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**Author**

Brown, AL, Therivel, R

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# Effective methodologies

## Principles to guide the development of strategic environmental assessment methodology

A L Brown and Riki Thérivel

*Despite much recent attention being given to strategic environmental assessment (SEA), there are considerable difficulties moving from a useful concept to widespread and enduring practice. This may be partly because the proponents of the policies, programmes and plans (PPPs) and the decision-makers remain unaware, or unconvinced, that SEA can add value to the existing processes in PPP development, assessment and decision-making. This paper attempts to respond to these difficulties by defining an overarching concept of SEA and a set of principles to assist in the evolution of effective methodologies. A broad range of SEA methodologies will be needed to adapt to the particular PPP-making context and these must be grafted onto the existing PPP process.*

Keywords: strategic environmental assessment; decision-making; participation

Professor Lex Brown is at the School of Environmental Planning, Griffith University, Kellels Road, Nathan, Queensland 4111, Australia; Fax: +61 7 3875 7645; E-mail: Lex.Brown@ens.gu.edu.au.

Dr Riki Thérivel is at Oxford Brookes University: her address is 28A North Hinksey Lane, Oxford OX2 0LX, UK; Tel/Fax: +44 1865 243488; E-mail: riki@ukoxford.freemove.co.uk.

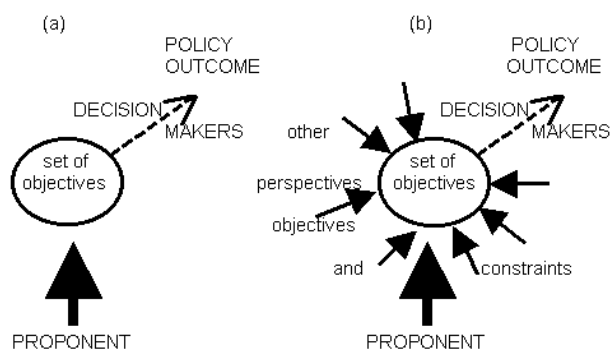
STRATEGIC ENVIRONMENTAL assessment (SEA) is an appealing concept to those currently involved in environmental assessment (EA) procedures. What could be more seductive than the notion that we can shift our project-based EA procedures upstream in planning processes to apply the same approaches and tools to plans, policies and programmes (PPPs)? SEA concepts and applications have developed rapidly in the past few years, spurred on by an increasing number of SEA regulations, examples of SEA, and studies on it (for instance, deBoer and Sadler, 1996; DHV, 1994; Elling and Nielsen, 1996; Mens en Ruimte, 1997; Sadler, 1996; Sadler and Verheem, 1996; Thérivel and Partidário, 1996; von Seht, 1999).

Yet in this explosion of interest in environmental assessment at the strategic level, and attempts to move the concept into action, there are still many questions to be resolved. Clark (2000), for example, makes some sobering observations about the challenges that must be tackled to make SEA attractive to policy-makers.

This paper begins with a broad but unambiguous conception of SEA. Then it advances the current dialogue on SEA methodology by developing a set of issues/principles that need to underpin the identification, development or selection of appropriate SEA methodologies. The paper is not prescriptive with respect to how to conduct SEA: instead it concentrates on principles for effective and efficient implementation in any operational PPP context.

### Concept underlying SEA

Why attempt to define SEA further? Surely, as one reads *ad nauseam*, SEA is the application of environmental



**Figure 1. A simple conceptual model of policy formulation and decision making without (a) and with (b) strategic environmental assessment**

Source: Modified from Théritel and Brown (1999)

assessment to PPPs? This is a definition that, at least at a superficial level, is largely agreed amongst environmental assessment practitioners, but there is much that is not agreed. For example, is SEA a document or a process? Should it be founded in legislation or left as a non-statutory administrative tool? Is it something new or is it a repackaging of existing approaches? How does it fit with other planning tools? Is it conducted in the same way and with many of the same players as project-based EIA? How does it link with PPP formulation and decision-making?

