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DRIVERS OF EFFECTIVENESS OF ENVIRONMENTAL ASSESSMENT

Abstract

Tallinn 2010

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Abstract

Institute of Mathematics and Natural Sciences, Tallinn University, Tallinn, Estonia.

The dissertation is accepted for the commencement of the degree of *Doctor Philosophiae* in Ecology by the Doctoral Committee of Natural Sciences of the Tallinn University on November 25, 2010.

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LIST OF ORIGINAL PUBLICATIONS

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II **Peterson, K.** (2010). Quality of Environmental Impact Statements and variability of scrutiny by reviewers. *Environmental Impact Assessment Review*, **30**, 3, 169 – 176.

III Mardiste, P., **Peterson, K.** (2004). The use of Strategic Environmental Assessments for predicting the impacts of EU regional development projects in new Member States: with reference to an Estonian case. *In:* J.F. Martín-Duque, C.A. Brebbia, A.E. Godfrey, J.R. Diaz de Teran (editors). GEO-ENVIRONMENT. Monitoring, Simulation and Remediation of the Geological Environment. WIT Press, Southampton, Boston, 217–228.

IV **Peterson, K.** (2004). The role and value of strategic environmental assessment in Estonia: stakeholders' perspectives. *Impact Assessment and Project Appraisal*, **22**, 2, June 2004, 159–165.

Author's contribution to the publications:

I K. Peterson designed the study. Based on the database populated by M. Uustal for the years 2004-2008, K. Peterson further populated the database with 2009 data. K. Peterson analysed the full data set, drew the conclusions and drafted the article. K. Peterson also communicated with the journal editor and the reviewers and redrafted the article according to the reviewers' comments.

II K. Peterson was solely responsible for the design of the study, collection of data, compilation of the database, analysis and interpretation of the data. K. Peterson drafted the article, held the communication with the journal editor and the reviewers and redrafted the article according to the reviewers' comments.

III The initiative for the article came from P. Mardiste, who designed the structure of the article, analysed the data and drew the first conclusions. K. Peterson supplied information on the Strategic Environment Assessment and complemented the conclusions of the article. P. Mardiste had communication with the book editor and the reviewers. Both authors redrafted the article according to the comments received.

IV K. Peterson designed the study, conducted the interviews, analysed the data and drew conclusions. K. Peterson drafted the article, communicated with the journal editor and the reviewers and redrafted the article according to the comments.

Other publications related to the dissertation:

1. Peterson, K. (2010). Role of Natura 2000 Assessment in climate change mitigation and adaptation with special reference to maintaining and enhancing of ecosystem services. Oral presentation and abstract in the IAIA Special Symposium "Climate Change and Impact Assessment", 25-26 October 2010, Aalborg, Denmark.
2. Peterson, K. (2010). Screening decisions on Natura 2000 Assessment. In: Biodiversity in impact assessment and decision making. Oral presentation and abstract in the IAIA'2010 "The role of impact assessment in Transitioning to the Green Economy", 6-11 April 2010, Geneva, Switzerland.
3. Peterson, K. (2010). Practice and expectations of actors of the Environmental Assessment in Estonia [in Estonian]. Series of SEI Tallinn Publications, No 12, 2010, 60 p.
4. Peterson, K. (editor) (2006) Overview of the practice of the Environmental Impact Assessment in Estonia [in Estonian]. Series of SEI Tallinn Publications, No 9, 2006, 289 p.
5. Peterson, K. (2006). Perceptions of stakeholders of the objectives and purpose of the EIA and their roles in the process. Oral presentation and abstract in the IAIA'2006 "Power, poverty and sustainability: the role of Impact Assessment", 23-26 May 2006, Stavanger, Norway.
6. Peterson, K. (2005). Expected impact of Strategic Environmental Assessment: case Estonia". Oral presentation and abstract in the IAIA'2005 "A Global Conference on Strategic Environmental Assessment", 26-30 September 2005, Prague, The Czech Republic.
7. Peterson, K. (2005). Stakeholder perceptions of impact of Strategic Environmental Assessment on national plans and programmes in Estonia. Oral presentation and abstract in the ESEE2005 6th International Conference of the European Society for Ecological Economics, June 14-17 2005, Lisbon, Portugal.

LIST OF ACRONYMS

EA	Environmental Assessment, meaning both EIA and SEA
EC	European Commission
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EU	European Union
HIA	Health Impact Assessment
MS	Member State
PPP	Policy, plan and programme
RIA	Regulatory Impact Assessment
SEA	Strategic Environmental Assessment
SA	Sustainability Assessment
SIA	Social Impact Assessment

ABSTRACT

Environmental Assessment (EA) is a systematic process that examines the consequences of development actions at project or strategic (policy, plan and programme) level prior to and after decision making. EA is also an open and participatory process that aims at designing the project or the policy, plan and programme to produce environmental benefits.

