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## Evaluating the substantive effectiveness of SEA: Towards a better understanding

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## ABSTRACT

Evaluating the substantive effectiveness of strategic environmental assessment (SEA) is vital in order to know to what extent the tool fulfills its purposes and produces expected results. However, the studies that have evaluated the substantive effectiveness of SEA produce varying outcomes as regards the tool's contribution to decision-making and have used a variety of approaches to appraise its effectiveness. The aim of this article is to discuss the theoretical concept of SEA substantive effectiveness and to present a new approach that can be applied for evaluation studies. The SEA effectiveness evaluation framework that will be presented is composed of concepts of, and approaches to, SEA effectiveness derived from SEA literature and planning theory. Lessons for evaluation can be learned from planning theory in particular, given its long history of analyzing and understanding how sources of information and decisions affect (subsequent) decision-making. Key concepts of this new approach are 'conformance' and 'performance'. In addition, this article presents a systematic overview of process and context factors that can explain SEA effectiveness, derived from SEA literature. To illustrate the practical value of our framework for the assessment and understanding of substantive effectiveness of SEA, three Dutch SEA case studies are examined. The case studies have confirmed the usefulness of the SEA effectiveness assessment framework. The framework proved helpful in order to describe the cumulative influence of the three SEAs on decision-making and the ultimate plan.

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## 1. Introduction

This paper addresses the concept of 'effectiveness' in the field of Strategic Environmental Assessment (SEA). An environmental assessment of strategic plans, programs, or policies constitutes an analysis of the environmental implications of the respective policy proposals and their realistic alternatives. It is hoped that the assessment of the environmental effects of strategic decisions will increase the "integration of environmental considerations in all relevant policy fields in order to effectively contribute to environmental protection and sustainable development" (Stoeglehner, 2010: 217). The expectations of SEA's contribution to environmental protection and sustainable development are high. Yet, while SEA has been practised for almost two decades, there remains ambiguity regarding the instrument's impact. Despite the importance of evaluating the effectiveness of SEA, the outcomes of evaluation studies vary with respect to the influence that SEA has on decision-making (see Runhaar and Driessen, 2007) and therefore more empirical data regarding this question are required (Partidário and Fischer, 2004; Retief, 2007a; Sheate et al., 2001; Stoeglehner et al., 2009).

SEA evaluation studies often make a distinction between *substantive* and *procedural* effectiveness. The majority of EA evaluation studies have overwhelmingly focused on procedural effectiveness (Cashmore et al.,

2004). When the procedural effectiveness of SEA is assessed, one evaluates whether the SEA is undertaken in line with established procedures and criteria (Cashmore et al., 2004; Sadler, 1996). Yet, while the evaluation of procedural effectiveness can provide insights into the quality of the SEA report and process, it does not contribute to an understanding of the influence of the tool, and accordingly its success in contributing to environmentally friendly planning and decisions remains elusive. In order to gain insights into the extent to which SEA is able to accomplish its purposes and produce expected results, one must evaluate substantive effectiveness. There does not appear to be an agreement on the theoretical concept of substantive SEA effectiveness, however, it is reflected in a wide variety of approaches to measure the influence of the instrument in evaluation studies. Evaluations of substantive effectiveness have covered diverse topics, including the assessment of environment- or sustainability-related changes in the plan as a result of the SEA (Retief, 2006; Thérivel and Minas, 2002), changes in the environment as a result of the SEA (Retief, 2006), modifications in the knowledge base of decision-makers regarding the environmental implications of the decision and other forms of 'learning' (De Jong et al., 2012), and the extent to which environmental issues were considered during decision-making processes (Morrison-Saunders and Arts, 2004; Retief, 2006; ten Heuvelhof and Nauta, 1997; Thérivel and Minas, 2002).

The aim of this article is to present a new and more comprehensive approach to the evaluation of substantive effectiveness of SEA, building on previous studies. The SEA effectiveness evaluation framework that

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will be presented is composed from concepts of, and approaches to, SEA effectiveness derived from SEA literature and planning theory. Planning theory has a longer history of analyzing and understanding how information and decisions affect subsequent decisions. Taking these insights into account allows for a richer understanding of SEA effectiveness, which suits the multiplicity of understandings of this concept.

The second issue that this article addresses relates to explanations for SEA effectiveness. Understanding why and how an SEA is effective is crucial for the further development and success of the tool. The search for factors important for SEA effectiveness is an important theme within SEA literature (see Arbter, 2003; Aschemann, 2004; Dalal-Clayton and Sadler, 2008; Fischer and Gazzola, 2006; Hildén et al., 2004; MEGJ/MIRI, 2003; Partidário, 1999; Retief, 2006; Runhaar, 2009; Runhaar and Driessen, 2007; Runhaar and van Nieuwaal, 2010; Sadler and Verheem, 1996; Sheate et al., 2001; Ten Heuvelhof and Nauta, 1996; Théritel and Minas, 2002). Nevertheless, more must be learned about the factors that contribute to SEA effectiveness (Runhaar and Driessen, 2007). When looking for explanations for SEA effectiveness, two aspects require attention. First, it is deemed relevant to examine how, and to what extent 'best practice' factors, relating to the assessment procedure and the report, influence SEA effectiveness. Second, when examining this issue attention should also be paid to the context in which SEA operates (Retief, 2007b). Given that every plan or program for which an SEA is conducted is different (e.g., deals with a distinctive problem and operates within a different decision-making culture), various scholars have emphasized that when analyzing the implementation and success of the tool one must be aware of the context in which SEA operates (see Fischer, 2003, 2005; Hilding-Rydevik and Bjarnadóttir, 2007; Kørnø and Thissen, 2000; Runhaar and Driessen, 2007; Wallington et al., 2007). It is helpful to know if the context in which SEA operates can have a discriminating function regarding the factors important for its actual and potential effectiveness. Such insights can inform the approach chosen for a specific SEA. An analysis of context also allows SEA practitioners to have realistic expectations with respect to the effectiveness of the SEA (Hilding-Rydevik and Bjarnadóttir, 2007; Runhaar and Driessen, 2007).

The following section will elaborate on the notion of SEA effectiveness and will present a new framework for assessing the substantive effectiveness of SEA. In addition, explanations for SEA effectiveness are examined. Based on a review of literature, an overview of factors considered to contribute to SEA effectiveness will be presented. Building upon the framework by Runhaar and Driessen (2007), attention will be devoted to the influence of context on the effectiveness of SEA and on the factors contributing to effectiveness. In Section 3 the utility of the framework for the assessment of SEA effectiveness will be illustrated by applying it in the analysis of three SEAs conducted in the Netherlands. In addition, the three cases allow for a first, tentative, verification of the explanatory power of the framework. Finally, the main conclusions will be summarized and reflected upon in Sections 4 and 5.

