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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.

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## 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)".

### 3.3. Incorporating sustainability objectives and principles

Third, several authors reported the opportunity SEA presents to adopt sustainability objectives and principles in the PPP decision making process (e.g. Pope et al., 2004; Stinchcombe and Gibson, 2001). Rossouw et al. (2000), for example, report that “the aim of SEA is to deliver the information necessary at the right time to integrate the concept of sustainability into decision-making” (p. 219). They go on to explain that “SEA interacts consistently with the plan and program procedure in an iterative way, to integrate sustainability into decision-making and introduces sustainability goals at the earliest stage in the plan and program process, from conceptualization through to the many stages of decision-making” (p. 220). Pope et al. (2004) similarly indicate that the use of sustainability objectives in SEA helps decision-makers and policy makers “decide what actions they should take and should not take in an attempt to make society more sustainable” (p. 596) and Stinchcombe and Gibson (2001) state that SEA “facilitates establishment of a more comprehensive overall system of sustainability application at all levels, from the setting of decision objectives to the monitoring of implementation effects” (p.357).

### 3.4. Considering relevant sustainability issues early on

Closely related to the above was the notion that SEA allows for the consideration of sustainability issues early on, at the time of PPP formulation (e.g. D’Auria and Cinneide, 2009; Liou et al., 2006; Partidario et al., 2008). Arce and Gullón (2000, p. 394), for example, argue that “the contribution of SEA towards sustainability stems from [the fact that]...SEA ensures the consideration of environmental issues from the beginning of the decision-making process...and can detect potential environmental impacts at an early stage, even before the projects are designed.” Liou et al. (2006) also emphasize, as a defining feature of SEA, that the environmental, social and economic impacts of proposed PPPs can be identified at an early stage of the decision-making process. Buckley (2000) similarly indicates that one of SEA’s principal aims, within the context of sustainability, is “to encourage consideration of environmental factors at an early stage in planning and policy formulation” (p. 214), and D’Auria and Cinneide (2009) also note that SEA “seeks to ensure that all environmental parameters and issues are integrated, appropriately addressed, and incorporated into the planning system at the earliest appropriate stage of the decision-making process” (p. 309). Arts and Van Lamoen (2005) similarly maintain that SEA is “important for a careful integrated consideration of environmental, economic and social issues before defining the scope of planning developments (p. 75). Partidario et al. (2008) go a step further, identifying SEA as “an instrument to enable integration of environmental and sustainable development issues into early stages of development policy and planning, to help design and assess preferred strategic options” (p. 219). They describe SEA as a “process that offers the capacity to enable the inclusion and integration of environmental and sustainability issues right from the early stages of the preparation of a strategic concept, and throughout the design and implementation stages of subsequent policy, planning or program development actions” (p. 219).

### 3.5. Adopting sustainability criteria

A sixth theme that emerged was the inclusion of assessment criteria in SEA against which the sustainability of PPPs are assessed (see Croal et al., 2010; Desmond, 2009; Pope et al., 2004). Obbard et al. (2002), for example, state that SEA “can be viewed as an integrated system of planning instruments in which sustainability criteria are integrated into the planning process” (p. 289). Kuo et al. (2005) contend that “indicators of sustainability are increasingly viewed as quite instrumental in the process of giving a certain dimension to

sustainability” (p. 265), and Pope et al. (2004) note that “environmental assessment processes...are among the most promising venues for application of sustainability-based criteria” (p. 598). In this regard, SEA has often been promoted as a means to determine the effects or contributions of a PPP based on sustainability criteria and indicators. Marsden (2002) argues that SEA can play a role toward sustainability if “simple (and) pragmatic indicators are used that can assist monitoring of the decisions to determine the actual effects” (p.37). Both Marsden (2002) and Partidario (2000) suggest that sustainability issues can be used as benchmarks against which objectives and criteria for SEA can be evaluated, and Briffet et al. (2003) indicate that it is vital to “identify environment and sustainability benchmarks by which the effects of a PPP can be tested” (p.176). Further, in developing their decision-maker’s tools for sustainability-centered SEA, Croal et al. (2010) indicate that sustainability-based criteria can “also function as evaluation criteria in the SEA process for judging the significance of impacts, alternatives, possible enhancement or mitigation measures and for designing follow-up requirements” (p. 13). By using sustainability decision criteria, “all policy and development objectives are considered together and trade-offs are addressed directly such that best options and not just acceptable options are achieved” (Desmond, 2009, p.57).

