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Strategic environmental assessment can help solve environmental impact assessment failures in developing countries

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Abstract

The current trend of industrialization and urbanization in developing nations has a huge impact on anthropogenic and natural ecosystems. Pollution sources increase with the expansion of cities and cause contamination of water, air and soil. The absence of urban environmental planning and management strategies has resulted in greater concern for future urban development. This paper advocates the adoption of strategic environmental assessment (SEA) as a means to achieve sustainable development in developing countries. It investigates project-level environmental impact assessment (EIA) and its limitations. The exploration of SEA and its features are addressed. The effective implementation of SEA can create a roadmap for sustainable development. In many developing countries, the lack of transparency and accountability and ineffective public participation in the development of the policy, plan and program (PPP) would be mitigated by the SEA process. Moreover, the proactive and broadly based characteristics of SEA would benefit the institutional development of the PPP process, which is rarely experienced in many developing countries. The paper also explores the prospects for SEA and its guiding principles in developing countries. Finally, the paper calls for a coordinated effort between all government, nongovernment and international organizations involved with PPPs to enable developing countries to pursue a path of sustainable development through the development and application of strategic environmental assessment.

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1. Introduction

Developing countries are accepting more responsibility for the environmental impacts that result from their development activities, and many have developed environmental impact assessment (EIA) legislation as a management tool for these impacts in the last two decades. EIA is now practiced in more than 100 countries worldwide (Donnelly et al., 1998). Today, EIA is firmly established in the planning process in many of these countries (Momtaz, 2002). In 1989, the World Bank ruled that EIA should normally be undertaken for major projects by the borrower country under the Bank's supervision. The United Nations Environment Program (UNEP) also made recommendations to member states regarding the establishment of EIA procedures and established goals and principles for EIA. It subsequently issued guidance on EIA in developing countries (UNEP, 1988).

Despite the existence of good EIA guidelines and legislation, environmental degradation continues to be a major concern in developing countries. In many cases, EIA has not been effective due to legislation, organizational capacity, training, environmental information, participation, diffusion of experience, donor policy and political will. EIAs have not been able to provide 'environmental sustainability assurance' (ESA) for these countries (Sadler, 1999). This failure and the inherent limitations of EIA lead to the consideration of strategic environmental assessment (SEA). It is the proactive assessment of alternatives to proposed or existing PPPs, in the context of a broader vision, set of goals or objectives to assess the likely outcomes of various means to select the best alternative(s) to reach desired ends (Noble, 2000).

2. Limitation of EIA and the role of SEA

2.1. Limitations of project-level EIA

In the early 1990s, researchers were studying the limitations of project-level EIA. Their findings called for the introduction of something other than project-level EIA to encompass environmental considerations. They realized the need for the environmental assessment of policy, plan or program:

“The requirements for the content of an EIS as laid down in the Environmental Protection (General Provisions) Act are suitable for application to project EISs. Problems may arise, however, if we try to draw up certain parts of an EIS, for plans and programs of a fairly abstract nature, in precisely the same way. (Verheem, 1992)”

In the first half of the 1990s, researchers emphasized the limitations of project-level EIA. The limitations stated by Glasson et al. (1994) and Lee and Walsh (1992) can be summarized as follows:

- (1) Project EIAs react to development proposals rather than anticipate them, so they cannot steer development towards environmentally “robust” areas or away from environmentally sensitive sites.

- (2) Project EIAs do not adequately consider the cumulative impacts caused by several projects or even by one project's subcomponents or ancillary developments.
- (3) Some small individual activities are harmless, but the impact of those activities can be significant, which cannot be addressed by project EIAs.
- (4) Before preparation of the EIA, a project can be planned quite specifically, with irreversible decisions taken.
- (5) Project EIAs cannot address the impacts of potentially damaging actions that are not regulated through the approval of specific projects.
- (6) Project EIAs often have to be carried out in a very short period of time because of financial constraints and the timing of planning applications.
- (7) Assessing impacts from ancillary developments, difficulties can arise in evaluating the environmental impacts, which may result from indirect and induced activities stemming from a major development.
- (8) Foreclosure of alternatives, typically, by the project assessment stage, a number of options, which have potentially different environmental consequences from the chosen one, have been eliminated by decisions taken at earlier stages in the planning process, at which no satisfactory environmental assessment may have taken place.

