UNIVERSITY OF GOTHENBURG

Centre for Environment and Sustainability, GMV

Review:
Experiences of Strategic Environmental Assessment in Developing Countries and Emerging Economies –

Effectiveness, Impacts and Benefits

Report prepared by: Dragana Davidovic,

Graduate student, University of Gothenburg

And intern at GMV – Spring term April-May 2014

Email: dragana_davidovic@hotmail.com

Advisor: Anders Ekbom, GMV

Email: anders.ekbom@gu.se

Abstract

Strategic environmental assessment has been described as being a tool to improve strategic decision-making by integrating environmental issues into plans and programmes. However, there is a limited amount of evidence of the effectiveness, impacts and benefits of application of SEA, in particular from developing countries and emerging economies. The purpose of this study is to evaluate the implementation of SEA in five developing country contexts including China, South Africa, Brazil, South Korea and India. To review their experiences I focus on three closely related aspects: has SEA been effective in terms of improving strategic decision-making from an environmental perspective; has it had an impact on the environment, planning processes, strategic decisions and the implementation of these decisions; and has it been beneficial by improving planning and decision-making? The method used is a meta-analysis that compares the results of multiple case studies found in the recent SEA literature. The case studies were selected with a focus on SEA application in the natural resource sector such as the energy sector, land use planning, transport and water management. The results of the study show some examples of effective SEA practice in developing/emerging economies, but still the majority of the case studies present an overall low performance in terms of SEA effectiveness. I conclude by providing several recommendations for improving SEA practice, both on case level and system level, based on key findings of the study. I also present the need for further research in the field to increase the knowledge of SEA effectiveness, impacts and benefits in practice – particularly concerning impacts of SEA on the environment.

Keywords: Strategic environmental assessment, SEA performance criteria, strategic decision-making, effectiveness, impacts, benefits, developing countries, emerging economies.

Table of Contents

1. Introduction

Strategic Environmental Assessment (SEA) is commonly referred to as a process-oriented tool to integrate environmental issues into planning and strategic decision-making of plans, programmes and policies (PPPs) by analyzing their potential impacts on the environment (Sadler & Verheem 1996; Thérivel et al. 1992, in Bina 2008). It can also be termed as an instrument for supporting "good" environmental governance, evaluating environmental impacts and the inter-linkages with economic and social considerations through an analytical and participatory approach (World Bank 2013). The main objective of the tool is to improve strategic decision-making by integrating environmental, and often also socio-economic, considerations into strategic actions (PPPs) (Thérivel & Minas 2002: 81). By implementing an effective SEA in decision-making it is expected that it will lead to the selection of the most environmentally friendly option and/or the adoption of the necessary mitigation measures if this option is not selected (van Buuren & Nooteboom 2009: 145). SEA is also expected to improve decision-making at the project level, through "tiering" with Environmental Impact Assessment (EIA) – an assessment tool used to make assessments of proposed projects.

SEA has become a legal procedure, or requirement, in increasingly many countries. In European countries it is a legal requirement to apply SEA in the making of plans and programmes, following from the European SEA directive 2001/42/EC. Some developing countries in e.g. Asia, Sub-Saharan Africa and Latin-America have institutional and legal initiatives to regulate SEA, but in many countries application of SEA is not mandatory (e.g. Brazil) or legislation requiring SEA simply does not exist (e.g Kenya). In the past, application of SEA has been limited to developed countries, but is now increasingly expanding across many different countries and economic sectors in both developed high income countries and developing low income countries (Alshuwaikhat 2005: 308).

Retief et al. (2008) argue that application and integration of SEA in decision-making is critically important within developing countries for two reasons. The first relates to the structure of their economies and the fact that large segments of the population rely heavily on primary sector activities such as agriculture, tourism and mining for their livelihoods. Secondly, almost all "biodiversity hotspots" and the majority of pristine environments are located in developing countries (Retief et al. 2008: 505), e.g. Brazil, Malaysia and Indonesia. Therefore, incorporating sustainability considerations and participatory approaches into strategic decision-making, through the use of SEA, is important from a global conservation

perspective but also has a direct impact on the well-being of citizens and plays a role in poverty reduction in developing countries.

SEA, however, is a relatively new emerging tool in developing countries, and has yet to overcome certain barriers that hinder its wide adoption and overall effectiveness (Kjörven & Lindhjem 2002: 16). Even though SEA is used in many countries there is a limited amount of evidence of the effectiveness, impacts and benefits of the application of SEA, in particular from developing countries and emerging economies such as Brazil, India and China. The role of SEA in emerging economies is especially critical since these countries are likely to shape our common economic and environmental future. According to OECD there is a limited amount of knowledge of SEA development in emerging economies, and comparative work on SEA practice in these countries is urgently needed. (OECD 2012: 16)

2. Focus and aim of the study

The aim of this study is to collect evidence of and analyze effectiveness, impacts and benefits from application of SEA in low income developing countries, including emerging economies. The focus of the study is not to explain what SEA is and how it works, since there already is a large amount of literature on that matter, but rather to evaluate the implementation of SEA in a variety of developing country and emerging economy contexts. To review the experiences of the application of SEA I focus on three closely related aspects:

Firstly, has the SEA been effective, i.e. has it made strategic decision-making more effective from an environmental perspective by integrating environmental and sustainability issues in strategic actions? This is the main focus of the study. Secondly, has the SEA had an impact on the environment, planning processes, strategic decisions and the implementation of these decisions? Thirdly, has the SEA been beneficial in any matter and improved planning and/or decision-making? This also includes an assessment of drawbacks; if application of the SEA was not found to be effective, beneficial or did not have any impacts, what is identified as the main causes of this in the case study?

3. Methodology

The method used is a literature review. It is an assessment of previous assessments including what others have done and key references on the topic. It is also a meta-analysis; comparing the results of multiple case studies from different contexts in order to find patterns and make an overall assessment of the effectiveness, impacts and benefits of applying SEA in strategic decision-making. Evidence of the effectiveness, impacts and benefits of SEA application in

developing countries and emerging economy contexts was collected by searching for case studies and reviews on Google, Google scholar and "SuperSearch" at Gothenburg University Library using keywords such as "SEA effectiveness/impacts/benefits", "SEA effectiveness review" etc. combined with developing countries. To get the relevant hits on these search tools it was often necessary to type in "strategic environmental assessment" instead of simply "SEA", which could lead to search results of the topic.

The case studies selected to evaluate the performance of SEA are from five countries from three continents: China, South Africa, Brazil, South Korea and India. These countries were chosen since they fit the criteria of being low income developing countries and/or emerging economies, and also partly because of the available material that could be found online. The case studies were selected with a focus on SEA application in the natural resource sector such as energy, transport, agriculture, water management and biodiversity conservation. Only plans and programs, not policies, were included when selecting the case studies (although in a few meta-analysis case studies one or two policies might be included).

To assess the performance of SEA application in the different contexts, a precondition is to understand what SEA effectiveness is and how it can be evaluated or measured, which is elaborated on in the following section. To map the effectiveness criteria used to evaluate SEA performance, case studies and reviews of SEA effectiveness mainly from developed high income countries were collected since these countries' experiences are the dominant ones in the international EA/SEA literature.

4. SEA effectiveness and performance criteria

What is SEA effectiveness according to the international Environmental Assessment (EA) literature, i.e. what makes an SEA effective? There is no uniform concept of, or approach to, SEA effectiveness (van Doren et al. 2013: 128). SEA effectiveness is a relative concept with plural interpretations, since different actors or stakeholders have different views and expectations of SEA due to e.g. professional background (Morgan et al. 2012, in van Doren et al. 2013: 121). The different meanings or perceptions of SEA effectiveness, including specific criteria, will be elaborated on below by presenting examples from some of the key references in the international EA/SEA literature, followed by a summary of the most commonly used performance criteria stipulated by the International Association for Impact Assessment (IAIA) presented in an overview table.

To evaluate SEA effectiveness there are certain effectiveness criteria against which it is measured. These criteria can be divided into four different categories according to Chanchitpricha and Bond (2013): transactive, normative, procedural and substantive effectiveness. Transactive effectiveness is concerned with how resources are used when conducting SEA including cost- and time- efficiency, while normative effectiveness is about how perceptions of the SEA process can lead to changes in views or attitudes (of those involved as stakeholders or in the implementation of the tool) based on experience and lessons learned from implementing SEA – the latter contributing to changes in institutions and improving strategic decision-making in the long term. (Chanchitpricha & Bond 2013: 69)

Most evaluation studies, however, focus on the distinction between procedural and substantive effectiveness. The majority of EA evaluation studies have focused on procedural effectiveness – whether the SEA is undertaken in line with established procedures and criteria (Cashmore et al. 2004; Sadler 1996, in van Doren et al. 2013: 120). Although, to gain insights into the extent to which SEA is able to fulfill its purposes and produce expected results substantive effectiveness must be evaluated. According to some authors (e.g. Therivel 2010) the substantive aspects of SEA are the most important when evaluating SEA effectiveness. Zhou and Sheate (2011) similarly state that SEA effectiveness is concerned with the degree of influence of SEA on decision-making and environmental quality (*outcomes*) (Zhou & Sheate 2011: 523). In other words the SEA is considered effective when fulfilling its objectives.

Bina (2008) suggests that there should be an additional conception of SEA effectiveness, in excess of substantive effectiveness, termed incremental effectiveness. Even if SEA does not have a direct impact on decision-making processes, it can produce long term benefits such as technical changes, or facilitate institutional changes leading to the need for decision-makers and planners to increasingly consider environmental issues during the planning process. (Bina 2008: 729) These types of changes or impacts refer to the context in which SEA is applied, and can be compared to normative effectiveness as presented above.