The effectiveness of EA is defined as the degree to which EA has been successful in meeting its objectives and purpose. The ability of EA in meeting its objectives and purpose depends on several interlinked factors. In the current thesis some of the factors, such as the quality of EA documentation and process are addressed. The quality evaluation of 50 Environmental Impact Statements (EIS) demonstrated a generally satisfactory level of quality, but it varied between different EIS and topic areas. Most gaps were identified in the project description, mitigation measures and consideration of alternatives. The experiments with individual and group assessments demonstrated a large individual variability of results and herewith the highly subjective nature of the assessment. The group evaluations resulted in several topic areas of EIS receiving lower grades than the initial individual assessments. It was speculated that a group of reviewers produced a more diverse competence and thus scrutinized the EIS more severely than an individual assessor who might not have been competent in all areas of environmental effects. Screening of projects and plans has an important role in putting the precautionary principle into action. However, the research results demonstrated that, for example, screening of likely adverse effects on Natura 2000 sites was poorly conducted and justified. Only every sixth screening decision addressed such effects. If addressed, then only the distance of the proposed development in relation to the Natura 2000 site was considered, ignoring the type and significance of effects. The study of the EA process showed that participants and stakeholders had different expectations regarding the management and outcome of the process. It is proposed that the objectives and the outcome of the EA need to be agreed at the onset of the process, and communicated effectively throughout the EIA process. Based on the literature review and the current research, five interlinked and interdependent components (drivers) characteristic of an effective EA could be derived: (1) clearly defined objectives and purpose of EA, (2) effective participatory and discursive process throughout the EA process, (3) high quality documentation, (4) positive effect of EA on the design of the project or plan (i.e. integration of EA and planning process) and on decision making, and verified by follow-up, and (5) highly time and cost effective. The level of application of these components, i.e. the effectiveness of EA depends on the legal regulation and guidance provided for best practice, but also on sufficient administrative capacities and expertise to produce environmental benefit. The applicability of the theoretical framework of other drivers of EA effectiveness, in addition to the quality of EA documentation and EA process studied in this thesis, however, needs to be further elaborated and tested in practice.

1. INTRODUCTION

Assessment of the likely impact of project proposals and plans on the environment (called Environmental Assessment) prior to their approval has been exercised for more than 40 years. Environmental Assessment (EA) has been institutionalised worldwide by governments and international organisations as a key mechanism for development planning and decision making. Having started with the assessment of the likely impact of projects, EA has now developed into an assessment of policies, plans and programmes and regulations driven by the sustainability agenda.

Environmental Assessment has been used in literature as a generic term encompassing many forms of identification, description and analysis of environmental consequences of human activity. Thus EA includes the many variants of impact assessment procedures that are either legally binding, such as Environmental Impact Assessment (EIA, regulated by EIA Directive 85/337/EEC and 97/11/EC), Strategic Environmental Assessment (SEA, regulated by SEA Directive 2001/42/EC) and Assessment regulated by the Habitats Directive 92/43/EC (hereinafter referred as Natura Assessment), or based on guidance and best practice, such as Regulatory Impact Assessment (RIA), or address any specific area of assessment, such as social aspects (Social Impact Assessment, SIA), health aspects (Health Impact Assessment, HIA) or a combination of all components aiming at the goal of sustainability (Sustainability Assessment, SA).

In this thesis, Environmental Assessment denotes the two basic types of legally binding environmental assessment procedures in the European Union: (i) the assessment of effects of projects on the environment (EIA), according to the EIA Directives 1985 and 1997, and (ii) the assessment of the effects of certain plans and programmes (hereinafter referred as plans) on the environment (SEA), according to the SEA Directive. Other types of impact assessments, either legally binding (e.g. Natura Assessment) or not (e.g. SIA, RIA, SA, etc) usually form either an integral and/or parallel part of EIA or SEA (as referred by European Commission (COM (2009) 378 Final).

Environmental Assessment, since the very start of its history in the 1970's in the USA, is today legally required in more than 100 countries wordwide. EA process has opened up a previously more or less internal administrative and political decision making process to public scrutiny at all levels (local, national and international level). With the involvement of many participants and stakeholders, EA has evolved into a platform of dialogue on problems and values, but also an arena of knowledge production where problem definitions may conflict and expert knowledge is challenged. Since EA needs to be carried out prior to the decision making, EA has become one of the principle tools to put precautionary principle in action.

Since the introduction of Environmental Assessment, practitioners and researchers have taken an interest in the factors that determine EA effectiveness. Having started with the evaluation of the quality of Environmental Impact Statements (EIS) the

research has further expanded into the evaluation of EA methods and systems, paying special attention to the effect of EA on the project or plan and final decision making, but also on the post-decision phase to monitor, evaluate, manage and communicate the EA outcomes that actually occur. In recent years evaluation of the effect of EA on meeting the goals of sustainability has become the centre point of discussions.