In the opinion of the authors, attempting to define SEA through prescriptive answers to these questions is not particularly useful. We argue that what must be agreed by all players is the concept of SEA and its utility. Outside the (relatively small) circle of EA practitioners, there is little agreement yet with respect to the utility of SEA, let alone its operations. In fact, rather than agreement, there may be scepticism, and even hostility, amongst both proponents of PPPs and PPP decision-makers towards any proposed expansion of environmental assessment activities beyond the project level.

Our conceptual definition of SEA is illustrated in Figure 1. For simplicity, the illustration is one of policy-making, but could apply equally to programme- or plan-making. Also for simplicity, no attempt has been made to incorporate the real complexity of policy types and policy processes or cycles (Bridgman and Davis, 1998), the iterative nature of policy-making, or the interactions between policy formulation and decision-making. Nor is the model intended to suggest that decision-making conforms to a rational and comprehensive model (Ham and Hill, 1984).

Figure 1 shows that the authority responsible for policy development (and here we have borrowed the term 'proponent' from project-based environmental assessment practice to describe the responsible authority) develops a policy in (say) its traditional subject area (housing or agriculture, for example) by focusing on specific sets of objectives and constraints. The proponent works through the policy development cycle then presents its preferred outcome to

decision-makers for approval. Once approved, the proponent proceeds to implement the policy outcome (Figure 1(a)).

Within this cycle, proponents define or harvest their own objectives and develop the policy proposal which most efficiently and effectively meets this set of objectives. This is a simplistic representation: in some situations there may be only a few objectives leading to an obvious outcome, but in others the policy proposal might be based on multiple objectives and require multiple iterations in its development, or there may be multiple proponents, each with their own specific objectives.

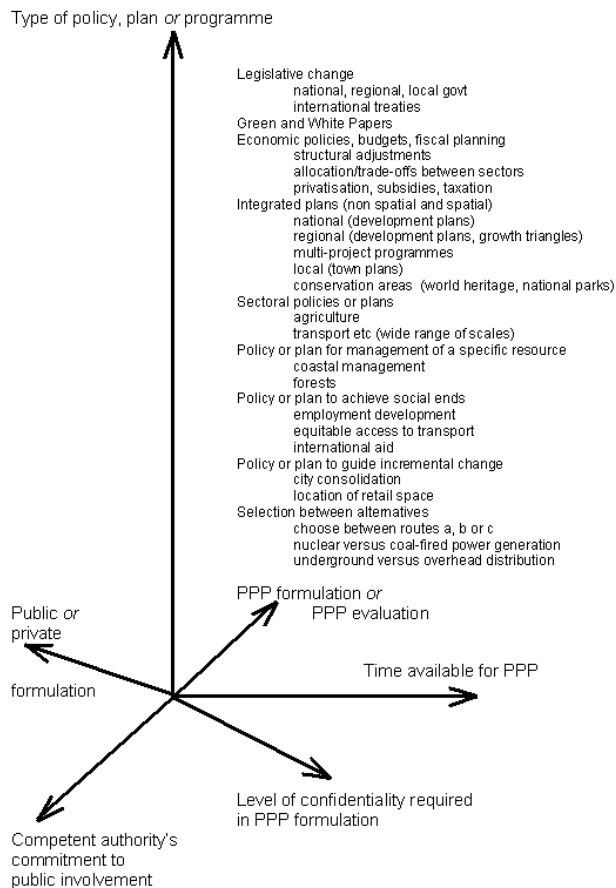
SEA aims to provide a process by which the policy is developed based on a much broader set of perspectives, objectives and constraints than just those initially identified by the proponent (see, for example, Harvey, 1992; Brown, 1998). This broader model is shown in Figure 1(b). The other perspectives and objectives need to be provided by other players, or by including other information sources. They include issues that would normally be considered in project-based EIA, such as waste, social impacts, pollution effects, ecological consequences, and all the dimensions of sustainable development — equity, participation, the precautionary principle, sustainable resource use and the provision of future needs. Doak *et al* (1998) provide a good example of a process to define the range of sustainability issues that might find practical expression in such an SEA exercise.