There are many different factors postulated in the EA/SEA literature that can contribute to effectiveness of SEA. Van Doren et al. (2013) present a table with an overview of factors considered important for SEA effectiveness according to recent and key sources of the international SEA literature. These factors include, amongst others, stakeholder and public participation, transparency and integration, and timing and quality (see table 1, in van Doren et al. 2013: 125). Moreover, Zhang et al. (2013) also present a comprehensive view of critical

factors for SEA implementation, both general factors influencing the SEA process as such and factors relating to the specific stages of SEA. Most of the critical factors were found to be of general character including factors such as communication and understanding, timing and organization, will and trust, and resources and capacity (Zhang et al. 2013: 93ff).

Cashmore et al. (2008) define four effectiveness criteria that determine the effectiveness of SEA: learning outcomes (both social and technical); governance outcomes (e.g. stakeholder participation and network development); development outcomes (design choices and consent decisions); and changes in attitudes and values (Cashmore et al. 2008, in van Buren & Nooteboom 2009: 146).

Van Bureen and Nooteboom (2009) further identify three criteria for SEA effectiveness:

1. The SEA enables decision-making based on authoritative and undisputed information on the environmental consequences of each alternative choice (content);
2. The SEA contributes to the inclusiveness of the collaborative dialogue, and thus to the realization of support and legitimacy by achieving consensus and frame-reflection (process);
3. As a procedural device, SEA contributes to the timeliness, transparency, and quality of the overall decision-making process (procedure).

They focus on the direct impact of an SEA on the quality of the decision-making process with regard to the quality of its content, stakeholder participation and procedural quality. If these conditions are met, the SEA would likely have the desired effect on the outcomes of the planning processes. They argue that *when* and *how* an SEA is applied is crucial to understand its effectiveness, and show that effectiveness depends upon how the SEA is embedded in the planning process. (van Bureen & Nooteboom 2009: 147)

According to Thérivel and Minas (2002) an effective SEA is one that identifies possible changes to a strategic action which makes it more sustainable or environmentally benign, and that these changes must be included in the strategic action. They emphasize four factors, building on Thissen's (2002) process criteria for effective SEA, that could contribute to the effectiveness of SEA: who carries out the SEA; when it is carried out; the documentation required or how it is documented; and the resources available. (Thérivel & Minas 2002: 82f)

IAIAs SEA performance criteria (2002) can be used to summarize the most commonly used SEA effectiveness criteria found in the literature, including the case studies presented above.

IAIA states that "a good-quality SEA process informs planners, decision makers and affected public on the sustainability of strategic decisions, facilitates the search for the best alternative and ensures a democratic decision-making process. This enhances the credibility of decisions and leads to more cost- and time-effective EA at the project level. For this purpose, a good-quality SEA process is:"

Table 1. SEA performance criteria (IAIA, 2002)

Category/Theme	Performance criterion
Integrated	• Ensures an appropriate environmental assessment of all strategic decisions relevant for the achievement of sustainable development. • Addresses the interrelationships of biophysical, social and economic aspects. • Is tiered to policies in relevant sectors and (transboundary) regions and, where appropriate, to project EIA and decision making.
Sustainability-led	• Facilitates identification of development options and alternative proposals that are more sustainable*.
Focused	• Provides sufficient, reliable and usable information for development planning and decision making. • Concentrates on key issues of sustainable development. • Is customized to the characteristics of the decision making process. • Is cost- and time-effective.
Accountable	• Is the responsibility of the leading agencies for the strategic decision to be taken. • Is carried out with professionalism, rigor, fairness, impartiality and balance. • Is subject to independent checks and verification. • Documents and justifies how sustainability issues were taken into account in decision making.
Participative	• Informs and involves interested and affected public and government bodies throughout the decision making process. • Explicitly addresses their inputs and concerns in documentation and decision making. • Has clear, easily-understood information requirements and ensures sufficient access to all relevant information.
Iterative	• Ensures availability of the assessment results early enough to influence the decision making process and inspire future planning. • Provides sufficient information on the actual impacts of implementing a strategic decision, to judge whether this decision should be amended and to provide a basis for future decisions.
	* i.e., that contributes to the overall sustainable development strategy as laid down in Rio 1992 and defined in the specific policies or values of a country.

Source: International Association for Impact Assessment (IAIA) January 2002.

There is some disagreement of the applicability of these criteria in all countries (including countries that are not represented in or have contributed to a very limited extent to the

international SEA literature). I.e. it is questioned if the performance criteria are universally applicable, e.g. Fischer and Gazzola (2006) identify different SEA effectiveness criteria for Italy. There is also question of whether the SEA performance criteria are equally valid for all SEAs. Fischer (2002) suggests that they are not and differ for three types of SEA; policy EIA, PEIA (Plan Environmental Impact Assessment), and program EIA, as each focuses on different aspects and has distinct assessment tasks (Fischer 2002, in Wu et al. 2011: 81).

Authors of the international SEA literature also draw attention to the effectiveness of SEA as closely connected to the context in which it is performed. SEA effectiveness depends on the purposes and expected results defined for the instrument (van Doren et al. 2013: 121), which can differ between different countries following from different understandings of the tool in strategic decision-making. Some authors also argue that the SEA criteria should be context specific in order to make an appropriate assessment of the implementation of SEA and to improve the practice of SEA, e.g. Wu et al. (2011) that suggest developing performance criteria applicable for Chinese practice. Victor and Agamuthu (2014) similarly state that SEA practice in Asia, regarding its role and effectiveness, should be re-examined and customized to local conditions, such as cultural context, and avoid mimicking SEA practice in Europe.

5. SEA impacts and benefits

The desired impact of SEA is to improve strategic decision-making by integrating environmental and sustainability issues into policies, plans and programmes, leading to the most environmental friendly actions and protection of the environment (Therivel 2010: 9; Van Buuren & Noteboom 2009: 146). This is the concern of SEA benefits as well – if the implementation of SEA has been beneficial and improved planning and decision-making (in terms of effectiveness) this will lead to minimal negative impacts on the environment and at the same time maximizing positive effects for the environment and promoting sustainability (Therivel 2010: 11). The impact of SEA on the content or choice of a strategic action is often unclear, since planning processes are influenced by additional sources of information as well as the views of stakeholders. The processes are fluid and influenced by multiple factors, which makes it impossible to pinpoint the exact impact of SEA on the final strategic decision as well as the benefits resulting from implementing SEA. (Buuren & Nooteboom 2009: 146). This is important to have in mind when evaluating the findings from the different case studies.

Some of the benefits with applying SEA to strategic decision-making includes that it informs decision-makers about environmental and sustainability issues at an early stage when multiple

alternatives can still be taken into consideration, before higher political decisions have been made. SEAs can deal with impacts that are difficult to grasp at the project level, and can handle cumulative and synergistic impacts of multiple projects. SEAs can also improve strategic decision-making and planning processes by facilitating public participation in the decision-making process, which leads to both increased transparency and legitimacy of strategic decisions. (Therivel 2010: 18ff) In addition the SEA can facilitate decision-making at the project level, through "tiering" or linking of SEA and EIA at different planning levels. Tiering can e.g. allow for postponement of detailed issues and better scoping of assessments (IAIA 2014). If all of this is true or has been the actual result of SEA application in practice there is nevertheless so far limited evidence of.

6. Findings: The experiences of SEA in five developing countries

This section presents the findings from reviewing a variety of assessments of SEA application in the following developing country and/or emerging economy contexts: China, South Africa, Brazil, South Korea and India. The focus is on SEA effectiveness, impacts and benefits.

6.1 China

China is one of the few Asian countries to have officially adopted SEA (Tao et al. 2007: 259). The legal requirement of applying SEA to plans and programs in China was established in 2003 following the implementation of the Environmental Impact Assessment Law (the EIA Law). SEA in China is often referred to as Plan Environmental Impact Assessment (PEIA), or plan EIA; the terms are often used interchangeably. (Bina et al. 2011: 515; Wu et al. 2011: 77). To evaluate the experiences of PEIA in China I provide a summary of key findings of different case studies and reviews in the recent SEA literature.

Findings from 36 semi-structured interviews

Bina (2008) focuses on three aspects of PEIA to evaluate China's experience of SEA: 1) purpose of the assessment, 2) quality of the process: timing, consideration of alternatives and public involvement, and 3) methods and expertise (Bina 2008: 721). The main findings of her analysis[1] show that the implicit concept of effectiveness in China is a narrow version of direct impact[2], focusing on solutions in terms of prevention, mitigation and compensation efforts. This is mainly because of the late start of PEIA, as the assessment of impacts of e.g. a plan is

[1] Based on a total of 36 semi-structured interviews with bureaucrats, technical experts, representatives from consultancies, academics, foreign consultants and officers of international organizations.

[2] Bina makes a distinction between direct and incremental impacts/effectiveness, the latter including changes in mindsets and awareness of decision-makers, institutions and organizations, and the culture of planning.

done when it has already been approved. The analysis of land-use master plans by Tao et al. (2007) – see below – confirms this. According to Bina the same is true for the transport sector, where PEIA is limited to discussions of alternative routings of already determined transport solutions. The SEA can in this way advise on sensitive areas that should be avoided and on mitigation efforts, but does not inform the choice of a strategic action that leads to the selection of a particular transport mode. (Bina 2008: 722)

When it comes to public participation Chinese laws and regulations have not fully addressed the prerequisites for this; that is the "access to information, public participation in decision-making processes and access to justice". (Zhu & Ru 2007, in Bina 2008: 722). And finally, concerning methods and expertise, Bina's findings show that there exists confusion among experts during the scoping stage in the SEA process; what depth of analysis to aim for and which strategic questions or issues to prioritize. To highlight key factors on which planning decisions should be taken requires close collaboration between planning and environmental actors, something that is very difficult in the current Chinese context (discussed further in the article). (Bina 2008: 723) Moving on to case studies from specific sectors including SEA application in land-use planning, master urban planning, and PLEI network planning.

SEA in land-use planning

Tao et al. (2007) investigate how SEA is enacted as an effective analytical tool to integrate the environment into land-use planning, identify factors that influence the integration and review the progress and current state of SEA in China. The results of a comparative analysis of three different case studies show that SEA provides many benefits in promoting environmental considerations into land-use planning processes. The benefits or key achievements of the SEA studies include amongst others: proposed environmental assessment indicators, assessment of potential cumulative environmental impacts, assessment and comparison of the environmental effects of various planning options, and good experiences on experts' participation in the SEA process (Tao et al. 2007: 258).

