



# Strategic environmental assessment-A tool for sustainable development

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## Abstract

Strategic Environmental Assessment (SEA) is the environmental assessment of policies, plans and programmes. It came in practice as an improvement over the Environmental Impact Assessment (EIA) to assist in sound environmental decision-making. It integrates the socioeconomic values with the environmentally viable development for better decision making. The scope of SEA is pluralistic, diversified, multidisciplinary and inter-sectorial. Infrastructure development is the main activities of development for any nation. These days Highway infrastructure development is the concern of main focus in India. This paper describes the concept of SEA; the evolution of SEA; the relation between SEA and EIA; SEA and sustainability criteria; the benefits of SEA; and the general methodology to perform SEA, which can be adopted for the highway infrastructure projects for sustainable development.

**Keywords:** SEA, EIA, Development

## INTRODUCTION

Strategic environmental assessment (SEA) refers to the environmental assessment of policies, plans and programmes. It is defined as a systematic process for evaluating the environmental consequences of proposed policy, programme or plan initiative and their alternatives in order to ensure they are fully included and appropriately addressed at the earliest suitable stage of the decision-making process (Seht, 1999). Several countries like, Canada, New Zealand, the United States, Denmark, Sweden, South Africa have already introduced some form of SEA system. While the European Commission intends to introduce a directive on SEA, which would require developing the corresponding National SEA provisions in all EU member states (Feldmann, 1998).

At present, SEA is neither legally required in India nor has the government published any guidelines for SEA. With the implementation of economic reform, opening up of economy to outside world and ongoing developmental activities, the natural resources are becoming more and more scarce; the resource consumption and its pressure on the environment are increasing. Thus there is a need for evolving SEA of future policy, programme or plan initiatives and their alternatives to meet the requirement of the people and economic development on one hand and conserving the fragile environment and natural resources on the other.

## CONCEPT OF SEA

SEA is a systematic, on-going process for evaluating, at the earliest appropriate stage of publicly accountable decision making, the environmental quality and consequences of alternative visions

and development intentions incorporated in policy, planning, or programme initiatives, ensuring full integration of relevant biophysical, economic, social, and political considerations. The concept of SEA usually should be associated with (Partidario, 1996):

- The strategic nature of decisions: intentions, guidance, orientations, regulations; strategies are reviewed or replaced, but they are not built (constructed) or demolished.
- The continuity of the decision-making process as opposed to discrete decision-making. SEA deals with the process of developing policies, plans and programs, which is continuous in nature. A policy, plan, or programme may be created, reviewed, or replaced, which is part of the continuous nature of the decision-making process at this strategic level.
- The optional value, referring to the range of multiple issue alternatives involved in a strategic process. Typical issues could be: what are the possible options to deal with a specific problem or a particular need; what can be the environmental consequences of these options; and which can be chosen as best environmental option.

## EVOLUTION OF SEA

SEA evolved after some disillusionment with the capacity of project EIA to assist sound environmental decision-making. SEA took much longer to take a form and to become a notion. Table 1 lists a series of key events that have contributed to the consolidation of SEA.

Table 1. SEA basic milestones (Source: Partidario, 2000)

1969	The National Environmental Policy Act (NEPA) passed by U.S. Congress, mandating all federal agencies and departments to consider and assess the environmental effects of proposals for legislation and other major projects.
1978	US Council for Environmental Quality (USCEQ) issues regulations for NEPA, which apply to USAID and specific requirements for programmatic assessments.
1989	The World Bank adopted an internal directive (O.D. 400) on EIA, which allows for the preparation of sectoral and regional assessments.
1990	The European Economic Community issues the first proposal for a Directive on the Environmental Assessment of Policies, Plans and