### 3.6. Identifying and evaluating ‘more sustainable’ alternatives

The identification and evaluation of alternatives in SEA were frequently identified as a defining feature of its ability to identify ‘more sustainable’ PPP options. In his 2007 study of SEA in South Africa, for example, Retief (2007a) states that “SEA is set within the context of alternative scenarios” (p. 87) and that SEA “facilitates identification of development options and alternative proposals that are more sustainable” (p. 86). Desmond (2009) similarly purports that “the formulation of alternatives is a core activity in the achievement of sustainable development” (2009, p. 52) and that “SEA seeks to inform the decision maker of... the range of plan or program alternatives available” (p. 51). The identification and evaluation of reasonable alternatives are identified by many authors as simply ‘best-practice’ SEA (see Noble and Harriman-Gunn, 2009; Partidario, 2000; Therivel, 2010). Therivel (2010), for example, states that the identification and comparison of alternatives “helps to ensure that the strategic action is as good as possible, including as sustainable as possible” (p. 43). In an international review of SEA, Marsden (2002) similarly noted that “it is believed... that SEA can play a role toward sustainability if...credible and feasible alternatives (are considered) that allow evaluation of a decision” (p. 37). Morrison-Saunders and Therivel (2006, p. 289) indicate that it is easier and more appropriate to develop alternatives at higher PPP decision-making levels, thus allowing for “significant sustainability gains (and avoidance of significant sustainability losses).”

### 3.7. Trickle-down sustainability

There was a consistent message in the literature that SEA can provide a ‘trickle down’ of sustainability (see Partidario, 2000; Sinclair et al., 2009; Therivel, 2010), thereby supporting more sustainable decisions from the level of PPPs to the individual development project (Kirchhoff et al., 2010; Noble and Harriman-Gunn, 2009; Retief et al., 2008) and ensuring that decisions are made in a broader sustainability context. Stinchcombe and Gibson (2001), for example, maintain that “one of the chief attractions of SEA as a tool for promoting sustainability is its potential for incorporating sustainability principles at the policy level, from which it can ‘trickle’ down through plans and programs, ultimately to projects and other specific activities” (p. 355). In their study of SEA processes in Ontario, Canada, Kirchhoff et al. (2010) determined that “SEA is intended to occur at a stage in the process and a scale that can provide guidance to



subsequent, lower-tier strategic undertakings as well as overall project planning” (p. 337). Similarly, in their study of the application of SEA to land use and resource management plans in New Zealand and Scotland, Jackson and Dixon (2006, p. 92) indicate that SEA can be seen as “an integral part of the assessment of individual projects for their sustainability implications” and that the assessment of projects is, ideally, “the end-product of a strategic overview of policy formulation that embraces sustainability.” Noble (2002, p. 10) goes a step further and argues that SEA, as a tiered-forward planning process, “allows sustainability objectives to be trickled down from the policy level and that higher level SEAs of policies will set the context for plan, program and project development”.

### 3.8. Capturing large scale and cumulative effects

It was also well argued that cumulative effects are best addressed at the strategic tier (e.g. Alshuwaikhat, 2005; Cooper and Sheate, 2004; Rossouw et al., 2000) and, in so doing, SEA can ensure the sustainability of ecological systems and landscapes by managing, if not avoiding cumulative effects at their source (Alshuwaikhat, 2005; Harriman-Gunn and Noble, 2009; Treweek et al., 2005). Stinchcombe and Gibson (2001) suggest that one of the advantages of SEA for sustainability is that it “facilitates proper attention to cumulative effects” (p. 343). Harriman-Gunn and Noble (2009) similarly maintain that SEA provides an opportunity to identify issues trends that may be “of regional relevance and cumulatively significant” (p. 285). They go on to state that SEA, particularly when applied at the regional scale, provides the “most appropriate framework within which to address cumulative effect issues, if the primary goal is to influence the nature and pace of development in support of regional sustainable development goals” (p. 287).