The authors emphasize that since SEA has been applied to a limited number of cases, it is difficult to draw conclusions about the impacts of SEA on land-use planning processes and decision-making (Tao et al. 2007: 257). But they nevertheless identify factors contributing to effective SEA and some of the problems when applying SEA in the Chinese context. When analyzing strengths and weaknesses of the SEA frameworks and procedures, they found that factors contributing to the effectiveness of SEA in China were the enactment of the EIA Law,

and guidance from the Chinese State Environmental Protection Administration (SEPA) and departments of land administration (Tao et al. 2007: 259).

The results from the case analyses show that SEA can be a good tool for integrating environmental friendly principles into land-use master planning, but there are still problems impacting its effectiveness. These problems include: a need for better integration of SEA and planning processes, need for sufficient research on methods and techniques available for land-use master planning (including methods for addressing uncertainty of the SEA process which compose one of the most important barriers for effective PEIA application), more support for collecting baseline data (concerning lack of time, financial support, local knowledge and information), and more effective public participation in the SEA process since current SEA practice in China takes place within a limited number of governmental agencies, stakeholders, interest groups and other people. (Tao et al. 2007: 260f)

One important detail mentioned concerning the integration of SEA and planning processes is that typically master plans in China are already approved before actual PEIAs are initiated, as appointed by Bina (2008). This affects the impact of SEA on the decision-making process.

SEA of Provincial Level Expressway Infrastructure (PLEI) network plans

Zhou and Sheate (2011) analyze two SEA applications of China's provincial level expressway infrastructure (PLEI) network plans: one case from Hunan, a central-southern province in China, and another from Shanxi, a central-western province (Zhou & Sheate 2011: 524). The authors have developed review criteria for assessing the quality of SEA application stressing the SEA application process, procedure and its major contents. Even if the focus of these criteria is on quality rather than effectiveness, poor quality SEA ultimately leads to weakened SEA effectiveness.

Through analyzing the SEA reports of the two case studies they found that current SEA practice in PLEI network planning has a number of problems including: late start of the SEA process (the SEA teams were involved in the planning process too late or possibly the SEAs started when the planning processes had finished); the SEAs' assessment objectives were not properly identified; there was no baseline environment study describing the current state of the environment and no alternatives were developed to improve environmental performance of the plans being assessed. In addition the public was not allowed to participate in the SEAs or the planning processes, and its participants were not given enough time to understand the

proposed plans before making contributions. And most importantly, no evidence was found of interaction between the SEA team and the planning team in either case or that the findings of the SEA teams were integrated into to the proposed plans leading to adjustment. (Zhou & Sheate 2011: 528).

The authors conclude that the SEAs applied in the two case studies were not interdisciplinary, since the SEA teams lacked specialists with professional backgrounds in relevant fields. Moreover, the purpose of the SEA appeared not to be understood by the SEA practitioners, causing the most vital problem in both cases: "the SEAs were not oriented by developing proper and quality alternatives and mitigation efforts to improve the environmental performance of the plans". (Zhou & Sheate 2011: 528)

SEA in master urban-planning

Che et al. (2011) presents a review of the effectiveness of one of the few applications of SEA in urban planning in China, reviewing PEIA applied to the Master Urban Plan of the southern city of Shenzhen. The PEIA and planning process in Shenzhen stands out with regard to timing and process integration since the scoping study of the PEIA was initiated before the drafting of the plan, in comparison to the late initiation of PEIA as described by Tao et al. (2007). In this case the PEIA was not only initiated early on in the planning process, it also gave the public and government agencies an opportunity to leave their comments or opinions relating to the plan's objectives, specific targets and content. A total of 30 suggestions of these were later integrated in the final planning scheme of the plan (Che et al. 2011: 565), which can be considered effective according to SEA performance criteria.

Nevertheless, there are several shortcomings of PEIA in China in general reviewed in the article including its poor integration with broader economic and industrial plans, over dependence upon strong leaders for support and coordination, poor integration of public participation, SEAs undertaken after key planning decisions have been made and failure to apply integrated methodological tools. The experience of PEIA in the master urban planning of Shenzhen shows that progress is occurring in implementation of PEIA in China, and in tackling these shortcomings to increase its effectiveness. (Che et al. 2011: 568).

SEA practice in general, a meta-analysis of case studies

Wu et al. (2011) by reviewing literature to assess the progress of SEA implementation in China and conducting a survey on current status and effectiveness, come to the conclusion

that SEA in China is "impact-based SEA" focusing on impact prediction through use of technical and inferential schemes (Wu et al. 2011: 84). However, the authors argue that SEA implementation has only fulfilled the objective to provide countermeasures and actions to prevent or mitigate adverse environmental impacts, while failed to accomplish the primary objective to attain sustainable development and to prevent any adverse environmental impacts resulted from proposed plans and programmes. This is a consequence of the limited functions of SEA resulting from late timing to initiate SEA, which makes it difficult to enact as an improving process-oriented tool and means for decision-making. (Wu et al. 2011: 81). As stated in the article: "According to the SEA performance criteria, most of the SEA cases in China are less effective" – confirming that integration of environmental considerations into plans and programmes in China has been ineffective, or on the other hand, that the SEA performance criteria stated by IAIA are not applicable or equally valid in the Chinese context as suggested by authors such as Wu et al. (2011) and Fischer (2002).

6.2 South Africa

South Africa is considered a leading developing country in terms of the evolution and practice of SEA (Thérivel & Partidario 2002, Dalal-Clayton & Sadler 2005, in Retief et al. 2008: 505) and also a key actor in the development of environmental assessment in the African and Southern African Development Community region (Weaver et al. 2002, SAIEA 2003, Tarr 2003, in Retief et al. 2008: 505). There is no legislation requiring application of SEA in South Africa. However, South Africa has developed its own approach to SEA including definitions, principles and guidelines for application of SEA to plans and programmes. These guidelines facilitate a common understanding of SEA in South Africa. The SEA approach in South Africa differs from other international SEA approaches and practices since it focuses on opportunities and constraints of the environment on PPPs (development), rather than the impact or consequences of PPPs on the environment. (Rossouw et al. 2000: 217ff)

SEA practice in planning, conservation and water management

Retief (2007a), and Retief (2007b), presents a review of the effectiveness of six high profile SEA case studies within the South African context. The case studies were selected with the aim to investigate effectiveness of SEA practice under different conditions in the South African context, and therefore consist of a variety of plans and programmes from different areas; planning, conservation and water management at different scales (local, sub-regional and provincial). The effectiveness of the SEAs was measured against a variety of key

performance areas and key performance indicators developed by the author, incorporating both international and South African SEA process principles and objectives (Retief 2007b: 91). These performance criteria include or explore among others the extent to which the SEA influenced the contents of the plan or programme, if the objectives of the SEA were achieved and if appropriate monitoring of the environment was in place (Retief 2007a: 87).

The results of the case study reviews show that the SEAs were particularly ineffective in terms of direct outputs, with only limited and isolated cases of good performance. They only partially managed to fulfill their project objectives and could not effectively integrate sustainability objectives into plans and programmes. Moreover, limited proof was found of the SEAs influencing the contents of plans and programmes and no evidence was found of decisions directly affected by the SEAs. Due to an overall lack of monitoring arrangements it could not be concluded whether sustainability objectives, or positive changes in the quality of the environment, were achieved. An additional drawback that was identified was that the SEAs in most cases seemed to produce a long "wish list" of too many issues, but still in some cases managed to miss key issues. Only two of the six cases showed indications of good performance, one of which managed to influence the contents of plans and programmes, achieve its objectives, and influence decision-making, while the other accurately identified key significant issues. (Retief 2007a: 95f)

Based on these overall poor effectiveness results the author concludes that SEA is not achieving its objectives within the South African context, even though the SEAs produced certain indirect outputs in terms of highlighting deficiencies and gaps in existing policy, facilitating capacity building and raising awareness of sustainability issues (Retief 2007a: 96f), which could be considered as benefits of the implementation of the SEAs. But why then did the SEAs in these cases show an overall poor performance in terms of impacts and effectiveness?

Retief (2007b), in a paper which examines the same case studies as the former but presenting the results with additional indicators, based on the results of the study concludes that there is no one understanding of the SEA process in the South African context, and the principles and elements included in the SEA guidelines have largely failed to facilitate a common understanding. The results of his study show that SEA practitioners have a very limited understanding of the strategic decision-making processes related to the SEA and also of the underlying political context. (Retief 2007b: 98)

The case studies also showed that there was little commitment (or political buy-in) confirmed to ensure that results of the SEA would be considered in future decision-making. This was identified as a possible consequence of the lack of consultation and participation processes. It emerged that politicians and decision-makers were willing to conduct the SEA but not to implement it. In addition, decision-makers expressed feelings of a lack of focus of the SEAs and of clear proposals and conclusive results, e.g. none of the SEAs formulated a clear definition of sustainability even if this was included as an objective in all of the cases. (Retief 2007b: 95ff) These are all important factors that could have contributed to the overall low performance of the SEAs.

SEA in a variety of sectors

Rossouw et al. (2000) reviewed selected South African SEA case studies and analyzed their contexts. The case studies, consisting of 8 different PPPs from different sectors, were evaluated against four criteria: did the SEA provide information before decision-making; did the SEA precede EIAs; was the SEA linked to PPP formulation; and did the SEA apply the South African conceptual approach? The results of the study showed that more than half of the case studies provided information before important strategic decisions were made. But whether the SEA led to informed decision-making, i.e. had an effect on the final decision, in all of the cases is difficult to determine according to the authors. The study also showed that half of the selected SEA case studies were not directly linked to PPP formulation and the majority of the cases did not precede EIAs, (of which the latter should not be seen as a weakness of SEA). All except one case applied the South African conceptual approach to SEA. (Rossouw et al. 2000: 221)

The authors argue that the evaluated case studies demonstrate the potential of SEA to integrate and apply sustainability principles to plans and programmes, but still the evidence of its effectiveness can be considered rather limited. What is evident from the analysis, according to the authors, is that the lack of an agreed approach has not been a major obstacle to conducting SEA in South Africa (Rossouw et al. 2000: 222). This stands in contrast to the findings of Retief (2007), which showed that there is no uniform approach to or understanding of the SEA process in the South African context. The fact that there is no uniform approach, demonstrated by the confusion amongst decision-makers and limited understanding of SEA practitioners, affects the performance of SEA practice. Further case studies presented below confirms SEA ineffectiveness in the South African context.