## 2. SEA effectiveness: an overview of concepts and approaches

### 2.1. SEA effectiveness in EA literature

Substantive SEA effectiveness is defined as the extent to which SEA accomplishes its purposes or produces expected results. SEA effectiveness thus depends on the purposes and expected results defined for the instrument. It is recognized by the authors that actors can have different views and expectations of SEA due to, among others, their professional background (Morgan et al., 2012). Because plural interpretations of effectiveness exist, the notion of 'SEA effectiveness' is a relative concept (Bond et al., 2011; Cashmore et al., 2010; Sadler, 2004). Accordingly, it is important to define what 'SEA effectiveness' encapsulates in this article. Based on an analysis of SEA legislation and literature, the following direct objectives of SEA

have been identified for the purposes of this study: supporting an informed decision-making and contributing to protection of the environment. Consequently, SEA effectiveness relates to the influence of a single SEA on decision-making and, ultimately, the environment. Other important effects of SEA, such as the gradual institutionalization of environmental values into political decision-making processes, increasing environmental awareness, and long-term learning processes (see Wallington et al., 2007) are not the focus of this research.

#### 2.1.1. Support an informed decision-making process

The first and immediate purpose of SEA is to improve informed decision-making by means of providing information about the environmental implications of the proposed action and its alternatives. The intention is that environmental considerations should be fully represented and taken into account during the decision-making process as a result of the environmental information (see Runhaar et al., in press). Planning is an iterative process during which the content of the plan is continuously altered. Decision-makers, together with stakeholders and environmental experts, may use the environmental data to develop, review, and discuss policy options that meet decision-makers' goals and that are environmentally friendly. The environmental information can also be explicitly used as a reference during deliberations and discussions between decision-makers, stakeholders, and the public in order to identify interests related to the plan and assess their environmental effects. SEA thus has the potential to facilitate a communicative process in which aspects of values, power, and interests are addressed (see Stoeglehner, 2010). Although this form of effectiveness has procedural as well as substantive aspects to it, here we are mainly interested in the latter (i.e. the extent to which the policy debate's content has been influenced by SEA).

#### 2.1.2. Contributing to protection of the environment

SEA is not merely a tool that can facilitate an informed decision-making process and dialogue; it also has explicit environmental objectives (Bina, 2008; Jesse, 2008). This is for instance reflected in the EU SEA Directive (2001/42/EC), which states:

*The objective of this Directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment.*

In her study, Jesse (2008) shows that this objective is also found in many other international documents and legal instruments related to EA (EIA and SEA).<sup>1</sup> The EIA principles of best practice of the International Association for Impact Assessment (IAIA) (1999) also reflect this objective; principle two namely states that the goal of EIA is to "anticipate and avoid, minimize, or offset the adverse significant biophysical, social, and other relevant effects of development proposals" (IAIA, 1999).

In literature two mechanisms have been described through which SEA can contribute to the environmental performance of policies, programs and plans: 'prevention', meaning that initiatives from the outset are designed to be more environmentally friendly, in anticipation of the SEA, and 'correction', meaning adjusting decisions on the basis of the SEA (Runhaar and Driessen, 2007; Runhaar et al., under review).

<sup>1</sup> The notions of EA in the documents of international organizations such as the UN (Biodiversity Convention), UNEP (principles of EIA), UNECE (Convention of Espoo, Convention of Aarhus, Protocol of Kiev), World Bank, OECD, as well as from private bankers (Equator-principles) all "imply that environmental pollution and other environmental harms should be prevented, or reduced as much as possible" (Jesse, 2008: 439) as a result of EA.

## 2.2. Effectiveness in planning theory

Planning theory has inspired the approach that will be used to assess the effectiveness of SEA. Planning theory has been concerned for a long time with the question of how a particular plan affects subsequent decisions, and ultimately the material reality. This chain of effects compares well with what we discussed above regarding the 'substantive effectiveness of SEA.' The knowledge and lessons learned in planning theory are therefore interesting, to conceptualize and evaluate the influence of an SEA on decisions and their material outcome. After all, like a plan, an SEA constitutes a source of (environmental) information that can guide and influence decision-making processes and outcomes.

In planning theory, two criteria have been proposed in order to evaluate the above form of 'effectiveness': *performance* and *conformance* (see Alexander and Faludi, 1989; Barrett and Fudge, 1981; Faludi, 2000; Mastop and Faludi, 1997). When evaluating the effectiveness of a plan in terms of conformance, one assesses whether "a determinate relationship between intention and outcome" of a plan can be found (Alexander and Faludi, 1989: 189). Mastop and Faludi (1997) distinguish between three different types of conformance effectiveness. First, there is 'formal conformity.' It occurs when policy statements are directly and literally adopted by (lower) governmental levels in their policies, plans, or projects. Second, 'behavioral conformity' occurs when "the recipients behave in accordance with their declared intentions" (Mastop and Faludi, 1997: 825) and thus implies that the decision is implemented as intended. The third, and ultimate, type of conformance is 'final conformity.' When assessing 'final conformity,' one evaluates whether the plan has attained its objectives and this can be looked for in the material reality (see Mastop and Faludi, 1997). In its totality, the three different types of conformance effectiveness constitute a step-wise scale.

However, it has been argued in planning theory that evaluating effectiveness of plans based on the outcome of a planning process is not sufficient to determine their complete contribution (Faludi, 2000). Planning is not only aimed at influencing a decision-making outcome, but also is concerned with coordinating and informing decision-making processes in order to gain a better understanding of problems and their possible solutions. Accordingly, conformance effectiveness does not necessarily reflect a plan's *only* contribution to the decision-making process. It does not provide insights into how the strategic plan has been weighted, taken into account, and whether it helped to clarify the various choices during the decision-making process (see Faludi, 2000).

Thus, to complement 'conformance,' the notion of 'performance' was introduced in order to be able to appraise the complete contribution of a plan to a decision-making process. Performance refers to the fact of whether the plan is "working through" by diffusion into deliberations which follow their adoption" (Mastop and Faludi, 1997: 815). According to the theory by Faludi (2000) and Mastop and Faludi (1997), performance is not only visible in the final (material) outcome of the plan. When applying this perspective, the focal point of the evaluation lies in the influence of the strategic plan on the *whole* decision-making process and in particular the behavior of the actors to whom the strategic plan is addressed (i.e. do they use the plan, when, and how?) (see Mastop and Faludi, 1997). It must be noted that performance can occur both with regard to the planning object itself and during subsequent decision-making, within the policy sector at issue but also within other sectors (Spit and Zoete, 2005).

Herweijer et al. (1990) have identified three stages of performance: acquaintance, consideration, and consent. The first stage of performance effectiveness is 'acquaintance' and means that the decision-makers become acquainted with the content of the plan. Detailed knowledge regarding the content and background of the plan is not required, but the respective actors must understand the content and visions of the plan. The second stage of performance is 'consideration,' which implies that the information provided in the plan must serve as a frame of reference

when the actors make a decision. There are multiple ways in which this can take place. For example, the policy-maker can refer to the plan during (subsequent) decision-making processes. Finally, the last stage of performance, 'consent,' occurs when the actors acknowledge the content of the plan and allow themselves to be influenced by it. When 'consent' is attained, the decision-makers, for example, use a problem definition, vision, or solution in line with the information provided by the plan (Herweijer et al., 1990). Faludi (2000) argues that once the decision-makers have acknowledged the plan, there are two options. On the one hand, it is possible that once the decision-makers have acknowledged the plan they will also conform to it ('formal conformity'). On the other hand, it is also possible that decision-makers are influenced by the plan (Faludi, 2000) but decide not to conform. In the latter situation, there will be a deliberate departure from the plan. Aardema (2002) has demonstrated how the three levels of performance, identified by Herweijer et al. (1990) and the three types of conformance identified by Mastop and Faludi (1997) and Faludi (2000) collectively constitute a step-wise scale of impact that a plan can have (see Fig. 1).