### 3.9. Enabling institutional change and transformational learning

Finally, but perhaps most subtly, several authors argued that SEA enables institutional change and transformative learning in support of sustainability. Sheate and Partidario (2010), Therivel (2010), and Runhaar and Driessen (2007), for example, argue that SEA supports decision makers' awareness and understanding of environmental and sustainability issues, enhances understanding of PPP issues and sustainability impacts and can change values and attitudes toward the environment. Therivel and Minas (2002) add that “...even when the strategic action remains unchanged after the SEA, the SEA may still be useful because it...may provide a better understanding of sustainability or the environment...” (p. 82). This is consistent with D'Auria and Cinneide's (2009) review of SEA in Ireland, who found that SEA “led to a considerably enhanced awareness, understanding and appreciation of local environmental issues” and that stakeholders “...arrived at a broad consensus regarding the need to be vigilant with respect to the protection of critical elements of the local environment, which is increasingly perceived by all concerned as underpinning the town's sustainable development” (p. 318). Based on study of a community based SEA in Costa Rica, Sinclair et al. (2009) similarly note that SEA can accrue many benefits, including “...social learning outcomes, and facilitating a transition towards sustainability” (p. 155).

## 4. Discussion

The past decade of academic literature suggests that the SEA process has the potential to contribute to the development of more sustainable PPPs, and in various ways. However, some of the literature reviewed suggested that SEA has been less than successful in terms of delivering on this sustainability mandate (e.g., Gibson, 2006; Liou et al., 2006; Noble, 2009). Based on our analysis of the literature, in the sections that follow we identify what we believe to be a number of persistent challenges to SEA for sustainability, and venture observations and recommendations for advancing SEA in a sustainability context.

### 4.1. The meaning and scope of environment and sustainability in SEA

First, what sustainability means within the context of SEA is still not well understood (see Bina, 2007; Noble, 2002; Tetlow and Hanusch, 2012; Thissen, 2000). Various SEA regulations and directives have now been implemented internationally, many with sustainability or sustainable development as a guiding principle, but the scope of sustainability in SEA is often not well defined. This is due, in part, to the variable interpretations of sustainability and ‘environment’ within both SEA guidance and the academic literature. Section 2.1.1 of the SEA Directive also indicates that by addressing potential environmental considerations of PPP proposals, departments and agencies will be better able to, among other things, implement sustainable development strategies. This implies that SEA is seen as having the potential to make a positive contribution to sustainability; both environmental and socioeconomic (see Noble, 2002). Across Canada, however, the scope of environment is more or less ambitiously defined under provincial and territorial environmental assessment legislation. In the European Union, the term ‘environment’ is used to refer to the biophysical aspects of the environment (EC, 2001). As a result, among practitioners and decision-makers globally, there are varying ideas about the scope of environment in SEA, and thus sustainability.

There is also much discussion regarding the scope of sustainability in SEA. Emerging based on the concept of environmental sustainability, with the specific purpose of ensuring that environmental considerations are taken into account in decision-making processes, several authors argue that SEA should focus primarily on environmental (ecological) sustainability. Several reasons are often suggested, including that economic and social impacts are often considered the most important factors and override environmental ones, as well as that focusing on the sustainability of environmental systems raises environmental awareness, strengthens environmental management and more clearly illustrates the potential environmental impacts of a PPP (Briffet et al., 2003; Morrison-Saunders and Fischer, 2006; Morrison-Saunders and Therivel, 2006; Smith and Sheate, 2001; Treweek et al., 2005). On the other hand, a number of authors suggest that in order to add value to PPP decision-making the assessment process must take into account all aspects of sustainability, including social, environmental and economic factors (Alshuwaikhat, 2005; Croal et al., 2010; Gibson, 2006; Morrison-Saunders and Fischer, 2006; Partidario, 2000; Rossouw et al., 2000; Stinchcombe and Gibson, 2001). The reasons posed are two-fold: first, in recognition that trade-offs among factors is how real-world decisions are made; and, second, so as not to undermine the environment in or have it excluded from the decision-making process (Morrison-Saunders and Fischer, 2006).

This paper does not argue one perspective on the scope of sustainability over the other. Rather, it argues that the meaning and scope of both ‘environment’ and thus ‘sustainability’ need to first be explicitly defined and agreed upon within each SEA application. Not to do so, which we found common in our review, may be sending mixed, or inconsistent messages to the practitioner and decision-maker communities and cause challenges in communicating sustainability in SEA among the academic community (see Noble et al., 2012).