SEA application in six different case studies

Retief et al. (2008) present the research results of performance evaluation of SEA practice in South Africa through a detailed analysis of six case studies[3] from various sectors, (and also review 50 SEAs conducted during 1996-2003 to locate features of the South African SEA system at a macro level). The results of the analysis show three key features of the application of SEA in South Africa which contribute to its ineffectiveness, including lack of focus, lack of integration and lack of assessment. In current practice the scope of SEA is far too extensive focusing on too many issues, objectives and indicators. Further, the SEAs are not sufficiently integrated into the strategic decision-making processes and at the same time the outcomes or proposals of these are not actually "assessed", according to the research findings. The lack of focus can be explained by the complex and poorly explained concepts such as carrying capacity and limits of acceptable change, that are used in the SEA frameworks. Lack of integration of SEA in decision-making is explained by the South African conceptual approach focusing on understanding the environment instead of the PPPs. And finally, the lack of assessment is explained by the interpretation of the SEA approach, which resembles a planning process rather than an assessment; instead of asking if proposed PPPs are within the environmental constraints they focus on what PPPs can be considered given the constraints and opportunities of the environment. (Retief et al. 2008: 509ff)

Retief et al. (2008) analysis of SEA practice in Africa also showed that there is a separation between the "neutral" experts represented by the SEA consultants and the decision-makers that they advise. This is a feature of the largely criticized "technocratic-rational model" applied in the South African context, and most other SEA practices, which contributes to ineffectiveness of the SEA. This means that the SEA application overly relies on scientific and quantitative outcomes that are considered accurate and conclusive, and rests on the assumptions that more and better information will lead to better decision-making and that environmental assessment can be objective. According to Retief et al. (2008) "Decisions are not only rational matters of expertise, facts and science, but also matters of opinion and values." They conclude that SEA in South Africa appears to be regarded as the answer to all environmental problems, whilst being ineffective in practice – indicating that current practice and approaches of SEA in the South African context is not working effectively.

[3] These six case studies are the same as the ones reviewed in Retief (2007a) and (Retief 2007b) above.

6.3 Brazil

In Brazil there is no particular legal provision requiring application of SEA to plans and programmes, or any administrative guidelines regarding SEA (Sánchez & Silva-Sánchez 2008: 516). Despite some institutional and legal initiatives, SEA practice to plans and programmes is not mandatory; instead it can be considered a voluntary initiative. There is a lack of practical experience in applying the SEA tool in Brazil. There are only a few cases of SEA application, and most SEA initiatives are undertaken by the national government, the National Development Bank, and others such as environmental agencies, universities and private companies (Dalal-Clayton & Sadler 2005, in Gallardo & Bond 2011: 268). The majority of the SEAs so far have been applied to the energy sector, focusing on oil and gas, electric energy planning, hydropower and watershed planning, and biofuel production. These make up 13 of a total of about 30 SEAs conducted in Brazil in the past 15 years.

SEA in the energy sector

Malvestio and Montaño (2012) investigate the procedural effectiveness of SEA applied to the energy sector in Brazil by analyzing and evaluating 13 SEA reports, within the focus areas mentioned above, against 16 procedural effectiveness criteria selected from the international literature. Using these criteria they aimed at identifying which steps/procedures in the SEA process were covered based on information presented in the SEA reports. (Malvestio & Montaño 2012: 3). The results of the study highlight some of the strengths and weaknesses of SEA practices applied to Brazilian energy planning. Some of the strengths identified were presenting the need for SEA, describing the current state of the environment and presenting mitigation efforts (e.g. preferred alternatives, modification on PPP objectives and measures for avoiding possible impacts). Two of the most important weaknesses that were found in the SEA procedure were presenting probable environmental evolution without the SEA object and identifying strategic alternatives. Since SEA benefits, according to Fischer (2007), are closely related to considering alternatives at the right time, deficiencies in this step can affect the whole assessment effectiveness. (Malvestio & Montaño 2012: 4)

Other weaknesses found in the cases were the identification and evaluation of environmental consequences of strategic alternatives, which was only met by three of the analyzed SEA reports. Four of the reports did not present or partially presented SEA objectives and indicators related to the SEA objectives, indicating other weaknesses of the SEA practices. To define and clearly present the assessment objectives is crucial to achieve some performance

criteria (IAIA 2002), like focusing on key issues and being participative. The study also showed that none of the SEA reports described how SEA and public participation were taken into account in decision-making, indicating that transparency is one additional weakness in the SEA practice. (Malvestio & Montaño 2012: 4f)

Although the authors were able to identify some strengths and weaknesses of the SEA procedures, they still acknowledge the need for further studies to continue the discussions about procedural effectiveness, and also work related to substantive effectiveness to better understand effectiveness of the SEA tool in the energy sector. Procedural effectiveness actually says nothing about substantive effectiveness; if the SEA produces expected results and fulfills its objectives, which is most important when evaluating SEA effectiveness according to some authors. Whether the SEAs analyzed affected or improved planning and decision-making is not clear from this study. It only gives indicators of what seems to be working well in the different stages of the SEA process and what is not and needs more attention. The conclusion that can be drawn from this study, when looking at procedural effectiveness, is that the SEA process applied to the energy sector in Brazil has been effective in some steps but there are however many important weaknesses related to the performance of SEA practices.

SEA in transport planning

Sánchez and Silva-Sánchez (2008) evaluate the effectiveness of SEA applied to the planning of a new highway in São Paulo, Brazil, called the Radoanel Programme, against IAIAs performance criteria. What this SEA experience shows is that the SEA report failed to take account of significant strategic issues, of which the most critical one was the highways potential to induce urban sprawl over water protection zones. Since no agreement was reached on the scope of the SEA prior to initiating the process, the findings of the SEA were encountered with skepticism and even strong resistance among stakeholders. (Sánchez & Silva-Sánchez 2008: 516) The Radonel is a case where the project preceded the programme – the decision to build the highway was made years before the SEA was conducted. This led to strong criticism from environmentalist non-governmental organizations of both the SEA process and report (Sánchez & Silva-Sánchez 2008: 519). Concerning public participation, the SEA was commissioned as a technical report with no provision for public input. However, the public had several previous opportunities to advance their opinions on the project, and the

SEA report explicitly states that public expectations were taken into account (Sánchez & Silva-Sánchez 2008: 517)

Evaluating the SEA against the IAIA performance criteria the Radonel SEA is far from fulfilling the potential to enable more effective environmental assessment at the project level. Tiering with project EIA, which was sought, was not fully achieved in practice. Effective consideration of water resources and land use policies and plans were disputed by stakeholders, demonstrating a lack of integration of the SEA. Another very unsatisfactory compliance with the performance criteria was ensuring availability of the assessment results early enough to influence the decision-making process and inspire future planning (see the iterative category, table 1). The SEA did not address the land-use/urban sprawl issue and only took one alternative scenario of the future into consideration, not including alternatives that could have been the better environmental option. The SEA did i.e. not provide sufficient information on the actual impacts of implementing the strategic decision, and to judge whether this decision was the best option or should be amended. (Sánchez & Silva-Sánchez 2008: 521) The effectiveness of SEA in this case can therefore be considered weak at many points, especially since the strategic decision to build the highway was made several years before the initiation of the SEA process.

An additional question asked by the authors when evaluating the SEA was whether or not it had been influential. The answer given was: "In this case, SEA did influence subsequent environmental impact statement and outlined routing alternatives to be evaluated, but did not influence the decision to build the highway, which had been made several years before." (Sánchez & Silva-Sánchez 2008: 521) This case study thereby serves as a concrete example of an SEA not influencing the final strategic decision. The major shortcoming identified of the Radoanel SEA was the scoping of strategic issues. The experience shows that if an agreement of "what is strategic" is not reached and recognized by influential stakeholders, then unsettled conflicts will be transferred to project EIA. In this way, the SEA will add just another loop to the commonly long and time consuming road to project approval. (Sánchez & Silva-Sánchez 2008: 522) In this case study the SEA clearly failed to improve planning and decision-making at the strategic level as well as the project level, by late initiation of the SEA process and not considering other alternatives to a strategic decision that was already made.

6.4 South Korea

South Korea, along with Hong Kong (China), and Japan for example, has a well-established system and good record of EIA and SEA application at project, program and plan levels. As in many other regions in the world, SEA is a new concept in the East Asia and Pacific region. As of 2005 only Hong Kong (China), Japan, Korea, mainland China, and Vietnam had legal requirements, to some extent, for SEA application at national or local levels (World Bank 2013), but this fact has probably changed since increasingly many countries have started to embrace SEA practice at different levels. To evaluate SEA practice in South Korea I managed to find one paper that mainly focuses on explaining the SEA process. However, it also provides a case study for how it has been applied to dam planning in South Korea illuminating some of the achievements of the SEA implementation. Even if it is difficult to draw any conclusions regarding the overall effectiveness of SEA application in the country through assessment of only one case study, it nevertheless provides one example from South Korean experience that is still valuable.