## 2.3. Towards a new approach for the evaluation of the substantive effectiveness of SEA

Combining the levels of conformance and performance as developed in planning theory with the ideas on effectiveness of SEA from impact assessment literature (see Section 2.1), we have developed a series of levels for effectiveness (see Fig. 2). These levels can be used to specify the degree of substantive effectiveness of an SEA.

### 2.3.1. Acquaintance

'Acquaintance' signifies that the decision-makers who write the plan have become familiar with the content of the SEA by means of reading and/or consulting it during the decision-making process (see Faludi, 2000).

### 2.3.2. Consideration

'Consideration' expresses itself in the use of a SEA as a reference during the decision-making process to develop, review, and discuss the plan and plan alternatives (cf. Mastop and Faludi, 1997). SEA allows decision-makers who write the plan to systematically assess its impacts, to identify alternative policy options that can be implemented in order to attain similar policy objectives, and to discuss the plan. Questions such as 'was the SEA consulted during the decision-making process?' and 'Did the decision-makers use the information from the SEA as a frame of reference in order to develop, review, and discuss the proposed actions and

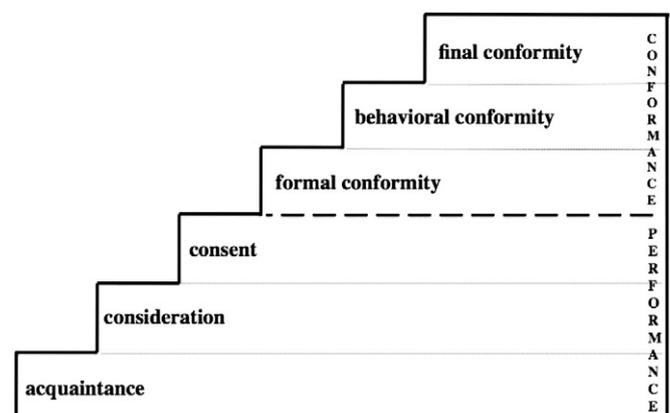
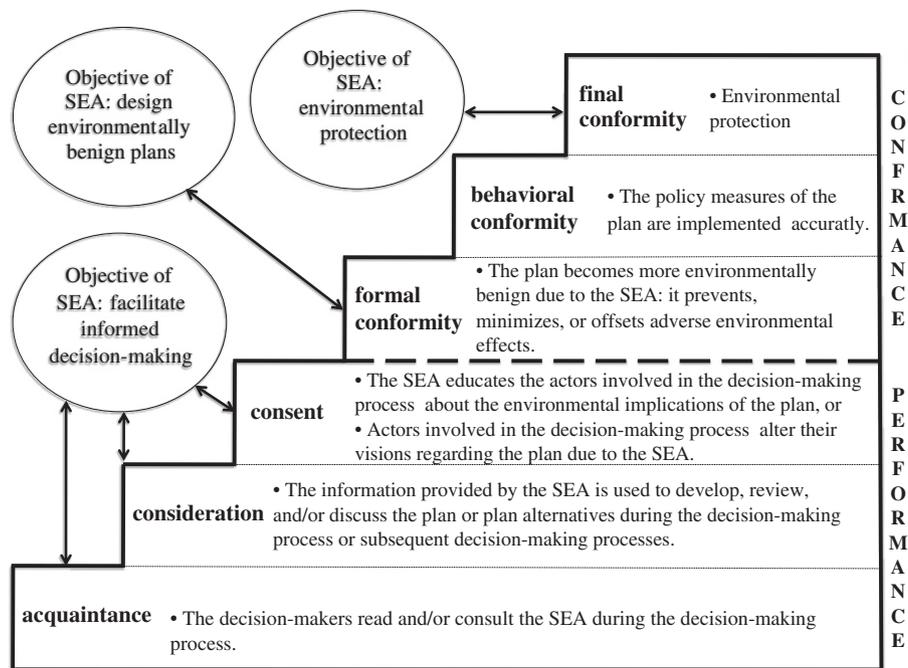


Fig. 1. Conformance and performance as gradual levels of influence that a plan can have. Sources: Aardema, 2002: 13; Herweijer et al., 1990; Mastop and Faludi, 1997; Faludi, 2000.



**Fig. 2.** SEA substantive effectiveness as an accumulation of conformance and performance indicators. **Note:** The circles indicate how the various levels of SEA effectiveness relate to the different objectives of SEA.

alternative development options?' must therefore be answered. It is relevant to note that in certain contexts, the SEA procedure could facilitate a communicative process in which stakeholders and the public can share their visions and interests concerning the plan. If this is the case, the SEA can be used to structure the debate and the information from the SEA can be used for argumentation. Moreover, the information provided by SEA can also inform and facilitate decision-making processes, other than the decision for which the SEA is conducted (see Ten Heuvelhof and Nauta, 1997).

### 2.3.3. Consent

'Consent' means that the actors involved in the decision-making process acknowledge the content of the SEA, are influenced by it, and change their understanding and/or visions accordingly. The actors involved in the decision-making process can include a broad variety of people, including planners, politicians, scientists, and stakeholders. It is deemed that the SEA has influenced actors when (1) they have learned more about the environmental implications of the plan and/or when (2) they have altered their visions regarding the plan. With regard to the first aspect of 'consent,' the information provided by the SEA can educate actors involved in the decision-making process about the environmental and sustainability issues related to the decision. With regard to the second aspect of 'consent,' actors can modify their interpretations and ideas about the plan, due to the SEA (see Ten Heuvelhof and Nauta, 1997).

The 'consent' level of performance can be perceived as an 'intersection': a critical situation in which two possibilities exist. Once the actors in the decision-making process have acknowledged the SEA and are influenced by it they can either (1) allow themselves to be influenced by the SEA and change their proposed actions accordingly or (2) allow themselves to be influenced by the SEA but still decide not to conform (Faludi, 2000), i.e. not to adapt their decision to recommendations of the SEA. For example, the plan alternative that is most environmentally friendly may be appreciated but not chosen, or proposed environmental management measures not adopted due to their costs. The insights retrieved due to the SEA can be used for subsequent decision-making but

the respective plan shall not reflect the new insights. In the former situation, the SEA will attain the fifth level of SEA effectiveness 'formal conformity.'

### 2.3.4. Formal conformity

'Formal conformity' is attained when the SEA has led to direct changes in the plan that will make it more environmentally friendly, meaning that adverse environmental effects caused by the plan will be avoided, minimized, or offset. One determines 'formal conformity' "by comparing the strategic action before and after the SEA is carried out, noting any sustainability or environment-related changes" (Thérivel and Minas, 2002: 82). In line with this approach, Thérivel and Minas (2002) identify three criteria for 'formal conformity.' First of all, the SEA must identify environmental effects of the plan and detect potential changes or alternatives to the plan. Second, the changes or alternatives of the plan that are proposed in the SEA ought to make the plan more environmentally friendly. Finally, these proposed changes must be included in the final strategic plan. If these three criteria are met the strategic plan will be more environmentally friendly as a result of the SEA.