### 4.2. Approaches to sustainability

Second, authors also seem to be referring to different approaches to sustainability and often without explicit acknowledgement. The ‘objectives-led’ approach, for example, “reflects a desire to achieve defined social, economic and environmental objectives by assessing the extent to which the implementation of a proposal contributes to these objectives when compared with baseline conditions” (Pope et al., 2005, p. 297). Pope et al. characterize the ‘impact based’ approach as identifying the environmental, social and economic impacts of a proposal and comparing them with the baseline condition to “ensure that impacts are not unacceptably negative overall and therefore

prevent things from becoming less sustainable when compared with the baseline” (p. 296). The ‘principles-based’ approach to sustainability in SEA tends to align more with sustainability assessment literature (see Bond et al., 2012; Gibson, 2006; Morrison-Saunders and Fischer, 2006); rather than focusing on separate environmental, social and economic aspects, ‘bigger picture’ sustainability principles are used as the driving consideration in the SEA process.

The sustainability approach adopted at the outset of an SEA is of significant importance as it sets the context for the SEA process and defines the types of objectives and criteria that are likely to be used in the SEA and thus influence the decision taken (see Pope et al., 2004). While, it is ‘nice to know’ the range of approaches to sustainability in SEA, the myriad of approaches may be creating uncertainty regarding how to approach SEA for sustainability. Research and guidance are needed that not only describes the different approaches to sustainability, but that illustrates how to appropriately choose the approach that is most appropriate for the planning context and decision-making situation at hand.

#### 4.3. Operationalizing sustainability: from principles to practice

Third, it is suggested that the use of ‘sustainability’ in SEA practice often posits little of substance. Many decision-makers and SEA applications adopt the language of sustainability and use ‘sustainability’ or ‘sustainable development’ as an overarching and guiding principle, but do not integrate sustainability into PPP assessment, development and implementation. It could be argued (see Sheate, 2009) that sustainability is implicit in all assessment tools; however, others (see Gibson, 2006) would argue that sustainability in SEA requires adopting and operationalizing explicit sustainability principles and criteria. Part of the challenge, however, is that sustainability is often mentioned as an overall principle in SEA reports (see OEER, 2008; OPA, 2007; PSCW, 2007) but the concept is not integrated beyond that initial statement to inform assessment and decision-making; likely because sustainability is a concept that is difficult to operationalize (Brunner and Starkl, 2004), or perhaps a concept that is simply not treated as having practical application beyond an overarching principle. Many authors agree that SEA can support sustainability by integrating the concept throughout the decision-making process from principles to practice (Partidario et al., 2008; Rossouw et al., 2000; Stinchcombe and Gibson, 2001); however, it appears that practitioners and decision-makers may not understand how to apply sustainability to the SEA process (Retief, 2007b) and struggle in advancing sustainability from broad principles to specific criteria for practice. Part of the reason may be attributed to the labeling of broad sustainability ‘principles’ as ‘criteria’ (e.g. Gibson et al., 2005), and the need to provide a clearer understanding of the relationship between sustainability principles, criteria and indicators in SEA (see Hacking and Guthrie, 2006). Although nobody is likely to disagree with sustainability as a guiding principle for SEA, it serves little merit in the absence of criteria that can be operationalized and practical guidance on how to do so.

#### 4.4. Flexibility and structure

Fourth, the debate regarding structure versus flexibility in SEA is creating uncertainty and confusion regarding the ‘best’ type of SEA framework to support of sustainability. Many authors promote the structured decision support framework of SEA as core to sustainability integration in PPP assessment (Brown and Ryan, 2010; Harriman-Gunn and Noble, 2009); others emphasize flexibility and being adaptive to context (Nilsson and Dalkmann, 2001; Partidario et al., 2008). On the surface, these two concepts may seem contradictory, perhaps stifling sustainability integration in practice.