SEA in water management – dam construction planning

Song et al. (2010) review how SEA was integrated into South Korea's Long-term Plan for Dam Construction (LPDC). In South Korea, the LDPC is the highest administrative level plan to govern action plans for dam construction in regions where water deficiency is expected (Song et al. 2010: 399). The results of the study show that the SEA raised the effectiveness of the planning process through feedback of environmental and social considerations to the plan. The SEA process also improved the inclusion of environmental priorities and factors that could lead to negative public opinion in the evaluation of water supply alternatives and dam construction sites. I.e. the SEA had an important role in reminding planners and decision-makers that dams have a negative environmental image with the public. The SEA was also considered to have created a paradigm shift from functional planning toward sustainable dam planning that considers local and regional situations. The results of the study also showed that in addition to improving the alignment of dam plans with environmental policies, SEA also raised awareness among dam planners of environmental and sustainability issues (Song et al. 2010: 398), which can be considered benefits of the SEA.

Regarding the impacts of the SEA on planning and decision-making, in addition to the ones already mentioned above in relation to effectiveness, the South Korean experience with the assessment of LDPC led to the re-evaluation of the objectives and plans for dam construction

by management agencies and to an integrated comprehensive national dam construction plan. It encouraged the inclusion of national environmental goals, policies and standards during the planning process, along with methods to maintain these standards. The SEA also led to mitigation methods for environmental damage through the review and correspondence of international environmental agreements, which demonstrates potential impacts of the SEA on the environment. At the regional level, the SEA improved the evaluation of water supply alternatives and dam construction sites. A complete range of water supply alternatives was considered, including the redevelopment of existing dams, desalination and underground dams. New dam construction was considered only when there were no other feasible alternatives. The authors conclude that, as shown by the experience of South Korea with applying the SEA tool to dam construction, SEA has great potential for improving planning of dams and other water resources infrastructure when it is implemented effectively and early in the planning process. (Song et al. 2010: 406)

6.5 India

Whereas China and a number of other Asian countries have made SEA a legal requirement for certain PPPs, experience with SEA in India has been limited to only a few externally supported programmes (Hayashi et al. 2011, Rajvanashi 2001, in Erlewein 2013). In India SEA is considered a voluntary practice that can be applied not only to policies, plans and programmes, but also to integrated or stand-alone projects. The SEA can be applied at two different stages: 1) before initiation of the project, reflecting a "top down" approach and 2) after project EIAs are prepared to review decision-making, reinforce accountability and build public confidence, reflecting a "bottom up" approach. (Rajsvanshi & Mathur 2005: 1)

Applying SEA before project initiation has been of importance in the Indian context, since outputs of these assessments have showed benefits of delivering information necessary to facilitate decision-making and reducing the need for EIA. The SEA outputs have been proved useful in reducing time and cost as well as the burden of conducting EIA, and have been extremely relevant in streamlining project level EIAs by a revised context and scope for EIA. SEA has also been proved useful at plan and programme level by providing a comprehensive view of environmental and social issues for a broad assessment of the cumulative impacts of proposed projects, before their implementation in some protected area of the country. (Rajsvanshi & Mathur 2005: 1f). All of these factors can be considered benefits of the SEA, while at the same time indicating SEA effectiveness in case of e.g. time- and cost-efficiency.

The SEA tool has been proposed by several authors as a promising approach to enhance the scope of India's system for environmental assessment including e.g. Agrawal et al. 2010, Paliwal 2006, Nandimath 2009, and Erlewein 2013. As mentioned above the experience of SEA in India has been limited, but there are still some examples of SEA practice in India that have been reviewed in the SEA literature. Two case studies are presented below.

SEA in water management

Rajvanshi & Mathur (2005) present a case study of an SEA of a proposed Human River Irrigation Project in Maharashtra State, India. The case study presents an example of an assessment where biodiversity issues formed the basis of informed decision-making, and led to the final approval of a project that had earlier been postponed due to a lack of inadequate considerations of biodiversity values of the project site and ineffective mitigation options of the identified impacts (Rajvanshi & Mathur 2005: 2). Since the application of SEA does not find its basis under current EIA legislation in India, the application of SEA in this case was more linked to its advisory, appraisal and mediation role in oversight of project level EIA to steer the environmental decision-making. The SEA was tiered to the earlier EIA to introduce additional considerations for reinforcing the evaluation of the project. (Rajvanshi & Mathur 2005: 5) This can be considered as evidence of the SEA process being highly integrated, in line with IAIA performance criteria. The proposed project being tiered with policies in relevant sectors, e.g. the National Water Policy, can be seen as further evidence of this.

There is also evidence of the SEA process being transparent and participative through the involvement of and consultations with stakeholders and arranged public hearings. The authors state that: "… review comments on the earlier EIA report by… reflected transparency in the assessment process that remained consistent in SEA, which was a stakeholder driven exercise conducted by an independent agency" (Rajvanshi & Mathur 2005: 8). The case study also showed that the SEA managed to solve earlier conflicting goals of development and conservation of biodiversity and provide a baseline of information for meaningful evaluation of impacts on biodiversity (Rajvanshi & Mathur 2005: 11). Since this was a part of the aim of the SEA, it can thus be considered effective in that matter. From the results of the assessment it is evident that the SEA mainly tried to address the biophysical aspects, which was probably a consequence of the SEAs' focus on biodiversity issues. This can however be considered ineffective according to IAIAs performance criteria since SEA should address economic and social aspects as well.

When it comes to impacts of SEA on planning and decision-making the authors state that "the SEA played a meaningful role in deciding a new course of conservation planning and impact mitigation to feed into the renewal of decisions". They further state that "the SEA was customized to the characteristics of the decision-making, which greatly helped in overcoming the inconsistencies and uncertainties that constrained decision-making for authorization of a project that was first mooted two decades ago" (Rajvanshi & Mathur 2005: 13). What is evident from this is that the SEA had a positive effect on the decision-making process, and also that the SEA was focused, as stated in the latter citation, in line with IAIA performance criteria.

SEA and biodiversity conservation

Rajvanshi (2001) presents the application of SEA for environmental review of investment policies, plans and programmes proposed under the India Ecodevelopment Project (IEP) – a five-year project (1997-2001) part of the pilot programmes of the World Bank to promote conservation of globally significant biological diversity through implementation of ecodevelopment strategies in and around seven selected Protected Areas (PAs) of the country. (Rajvanshi 2001: 374) One of the objectives of the IEP was to improve PA management to conserve biodiversity and increase opportunity for local communities to participate in conservation initiatives. The core of the SEA process for assessment of IEP was analyzing the significance of ensuing impacts of activities and policy proposals, which if were ignored, could severely undermine the objectives of biodiversity conservation within the PAs and the sustainability of IEP (Rajvanshi 2001: 379). This clearly demonstrates the fulfillment of IAIAs sustainability-led performance criterion (see table 1).

Since the findings of the SEA have justified most investments, as the proposed activities conform to the overall objectives of ensuring environmental sustainability and offer long term solutions to the challenges of biodiversity conservation, and the SEA process identified specific actions that predict irreversible environmental implications (Rajvanshi 2001: 385), it can be stated that there is evidence of SEA providing sufficient and usable information that can potentially inform decision-making. In fact, the author states that the recommendations of the SEA have been incorporated in informed decision-making by the government of India (Rajvanshi 2001: 389).

The findings of the study show that even though the SEA of IEP was conducted on a very broad scale, including a broad range of activities, it has delivered major dividends or benefits,

which can also be considered as indicators of SEA effectiveness. These include (i) clarity of conservation objectives, alternatives and implications of strategies and programmes proposed under IEP, (ii) incorporation of environmental sustainability into the early stages of IEP, and (iii) recognition of potentially irreversible effects of some project activities and avoidance of their implications on PA values (Rajvanshi 2001: 385). The results of the SEA in the case of IEP is considered effective and beneficial, as stated by the author: "The SEA of this World Bank funded project became a vector for transition from a pro-environmental practice to the sustainability agenda for environmental protection and greatly helped in advancing conservation objectives" (Rajvanshi 2001: 388).

7. Conclusions and implications for future SEA practice

Which are the common factors influencing SEA effectiveness, impacts and benefits according to the findings presented in the previous section? What can be said about the overall performance of SEA in the developing countries/emerging economies reviewed in this paper? Given the results of the study what should SEA practitioners and decision-makers do in the future to improve the application and implementation of SEA in strategic decision-making? In this section an overall assessment based on a comparison of the results from the case studies is made with an emphasis on common weaknesses found in the SEA practices. At the end I present recommendations for improving future SEA practice, including recommendations by the authors of the case studies reviewed in this paper.

7.1 Assessment of key findings

The results from the case studies present important findings that can be used to improve future SEA practice in terms of effectiveness, impacts and benefits in developing countries. Many of the findings in terms of factors contributing to ineffective SEA are common across multiple cases in the different countries, while the few case studies that showed positive experiences of SEA present important results of factors that have contributed to the effectiveness of SEA.

The experience of China shows an overall low performance or ineffectiveness of SEA implementation, where SEA does not fulfill its primary objective. The case studies showed that SEA did provide actions and measures to prevent or mitigate adverse environmental impacts, but failed to prevent any of the actual impacts resulting from proposed plans and programmes mainly due to late initiation of the SEA process. This is an important lesson for future SEA practice; in order for SEA to have an impact on the planning process and the final strategic decision it has to be initiated earlier on in the planning process. According to authors

SEA is too often initiated after important strategic decisions have been made, which we have seen examples of in the case studies reviewed in this paper.

Another important finding from the Chinese SEA experience is the need for increased collaboration between environmental experts and planners. No evidence was found of interaction between SEA practitioners and planners in some case studies, and in others SEA teams were involved too late in the planning process. This is a finding common with the South African experience that showed limited evidence of interaction between SEA practitioners and decision-makers. These are crucial findings since lack of collaboration has proved to lead to poor integration of SEA results in planning and decision-making processes.

An additional finding from both Chinese and South African experiences was the confusion among decision-makers and experts during the SEA process. The Chinese experience showed that there was confusion among experts in terms of what depth of analysis to aim for and which issues and strategic questions to prioritize, demonstrating the need for a common understanding and clarification of the purpose of SEA as well as of guidelines for how to perform the critical stage of scoping in the SEA process. A similar confusion was found in the South African experience among planners on what key issues to focus on, following from the SEAs producing "long wish lists" of too many issues and the lack of focus of the SEAs without clearly defined objectives. Moreover, both authors reviewing the South African and Chinese experiences come to the conclusion that SEA is not fulfilling its objectives, which further acknowledges ineffectiveness in current practices.