### 2.3.5. Behavioral conformity

'Behavioral conformity' implies that the environmentally friendlier policy measures that avoid, minimize, or offset adverse environmental effects described in the plan are implemented as decided. A strategic plan sets out a general course of action, incorporating policy ends, options, and means to implement them (Mastop and Faludi, 1997). The decisions and actions to which SEA applies often have a high level of abstraction. A strategic plan as such can therefore often not be directly implemented; it must be translated into programs and projects first. Accordingly, the attainment of 'behavioral conformity' is dependent on subsequent decision-making and implementation by parties other than the leading authority (Arts, 1998).

Monitoring is important in order to evaluate the attainment of this level of SEA effectiveness. One would have to assess how the plan informs programs and plans, and whether the ideas and suggestions

promoted in the plan are directly adopted. It is possible, for instance, to monitor whether the recommendations for procedures in follow-up tiers (e.g. program or project-level) are being respected and whether the envisaged actions are in line with those described in the plan (see Partidário and Fischer, 2004).

### 2.3.6. Final conformity

The ultimate level of SEA effectiveness is 'final conformity': the protection of the environment as a result of the implementation of plans that, due to SEA, avoid, minimize, or offset adverse environmental effects. When evaluating 'final conformity,' one must determine the impact of the plan upon the material reality. This can be done by means of measuring several environmental indicators and quality standards and establishing a relationship between these and the policy proposals in the plan (Partidário and Fischer, 2004). One must evaluate to what extent the changes can be attributed to the plan as opposed to the influence of other factors (see Rossi et al., 2004). "The challenge is both to recognize the impacts and to differentiate the impacts of [SEA] from the effects of other factors, such as other environmental statutes, interaction between stakeholders beyond the scope of EIA, technological innovations, and the markets" (Pölonen et al., 2011: 122).

Fig. 2 summarizes the different and cumulative levels of SEA effectiveness and the corresponding indicators. It has the form of a ladder: each gradual level indicates a higher level of utilization and/or influence of the SEA — and a higher level of the attainment of the objectives of SEA. While the levels related to *conformance* effectiveness indicate high levels of goal attainment, and thus SEA effectiveness, it must be emphasized that non-conformity does not imply ineffectiveness. Attainment of *performance* effectiveness, but not conformance effectiveness, means that the objective of SEA 'enhancing an informed decision-making process' is attained.

### 2.4. Explaining SEA effectiveness

Once the effectiveness of an SEA has been analyzed it is also important to understand why the SEA has or has not been effective. Many SEA evaluation studies have identified factors that contribute to SEA effectiveness. A summary is provided by Runhaar and Driessen (2007). Table 1 builds on the work by Runhaar and Driessen (2007) and provides an overview of 13 process-related factors that are believed to contribute to the effectiveness of SEA, as found in the studies that have been consulted (Arbter, 2003; Aschemann, 2004; Dalal-Clayton and Sadler, 2008; Fischer and Gazzola, 2006; Hildén et al., 2004; MEGJ/MIRI, 2003; Partidário, 1999; Retief, 2006; Runhaar, 2009; Runhaar and Driessen, 2007; Runhaar and van Nieuwaal, 2010; Sadler and Verheem, 1996; Sheate et al., 2001; ten Heuvelhof and Nauta, 1996; Théritel and Minas, 2002). The factors that are deemed to influence SEA effectiveness are related to either the SEA content or SEA procedure.

In line with the observation by Runhaar and Driessen (2007), the table indicates that among the studies there is no unanimity with respect to the factors contributing to SEA effectiveness. "Factors contributing to SEA impact on decision-making thus seem to be rather heterogeneous" (ibid: Runhaar and Driessen, 2007: 5). It is hypothesized by the authors that this can be explained by the context in which SEA operates; not all factors are important in each decision-making context. The decision-making context can be described as the set of conditions and circumstances in which the SEA is carried out that influence the SEA. The decision-making context differs, in our view, from the factors described in Table 1 in the sense that the latter are process related factors upon which the SEA-maker has significant influence. Building upon the work by Hoppe (2002), Runhaar and Driessen (2007) and Fischer (2003), three dimensions of the SEA implementation context are identified here: (1) certainty about the knowledge base; (2) agreement on norms and values; (3) and the characteristics of the decision-making process. The latter

relates to the openness of decision-makers towards (environmental) values and their willingness to share decision-making powers (Runhaar and Driessen, 2007).<sup>2</sup> With respect to the first two, four types of policy problems can be distinguished based on these two dimensions: unstructured problems (scientific uncertainty, no agreement), structured problems (scientific certainty, agreement), semi-structured goals problems (scientific certainty, no agreement), and semi-structured means problems (scientific uncertainty, agreement). The study by Runhaar and Driessen (2007) highlights that "where many different and partly conflicting interests were at stake [i.e., unstructured and semi-structured goal problems], both the potential and the absolute impact of the SEA were relatively low" (ibid: 11). It is also hypothesized that the 'structuredness' of a problem influences the importance of a deliberative, participative assessment process. It is argued that stakeholder involvement especially can add value to the SEA process when interests diverge and scientific knowledge regarding the policy problem is uncertain (ibid).

## 3. Illustrating the framework

### 3.1. Research design

In order to illustrate the practical applicability and usefulness of the SEA effectiveness assessment framework a comparative case study analysis has been conducted. Three Dutch SEAs undertaken at the national government level were studied. In addition to an analysis of the effectiveness of SEA in these cases, an explanation of this effectiveness has also been examined. Data were obtained through interviews and desk analysis of relevant documents.

In order to illustrate the practical applicability and usefulness of the SEA effectiveness assessment framework a comparative case study analysis has been conducted. Three Dutch SEAs undertaken at the national government level were studied. In addition to an analysis of the effectiveness of SEA in these cases, an explanation of this effectiveness has also been examined. Data were obtained through interviews and desk analysis of relevant documents.

The SEA effectiveness assessment framework was operationalized by means of defining indicators (see Fig. 2) and corresponding interview questions level (see Table 2). The indicators and interview questions concerning performance effectiveness relate to the manner and extent to which the information provided by the SEA was used and has influenced the decision-making process. As regards conformance effectiveness, only 'formal conformity' has been evaluated. Desk research was conducted in order to determine 'formal conformity.' The SEA was examined as were the proposals and alternatives described therein that would make the plan more environmentally friendly. The draft strategic plan was compared to the final strategic plan and it was judged whether the policy proposals of the plan were in line with the recommendations of the SEA. Evidently, it is possible that the SEA has been carried out as an integral part of the planning process and/or that the information in the draft plan was already in line with the SEA. When these situations occurred, it was not immediately clear what the role of the SEA had been. Accordingly, to determine causal relationships between the SEA and alterations in the plan, references to the SEA in the (draft) plan were looked for, and interviewees were asked to elaborate on, or confirm, the relationship between changes in the plan and the SEA.