Our conceptual definition of SEA is thus a process directed at providing the proponent (during policy formulation) and the decision-maker (at the point of policy approval) with a holistic understanding of the environmental and social implications of the policy proposal, expanding the focus well beyond the issues that were the original driving force for new policy. SEA provides the potential to incorporate new objectives and constraints in policy formulation, the substitution of alternative objectives, policy instruments and implementation strategies, and the identification, clarification and resolution of conflicts, compromises and interlinkages. It provides an opportunity to internalise externalities often not adequately considered in much sectoral policy formulation and decision-making. The intention of SEA is moving policy (and PPP generally) towards sustainable outcomes.

### SEA as a family of tools

What guidance does this conception of SEA provide with respect to the shape and nature of the tool itself? First, we argue that appropriate SEA methodology will have to be shaped according to the PPP formulation and decision-making context. The techniques, processes, time frames and administrative requirements for implementing SEA need to be tailored closely to the particular circumstances of the PPP under consideration.

Figure 2 shows, schematically, that there is a wide



**Figure 2. Diversity of policies, programmes and plans (vertical axis) and a sampling of differing contextual dimensions (horizontal axes) in which policies, programmes and plans are formulated and determined**

Source: From Thérivel and Brown (1999)

range of strategic actions for which SEA is likely to be appropriate, and a wide range of contexts in which these strategic actions might be formulated and determined. The vertical axis of Figure 2 provides examples of PPPs, illustrating all scales (international, national, regional, local), sectors and resources, both spatial and non-spatial plans and policies, and issues as diverse as legislative change and selection between alternative transport routes. This is not intended to be a comprehensive list of policies, plans and programmes, but all are clearly candidates for environmental and sustainability assessment through the application of SEA.

There is a rapidly expanding range of examples of such SEA application in the literature (for instance, deBoer and Sadler, 1996; Thérivel and Partidário, 1996; in water resources: Hedo and Bina, 1999; Bass and Herson, 2000; Brooke, 2000; in transport: Fischer, 1999; Pohjolainen, 1999; Richardson, 1999; in spatial planning: Curran *et al.*, 1998; Thérivel, 1998; Milling, 1999; in agriculture and forestry: Ashe, 1999; Tzilivakis *et al.*, 1999; in trade agreements: Schramm, 2000; in regional economic development: Pepper, 1999; Bradley, 1999).

An inescapable conclusion of this diversity in PPPs

is that no single SEA methodology will be able to be applied uniformly to these different tasks. SEA methodologies will need to be adaptive to the existence of different agendas, actors, discourses, knowledge requirements (substantive issues; qualitative versus quantitative information) and bargaining styles within different policy-making sectors. The involvement of different organisations within different PPP-making sectors will also influence the nature of the SEA methodologies required, as these organisations operate according to different decision rules and organisational cultures (Bailey and Renton, 1997; Pollack, 1994; Feick, 1992; Padgett, 1990).

The level at which PPP formulation and decision-making occurs (international, national, regional or local) will also influence the nature of SEA methodologies. The objectives and complexity of issues at these levels are very different and, as Blom-Hansen (1999) notes, even at the same level of government, will vary considerably among different countries. SEA methodologies will have to adapt accordingly. For example, it should be expected that the SEA of a national structural adjustment programme (Kessler and van Dorp, 1998) will be vastly different in form and content to the SEA of a local authority's planning policy on the location of retail shopping space or a district-wide local plan (Milling, 1999; UKDoE, 1993), even though both will need to conform to the conceptual model of SEA described above.

Further, not only will different SEA methodologies be required for different strategic actions but, as the horizontal axis of Figure 2 indicates, there is a complexity provided by a range of inter-related characteristics, or dimensions, of the PPP formulation and decision-making context. Development of appropriate SEA methodology will have to be cognisant of these characteristics.