2.2. The role of SEA in policy and decision making

SEA can be defined as “the formalized, systematic and comprehensive process of evaluating the environmental impacts of a policy, plan or program and its alternatives, including the preparation of written report on the findings of that evaluation, and using the findings in publicly accountable decision-making” (Therivel et al., 1992). It is, in other words, the EIA of policies, plans and programs, bearing in mind that the process of evaluating environmental impacts at a strategic level is not necessarily the same as that at a project level.

If SEA is to be used as a supporting tool for sustainable development, then it must include not only formal policy documents under that name but also any instrument that gives effect to a policy (Buckley, 2000). Buckley (2000) suggested a list of government instruments to which SEA should apply. It mainly includes formal policy, any bill of legislation and any government document involved with budget, national or international agreement. An additional assessment trigger can be added to this list—any government decision-making process that might result in a policy or policy-related strategy or course of action (Noble and Storey, 2001).

There is growing recognition of the need for the environmental assessment of the implications of policy, plan and program (PPP) alternatives at an early stage in the decision-making process (Noble and Storey, 2001). The early consideration of environmental factors in government decision making became an accepted part of World Bank policy in 1987 (Noble and Storey, 2001). SEA has emerged as a structured proactive process to strengthen the role of environmental issues in decision making through the assessment of the environmental effects of policies, plans and programs (Verheem and Tonk, 2000; Therivel et al., 1992).

For SEA to fulfill its purpose and be effective, it must be built into policy and planning decision making, adopted by policy makers, planners, sectoral bureaucratic officers and all

the potential users who, at this point in time, prefer to ignore the existence of SEA than to risk sacrificing the incremental nature of their decision-making processes to the technocratic and rationalistic commitments imposed by the EA procedures used to date (Clark, 2000). SEA must be focused on improving decision making and on the quality of the final policy, planning or programming decisions (Partidario and Clark, 2000). Considering the limitations of project-level EIA, the advantages of SEA can be exploited by introducing it into the decision-making process of PPPs.

3. Recognition of the role SEA in accomplishing sustainable development

Sustainable development is now a generally accepted vision for any sort of development, but there is concern over how to achieve such a process. The concept of SEA can contribute to the sustainable development process. Over the last 10 years, SEA has become widely recognized by governments and development stakeholders worldwide as a valuable component of the sustainable development process (Noble, 2002; Annandale et al., 2001). SEA, involving the environmental assessment of proposed and existing PPPs and their alternatives, is gaining widespread recognition as a supporting tool for decision making towards achieving sustainable development (Noble and Storey, 2001; Brown and Therivel, 2000).

The Canadian Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals, which outlines the guiding principles for SEA implementation, states:

“...To support sound decision-making that is consistent with the principles of sustainable development, the consideration of environmental effects should begin early in the conceptual planning stages of the proposal, before irreversible decisions are made. (Environment Canada, 2003)”

The role of SEA is often related to sustainability objectives, such that SEA can assist the decision making in improving the design of more sustainable policies and strategies (Noble and Storey, 2001). Consistent with the nature of an SEA system is its potential capacity to contribute to the achievement of sustainability aims (Partidario and Clark, 2000).

Numerous authors have recognized the role SEA can play in incorporating environmental issues into PPP decision-making processes, thereby contributing to sustainability (Noble and Storey, 2001). “SEA aims to provide a perspective by which the policy is developed on a much broader set of perspectives...and all the dimensions of sustainable development” (Brown and Therivel, 2000). Therivel and Partidario (1996) noted the contribution of SEA to PPP development by allowing sustainability principles to “trickle down” from policies and plans to individual development projects within a particular program. From an applied perspective, recent-practice SEA is often related to sustainability goals, such that SEA can assist in the selection of more sustainable policies and strategies (Noble and Storey, 2001). The holistic problem-solving and integration characteristics enable SEA to contribute to more sustainable decision making. Through the consistent and timely application of SEA to policy, plan and program proposals, decision making is enhanced and more informed.

SEA is based on several principles, which provide the basis and driving force for the development of more sustainable policy, plan and program proposals. Adherence to the principles will result in an effective and integrated assessment. The key principles of an SEA include knowledge, integrated decision making and long-term planning, innovation, precaution, anticipation and prevention, public participation, partnerships, equity, early integration, flexibility, self-assessment, appropriate level of analysis, adaptability and understandability (Environment Canada, 2003). SEA also contributes to the evaluation of sustainable development by helping in the development of sustainability indicators. The Autonomous Province of Trento (APT), Italy, recently approved a plan for sustainable development in which a reference to future SEAs considers selected sustainability indicators.