Due to the time lapse between the case decisions and this research, as well as the importance of subsequent decision-making, and the fact that there are many other external factors that can

<sup>2</sup> The importance of in particular the willingness of decision-makers to share decision-making powers is typical for western, neoliberal societies. In authoritative societies where decision-makers are less dependent on stakeholders, other contextual factors are more important (see Kolhoff et al., 2012).

influence the implementation of a plan, it was not feasible to measure the attainment of 'behavioral conformity' in this study. Also, the three cases have not been assessed on 'final conformity' because in order to be able to do this it must be determined how the plan, that has become more environmentally friendly due to SEA, has influenced several environmental indicators. Besides the challenges of this task, final conformity could not be evaluated because of a lack of data regarding environmental indicators prior to and after the implementation of the plans.

To analyze the influence of the different factors on SEA effectiveness, a four-level Likert scale has been used. The respondents were asked to rank the importance of 13 factors for the effectiveness of the SEA in the case that they were involved with (1: not important; 2: slightly important; 3: important; 4: very important) for the effectiveness of the

respective SEA, and to rationalize their choice. The three dimensions of the SEA implementation context also corresponded to various interview questions (see Table 2).

Data were acquired by means of interviews with 19 experts in total, as well as desk analysis of relevant reports (SEA, plan, etc.). The interviewees included five SEA-makers, six respondents from the competent authority (i.e., the respective Ministry responsible for the strategic plan), seven respondents from the Netherlands Commission for Environmental Assessment (NCEA), and one civil society stakeholder. Six people were interviewed in order to obtain data regarding the effectiveness of the SEA of the National Waste Management Plan (two from the competent authority, two SEA-makers, and 2 respondents from the NCEA, six people were interviewed about the SEA of the third Structure Scheme Electricity Supply (2

**Table 1**  
Factors considered important for SEA effectiveness. The table provides an overview of respectively: the factors, the articles in which the relevance of the factors are discussed ('found in'), the operational definitions of the factors, and the indicators of the factors.

Factor	Operational definition	Indicators	Source
Stakeholder participation	The participation of the representatives of organizations, communities, or interest groups that have a direct stake in the plan.	Provision for stakeholder participation during the SEA	Arbter, 2003; Aschemann, 2004; Fischer and Gazzola, 2006; Hildén et al., 2004; IAIA, 2002; MEGJ/MIRI, 2003; Retief, 2006; Runhaar and van Nieuwaal, 2010; Sadler and Verheem, 1996.
Public participation	The participation of "the broader, relatively undifferentiated, collectivity of unorganized individuals who may have some interest or be affected relatively indirectly by a decision" (Dietz and Stern, 2008: 61).	Provision for public participation during the SEA	Aschemann, 2004; Dalal-Clayton and Sadler, 2008; Fischer and Gazzola, 2006; Partidário, 1999; Retief, 2006; Sadler and Verheem, 1996.
Integration	The cooperation and communication between SEA- and decision-makers during the decision-making process.	Frequency of communication between SEA- and decision-makers about their work during the decision-making process Cooperation between decision- and SEA-makers during the decision-making process	Arbter, 2003; Fischer and Gazzola, 2006; Hildén et al., 2004; IAIA, 2002; Retief, 2006; Sheate et al., 2001; Thérivel and Minas, 2002.
Transparency	An SEA process in which the roles and responsibilities of the actors involved in the SEA and decision-making process are clearly defined An SEA report in which the objectives, content, methodological approach, and results of the SEA are made explicit	Roles and responsibilities of the actors involved in the SEA and decision-making process are clearly defined The objectives, methodological approach, and results of the SEA are made explicit	Arbter, 2003; Aschemann, 2004; Fischer and Gazzola, 2006; MEGJ/MIRI, 2003; Retief, 2006; Runhaar, 2009; Runhaar and van Nieuwaal, 2010
Timing	The start of the SEA process and its relation to the decision-making process	Timeframes of the planning process and the SEA	Aschemann, 2004; Hildén et al., 2004; Partidário, 1999; Retief, 2006; Runhaar and Driessen, 2007; Sheate et al., 2001; ten Heuvelhof and Nauta, 1996; Thérivel and Minas, 2002.
Quality	The quality of the SEA is based on the validity of the data and methodological approach.	The assessment report by an independent body	Fischer and Gazzola, 2006; Hildén et al., 2004; MEGJ/MIRI, 2003; Retief, 2006; Runhaar and van Nieuwaal, 2010; Sheate et al., 2001.
Independent review	Review of the quality of the SEA by an independent body	Review of the SEA by an independent body?	Dalal-Clayton and Sadler, 2008; Retief, 2006; Sheate et al., 2001.
Pragmatism	An SEA report that provides information that is adapted to the decision-makers' needs and understandable for all actors involved in the decision-making process (also those without technical expertise regarding the plan).	Opinion of decision-makers regarding the utility and comprehensiveness of the SEA report Decision-makers', stakeholders', and the public's understanding regarding the content of the plan	Aschemann, 2004; MEGJ/MIRI, 2003; Retief, 2006; Sadler, 2004; Sadler and Verheem, 1996; Thérivel and Minas, 2002.
Scoping	The stage during which the likely extent (geographic, temporal, and thematic) and level of detail of the assessment and the information to be included in the SEA (Fischer, 2007: 29) are determined.	Determination of the extent (geographic, temporal, and thematic) and level of detail of the assessment and the information to be included in the SEA before the start of the assessment process	Dalal-Clayton and Sadler, 2008; MEGJ/MIRI, 2003; Retief, 2006; Sadler and Verheem, 1996.
Tiering	Decisions set at a high, strategic level are directly linked to lower, more concrete program and project decisions.	Identification of relations between the plan and decisions that will be conducted at lower project levels in the SEA report	Fischer and Gazzola, 2006; Hildén et al., 2004; MEGJ/MIRI, 2003; Retief, 2006; Sadler and Verheem, 1996.
Experience	The knowledge or practical wisdom that SEA- and/or decision-makers gained during previous SEAs.	The SEA-maker's practical knowledge about SEA, gained from conducting SEAs The SEA- or plan-makers practical knowledge about the SEA gained from conducting comparable types of SEAs for similar plans.	Dalal-Clayton and Sadler, 2008; Fischer and Gazzola, 2006; Thérivel and Minas, 2002.
Financial resources	The financial budget available for the SEA that enables it to fulfill its objectives.	Financial budget available for the SEA Opinion of SEA- and decision-makers regarding whether the financial budget was sufficient in order to fulfill the objectives of the SEA	Fischer and Gazzola, 2006.
Evaluation of social and economic effects	A strategic environmental assessment in which environmental, social, and economic effects are evaluated.	Assessment criteria applied in the SEA (environmental, social, and/or economic)	Arbter, 2003; Retief, 2006.

**Table 2**  
Interview questions concerning the effectiveness of the three SEAs.

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*I. The effectiveness of the SEA: performance*

I.a Did decision-makers read and/or consult (seek information from) the SEA during the planning process?

I.b To what extent, and how, did the SEA function as a reference during the decision-making process? Was it used to develop, review and/or discuss the plan and plan alternatives?

I.c Did the SEA influence subsequent decision-making, EIAs or SEAs? If yes, how?

I.d Did the SEA educate actors involved in the decision-making process about the environmental implications of the plan?

I.e. Did the actors involved in the decision-making process alter their vision of the plan due to the SEA?