For example, different approaches will be required depending on the time available for PPP development. The time frame will influence, *inter alia*, the information available and the degree of interest-group and public involvement possible (Pollack, 1994; Padgett, 1990). The SEA of an agricultural programme will, for example, certainly adopt different methods if the programme is to be formulated over the next two years, from those used if it is to be completed within a month.

Even a sampling of the policy literature provides

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**No one SEA methodology will apply to all strategic actions and in all socio-political contexts: we must begin to think in terms of an array of SEA tools from which the appropriate one(s) can be selected to meet the needs of the particular circumstances**

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copious evidence of the differences that exist in the PPP formulation and decision-making context — the science of policy analysis has developed around the fact that context affects both process and policy outcomes. Bailey and Renton (1997) provide empirical evidence of this from a survey of Australian government departments. The degree of openness and public involvement in the PPP-formulation process will strongly influence the issues on the PPP agenda (May, 1991), the nature of information presented, and the degree of political intervention in the process (Padgett, 1990).

Other important contextual factors will include whether the PPP formulation process is being conducted using private or public funds, the complexity of the issues examined (that is, single-issue PPPs vs complex, multi-sectoral PPPs) (Padgett, 1990) and whether the SEA is being used in the formulation stages of the PPP, or as a post-formulation evaluation. This last issue, whether SEA should be a formulation tool or an aid to decision-making, is considered in more depth below.

The principle that emerges from this analysis is that SEA must be seen as an overarching concept rather than as a unitary technique, housing within it a family of tools, with different members being appropriate for different types and different stage, of PPP planning, development and review (Goodland and Tillman, 1996). No one SEA methodology will apply to all strategic actions and in all socio-political contexts: we must begin to think in terms of an array of SEA tools from which the appropriate one(s) can be selected to meet the needs of the particular circumstances.

Partidário and Clark (2000) too, argue that “SEA must be absolutely tailor-made to the kind of decision at stake, and the nature of the decision-making process in place”. Irrespective of the form of SEA that emerges from consideration of the contextual factors in which the PPP formulation and decision-making is located, it must still conform to the fundamentals of SEA illustrated in Figure 1.

### SEA methodologies and PPP processes

Related to recognition of diversity in PPPs and their contexts, is recognition that development of each PPP already involves a formal planning process, engages the skills of professionals from different disciplines with long-term experience and expertise in the particular field, and a set of protocols and tools for PPP formulation. Further, a formal decision-making process is already associated with each formulated PPP.

In general, any attempt at imposition of SEA by environmental assessment practitioners on PPP processes is unlikely to be effective unless it recognises existing processes and has the co-operation of existing players. What is more likely to be effective is first to examine how to graft SEA to these existing planning, formulation and decision-making activities. SEA practitioners need to understand the dynamics,

tools, and protocols of each PPP development process, and once having understood them, work to integrate the objectives of SEA with these procedures.

Marsden (1998) similarly argues that, to be effective, SEA should integrate itself within existing contexts in which proposals are formulated, assessed and implemented because of the differences that are present between processes. His tentative framework for analysis of these different contexts includes social/political, environmental/economic and legal/administrative dimensions. To this we would add the dimension of different discourses used by different disciplinary areas.

Before there is acceptance of SEA procedures/administrative requirements/legislation by decision-makers and senior administrators, such integration, or grafting, will be a critical step. The notions of sustainable development, at least in terms of rhetoric, have infiltrated many levels of government so that there may already be broad-scale acceptance at the conceptual level of the need to incorporate sustainability and environmental considerations into PPP formulation and decision-making.

However, unless decision-makers and senior administrators can see that any proposed SEA methodology will fit, or readily extend, the way they currently develop PPPs and make decisions, and that it will add value, it is unlikely to be embraced, and more likely to be met with reluctance, probably resistance. The need for SEA procedures to be integrated with PPP formulation procedures is supported by other EA commentators (Fischer, 1999; Curran *et al*, 1998), however, apart from a few examples (such as Devuyst *et al*, 2000) experience of such integration within SEA practice remains very limited.