Sustainability is sometimes viewed as a ‘fuzzy concept’ (Abouelnaga et al., 2010; Phillis and Andriantiatsaholiniaina, 2001). This does not mean that SEA needs to be fuzzy or necessarily ‘soft’ in approach; however, neither does it mean that SEA need be highly structured and

quantitative. In order for SEA to support sustainability, the SEA process must identify the sustainability ramifications of the PPP, suggest changes to make the PPP more sustainable and incorporate those changes in the PPP itself (Therivel and Minas, 2002). Whether a flexible or structured SEA approach is used to accomplish this is of little matter (see Tetlow and Hanusch, 2012). What does matter is that the SEA framework is applied early and effectively and that sustainability principles and criteria are integrated throughout the process. This requires decision-makers and SEA practitioners to cooperate and decide upon an SEA approach that is appropriate to the institutional culture within the organization, including the level of willingness to learn about sustainability issues, adapt current decision-making processes and move beyond simply meeting legislative requirements for SEA. Thus, as a minimum requirement, guidance is needed that adequately describes both structured and flexible SEA approaches and how each can effectively operationalize sustainability from principles to practice. In their review of methods and guidance for SEA, Noble et al. (2012) argue that more attention needs to be given to practical guidance on how to operationalize SEA, versus principles-based guidance focused on generic processes and compliance with directives, such that practitioners are able to make informed choices about the best SEA design set of supporting methods to facilitate sustainability integration.

#### 4.5. Institutional change and learning for sustainability

Finally, regardless of the above, achieving sustainability through SEA is often constrained due to the lack of institutional willingness to change. According to Bochman and Kroth (2010, p. 329), “organizational learning hinges on an organization’s willingness to change and adapt” and is most often brought about by crisis or major failure. However, it appears that institutional constraints are deeply rooted in a number of factors, including an inability or lack of willingness to examine past failures in decision-making and decision-makers themselves are sometimes unwilling to tackle complex sustainability issues through SEA. For example, decision-makers are sometimes constrained to focusing primarily on satisfying regulatory obligations (Tetlow and Hanusch, 2012), or restricted by higher level policies that prevent them from effective application of sustainability in SEA (see OPA, 2007). Institutional change and learning in organizations are also slow processes (Jha-Thakur et al., 2009). There is often a lengthy time period required to realize the influence of an assessment process for decision on actual environmental outcomes, thus organizations may not see the value of making changes to decision-making practices in the short term (Tetlow and Hanusch, 2012). And, institutional resistance to the consideration of other, sometimes competing priorities can be significant. This is particularly the case when the application of sustainability in SEA, as opposed to its adoption as an overarching principle, may be incompatible with political objectives in PPP development, especially during times of national, regional or local economic recession.

Institutional arrangements, and specifically how organizations learn through SEA, are important to the success of SEA as a tool for sustainability. We agree with Slootweg and Jones (2011) in that more emphasis is needed in SEA research on governance and institutions and ways of “learning our way into sustainable futures, rather than planning our way” (p. 269). Specifically, considerably more attention needs to be placed on institutional learning and change through SEA application, and exploring how to facilitate this learning within organizations.

## 5. Conclusion

This paper set out to identify and 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. The ‘value add’ of SEA for sustainability, which many

authors believe is the ultimate measure of the effectiveness of SEA (Noble, 2002; Partidario, 2000; Therivel, 2010), includes a number of elements, including adding structure and flexibility, allowing for early adoption of sustainability principles and identification of sustainability issues, promoting development and consideration of more sustainable alternatives, delineating and applying impact assessment criteria, allowing for trickle down of sustainability principles and promoting transformational learning regarding sustainability. However, potential is not practice and one might wonder why, with so much potential for SEA, there is not more widespread evidence of it achieving sustainability outcomes. Many barriers still exist that challenge SEA for sustainability including variable interpretations of the scope of sustainability in SEA, the limited adoption of assessment criteria in SEA that are directly linked to broader sustainability principles, and the challenges for decision-makers in adapting PPP development decision-making processes to include sustainability issues. The nature of academic work on the matter may also be stifling progress. Rather than simply adopt and build on current framings of sustainability principles, which, in our view, seem to have contributed only modestly to SEA practice, we argue the need to challenge such framings or, at a minimum, focus on how to better operationalize the principles.

Arguably, however, many of these issues are not unique to SEA, and will not be resolved simply by abandoning SEA in support of sustainability assessment or other tools. But, in order to advance SEA for sustainability, there is a need for 1) detailing the nature and scope of sustainability and elucidating the purpose of SEA in a variety of decision-making contexts; 2) describing how to select and operationalize the different approaches to sustainability in SEA frameworks; 3) guiding the adoption of sustainability objectives and the development of assessment criteria linked to sustainability goals; and 4) placing much more attention on how to facilitate institutional learning regarding sustainability through SEA application.

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