I.e. What was the most important contribution of the SEA to the decision-making process?

*II. The effectiveness of the SEA: formal conformity*

II.a Did the SEA have an influence on the final plan? If yes, did the content of the plan alter due to the SEA? If yes, how has the plan changed and can you guarantee a causal relationship between the SEA and the alteration in the plan?

II.b When you have indicated that the plan has been altered because of the SEA, how significant is this alteration from an environmental perspective?

*III Description of the SEA implementation context and its influence on the SEA type of policy problem:*

III.a Where there agreement in norms and values between decision-makers and stakeholders regarding the plan?

III.b Was there, and to what extent, scientific certainty regarding the knowledge base of the plan?

*characteristics of the decision-making process:*

III.c How would you describe the political context and the decision-making culture of the planning process?

III.d Did decision-makers involve stakeholders during the formal planning procedures? If yes, how?

III.e Where decision-makers perceptive towards environmental values?

III.f How, and to what extent, did the SEA implementation context influence the potential effectiveness of the SEA?

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from the competent authority, 2 SEA-makers, and three respondents from the NCEA), and seven people were interviewed with regards to the effectiveness of the National Water Plan (two from the competent authority, two SEA-makers, two respondents from the NCEA, and one civil society stakeholder). The interviewees were selected based on their expertise in SEA and influence and role in the SEA process. While any SEA is a complex procedure in which many people are involved, the interviewees had to have a holistic perspective upon the assessment process and its relation to decision-making ('helicopter view'). Of all people approached, 19 were able and willing to participate in the research, and were interviewed. Interviews were conducted in the period May–June 2011.

In order to improve the validity of the outcomes of the case studies, conclusions are based on the inter-subjectivity of the responses: the agreement or consensus between the experts about the effectiveness of the SEAs (see Scheff et al., 2006). Yet, disagreement between experts regarding SEA effectiveness is, when applicable, also noted in the case studies. The case analyses below are summaries of comprehensive descriptions to be found in the original research report (Van Doren, 2011<sup>3</sup>).

### 3.2. Case 1: The National Waste Management Plan

The National Waste Management plan 2002–2012 aims to avoid and reduce the environmental pressure resulting from waste management (VROM, 2007). The plan describes the national objectives, principles, and capacity for waste management in the Netherlands and consists of the 'sector plans' for waste streams. Each sector plan describes the waste type(s) within that sector and the minimum standard for managing these waste types(s). Waste management producers may only apply standards that are equal to, or better than, the minimum standard.

<sup>3</sup> The original research report by van Doren (2011) can be found on the following website: <http://igitur-archive.library.uu.nl/student-theses/2011-1207-200552/JUindex.html>.

All respondents maintain that the plan addressed a 'moderately structured, means problem.' The main objectives of the waste management plan were well defined and the approach of setting minimum standards was widely supported. However, there was ambiguity regarding the feasibility of various minimum standards taking into account existing waste processing facilities and infrastructure. Accordingly, in order to determine minimum standards that were feasible, decision-makers required the knowledge of waste processing companies. Due to the involvement of many stakeholders, the decision-making context is categorized as 'open.' Also, as the plan had objectives relating to environmental protection (i.e., the reduction of environmental pressure caused by waste management), decision-makers were receptive to environmental values during the planning process.

The case study analysis indicates that performance effectiveness of the SEA on the sector plans has been achieved. The levels 'acquaintance,' 'consideration,' and 'consent' have all been fulfilled. Respondents from the competent authority and SEA-makers note that the SEA was consulted extensively ('acquaintance') and used as a reference during the decision-making process in order to develop, review, and discuss the minimum standards for the various waste streams ('consideration'). While in most cases the outcomes of the SEA confirmed existing notions regarding the environmental effects of waste processing techniques, it did give rise to several new insights ('consent'). With regard to 'formal conformity,' it is concluded that the SEA has influenced many minimum standards. The majority of the minimum standards are preferred or acceptable from an environmental perspective. In the final plan it is clearly described why a specific minimum standard for waste management has been selected and how the information from the SEA has influenced the decision. In the case that a minimum standard has been selected that is not optimal from an environmental viewpoint, it is clearly explained which, and why, other factors prevailed during decision-making; there is thus a deliberate departure from the SEA.

The interviews indicate that an open decision-making process and the political will and need to take environmental values into consideration enhanced the SEA's influence on the planning process and decision. Respondents from the competent authority have made clear that since the object of the Plan was the reduction of environmental pressure resulting from waste management, there was a direct interest in the outcomes of the SEA and a wish to use the environmental data during the decision-making process. The respondents indicate that the motivation to use SEA during the planning process led to an early start and integration of the assessment into the planning process, which contributed to high level of cooperation between the decision- and SEA-makers. In addition to the factors 'timing' and 'integration,' other important factors identified by the respondents include 'pragmatism' and 'transparency.' These enhanced the decision-makers' ability to use the environmental data as a reference to develop the plan. As noted, 'stakeholder participation' was required in order to fill knowledge gaps. In addition, the SEA enhanced support and acceptance of the plan that was finally adopted. The SEA-makers and respondents from the NCEA have stated that the factor 'experience' was especially important in this SEA because of the application of the complex Life-Cycle-Analysis (LCA) methodology. To guarantee a high quality SEA report and efficient process, it was essential that experts with much experience and practical knowledge concerning this method should conduct the assessment.

### 3.3. Case study II: the SEA of the Third Structure Scheme Electricity Supply

The Third Structure Scheme Electricity Supply (SEV III) 2008–2020 is the Dutch National plan on the production of electricity, which sets the environmental and spatial conditions for electricity supply (EZ/VROM, 2009). The SEV III constitutes an overall revision of previous national plans on electricity supply. Due to the liberalization of the electricity market in 1998, the centralized planning of electricity generation has

been terminated and it is now the sector's own responsibility to, within the boundaries of the law, ensure the availability of sufficient electricity (EZ/VROM, 2009). For that reason, the SEV III only gives a general direction for future energy production by setting out the locations that energy producers may use for the establishment of electric power plants (> 500 M), HV tracks (> 220 KV), and potential landing sites for connections with wind-energy locations at sea. The SEV III also included locations that could potentially be used for the generation of nuclear energy. The SEA was used to evaluate the environmental effects of electricity facilities at the various locations.

There is no agreement among respondents regarding the type of policy problem addressed by the SEV III. On the one hand, respondents from the competent authority have argued that the plan addressed a 'structured' policy problem because the objectives of the plan were clear and there was limited scientific uncertainty about the environmental effects of electricity generation on the various locations. On the other hand, respondents from the NCEA are of the opinion that the SEV III addressed a 'semi-structured, goal problem.' "Important strategic questions regarding the capacity and type of electricity generation were not addressed in the Plan and SEA" (respondent from the NCEA). In all, while there might not have been much conflict in norms and values pertaining to the respective locations for electricity facilities, there was no agreement on the underlying values regarding the capacity and type of electricity generation in the Netherlands.

