven differences make it all the more important to review and refine the SEA system based on case studies of SEAs and the context-specific characteristics in each case.

As an economically powerful province of China with a large population, Shandong Province has earned its economic growth to some extent at the cost of environmental quality since the 1950s. A series of policies made by central and/or local governments were economy-oriented without taking enough environmental concern into account. These policies sped up the environmental degeneration of Shandong Province. Facing the deterioration of environmental quality, the people and Government of Shandong Province have realized the importance of ecosystem services and other values of the environment and have been paying greater attention to improving

* Corresponding authors. Liu is to be contacted at Room 214, Building of Institute of Environment Research, Shandong University, No. 27 Shanda South Road, Ji'nan 250100, PR China. Tel.: +86 531 8836 4425; fax: +86 531 88369788. Wang, Room 501, South building of School of Life Sciences, Shandong University, No. 27 Shanda South Road, Ji'nan 250100, PR China. Tel.: +86 531 8836 4425; fax: +86 531 8836 3573.
E-mail addresses: shujunwang@mail.sdu.edu.cn (S. Wang), ecology@sdu.edu.cn (J. Liu), ljren@sdu.edu.cn (L. Ren), sdepi@126.com (K. Zhang), wrq@sdu.edu.cn (R. Wang).

0195-9255/$ – see front matter © 2009 Elsevier Inc. All rights reserved.
doi:10.1016/j.eiar.2009.02.005

environmental quality. Supported by the 2002 Environmental Impact Assessment (EIA) Law of the People's Republic of China, SEA was introduced to Shandong Province with the following goals:

- To achieve a systematic and comprehensive decision-aiding tool to consider potential environmental consequences as part of the decision making process over proposed PPPs;
- To provide a high level of environmental protection; and
- To achieve coordinated and sustainable development of the socio-economic wellbeing of the residents without excessive degradation to the environment, in Shandong Province.

A series of SEA cases were carried out by the Shandong Province Environment Protection Bureau (SEPB) and Shandong University based on the indicators, methodologies, and procedure of SEAs practiced by regions and countries with the most developed SEAs. Despite some problems in the implementation stage of the SEA cases in Shandong Province, these cases contributed a lot to the following:

- at least in part inform and promote the transition of decision-making mechanism from traditionally economy-oriented, characterized by the development of pollution and resources intensive industries, to environmentally-friendly,
- protection and improvement the environment of Shandong Province and to the further implementation of SEA in Shandong Province,
- provision for practical experience for the carrying out of SEA in other provinces of China.

Specific issues with regard the aforementioned problems in the implementation of the SEA cases involved the identification of the scope, indicators, methodologies and procedure of SEA, and lack of enough public participation and legal and financial support for the high-level SEA.

In this paper, the developmental processes and the procedures of SEA in Shandong Province are first presented, followed by an analysis of the five SEA cases, including an identification of the problems in the indicators, methodologies and procedures of SEA. This is followed by recommendations to improve the SEA system, including how to further the implementation of SEA in Shandong Province.

2. The development and the procedure of SEA in Shandong Province

2.1. Socio-economic and environmental status of Shandong Province

Shandong Province, located between 114°47.5′E and 122°42.3′E and between 34°22.9′N and 38°24.01′N in the eastern coastal area of China on the lower reaches of the Yellow River (Fig. 1), covers an area of 1.57×10^5 km^2, which accounts for 1.6% of the total land area of China (SBS, 2007). As an economically powerful province with a large population (9.4×10^7 inhabitants in 2007), it has experienced rapid and sustained development of its economy, with an economic structure deemed growingly optimized. The provincial gross domestic product (GDP) increased at a mean annual rate of over 10% from 1999 to 2006, while the per capita figure broke through 8 000 Chinese Yuan (CNY) in 1999 and doubled in 2006 (SBS, 2007). Since the 1980s when China opened up its economy, a series of policies made by central and/or local governments have been by and large economy-centered which has contributed to a sharp degeneration of the environment of Shandong Province (Liu and Diamond, 2005).

2.2. Institutional security system for SEA in Shandong Province

The institutional security system (ISS) for the further implementation of SEA can be defined as a series of legal, policy, financial and other measures including publicizing and improving environmental and ecological awareness. ISS is established to ensure that more SEA practices and case-studies will be successfully carried out in various industries and different regions of Shandong Province and/or China.

Environmental impact evaluation is required by the following four laws and ordinances promulgated by central and/or local governments:

- Environmental Protection Law (EPL) of the People's Republic of China, put into force in 1989;
- Ordinances on Environmental Protection Management for Construction Projects, legislated in 1998;
- Environmental Impact Assessment (EIA) Law of the People's Republic of China, brought into effect on September 1, 2003; and

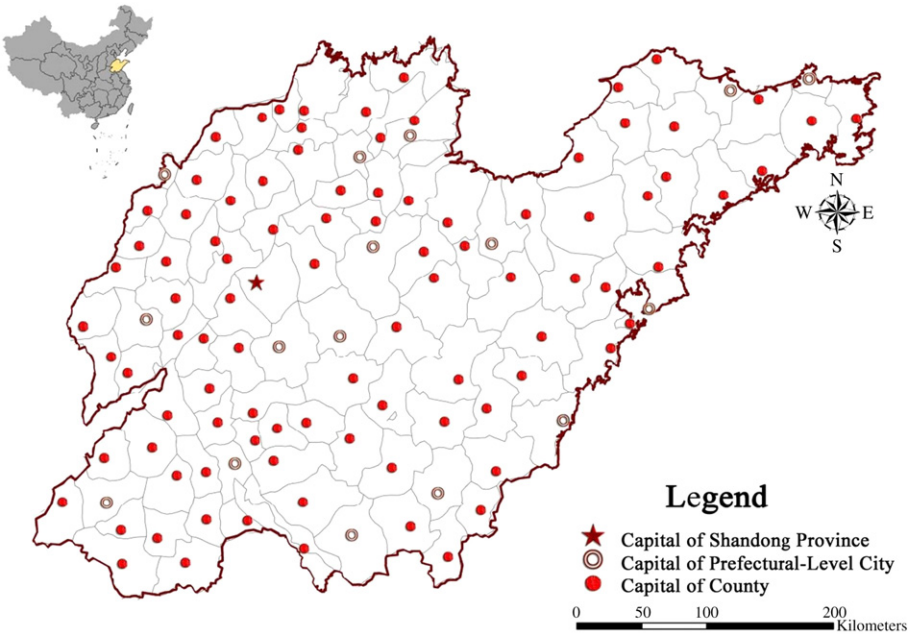

Fig. 1. Location of Shandong Province.