### Is SEA an upstream project-based EIA?

Clearly, grafting SEA on to existing PPP formulation procedures will not be achieved by attempting to translate existing project-based EIA legislation, procedures and format, upstream. Thus, new methodologies and procedural requirements, specifically for SEA, will be required. Nevertheless, there are valuable principles and concepts from project-based EIA that are equally relevant in SEA. These include the consideration of PPP need, alternatives, means to ameliorate adverse impacts, involvement of a range of disciplines in the assessment process, and maximum stakeholder participation.

There is empirical evidence to support this view. In a survey of Australian government agencies (both state and federal) Bailey and Renton (1997) reported a

“distinct rejection by government agencies of [project-based type] EIA of policies ... but they are willing to integrate environmental concerns into their policy formulation procedures, but not by means of a simple extension of EIA to the level of policy.”

### Environmental dimensions in PPP making

With increasing awareness of environmental and sustainability issues at a policy level in government, and the development of environmental management systems (EMS) in government and in industry, there is often at least some consideration of these matters within much existing PPP formulation and decision-making. These may already constitute effective SEA or, more likely, represent elements of SEA. For example, the formulation of integrated catchment management plans, regional environmental plans, urban conservation programmes, amongst others, may have included SEA-like methodologies in their development, even though they may not have been recognised as such.

SEA proponents have to be cautious that introduction of SEA is cognisant of environmental and sustainability considerations already taken into account in any existing PPP development activities. Environmental assessment practitioners developing SEA methodologies must recognise where existing processes include some elements of SEA, supplement them where they are deficient, or provide the complete framework for SEA where none is present.

This tendency for convergence of SEA and other planning methodologies in their consideration of environmental, social and sustainability dimensions is clearly a benefit, but it is also a source of confusion and, more importantly, can lead to the response by PPP proponents that “we are already doing SEA but just not calling it that”. Wiseman (2000) reports this reaction from planners in South Africa. In our experience, this is often partly true, but SEA when defined as in Figure 1, may provide the framework to bring these techniques together in a more conscious, structured, and comprehensive manner, moving towards a more holistic sustainability analysis.

Even where existing techniques include an emphasis on the environment, SEA provides an opportunity to broaden this from too narrow a biophysical emphasis in some instances, or too narrow a social emphasis in others. This breadth is particularly appropriate for PPP formulation and decision-making, where environmental costs at one tier could be counterbalanced by benefits at another tier, and where a PPP formulation decision would more appropriately be based on a wide range of social, economic and environmental factors.

### SEA as a PPP formulation tool

Finally, we note that SEA methodology should emphasise the role of SEA as a PPP formulation tool. It is at the stage of PPP formulation, rather than of appraisal of an already formulated PPP (for instance, green paper stage, review, public consultation) that SEA can be most effective. PPPs go through a complex process of evolution during their development, and SEA has a significant role to play in this, as shown in Figure 3.

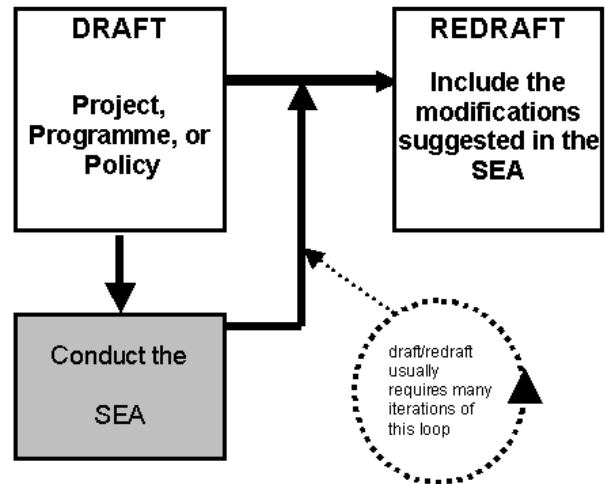


Figure 3. Role of SEA in PPP formulation

Source: Modified from Brown (1997)