The decision-making culture can be characterized as 'closed.' As the decision-makers considered the problem to be structured, they did not require the involvement of the public and stakeholders during planning in order to fill knowledge gaps and/or define the objectives of the plan. Moreover, since the plan did not have explicit environmental objectives, environmental considerations were not sufficiently represented and taken into account during planning. The respondents from the NCEA suggest that there were public and stakeholder's questions regarding energy policy and management that were not addressed by the SEV III (e.g., renewable energy, the capacity for electricity production, the desirability of coal-fired power plants, and nuclear energy). Because the SEV III and the SEA do not concentrate on these questions, there remains ambiguity regarding these issues at project level.

Strictly speaking, the effectiveness levels acquaintance, consideration, consent, and formal conformity have been attained. Respondents from the competent authority stated that the SEA was read and consulted during the decision-making process (acquaintance). The environmental information pertaining to the locations for power plants, HV tracks, and landing sites was mainly used to verify that the pre-defined locations or tracks would not violate environmental and nature legislation (NCEA, 2008). The information on the environmental implications of the sites designated for nuclear energy generation has been used more explicitly to discuss the plan. While the SEA was not proactively used to discuss strategic issues regarding energy generation or select locations that would be preferable from an environmental perspective, the effectiveness level 'consideration' has been attained because the SEA was used to review and discuss the plan. The SEA reviewed the environmental performance of each location and ensured that the locations included in the SEV III would respect environmental and nature legislation. The SEA also influenced decision-makers' visions regarding the suitability of the respective locations for the generation of nuclear energy ('consent'). As a result, two locations for nuclear energy and one location for an HV track have been deleted from the plan ('formal conformity').

All interviewees consider the content and process of the SEA to be quite good. SEA elements including 'scoping,' 'transparency,' and 'pragmatism' contributed to a high quality of the SEA report and an efficient SEA and decision-making process. Respondents from the NCEA maintain that the effectiveness of the SEA has been significantly reduced as a result of the implementation-context and (consequently) the late start and lack of integration. There was no political need and will to decide on the amount and type of energy generation because this was

regarded as being inconsistent with the free market approach promoted for electricity policy in the Netherlands. The NCEA respondents note that the SEA could have played a more significant role during the planning process and have been used more proactively to develop an environmentally friendly plan. One respondent from the NCEA explains that decision-makers could have set guidelines regarding the capacity and type of electricity production, and still have acted in line with the principles of the free market approach. Decision-makers could have used the information from the SEA in order to make a selection of locations or tracks that ought to be prioritized or deleted, from an environmental perspective and could have determined the capacity and fuel mix permitted for each location.

#### 3.4. Case study III: the SEA of the National Water Plan

The object of the National Water Plan (NWP) 2009–2015 presents various initiatives and strategies that must be undertaken in order to ensure water safety and security in the Netherlands (V&W, 2009). The NWP consists of short-term decisions that will be made before 2015 and long-term decisions that will be made after 2015. An SEA was conducted for the decisions of the plan, which set a concrete frame of reference for future activities that could negatively affect the environment.

As the National Water Plan consists of a broad variety of policy proposals, each subject (i.e. policy proposal) can be characterized as a different policy problem. However, taken as a whole, all respondents deem the NWP to be a complex plan because it consists of many different policy problems and affects many actors. Due to the fact that the plan affects many stakeholders, whose knowledge and support is required for the effective implementation of the plan, decision-makers shared decision-making powers. As the NWP aims to contribute to sustainable water management, environmental values were also sufficiently represented during planning. In all, the decision-making process was 'open.'

The effectiveness levels 'acquaintance,' 'consideration,' 'consent,' and 'formal conformity' have strictly been attained. The SEA was consulted and read during the decision-making process ('acquaintance'). The effectiveness level 'consideration' has strictly speaking been attained because it was used to review the environmental performance of the concept plan. However, respondents from the competent authority and NCEA maintain that the SEA has not been used to develop or discuss policy measures during the conceptualization phase of the plan because the preparation of the SEA started when the concept NWP had already been concluded and policy alternatives had already been developed. In consequence, the opportunity to use the SEA as a policy development instrument was lost and the information generated by the SEA could not be used to identify problems and develop alternative plan options. As a result, the SEA of the NWP was predominantly utilized to evaluate and validate pre-defined policy measure and to ascertain that the plan did not contain any policy measures that would violate nature- and environmental legislation. 'Consent' has been attained; respondents from the competent authority have noted that the SEA gave rise to new insights regarding the environmental effects of an increase in the water level in the IJsselmeer and the placement of wind turbines in the North Sea. With regard to 'formal conformity,' all the interviewees note that the SEA has had only limited influence on the substantial content of the NWP. Of the 15 policy options that have been included in the SEA, only two have been adjusted marginally due to the SEA.

SEA-makers, respondents from the competent authority and NCEA note that factors including 'scoping' and 'transparency' contributed the quality in the SEA process and report. Given the high quality of the SEA and the political will to take environmental considerations into account during planning, many interviewees believe that the effectiveness of the SEA could have been much higher. The SEA could have been used to develop policy alternatives and could have provided a platform for discussion among stakeholders and decision-makers. All respondents maintain that the most important reasons for the limited

effectiveness of the SEA are its late start, and the resultant lack of integration. Halfway through the planning process it was realized that it was compulsory to conduct an SEA for several aspects of the NWP. A respondent from the competent authority argues that “the SEA should have started at the start of the planning processes, when there was still opportunity to develop ideas and policy proposals.” Due to the late start, the SEA could not be used as a policy-developing tool and there was limited time to adjust the NWP to the outcomes of the SEA (de Graaff et al., 2010).

#### 4. Reflection on the three case studies

The SEA effectiveness assessment framework proved to be helpful in order to describe and assess the influence of the SEAs on the decision-making processes and final decisions. Based on the case study analyses, several conclusions can be reached regarding the SEA effectiveness assessment framework and the three cases. First, the cases suggest that higher levels of SEA effectiveness can only be achieved when lower-ranking SEA effectiveness levels have been attained. This finding supports the cumulative character of the levels of effectiveness as assumed in our framework. Second, the cases indicate that each effectiveness level consists of gradations on its own. In order to have an accurate impression of an SEA's effectiveness, it is important to depict, in detail, how the steps have been attained. For instance, in this research all cases have, strictly speaking, attained the level ‘consideration’; the SEAs were used to develop, review, or discuss the plan. Yet, only one SEA (SEA of the waste management plan) was used to develop, review, and discuss the plan and plan alternatives. Third, the cases suggest, and the respondents emphasize, that the degree to which the ‘consideration’ level was reached is related to whether the SEA was used as a *pro-active* policy-developing tool that could significantly influence the planning process, or whether it was merely used to *reactively* evaluate the environmentally friendliness of pre-defined policy proposals. This outcome corresponds to the conclusion of the review of EA in the Netherlands by Runhaar et al. (in press), stating that EA is regarded as a mandatory check prior to decision-making, but that EA is merely used as a tool to develop policy as such. In line with this, a fourth conclusion regarding the SEA effectiveness framework pertains to the fact that when the SEA is used to actively develop the plan (‘consideration’), the SEA will have more influence on the plan (i.e., ‘formal conformity’ will be higher). This outcome confirms what is often noted in the impact assessment literature: that when an SEA is only used to assess pre-defined policy proposals it might lead to small adjustments or the introduction of mitigation measures, but will not contribute to the development of innovative, environmentally friendly solutions that fulfill the decision-makers' goals (cf. Stoeglehner et al., 2009).