	Programmes.
1991	The UNECE Convention on EIA in a Transboundary Context promotes the application of EA for policies, plans and programmes (adopted in Espoo, Finland) (Schrage, 1999)
1991	The OECD Development Assessment Committee adopted principles calling for specific arrangements for analyzing and monitoring environmental impacts of programme assistance (OECD, 1992)
1992	The UNDP introduces the environmental overview as a planning tool (UNDP, 1992)
1997	The European commission issues a proposal for a Council Directive on the assessment of the effects of certain plans and programmes on the environment (EC, 1997)

## RELATION BETWEEN SEA AND EIA

EIA focuses on a better execution of specific actions, but does not orientate or frame the intention. On the other hand, SEA focuses on the previous conditions in which actions are inserted. Their effects are subsequently assessed by EIAs. SEAs are proactive while EIAs are more reactive (Arce et al., 2000). The scope of EIA is either local or regional where that of SEAs is global. SEAs have broadened the spatial and temporal scope of environmental assessment and address the source rather than the symptoms of environmental damage. EIA is a project level assessment of impacts while SEA is assessment at policies, plans and programmes (which includes project also). The level of detail of SEA is generally smaller than EIA, as SEA addresses a broader geographical area and captures consideration from very different disciplines. In SEA sustainability indicators such as energy consumption, spatial impacts, cultivable soil loss etc. are also addressed. Relation between SEA and EIA is shown in Figure 1.

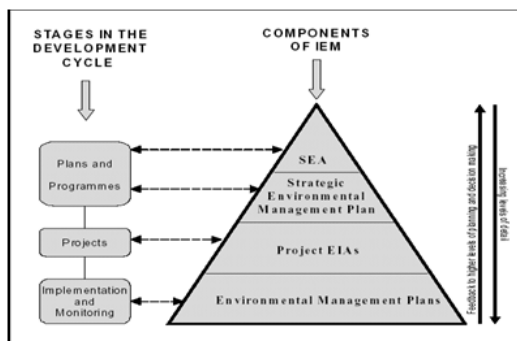


Fig 1. Relation between SEA and project-level EIA (Source: Department of Environmental affair and tourism South Africa, Pretoria, 2000)

## SEA AND SUSTAINABILITY

SEAs increase the possibility of analyzing and proposing alternative solutions and incorporating sustainability criteria throughout the planning process, because they carry the principles of sustainability down from policies to individual projects (Annandale et al., 2001). The SEA takes in consideration the sustainability criteria by:

1. considering the environmental issues from very beginning of the decision-making process.
2. providing a framework for the chain of actions.
3. integrating policymaking, planning and programme.
4. identifying the potential impacts in advance from sustainability point of view.

## SEA METHODOLOGY

The basic SEA methodology is designed aiming at clarity, simplicity, and adaptability to the analysis of any policy, plan, or

programme (PPPs) in different sectors and planning contexts. The general procedure to perform SEA has been shown in Figure 2. There are many important factors, which decide the methodology to be adopted (Hedo and Bina, 1999):

- The type and scale of the plans being analyzed.
- The region's provision regarding the contents of SEA reports.
- The relevant planning sector.
- The joint analysis of plans that show strong interdependencies.
- The formulation stage of each plan at the time of assessment.
- The time and resources available.

The fundamental elements of a methodology for the SEA of development plans are as follows:

### Defining the reference framework

The reference framework sets the basics for analysis. It is done to provide the general view of the condition of the region under study related with main socioeconomic and environmental issues. Framework also describes the current legislation of the regional government regarding the natural resources likely to be disturbed. The reference framework identifies the interaction between socioeconomic and environmental elements on the one hand and between the various policies and institutional and legal principles on the other hand.

### Description of the plan and setting objectives

The description and early analysis of the plans is based on the wording of the objectives, the line of action, and the budget allocated. New or additional objectives addressing environmental principles have to be set at this stage if the SEA process had been integrated into plans' formulation.

### Drafting plans or programs, with identified alternatives

Broad plan or programme alternatives should be identified. These should indicate the physical and administrative boundaries, the level of planning and type of plan or programme (sectoral or regional). These laid alternatives may be refined or changed as the plan or programme is developed.