SEA enables the operationalization of sustainability principles. SEA does include and apply fundamental sustainability principles. These principles need to be maintained during the development of policies, plans and programs to ensure sustainability.

4. The context of developing countries

4.1. Failure of EIA

By the 1990s, developing countries in Asia came to the forefront in terms of EIA practice in the developing world. Today, EIA is firmly established in the planning process in many of these countries. However, many authors (e.g., see Briffett, 1999) suggest that despite the existence of good EIA guidelines and legislation, environmental degradation continues to be a major concern in these countries. EIAs have not been able to provide ‘environmental sustainability assurance’ (ESA) for these countries (Sadler, 1999).

In many Asian countries (e.g., Sri Lanka, Vietnam and Saudi Arabia), environmental assessment, specifically EIA, was introduced with insufficient staffing, experience and monitoring, with evaluation inadequacies and without enough baseline data. It seems that a political decision was taken without considering the technical and infrastructural aspects required to carry out assessments smoothly (with proper monitoring and incremental development of the environmental assessment over time). In Asia, many countries give lower priority to environmental assessment, at least at the policy level, in dealing with poverty alleviation, economic growth and development and, sometimes, political stability. But in such countries, the World Bank, Asian Development Bank (ADB) and other international agencies are partly forcing the respective governments to address environmental issues as part of lending and grant-issuing conditions (e.g., Sri Lanka and Bangladesh; see Briffett et al., 2003; Momtaz, 2002). Sometimes, this results in the adoption of environmental considerations simply as a political decision, without the involvement of any public awareness or participation and even without clear perceptions of environmental assessment by governmental agencies:

“The general perception is that EIAs are conducted only because they are required by the government legislation and donor agencies, not to ensure sustainability of projects or to develop better management plans. In many cases, EIA is seen by proponents as an impediment to the implementation of development projects. It is

regarded as a tool to justify projects rather than using it as a means to derive the best decision. (Momtaz, 2002)”

When EIA was first used for development projects in developing countries, this was largely donor driven and conducted by expatriate consultants with little involvement or enthusiasm on the part of the recipient countries (Abaza, 2000).

In addition to the inherent limitations of EIA (such as the failure to consider the cumulative impact of projects and nonproject activities), this assessment became ineffective in protecting natural resources due to the problems associated with political, technical, legal, social and environmental factors, especially in Asian countries. For example, in the case of the Philippines, ineffective EIA implementation means that the environment is not protected, especially in main cities, although EIA has been legally mandated since 1970. This does not necessarily reflect any serious imperfections or drawbacks in the EIA process but has more to do with the lack of effective implementation (Brown and McDonald, 1989). Lack of implementation capacity—ability to conduct proper EIA and to implement mitigation measures—has been identified by the World Bank (WB) as the biggest constraint to effective EAs (Goodland and Mercier, 1999).

In Saudi Arabia, the need for EIA was realized in the Fifth Development Plan (1990–1995). This development plan mentioned that up until then, there was no general system for the inclusion of EIA and social cost–benefit analysis in program and project decision making, and that EIA should become an integrated part of feasibility studies for new projects and programs. In the Sixth Development Plan (1995–2000), the same issue was reiterated by calling for a national EIA system to be adopted in projects undertaken in the various development sectors throughout the kingdom, especially industrial, agricultural and urban projects. The EIA experts in Saudi Arabia feel that a lack of transparency, public participation, unified standards and clear implementation procedures for EIA prevent it from becoming a success. Interestingly, EIAs are not publicly available in Saudi Arabia, and for this reason, there is no sharing of information among geographically adjacent projects. This hinders the public awareness process and prevents research work from contributing to the field of environmental assessment. In Saudi Arabia, national policies and plans still remain immune to criticism.