As regards the explanations for SEA effectiveness, the cases indicate that accurate timing and integration are interlinked and are both crucial for SEA effectiveness. An early start and good cooperation during the planning process between decision- and SEA-makers allows decision-makers to use the information from the SEA to develop, review, and discuss the plan (‘consideration’). This, in turn, increases the chance that the environmental information influences the knowledge and visions of actors in the planning process (‘consent’) and the final plan (‘formal conformity’). The case studies of the NWP and SEV III indicate that the late inclusion of the SEA, which makes it difficult to integrate the SEA into the decision-making process, will significantly limit its effectiveness, regardless of the quality of the SEA report, assessment process, and the political motivation to use SEA. This links to the conclusion by Hildén et al. (2004), who note that when “the environmental assessment is initiated after key decisions on the plan or program have already been made, it is almost impossible to influence the plan or program, even if it has not yet been formally adopted” (ibid: 528).

In all three cases the ‘quality’ factor enhanced the likelihood that the SEA was consulted and used during planning (‘acquaintance’ and ‘consideration’) and influenced visions (‘consent’) and decisions (‘formal conformity’). The factors ‘independent review,’ ‘experience,’ and ‘financial resources’ positively influenced the quality of the SEA reports. The factors ‘scoping,’ ‘pragmatism,’ ‘transparency,’ ‘stakeholder participation,’ and ‘tiering’ positively influenced the attainment of the effectiveness levels ‘acquaintance’ and ‘consideration.’ In all three cases, the factors increased the likelihood that decision-makers were able to read, consult, and use the environmental data to develop, review, and discuss the plan during decision-making. It is difficult to draw robust conclusions regarding the relevance of the factor of ‘evaluation of social and economic effects’ because only the SEA of the NWP assessed some social and economic effects, and the opinions of respondents regarding this issue diverge. Finally, the outcomes of the research indicate that public participation could not add much value to the SEAs because the issues were too technical, too abstract, or not directly relevant for the public. Nevertheless, while public participation did not influence the effectiveness of the SEA, it did enhance the legitimacy of the plan and SEA.

The cases confirm the assumption by Runhaar and Driessen (2007) that the decision-making context can be helpful to understand the effectiveness of an SEA. The openness of the decision-making context seems to have a discriminatory function in relation to the potential effectiveness of the SEA. When decision-makers are not receptive to other (environmental) values during decision-making, the usage and influence of the SEA will be diminished. Political will to take environmental values into account during decision-making determines whether the SEA is seen as a mandatory exercise, that must be conducted in order to obey environmental legislation (see electricity plan), or as an opportunity to engage in an informed negotiation process (see waste management plan) (Stoeglehner et al., 2009). The cases cannot be used to validate the assumption that the type of policy problem influences the potential effectiveness of SEA. The cases vary with regard to the level of scientific certainty and agreement on norms and values. Yet, in none of the three cases do these issues appear to have influenced the effectiveness of the SEAs.

As regards the context-specificity of factors, it was found that ‘stakeholder participation’ is more important when decision- and SEA-makers are dependent on the knowledge and support of stakeholders (see waste management plan). Thus, in line with the proposition by Runhaar and Driessen (2007), it could be argued that when solving moderately structured ‘means’ problems, stakeholder involvement is needed in order to determine solutions to the problem; whereas their participation is required in order to identify and address their interests when handling a moderately structured, ‘goals’ problem. When unstructured problems are at issue, stakeholder involvement is necessary for both functions (ibid). Besides this factor, no other relationships were found between the SEA implementation context and factors important for SEA effectiveness.

#### 5. Conclusions

The starting point of this article was the observation that there appears to be no uniform concept of, and approach to, SEA effectiveness. This article has presented an innovative approach to the evaluation of substantive effectiveness of SEA, composed of concepts of, and approaches to, SEA effectiveness as derived from SEA literature and planning theory. Lessons from planning theory in particular were useful in order to assess how a source of environmental information (e.g., SEA) influences (subsequent) decision-making. A new element in our framework is the hierarchical and cumulative conceptualization of various forms of effectiveness suggested elsewhere (e.g. awareness of environmental impacts, considering these in decision-making, adjusting decisions accordingly, etc.). An SEA's value cannot solely be evaluated on the basis of the influence it has on the final decision; neither can an analysis of the SEA during decision-making process provide conclusive answers regarding its

contribution to environmentally friendly decision-making. One needs to assess both kinds of influence in order to be able to gain a comprehensive understanding of the extent to which SEA is able to fulfill its purposes. For the purpose of this research, the authors have applied a more rational approach to SEA effectiveness, which focuses on the influence of environmental data on decision-making and, ultimately, the environment. Nevertheless, the authors acknowledge that the meaning of the concept 'SEA effectiveness' is dependent on one's framing and expectations of SEA (see Bond et al., 2011; Cashmore et al., 2010), and that the proposed framework can accordingly be contested when SEA is viewed more as a communicative instrument.

The proposed SEA effectiveness evaluation framework has been illustrated by means of an analysis of three cases of SEAs conducted for strategic plans prepared by the Dutch government. The case studies that have been conducted demonstrate the practical applicability of the framework. The framework allows for a more systematic, integrated, and richer understanding of how effectiveness may be understood. From the cases, it is concluded that the levels of effectiveness that we proposed are indeed cumulative. The case studies also confirm that the impact of SEA on decision-making will be more significant if it is explicitly used as a tool to develop policy. When SEA is merely used to review predefined policy proposals it still has value, but its potential contribution to the planning process is significantly reduced and opportunities are lost for creative decision-making processes in which social, economic, and environmental interests are represented. Because of practical reasons, the cases concentrated around formal conformity, not around higher levels of conformance effectiveness. The cases hence do not allow us to draw conclusions on the value of our framework regarding these forms of effectiveness.

In addition, this article has examined explanations for SEA effectiveness and has provided, based on previous SEA studies, a systematic overview of process and context factors considered to influence SEA effectiveness. The analysis of explanations for effectiveness yielded no additional factors. In the three cases an early start and an integrated SEA and planning process were vital to allow the tool to influence the planning process. Ultimately, the presence of these factors, and thus SEA effectiveness, is dependent upon decision-makers' receptivity to environmental values and determines their will to use SEA.

It needs to be emphasized that because of the exploratory nature of the analysis the conclusions drawn can only be indicative. More testing of the framework is required in order to come to more robust conclusions. Conclusions in this article regarding the factors important for SEA effectiveness cannot be generalized; due to the limited number of case studies, the conclusions only pertain to the cases at hand. Future studies should examine which factors are specific for the different levels of performance and conformance effectiveness in the framework and which factors are key, in order to climb the effectiveness ladder. Another theme that needs to be further clarified in future studies regards the question which actors involved in the decision-making process and implementation of a decision, play a role and influence the attainment of the various SEA effectiveness levels. For example, performance effectiveness may be determined by decision-makers (planner, politician, developer), whereas conformance is in the realm of plan implementation agencies. Also, do the relevant actors in plan implementation need to experience performance and conformance, before behavioral conformity can be achieved? Answers to such questions can help to improve SEA effectiveness by involving different actors in more targeted way in the SEA process.

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