The South African case studies showed limited or no evidence of SEA influencing the contents of plans and programmes and of affecting decision-making. This was also the case in the Chinese experience that demonstrated poor integration of SEA findings in the planning process and no evidence of SEA influencing decision-making. There is one additional factor identified in the South African SEA practice, in excess of the separation between SEA practitioners and the decision-makers they advise, that could possibly explain the poor integration of SEA findings in the decision-making process. This is the finding that there is limited understanding of the strategic decision-making process and the underlying political context amongst SEA practitioners. Consequently, in order for SEA findings to be integrated in the decision-making process there is a need for better understanding amongst SEA practitioners as well as increased collaboration between SEA practitioners and decision-makers. An important precondition, as showed by the lack of political buy-in in the South

African experience, is that the SEA is supported by planners and decision-makers that are willing to actually implement it.

The Brazilian experience showed two features considered as weaknesses of the SEA process that are also common with the Chinese and South African practices. These are unclear objectives and the lack of evaluation of alternatives to strategic actions. One important lesson that can be learned from the Brazilian experience is that it is crucial to have identified the scope of the SEA before initiating the SEA process to avoid SEA findings to be met with skepticism by stakeholders, as demonstrated by the case study of the application of SEA to the planning of a new highway in São Paulo (the Radoanel Programme). As with Chinese and South African experiences the Brazilian case studies emphasize that it is crucial for the SEA to be focused on key issues such as e.g. critical environmental factors or political feasibility in order to be effective. The focus of the SEA is also crucial to improve decision-making at the project level, since unresolved issues or conflicts at the strategic level will be transferred to the project level as shown by the Brazilian experience with the Radoanel Programme.

The Brazilian case studies also showed a lack of integration of SEA objectives with other policies and plans, and national environmental goals and also that tiering with EIAs was not successful, which affects the overall performance of the SEA. Concerning the inclusion of multiple alternatives, not just one, when evaluating strategic actions is important to improve the environmental performance of plans and programmes, and most importantly to be able to identify the best environmental option.

One additional finding stressed by the Brazilian, as well as the Chinese, experience is the inclusion of the public in the SEA process. Stakeholder involvement and public participation was found to be one of the weaknesses, indicating poor transparency of the planning and decision-making processes. This was explicitly shown in the Chinese practice of the SEA applied to PLEI network planning, where the public was not allowed to participate in the SEA processes nor in the planning processes. Stakeholders, moreover, were not given enough time to understand proposed plans or programmes before making contributions to the decision-making process. In this case it was clear that the requirements for an effective SEA were not fulfilled, since SEA is supposed to be an integrated and participatory approach involving all stakeholders including the public. Moreover, ensuring availability of SEA findings at an early stage is important if the SEA is to influence the decision-making process.

The South Korean case study shows a positive experience of SEA practice, where the SEA managed to improve the effectiveness of the planning process, and improved inter-linkages with other relevant PPPs (in contrast to the Brazilian experience above), while at the same time raising awareness of environmental and sustainability issues among planners. The latter can be considered as indirect outputs of the SEA process, which was also experienced in the South African context. The SEA in this case also had an important role in reminding planners and decision-makers of negative environmental images of the project of dam-construction with the public. This is an important lesson for future SEA practice, in different contexts as well, as a way to increase legitimacy of SEA findings by including environmental priorities and factors that can lead to negative opinions with the public in the evaluation of alternatives. Moreover, public participation is stressed once again together with early integration and effective implementation as important conditions for good SEA performance.

The experience of India presents case studies showing that SEA was highly integrated both with EIAs and policies in relevant sectors. There was also evidence found of the SEA process being transparent and participative through the involvement of and consultations with stakeholders and arranged public hearings. One case study (SEA applied to IEP – the India Ecodevelopment Project) also showed that the recommendations of an SEA were actually incorporated in the decision-making process by the government of India. These findings clearly stand out from the results of the case studies in the other developing country contexts, and therefore pose as an example of effective SEA implementation. But what made SEA effective in this particular context?

Since there are multiple factors influencing the planning and decision-making processes of plans and programmes, it is difficult to pinpoint what the determining cause could be. One important factor, which was also indicated within the experience of South Korea, is the fact that the SEA in this case was focused and customized to the decision-making process. In the experience of South Korea it was claimed that the SEA created a paradigm shift from functional planning toward sustainable planning that considers local and regional conditions. What is indicated by these findings, and is also stressed among authors in the SEA literature[4], is that the application of SEA needs not only to be customized to local and regional conditions in different contexts but also to the decision-making processes.

[4] E.g. Bina (2008) that suggests the need for a context specific SEA system to maximize its effectiveness.

Finally, the experience of India also showed that SEAs can be effective and produce multiple benefits even if they are conducted on a very broad scale, as showed by SEA applied to the Indian Ecodevelopment Project (IEP), which consisted of several policies, plans and programmes. The fact that the SEA applied to IEP was largely sustainability-led probably contributed to the overall effectiveness of SEA in this case.

But what about SEA impacts on the environment? As is evident from the case studies and key findings above, most experiences show how SEA has contributed to intermediate impacts and benefits; e.g. improved planning, enhanced expert participation in the SEA process, assessed potential cumulative effects on the environment or identified strategic alternatives of proposed plans and programmes. However, little is said about if implementation of SEA has actually contributed to a better environment, i.e. if SEA application has mitigated negative effects on the environment and accomplished its primary objective – to attain sustainable development. As showed by the Chinese experience SEA has failed to accomplish this objective. Moreover, the South African experience showed that a lack of monitoring lead to the inability to conclude whether sustainability objectives, or positive changes in the quality of the environment, were achieved. The South Korean experience with SEA in dam construction showed indications of potential impacts of SEA on the environment, providing mitigation methods for environmental damage. However, if these methods were later used is not evident. More evidence of actual impacts of SEA on the environment is needed.

One additional factor that needs to be considered in all of the case studies above is if legal requirements of SEA, which varies between different country contexts, is of importance for future SEA practice. When looking at some of the findings from e.g. China, where both legal regulations and guidelines exist, there is still confusion amongst experts about the purpose of SEA, how it works and how it should be used in strategic decision-making. In South Africa there are guidelines that are supposed to facilitate a common understanding of SEA practice, but they have failed to do so. This does not say that there is not a need for legal requirements for SEA application in other emerging economies and developing countries were SEA is not mandatory. Rather it demonstrates that there is room for improvement in existing legislation and guidelines. It also highlights the importance of clearly defined objectives of SEA if legal provisions are to be established in additional countries. Moreover, it is important that these legal requirements, regulations and guidelines are supported by political leaders in order for SEA to be effective.

7.2 Recommendations and prospects for future SEA practice

From the above assessment of the key findings of the case study reviews it can be said that there are examples of effective SEAs that have been conducted in developing country and emerging economy contexts, but still the majority of the case studies present an overall low performance in terms of SEA effectiveness. This is especially true for the Chinese and South African contexts. The experiences from Brazil, South Korea and India are however rather limited. Still the Brazilian case studies also present mainly weaknesses in recent SEA practice by demonstrating several shortcomings. Some case studies, nevertheless, have been partly effective producing benefits in terms of e.g. indirect outcomes, while others have succeeded to impact decision-making, being focused and integrated, as well as involving important stakeholders including the public. The South Korean and Indian case studies show clear examples of this even though SEA practice is relatively new in these countries, and there is a lack of legal regulations and guidelines to support the application and implementation of SEA. These case studies present positive indications for future SEA practice if application is further developed and established in different sectors in these and in similar developing country and emerging economy contexts.

The remainder of this section provides several practical recommendations for improving future SEA practice based on the key findings presented above. In the final section of this paper demands for further research in the field is discussed.

In order to improve the performance of SEA practice in the future the following activities, based on the findings presented in this review are recommended:

Ensuring quality of the SEA process

- *Clearly identify the scope and objectives of the SEA.* The purpose or aim should be clearly defined to minimize risks of the SEA objectives not to be understood by practitioners. Moreover, there needs to be an agreement on what is strategic, to avoid conflicts being transferred to the project (EIA) level.
- *Increase the focus of SEA reports.* The purpose or aim of the SEA should be clearly defined. SEA reports should be presenting key issues, providing clear proposals and conclusive results to facilitate integration of SEA findings in decision-making.
- *Ensure the presence of experts from relevant fields during the SEA process.* This is to ensure that all relevant information or necessary knowledge is included in the SEA report, providing a complete basis for strategic decision-making.

- *Separate SEA from EIA to ensure optimal use of the strategic assessment tools.* This is crucial to avoid overlapping between different levels and unnecessary additional work. SEA should be focused on the overall picture; covering the largest issues, while details should be left to the EIA.

Increasing communication and collaboration between key actors

- *Increase collaboration between SEA experts and decision-makers.* To highlight key issues on which planning decisions should be made requires close collaboration (Bina 2008: 723). By increasing interaction between SEA practitioners and decision-makers it could contribute to an increased understanding of the decision-making process and of the underlying political context among SEA practitioners, while at the same time reducing confusion among planners concerning which key issues to focus on.

Ensuring appropriate timing of processes and integration of SEA findings

- *Early initiation of the SEA process*. Since late integration of SEA in the planning process may reduce the credibility of the SEA process, whereas integration too early can lead to an assessment without a clear target (Zhu et al. 2005, in Tao et al. 2007: 261), timing of the SEA in relation to the planning process is important to achieve better integration of SEA findings in decision-making. To ensure integration of SEA in the planning process stipulate when SEA is supposed to be integrated in the planning process (Zhou & Sheate 2011: 528), and emphasize engagement of SEA from beginning to end of the planning process (Che et al. 2011: 569).
- *Ensuring involvement of SEA practitioners early in the planning process*. By ensuring early involvement of SEA practitioners, stakeholders and planners are given enough time to consider the results while at the same time promoting integration of SEA findings into proposed plans and programmes.