The enforcement of legislation can help in implementing and monitoring EIA effectively and successfully. However, this is not an easy task in many of the Asian countries where corruption is pervasive. It is important that nongovernmental organizations (NGOs) and donor agencies play a major role in monitoring the carrying out of EIA, in collaboration with Department of Environment (DOE) (Momtaz, 2002). However, the presence of donor agencies as organizations parallel to the DOE in project approval (e.g., Bangladesh) is also not suitable in maintaining a single standard for EIA quality. Moreover, there should be a mechanism to ensure monitoring of project impacts to identify and rectify impacts that were not picked up by the EIA.

4.2. SEA in developing countries

To date, there are only a limited number of fully operational SEA systems from which lessons of implementation can be drawn. For example, many newly independent

states (NIS) have SEA provisions but do not necessarily implement them (Cherp, 2001). Although still limited to certain countries, SEA practice extends across an increasing number of sectors and areas of application, even in developing countries. For example, EIA is part of Nepal's forest plan, Pakistan's water and drainage programs, Sri Lanka's city and tourism plans and the national conservation strategy development in many countries. In the developing world, a small number of countries have SEA processes or elements in place already (e.g., Brazil, Chile and South Africa), and recently, China passed a new EIA law that includes provision for SEA of plans and programs. In 1998, the Environmental Protection Agency (EPA) in Taiwan published two important documents: an SEA manual and a mandatory screening list for PPPs subject to SEA (Liou and Yu, 2004).

SEA is also becoming popular at a regional level. For example, the environment program of the Mekong River Commission (MRC) is focusing on aspects of environmental assessment systems, including related areas such as SEA, and is examining how transboundary impacts can be accounted for and incorporated into the various EA processes (see Öjendal et al., 2002). The MRC is an intergovernmental agency of the four countries of the Lower Mekong basin: Cambodia, Lao PDR, Thailand and Viet Nam. The MRC replaced the Mekong Committee (1957–1976) and the Interim Mekong Committee (1978–1992) and was formed with the signing of the 1995 Agreement on Cooperation for the Sustainable Development of the Mekong River Basin. Several sets of issues need to be addressed on a regional basis, including how to establish mechanisms that allow environmental impact investigations to be carried out across national borders.

However, all SEA efforts are not equally effective and successful. In many developing countries, integration is missing between the formal decision-making procedures for many PPPs and SEA findings (e.g., China; see Che et al., 2002); there is also a lack of appropriate discussion of alternatives and an absence of public participation procedures (e.g., China and Taiwan). In fact, the limited number of case studies and the absence of associated research into SEA cause problems for authorities in effectively practicing SEA concepts (see Liou and Yu, 2004). SEAs also suffer from technical problems, such as the formulation of predictive techniques and methods.

The current framework for national environmental policies in Saudi Arabia suffers from overlapping authority, a slow decision-making process, gaps in the legislation and implementation difficulties (Al-Gilani and Filor, 1999). The main sources of national environmental policies in Saudi Arabia are the 5-year development plans. These documents contain a good and clear direction for government environmental policies, especially the fifth and sixth plans (Al-Gilani and Filor, 1999). However, there is no sign that indicates that SEA is considered in evaluating the impact of national development policies. A few researchers have suggested placing environmental assessment upstream in the decision-making process (Alshuwaikhat and Aina, 2004). Alshuwaikhat and Aina (2004) suggested that inasmuch as the Ministerial Committee on the Environment (MCE) and the Preparatory Committee for MCE are at the apex level of policy formulation, the SEA-tiered approach should commence from this level. In Saudi Arabia, this approach will be able to incorporate SEA at higher levels of decision making and complement the environmental impact assessment of projects that take place in the later stages of the policy-making and planning process (Alshuwaikhat and Aina, 2004). It is realized that

SEA must be included as a requirement for governmental policy proposals (Al-Gilani and Filor, 1999).

4.3. Future and prospects for SEA

SEA has the potential to screen out many environmentally unfriendly projects or guide many projects before irreversible decisions are taken, such as land acquisition, selection of the development proposal and financing commitments. This is why the increased use of SEA not as a substitute for EIA but more as an up-front supplement can ensure long-term benefits to the environment, intergenerational equity regarding natural resources and finally lead to sustainable development.

In fact, the identification of serious environmental threats in proposals of policy, plan or program will cause a reduction in the number of project-based impacts. Therefore, the failure of EIA due to the inherent problems associated with governance should not undermine the adoption of SEA.