### Choosing indicators and prediction techniques

Indicators are chosen according to the reference framework. For every critical aspect, a set of indicators is selected. The set of indicators used in the study is a direct indicator of the economic objectives set in the plan and the environmental quality of the area under consideration with legal environmental policy of the region. Prediction in SEA is normally done with a high degree of uncertainty, as the nature of PPPs is abstract and the time involved between

planning and its real implementation is quit large. So the probable time scale and likelihood of the impact prediction should be clearly

mentioned in SEA.

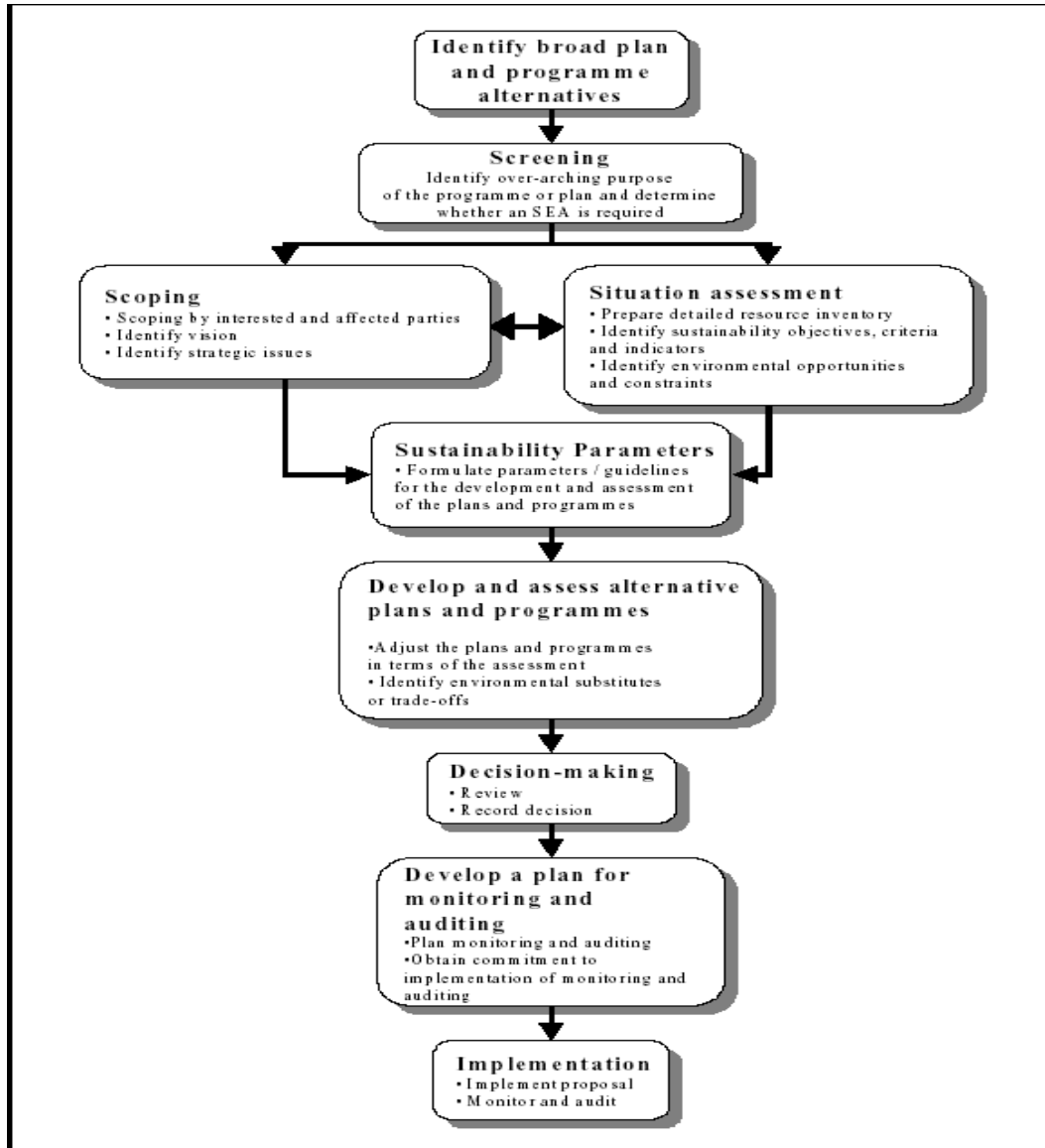


Fig 2. SEA procedure (Source: Department of Environmental affairs and tourism South Africa, Pretoria, 2000)

**Evaluating the significance**

The relationship between the magnitude of an impact and its significance is not necessarily direct. The significance will depend on situation like the same traffic noise level will have different significance for rural and urban areas. Hence the knowledge of significant impacts is essential for decisions on alternatives, mitigation measures and approvals (Seht, 1999). The significance can be determined based on sustainability or carrying capacity considerations as well as its dependence on guidelines, regulations and the objectives of the proposed PPP, or public perception.

**Mitigation measures**

Deciding the main mitigation measures to take care of adverse environmental impacts of the proposed action is a very

important matter in SEA. In case of SEA due to wide range of alternatives available as compared to EIA, the choice of mitigation measures is also more. Mitigation measures as well as the alternatives play a key role in protecting the environment.

**Monitoring plan**

There are different types of monitoring and auditing in environmental assessment: implementation monitoring, impact monitoring and impact auditing. Implementation monitoring is aimed at checking whether PPPs and mitigation measures are implemented as proposed, and whether agreed environmental conditions are met (Wood, 1995). Impact monitoring provides the idea about any unexpected or miscalculated adverse impact of the action which need remediation with a feedback for the future SEAs. Impact monitoring is extremely important in the process of SEA as the

prediction of the impacts made due to the proposed action are highly approximate because of many variables which are ignored during prediction stage. And if it is required to amend the original PPPs in connection with the impact monitoring, PPPs should have scope to be amended accordingly.

