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Strategic environmental assessment for sustainability: A review of a decade of academic research

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ABSTRACT

This paper examines the strategic environmental assessment (SEA)–sustainability relationship over the past decade, from 2000 to 2010, focusing in particular on the incorporation of sustainability in SEA. A total of 86 papers from the academic literature containing the terms 'sustainability' or 'sustainable development' and 'strategic environmental assessment' were identified and reviewed. Several common themes emerged by which SEA can support sustainability, including providing a framework to support decision making for sustainability; setting sustainability objectives, ensuring the consideration of 'more sustainable' alternatives, and integrating sustainability criteria in PPP development; and promoting sustainability outcomes through tiering and institutional learning. At the same time, our review identified many underlying barriers that challenge SEA for sustainability, including the variable interpretations of the scope of sustainability in SEA; the limited use of assessment criteria directly linked to sustainability objectives; and challenges for decision-makers in operationalizing sustainability in SEA and adapting PPP development decision-making processes to include sustainability issues. To advance SEA for sustainability there is a need to better define the scope of sustainability in SEA; clarify how to operationalize the different approaches to sustainability in SEA, as opposed to simply describing those approaches; provide guidance on how to operationalize broad sustainability goals through assessment criteria in SEA; and understand better how to facilitate institutional learning regarding sustainability through SEA application.

1. Introduction

Strategic environmental assessment (SEA) is argued to provide a sound basis for informed decision making toward sustainability (see Partidario and Clark, 2000; Tetlow and Hanusch, 2012). Presumably, SEA helps ensure that policies, plans and programs (PPPs) are developed in a more environmentally sensitive way; that environmental impacts are taken into account early in PPP decision making; and that individual projects are implemented in a broader sustainability framework (Morrison-Saunders and Therivel, 2006; Noble and Harriman-Gunn, 2009; Therivel, 2010). This is consistent with various international policies and directives that support SEA. In Canada, for example, SEA is formalized under a Cabinet directive to ensure, among other things, that environmental considerations are fully integrated into the analysis of PPPs in order to "make informed decisions in support of sustainable development" (Privy Council Office and the Canadian Environmental Assessment Agency, 2004). The European SEA Directive also identifies SEA as contributing "…to the integration of environmental considerations into the preparation and adoption of plans and programs with a view to promoting sustainable development" (EC, 2001).

The academic literature has similarly promoted SEA's sustainability mandate. According to Fischer (2003, p. 162), "the main rationale for applying SEA is to help create a better environment through informed and sustainable decision making." Arce and Gullón (2000) indicate that sustainability is core to SEA, and both Linacre et al. (2006) and Liou and Yu (2004) argue that SEA adds value to the decision-making process by informing decision makers about the sustainability of strategic actions. In their recent review of the state-of-the-art of SEA, Tetlow and Hanusch (2012, p. 16) describe SEA as having evolved into a "…proactive process of developing sustainable solutions as an integral part of strategic planning activities." However, notwithstanding the recognized potential for SEA to contribute to sustainability (Bond et al., 2012), there is a plethora of views on how this may be accomplished (see D'Auria and Cinneide, 2009; Liou et al., 2006; Noble, 2002; Partidario, 2000).

There have been several reviews of SEA over the past decade including recent reflections on the state-of-the-art of SEA (see Tetlow and Hanusch, 2012), the need for SEA (see Bina, 2007), and the emergence of sustainability assessment (see Bond et al., 2012). There has been much less critical review of *how* SEA supports sustainability and the potential tensions between SEA and sustainability. In this paper we examine the SEA–sustainability relationship based on the

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past decade of academic research on the subject. The purpose of this paper is to identify and critically examine what the academic literature reports as to *how* SEA, as an assessment tool or process, can or should support sustainability in PPP development, assessment and decision making. Such a review is timely. It follows the 10-year anniversary of the European SEA Directive and precedes the start of what may be a new era in Canadian environmental assessment, marked by increasing demands on SEA to offset regulatory reforms to streamline project environmental impact assessments (see Gibson, 2012). In the sections that follow we first describe our approach to the review, followed by author perspectives on SEA as a means to support sustainability. A number of observations are then ventured concerning the state-of-the-art of SEA *for* sustainability and directions for future research.

2. Methods

The focus of this review was the academic literature between 2000 and 2010. This is a decade marked by unprecedented growth in the adoption of SEA systems internationally (see Tetlow and Hanusch, 2012). It was also a decade characterized by much debate about the rationale for SEA (see Bina, 2007), criticism about SEA's ability to ensure sustainability (see Noble, 2002), and considerable discussion about the role of SEA alongside emerging interests in sustainability assessment (e.g., Govender et al., 2006; Morrison-Saunders and Fischer, 2006; Morrison-Saunders and Therivel, 2006).