EIA practice is constrained by certain limitations and weakness, which are centered on the relatively late stage at which EIA is usually applied in decision making. By this point, high-order decisions regarding the type and location of a development have taken place with little or no environmental analysis. Project-by-project EIA also cannot consider these issues. SEA can complement project-level EIA to incorporate environmental considerations and alternatives directly into policy, plan and program design.

SEA offers an opportunity to address cumulative effects, which cannot be properly handled by EIA because of the pervasive nature of cumulative effects and large-scale environmental change.

SEA is a proactive approach that identifies alternative goals and seeks the preferred option among a variety of alternative options to reach the most desired end. Ideally, SEA and EIA are considered in sequence, where SEA proactively examines a broad range of alternatives and selects the preferred course of action, and EIA is initiated reactively to determine in greater detail the potential impacts of the preferred alternative (Noble, 2000).

The success of SEA is contingent upon the availability of accessible and appropriate information (Thompson et al., 1995). Unfortunately, baseline information on ecological and socioeconomic conditions or on the nature, scale and location of likely future development does not always exist, especially in developing countries. In fact, inadequate or unavailable data lessen our ability to anticipate and monitor the environmental impacts of a policy. The huge scale of SEA will also exacerbate the difficulty of predicting impacts. As a result, unreliable data and indefinite predictions will undermine public support for SEA and the policies that result.

5. Conclusions and recommendations

To ensure that sustainable development needs are implemented at local level and impact assessment is be considered a tool for promoting sustainable development, SEA should be established in local municipalities and applied by local authorities on a regular basis. However, the SEA system for the municipal level cannot be separated from SEA at the

national, federal and/or regional levels of government. As policies are enacted at the national level, a process of implementing SEA at the municipal level should reflect the tiered and multilevel nature of PPPs.

We emphasize the importance of the clear understanding of SEA and sustainability concepts among government servants, academics and practitioners in the context of their own countries. Particular attention needs to be paid to the types of action to which SEA can contribute, and how it would operate in practice, its relationship to existing policy and planning arrangements, its relationship to existing EIA and the main benefits and costs of using it.

At the local level, there is a need for SEA training, simple and flexible SEA systems and further scientific research. The limited number of case studies and the absence of associated research into SEA methodologies can lead to the failure of effective application of SEA concepts to actual practice (e.g., in Taiwan; see [Liou and Yu, 2004](#)). Moreover, lessons from EIA failures point to the importance of achieving effective implementation in practical terms, as well as highlighting the problem of not having sufficient power and influence over all sectors, ministries and departments in many developing countries. Certainly, it is beneficial to link policy making, planning and SEA at the municipal level.

Extensive public participation, including the public and NGOs, is necessary to prove the reliability in drawing and implementing SEA. Strategic issues, by definition, are higher level and long term, and their perceived effects on people's interests may not be evident or of immediate concern (whereas a project situated in their locality will be seen very differently). In addition, it should be realized that, in the case of plans and policies of a more abstract nature (e.g., long-term objectives or purpose), the effects on the public will only be indirect, and there will be little public interest in getting involved.

There is a need to develop simplified SEA procedures that would be consistent with the availability of resources and existing program and policy frameworks within the country. Dependence on international voluntary donor agencies to meet the cost of SEA undermines the whole idea of using SEA as a tool for sustainable development.

SEA practitioners need to become informed about the nature of policy-making processes. They have to identify where the opportunities lie for SEA to contribute to any particular policy-making process, who is involved and who is making the decisions implicit in the policy making, and the type and form of environmental information that is pertinent to this decision making.

The proactive and broadly based characteristics of SEA can be used to assess regional and sectoral effects and integrate them into the consideration of potential cumulative and synergistic effects from a strategic perspective. The early identification of potential cumulative impacts can set the platform for the screening out of many potential environmentally detrimental projects. The subsequent result will facilitate effective implementation of EIA.

As in the European Union, developing nations can consider developing an SEA directive to preserve their environment at a regional level under the authority of regional cooperation associations, such as the South Asian Association for Regional Cooperation (SAARC) and the Association of Southeast Asian Nations (ASEAN). The extension of cooperation among member countries from economic to environmental concerns will

facilitate the implementation of SEA in each member country. However, it will require huge efforts from all member countries to introduce and amend legislation, prepare guidance and experiment with case studies during the preparation stage of an SEA directive. Ultimately, this SEA directive will also increase the effectiveness of those regional associations.

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