### Public participation

Public participation and their views are essential for the success of SEA. Public can be classified in two main groups - first group people who lives in or near the area which PPP would cover or the directly affected people by the proposed PPP; second group of peoples are the voluntary groups like NGOs or issue-based pressure groups which are related with a particular aspect of the environment. The common mode of participation in EA is some form of consultation. Other form of participation is publication of SEA report for objection and suggestions from the public.

### Final review and decision-making

The decision of whether to adopt a PPP and under which conditions, is the important aspect of SEA. The concept of SEA as well as EIA is to give more weightage to environmental considerations in the final decision-making process. In the democratic process of decision making the final decision should always be made public. The rationale for decision and a description of the facts that how the findings of the prior SEA processes have been taken into account should be provided.

### CONCLUDING REMARKS

1. SEA does not substitute EIA at a project level. But, it gives a basis for arriving at better-informed decisions on broader strategic decisions, like long term and range planning.
2. SEA has a significant impact on strategic decision-making as links the national sustainability goals, public participation, socioeconomic aspects and environmental considerations at all three levels of policy, plan and programme.
3. The case studies clearly show that The participants in the planning process are convinced that their selection represented the best balance between environmental and transportation benefits and was possible due to SEA (case study 1). It is not necessary that the least cost alternative may be chosen. It is possible that one of the more expensive plan alternatives may be chosen as a result of systematic strategic evaluation of various types of environmental impacts and public involvement (case study 2).
4. It is very useful in providing a strategic framework for tying together many project level EIAs, which is particularly required for implementation of typical transportation improvements

throughout the corridor or the region (case study 3). Thus, with the help of SEA, it will be possible to avoid opposition from the environmental agencies, especially opposition on strategic issues that would be expressed late in the process (on project level environmental impact statements).

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