This review is based on a select set of literature in impact assessment, namely *Environmental Impact Assessment Review*, *Impact Assessment and Project Appraisal* and the *Journal of Environmental Assessment and Policy Management*. The review was limited to these three journals as their primary focus is on impact assessment and, arguably, contain the largest volume of peer reviewed published research on the subject from leading scholars in the field. We acknowledge that these are not the only sources of peer reviewed research on SEA and sustainability, and that the scope of the journals reviewed does have bearing on the themes emerging from our analysis.

All journal volumes and issues published between 2000 and 2010 were searched using an online search engine database, Engineering Village 2 (EI Engineering Village Compendex and Inspec). The search targeted the key terms 'sustainability' or 'sustainable development', as well as the term 'strategic environmental assessment' appearing in the title, abstract or keywords. A total of 86 papers were identified. Selected book chapters published during the same period were also used for supplemental or background information, including Therivel (2010), Dalal-Clayton and Sadler (2005), and Noble and Harriman-Gunn (2009). These chapters were chosen as reference material due to their focus on SEA definitions and principles as well as their collective, comprehensive overview of SEA development, processes and methodologies.

All papers were imported in their entirety, organized, coded thematically and analyzed with the assistance of QSR NVivo© v.9, a software program designed to classify and manage qualitative information. We adopted a 'coding-up' process (see Lockyear, 2004) whereby an initial review of each paper was undertaken to identify the key terms, and concepts that were being discussed in relation to SEA process and sustainability; for example, concepts such as flexibility, sustainability principles, and alternative assessment. Over a series of iterations similar terms and concepts were then grouped and regrouped into larger concepts (see Corbin and Strauss, 2008), from which we identified nine broad themes addressing how SEA, procedurally, is a means to support sustainability and the different types of sustainability that SEA supports. Each of these themes is discussed in the sections that follow. We acknowledge that the results that follow are not the *only* themes identified in the literature and are not comprehensive of all authors or views on the subject — for example, there are broader issues, such as power relations, that are important to the SEA–sustainability relationship. Our approach to framing the issue was based on SEA as a process and, based on our review and the sample of literature, we suggest that these themes capture those lines of argumentation that appear most dominant in terms of SEA for sustainability.

3. Perspectives on SEA as a means to support sustainability

Several dominant lines of argumentation emerged from the review as to how SEA supports sustainability in PPP development and decision making. The majority of these were methodological in nature, based on SEA process, while others were more implicit and based on institutional change and learning resulting from SEA application. Each of these is reported briefly below. The views presented are not mutually exclusive.

3.1. Providing a decision support framework for sustainability

First, several authors identify the 'decision support framework' of SEA and its ability to employ a range of assessment tools as core to its ability to facilitate the assessment of, and decisions based on, sustainability (see Balfors et al., 2005; Browne and Ryan 2011; Harriman-Gunn and Noble, 2009; Kuo et al., 2005; Noble, 2009). As noted by Sheate (2009), sustainability is an underlying objective of all environmental assessment tools. Partidario (2000)maintains that "the value of SEA is a function of the extent it influences, and adds value, to decision making" (p. 647), and that SEA, conceptualized as a framework defined by a set of core elements, can "help achieve sustainable development by changing the way decisions are made" (p. 647). Noble (2002) similarly identifies the importance of the SEA decision support framework, stating that "the effectiveness of SEA in achieving sustainability objectives will only be realized when a structured and systematic methodological assessment framework is adopted" (p. 14). Noble (2009) goes on to note that a well-defined framework for SEA is one of the most important attributes necessary to ensure SEA's ability to contribute to sustainability. This is consistent with the views of others, such as Therivel (2010) and Fischer (2003), who suggest that SEA, as a structured framework, can readily support sustainable development goals and objectives by, among other things, incorporating sustainability considerations directly into impact assessment tools and decision making processes.

3.2. Being adaptive to the decision making process

Notwithstanding the recognized importance of the decision support structure provided by SEA, the literature also emphasized the adaptive nature of SEA as core to its ability to support sustainability (e.g. Nilsson and Dalkmann, 2001; Partidario et al., 2008; Retief, 2007a). Partidario et al. (2008), for example, note that SEA can be viewed as "a framework of activities" and this enables SEA "to become flexible, diversified and tailor-made to the decision-making processes" (p. 219). In this regard, Nilsson and Dalkmann (2001) note that SEA must also be "sensitive to the real characteristics of the decision making context" (p. 305) and, in doing so, it can "adapt to the way in which sustainability considerations are dealt with in the process" (p. 322). Retief (2007a) explains that "the evolution of SEA debates has shifted in its views of the SEA process as a formal process…to a much more flexible and adaptable approach" (p. 85). Eggenberger and Partidario (2000) suggest that "SEA…can play a significant role in enhancing the integration of sustainability concerns in policy and planning processes" and that in doing so SEA is adaptive to context; it can be "approached through highly structured and rationalized processes; highly regulated; or result more simply from providing principles and informal procedures and changes in the decision-making process (p. 202)".

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