Promoting public participation, stakeholder involvement and political engagement

- *Ensure public participation and stakeholder involvement in planning and decision-making processes.* This includes access to information and opportunity to leave comments at least, and giving stakeholders sufficient time to consider the results of the SEA. The SEA should not be conducted within a too limited group of actors. Further, stakeholder involvement and public participation should also be regulated by law.

- *Build an SEA platform to promote public participation and information exchange.* This could be a national SEA platform and/or several platforms providing information of SEA application in different sectors, e.g. the energy sector or the land-use sector.
- *Promoting positive attitudes toward SEA amongst key decision-makers and planners*. Since efficient SEA practice depends on support from higher political leaders, and the attitudes of these have a great and direct influence of SEA implementation (Wu et al. 2011: 84), it is crucial to facilitate SEA application and let the tool be subject to continuous improvement.

Ensuring proper legal requirements and widening the scope of SEA application

- *Establish clearly defined legal requirements, regulations and guidelines for SEA practice.* Legal requirements, regulations and other guidelines form the basis for a uniform SEA approach. In the legal requirements and regulations emphasize that a baseline study (including trend identification and prediction), alternative options and mitigation measures, assessment, comparison and final decision is compulsory for SEA. (Zhou & Sheate 2011: 528). Further, state who is responsible for conducting and implementing the SEA to ensure accountability for SEA outcomes.
- *Create a uniform approach to and common understanding of SEA.* By clearly defined and formulated guidelines, regulations and legal requirements explaining what SEA is, what it is aimed to achieve and how it is to be used SEA practice will be facilitated. Establishing guidelines for specific sectors is an additional benefit to enhance SEA flexibility in different contexts. (see below)
- *Some projects requiring mandatory EIA should be reviewed for application of SEA.* In this way projects with significant potential or irreversible impacts can be excluded from consideration and costs for conducting detailed EIA be avoided (Rajvanshi 2001: 290).

Customizing and integrating SEA

- *Customize the SEA to the specific context.* Promoting a flexible SEA process that fits into the decision-making process and customizing it to local and regional conditions contributes to the effectiveness of SEA.
- *Integrate SEA with national environmental goals, EIAs and other relevant PPPs.* This will lead to greater legitimacy of SEA application among stakeholders and the public

and facilitate its implementation, thereby improving decision-making and increasing SEA effectiveness.

- *Enhance a variety of mechanisms for domestic and international communication and collaboration.* This can be achieved by working together with international SEA research institutes and associations, or international financial organizations (e.g. the World Bank and OECD) on SEA development. At the domestic level enhance mechanisms for vertical and lateral interaction and collaboration, which is essential for effectiveness of SEA implementation. (Wu et al. 2011: 83)

Strengthening SEA system components

- *Establish SEA educational and training systems or strengthen existing ones*. Involving SEA practitioners and decision-makers in such activities will increase capabilities required to perform high quality SEAs (Wu et al. 2011: 83). This will potentially enhance the awareness of key decision-makers of the importance/benefits of SEA and highlight how SEA findings can be incorporated in decision-making. These activities can also involve the general public in order to enhance awareness of SEA benefits and encourage participation (Tao et al. 2007: 263).
- *Establish national environmental monitoring and evaluation systems.* To support better informed baseline studies, impact assessment itself and monitoring measures, there is a need for appropriate monitoring systems to be in place (Zhou & Sheate 2011).

Evaluating SEA performance

- *Develop SEA performance criteria applicable in different contexts.* In order to evaluate SEA performance in different contexts individual criteria for developing countries are needed.
- *Ensure continuous evaluation of SEA impacts on the environment.* By having proper monitoring systems in place continuous evaluation of SEA impact on the environment as well as adjustments in SEA practice is feasible.

8. Concluding remarks and further research

This paper has presented some important findings from SEA experience in developing and emerging economies, and provided implications for future SEA practice. However, further research is needed, especially concerning SEA impacts on the environment. Further research should include the review of more cases studies from emerging economies, including low income, mid income and transition countries. There is a need for more case studies of both substantive and procedural effectiveness, in order to better understand SEA impacts, benefits and effectiveness in different contexts. An important contribution to the field would be to conduct interviews with SEA practitioners and decision-makers that have implemented SEA in practice, and collect evidence of SEA effectiveness, impacts and benefits through field studies. These methods would most likely reveal further dimensions and information of the application of SEA in practice, that are difficult to grasp only through reviews of documents and SEA reports. Some of the case study reviews assessed in this paper include these types of methods, but still the majority employed an analysis of written documents. Further research in the field will be crucial in order to provide recommendations in the future as SEA practice continues to evolve in a variety of developing country contexts.

9. Appendix

1. Number of SEAs reviewed in the study

Country: *Sector:*	**China**	**South Africa**	**Brazil**	**South Korea**	**India**
Transport	2 (Provincial level express infrastructure, PLEI, network plans, Zhou & Sheate 2011) 18 (Wu et al. 2011)		1 (Radoanel Programme – new highway in São Paulo, Sánchez and Silva-Sánchez 2008)		
Urban construction	1 (Master Urban Plan of Shenzhen, Che et al. 2011) 45 (Wu et al. 2011)				
Regional development	64 (Wu et al. 2011)	1 (Forestry, Rossouw et al. 2000)			
Local Development	14 (9 Tourism, 5 Marine development, Wu et al. 2011)	3 (1 develop-ment plan, 1 Port, 1 Sport Rossouw et al. 2000)			
Land use planning	22 (Wu et al. 2011) 3 (Tao et al. 2007)	3 (Retief 2007 a & b, Retief 2008)			
Water Management	12 (Wu et al. 2011)	1 (Retief 2007 a & b, Retief 2008)		1 (Long-term plan for dam construction, Song et al. 2010)	1 (Human Irrigation River Project, Rajvanshi &Mathur 2005)
Energy	9 (Wu et al. 2011)		13 (Malvestio & Montaño 2012)		
Conservation	7 (Water, Wu et al. 2011)	2 (Retief 2007 a & b, Retief 2008)			1 (India Eco-development Project – IEP, Rajvanshi 2001)
Agriculture	4 (Wu et al. 2011)				
Natural resources	8 (Wu et al. 2011)				
Industry	22 (Wu et al. 2011)	4 (Rossouw et al. 2000)			
Total number of SEAs:	231*	14	14	1	2

*The high number is a result of reviewing a large sample meta-analysis, conducted by Wu et al. 2011.

2. Summary of SEA case study review findings

Evaluation criteria: **Country:**	**Improved planning and decision-making**	**Involved key actors and stakeholders**	**SEA impacts on the environment**	**Tiering with EIAs and other policies, plans and programmes**	**Benefits of SEA implementation if any**
China					
SEA practice in China in general (Bina 2008)	Late start of PEIA, resulting in focus on prevention; mitigation; compensation efforts. SEA does not inform the choice of strategic action. Confusion among experts during the scoping stage of SEA – what key issues or strategic questions to focus on.	Chinese laws and regulations have not fully addressed the prerequisites for public participation and rights to access information. There is a need for better collaboration between planning and environmental actors, to highlight key factors on which decisions should be made.			
SEA in land-use planning (3 case studies by Tao et al. 2007)	Since SEA has been applied to a limited number of cases it is difficult to conclude if SEA has had an impact on land-use planning and decision-making. Late initiation of PEIA; affects impact of SEA on decision-making.	Current SEA practice takes place within a limited number of stakeholders/actors. In these case studies there was good experience of experts' participation in the SEA processes. There is however a need for more effective public participation.			Proposed indicators for environmental assessment, assessed potential cumulative environmental impacts, compared impacts of various planning options, and improved experts' participation.

SEA in transport planning; expressway infrastructure (Zhou & Sheate 2011)	Late start of the SEA process, or possibly SEA started when planning processes had already finished. No evidence of interaction between SEA practitioners and planners, or that the findings of the SEA were integrated into proposed plans, leading to adjustments.	SEA teams involved in the planning process too late. The public was not allowed to participate in the SEA or planning processes. Participants were not given sufficient time to understand proposed plans before making contributions.	No baseline study conducted describing the current state of the environment – difficult to measure potential SEA impacts. The SEAs did not provide proper and quality alternatives and mitigation efforts to improve environmental performance of plans.		
SEA in master urban planning (Che et al. 2011)	Early start of the SEA process – scoping stage was initiated before drafting of the plan. This stands in contrast to other cases, since SEAs are generally undertaken after key planning decisions have been made.	The public and government agencies were given opportunity to leave comments, of which many were integrated in the final strategic decisions.		Poor integration with broader economic and industrial plans was identified as one of the shortcomings in general SEA practice in China.	
SEA practice in China in general (meta-analysis by Wu et al. 2011)	Due to late timing to initiate SEA processes, it is difficult for SEA to enact as an improving tool and means for decision-making.		SEA has failed to prevent any adverse environmental impacts resulted from proposed plans and programmes.		

South Africa					
SEA in planning, water management and conservation (six case studies by Retief 2007a &b; Retief et al. 2008)	The SEAs could not effectively integrate sustainability objectives into plans and programmes, and limited prof was found of SEA findings influencing their contents. No evidence was found of decisions directly affected by the SEAs. The SEAs in most cases produced "long wish lists" of too many issues, but still they managed to miss some key issues.	There was a lack of "political buy-in" to ensure integration of SEA findings in the decision-making process. This was identified as a possible consequence of the lack of consultation and participation processes. There is a separation between experts, i.e. SEA consultants, and the decision-makers they advise.	Due to an overall lack of monitoring systems it could not be concluded whether positive changes in the quality of the environment were achieved.		The SEAs produced some indirect outputs in terms of highlighting deficiencies and gaps in existing policy, facilitating capacity building and raising awareness of sustainability issues.
SEA in a variety of sectors (six case studies by Rossouw et al. 2000)	More than half of the case studies provided information before important strategic decisions were made, but whether SEA led to informed decision-making, i.e. had an impact on the final strategic decision in all cases, is difficult to determine.			Half of the case studies did not precede EIAs. Whether SEAs were tiered to the EIAs or integrated with other policies, plans and programmes is unclear.	