SEA should start early in PPP formulation and be integrated, preferably as an active intervention in the PPP design process. The added value of the SEA is likely to be severely diminished if conducted too late in the formulation stage. As Hedou and Bina (1999) note in their description of the SEA of an irrigation plan in Spain, “... the scope of the proposed options [initiated by the SEA] was limited by the advanced stage of the plans’ [the PPP] formulation ...”. Curran et al (1998) note, “... ideally, the [S]EA should be commenced at the beginning of formulation of the development plan and continued as an interactive and influential process throughout the evolution of strategy and policies of the plan”.

Figure 3 shows SEA as a design tool, not as a document. Our view is that the preparation of a report is probably the least important part of the SEA. It should be regarded only as documentation of the processes used, and available, where necessary for later review. The real value in SEA is as a creative tool in the cycle of PPP formulation and reformulation. Bailey and Renton (1997) report, from their study of government agencies in Australia, “... the majority of responding agencies view policy formulation as the most appropriate point in the decision-making process for the consideration of environmental effects ...”.

This value is derived from the involvement of environmental professionals in PPP formulation and increased environmental awareness amongst decision-makers, which leads to PPP modification where necessary to respond to environmental/ sustainability objectives. We cannot overemphasise this principle of SEA as process, not as report.

This role for SEA also requires that the decision-maker be an active participant in the SEA process. Relegation of the conduct of the SEA to consultants external to the PPP formulation process is unlikely to have the same effect on the outcome as extensive involvement by the proponent who holds the key to PPP modification (Brooke, 2000), and the early involvement of the decision-makers themselves.

## Conclusions

SEA has developed out of an understanding by environmental assessment practitioners of the need to upstream EIA concepts. This paper has provided a broad conceptual definition of SEA and a set of issues/principles for the development of SEA methodology. They include that SEA must be seen as an overarching concept and as a family of tools — different SEA methodologies will be required for the environmental assessment of different strategic tasks and for different contexts in which the SEA is prepared. Much more experience of SEA in different contexts is required to start to sketch the bounds of this family, but it is most unlikely that it will include the wholesale application of project-based EIA techniques and administrative systems to the strategic level.

Many proponents and decision-makers currently involved in PPPs will not be as accepting as environmental practitioners of the need for, and utility of, SEA. Development of SEA methodologies will have to recognise and accommodate any overlap of SEA with existing PPP processes and be grafted to existing PPP formulation and decision-making procedures.

It is suggested that the emphasis be on process and not on product (the report) and that most effectiveness will be achieved by starting SEA early in PPP formulation. Failure to do so will restrict the potential of SEA to influence PPP outcomes through limiting consideration of alternatives for formulation and implementation, and the role of SEA in environmental education of those currently involved in PPP making.

Environmental assessment practitioners will have to spend considerable time developing an understanding of the PPP formulation and decision-making process. In the same way that Brown and Hill (1995) argued that environmental assessment professionals need to analyse project development and project decision-making processes so that they can design effective and efficient EIAs (they termed this 'decision-scoping'), our conclusion is that environmental assessment practitioners need to analyse existing PPP formulation and decision-making processes for the design of effective and efficient SEA.

There is much need for research in this area of adaptive environmental assessment, including analysis of the stages in PPP formulation to identify the potential for, and appropriate nature of, SEA input to each of these stages. Empirical research into the potential for SEA concepts and methodologies to adapt to different policy, actors, and networks, organisational cultures and decision-making processes, is required.

In the explosion of SEA literature in recent years, much has been written of what must or should be included in the SEA, but very little of the relationship of the SEA to the PPP formulation and decision-making process, and even less on the effectiveness of the SEA on PPP outcomes. This will have to change if SEA is to realise its potential.

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