Brazil					
SEA in the energy sector (13 case studies by Malvestio & Montaño 2012)	Whether the SEAs had an impact or improved planning and decision-making is not clear from this study. But some *weaknesses* that were identified suggest limited improvement, including: identifying strategic alternatives, evaluating environmental consequences of strategic actions, and presenting clear SEA objectives.	None of the SEA reports reviewed in this case study described how public participation was taken into account in the decision-making process.	One of the strengths of the SEAs was describing the current state of the environment. However, if this state changed after implementing the SEAs is unclear. Weaknesses in terms of identification of strategic alternatives and evaluation of their environmental consequences, shows a lack of concern for impacts on the environment.		Presenting mitigation efforts such as e.g. preferred alternatives, modification of PPP objectives and measures for avoiding possible impacts.
SEA in transport planning; the building of a new highway (Sánchez & Silva-Sánchez 2008)	Since the decision to build the highway was made several years before the SEA was conducted, the SEA did not inform the final strategic decision. The SEA did however influence subsequent environmental impact statements and outlined routing alternatives to be evaluated.	The Radoanel Programme is the first self-denominated SEA to be publicly presented and debated in São Paulo. The public were allowed to give their opinions prior to the decision to build the highway, but not during the actual SEA process.	There was no evidence found of SEA impacts on the environment. However, the SEA only took one scenario of the future into account, not including alternatives that could have provided a better environmental option.	Tiering with project EIA was not fully achieved in practice. Effective consideration of water resources and land use policies and pans were disputed by stakeholders.	

	The SEA failed to take into account significant strategic issues (such as the plan inducing urban sprawl in water protection zones) The SEA did not ensure availability of SEA results early enough to influence the decision-making process and inspire future planning.				
South Korea					
SEA in water management; dam construction planning (Song et al. 2010)	The SEA raised the effectiveness of the planning process, through feedback of environmental and social considerations to the plan. The SEA created a paradigm shift from functional planning to sustainable dam planning that considers local and regional conditions. The SEA led to re-evaluation of the objectives and plans for dam construction.	The SEA included public opinions of dam construction in the decision and planning processes.	The SEA led to mitigation methods for environmental damage demonstrating potential impacts of the SEA on the environment. If these methods were later used is not clear.	SEA encouraged the inclusion of national environmental goals and policies, and methods to maintain these standards. SEA also improved alignments of dam plans with environmental policies.	SEA raised awareness of sustainability and environmental issues among planners, and acted as a "reminder" to decision-makers – improving inclusion of factors in the planning process that could lead to negative public opinions. SEA produced methods for mitigating impacts on the environment. SEA improved the evaluation of water supply alternatives and dam construction sites.

India					
SEA in water management (Rajvanshi & Mathur 2005)	The authors state that: "The SEA played a meaningful role in deciding a new course of conservation planning and impact mitigation." Further, the SEA helped to overcome inconsistencies and uncertainties that constrained decision-making for approval of the project several years ago.	There is evidence of the SEA being participative through involvement of and consultations with stakeholders and arranged public hearings.		The SEA was tiered to the earlier EIA to introduce additional considerations for reinforcing the evaluation of the proposed project. The project was also tiered with policies in relevant sectors, such as the National Water Policy.	The SEA managed to solve earlier conflicting goals of development and conservation of biodiversity, and provided a baseline for meaningful evaluation of impacts on biodiversity.
SEA in biodiversity conservation (Rajvanshi 2001)	There is evidence of SEA providing sufficient and usable information that could inform decision-making. In fact, recommendations of the SEA have been incorporated in decision-making by the government of India.		The SEA process identified specific actions that predict irreversible environmental implications, showing consideration for environmental impacts. These actions were later considered in the decision-making process.		

10. Bibliography

Alshuwaikhat, H. M. (2005). Strategic environmental assessment can help solve environmental impact assessment failures in developing countries. *Environmental Impact Assessment Review 25*, pp. 307-317.

Bina, O. (2008). Context and Systems: Thinking More Broadly About Effectiveness in Strategic Environmental Assessment in China. *Environmental Management*, pp. 717-733.

Bina, O., Xu, H., Brown, A., & Partidario, M. (2011). Review of practice and prospects for SEA in China. *Environmental Impact Assessment Review 31*, 515-520.

Chanchitpricha, C., & Bond, A. (2013). Conceptualising the effectiveness of impact assessment processes. *Environmental Impact Assessment Review 43*, pp. 65-72.

Che, X., English, A., Lu, J., & Chen, Y. D. (2011). Improving the effectiveness of planning EIA (PEIA) in China: Integrating planning and assessment during the preparation of Shenzhen's Master Urban Plan. *Environmental Impact Assessment review 31*, pp. 561-571.

Erlewein, A. (2013). Disappearing rivers — The limits of environmental assessment for hydropower in India. *Environmental Impact Assessment Review 43*, pp. 135-143.

Fischer, T. B., & Gazzola, P. (2006). SEA effectiveness criteria - equally valid in all countries? The case study of Italy. *Environmental Impact Assessment Review 26* , pp. 396-409.

Gallardo, A. L., & Bond, A. (2011). Capturing the implications of land use change in Brazil through environmental assessment: Time for a strategic approach? *Environmental Impact Assessment Review 31*, pp. 261-270.

IAIA. (2002, January). *Special Publication Series No. 1, Strategic Environmental Assessment Performance criteria.* Retrieved April 2014, from International Association for Impact Assessment (IAIA) : http://www.iaia.org/publicdocuments/special-publications/sp1.pdf

IAIA. (2014). *Conferences & Special Meetings, C7n EIA and SEA tiering: The missing link?* Retrieved April 2014, from International Associaton for Impact Assessment (IAIA): http://www.iaia.org/conferences/special-meetings/prague/eia-sea-tiering.aspx

Kjörven, O., & Lindhjem, H. (2002). *Strategic environmental assessment in World Bank operations Environment Strategy Papers No.4.* World Bank.

Malvestio, A. C., & Montaño, M. (2012). Effectiveness of Strategic Environmental Assessmet applied to energy sector in Brazil. *Energy Future The Role of Impact Assessment* (pp. 1-6). Portugal: International Association for Impact Assessment, IAIA .

OECD. (2012). *Strategic Environmental Assessment in Development Practice, A Review of Recent Experience.* OECD publishing.

Rajvanshi, A. (2001). Strategic Environmental Assessment of the India Ecodevelopment Project: Experiences, Prospects and Lessons Learnt. *Journal of Environmental Assessment Policy and Management*, pp. 373–393.

Rajvanshi, A., & Mathur, V. B. (2005). *Integrating Biodiversity into Strategic Environmental Assessment - Case Studies from India.* Chandrabani: Wildlife institute of India .

Retief, F. (2007a). Effectiveness of strategic environmental assessment (SEA) in South Africa. *Journal of Environmental Assessment Policy and Management*, pp. 83-101.

Retief, F. (2007b). A performance evaluation of strategic environmental assessment (SEA) processes within the South African context. *Environmental Impact Assessment Review 27*, pp. 84-100.

Retief, F., Jones, C., & Jay, S. (2008). The emperor's new clothes - Reflections on strategic environmental assessment (SEA) practice in South Africa. *Environmental Impact Assessment Review 28*, pp. 504-514.

Rossouw, N., Audouin, M., Lochner, P., Heather-Clark, S., & Wiseman, K. (2000). Development of strategic environmental assessment in South Africa . *Impact Assessmet and Project Appraisal* , pp. 217-223.

Sánchez, L. E., & Silva-Sánchez, S. S. (2008). Tiering strategic environmental assessment and project environmental impact assessment in highway planning in São Paulo, Brazil. *Environmental Impact Assessment Review 28*, pp. 515-522.

Song, Y.-I., Park, D., Shin, G., Kim, C., & Grigg, N. S. (2010). Strategic environmental assessment for dam planning: a case study of South Korea's experience. *Water International*, pp. 397-408.

Tao, T., Tan, Z., & He, X. (2007). Integrating environment into land-use planning through strategic environmental assessment in China: Towards legal frameworks and operational procedures. *Environmental Impact Assessment Review 27*, pp. 243-265.

Therivel, R. (2010). *Strategic Environmental Assessment in Action.* London and Washington DC: Earthscan.

Thérivel, R., & Minas, P. (2002). Ensuring effective sustainability appraisal . *Impact Assessment and Project Appraisal* , pp. 81-91.

van Buuren, A., & Nooteboom, S. (2009). Evaluating strategic environmental assessment in The Netherlands: content, process and procedure as indissoluble criteria for effectiveness. *Impact Assessment and Project Appraisal*, pp. 145-154.

van Doren, D., Driessen, P., Schijf, B., & Runhaar, H. (2013). Evaluating the substantive effectiveness of SEA: Towards a better understanding. *Environmental Impact Assessment Review*, pp. 120-130.

Victor, D., & Agamuthu, P. (2014). Policy trends of strategic environmental assessment in Asia. *Environmental Science and Policy*, p. (Article in Press) No. of pages 14 .

World Bank. (2013). *Strategic Environmental Assessment (SEA)*. Retrieved April 2014, from The World Bank: http://go.worldbank.org/1RT0P09R80

Wu, J., Chang, I.-S., Bina, O., Lam, K.-C., & Xu, H. (2011). Strategic environmental assessment implementation in China - Five-year review and prospects. *Environmental Impact Assessment Review 31*, pp. 77-84.

Zhang, J., Christensen, P., & Kørnøv, L. (2013). Review of critical factors for SEA implementation . *Environmental Impact Assessment Review 38*, pp. 88-98.

Zhou, K.-Y., & Sheate, W. R. (2011). Case studies: Application of SEA in provincial level expressway infrastructure network planning in China - Curent existing problems. *Environmental Impact Assessment Review 31*, pp. 521-537.