This current thesis addresses the quality issues of Environmental Assessment and builds a general framework of factors that drives the effectiveness of Environmental Assessment towards further elaboration and testing.

2. OBJECTIVES

The research is aimed at evaluating some of the key components of the Environmental Assessment (EA) process that determine the effectiveness of EA, the quality of EA documentation and the quality of the EA process, in particular. The study is aimed at the following:

1. To evaluate the quality of Environmental Impact Statements (EIS) and to identify possible gaps as a potential source of insufficient provision of information for decision making;
2. To identify the range of variability of EIS quality evaluations among reviewers as a potential source of inconsistency in ensuring high quality EA;
3. To evaluate the quality of screening decisions on the likely effects on Natura 2000 sites to ensure that a plan or project will not adversely affect nature conservation areas of European Community importance and the effect of such decisions on the quality of the EA process;
4. To identify the perceptions of the role and value of Environmental Assessment by stakeholders and their effect on the EA process.

Based on the research results, the role of the quality of EA documentation and the quality of EA process in the general framework of EA effectiveness is discussed.

3. EFFECTIVENESS OF ENVIRONMENTAL ASSESSMENT

3.1. DEFINING THE EFFECTIVENESS OF ENVIRONMENTAL ASSESSMENT

The term "effectiveness" is defined as the degree to which something is successful in producing a desired result (e.g. Oxford Dictionaries Online; Collins Dictionary Online). Correspondingly, effectiveness of Environmental Assessment could be defined as the degree to which EA has been successful in meeting its objectives and purpose, that is meeting the aims of EA and reasons for which it is conducted, respectively (see Jay *et al.*, 2007).

A review of literature has shown that the objectives and purpose of Environmental Assessment are embedded in the definitions of EIA and SEA, initially provided in respective directives, but further interpreted by researchers and practitioners. Thus, analysing these definitions provided in legal acts, textbooks and academic literature over time, one may come to a variety of elucidations (Table 1). Interestingly enough, some of the definitions provide overlapping definitions of the EIA and SEA (*e, m, n*), embracing the assessment of the effects of policies and programmes under EIA definition while such documents are typically the objects of SEA. Mixing the objects of EIA and SEA has even taken place as recently as in 2008 (e.g. Rogers *et al.,* 2008; Crabbé & Leroy, 2008). The sample of Environmental Assessment definitions (Table 1) provides three approaches towards the definition of the objectives and purpose of EA: that is, EA is to provide environmental benefits (environmental benefit approach), follow a legally defined process (normative approach) or do both.

Table 1. Selected definitions of environmental assessment (EIA; SEA; Natura Assessment) and their approach

Definitions of EIA, SEA and Natura Assessment	Year	Environmental benefits-oriented assessment and decision making (environmental benefit approach)	Process-oriented assessment and decision making (normative approach)
a)Member States shall adopt all measures necessary to ensure that, before consent is given, projects likely to have significant effects on the environment by virtue *inter alia*, of their nature, size or location are made subject to an assessment with regard to their effects. (EIA Directive	1985	The results of consultations and information gathered pursuant [to the EIA procedure] must be taken into consideration in the development consent procedure (art 8)	Projects with significant effects are subject to an assessment (art 2)

Definitions of EIA, SEA and Natura Assessment	**Year**	**Environmental benefits-oriented assessment and decision making (environmental benefit approach)**	**Process-oriented assessment and decision making (normative approach)**
85/337/EEC, art 2); The results of consultations and information gathered pursuant [to the EIA procedure] must be taken into consideration in the development consent procedure (art 8)			
b) SEA is the formalised, systematic and comprehensive process of evaluating the environmental effects of a policy, plan or programme and its alternatives, including the preparation of a written report on the findings of that evaluation, and using the findings in publicly accountable decision-making (Therivel *et al.*, 1992; reiterated in Therivel & Partidario, 1996, and modified in Sadler & Verheem, 1996)	1992; 1996		Formalised, systematic and comprehensive process of evaluating effects
c) Natura Assessment is mandatory, if ".... any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained	1992	The competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned.	Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's

Definitions of EIA, SEA and Natura Assessment	Year	Environmental benefits-oriented assessment and decision making (environmental benefit approach)	Process-oriented assessment and decision making (normative approach)
that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public (Habitats Directive, art 6.3).			conservation objectives.
d) EIA is a process, a systematic process that examines the environmental consequences of development actions, in advance. (Glasson *et al.*, 1994)	1994		Process that examines environmental consequences
e) EIA is an anticipatory, participatory, integrative environmental management tool which has the ultimate objective of providing decision-makers with an indication of the likely consequences of their decisions relating to new projects or to new programmes, plans or policies. Effective EIA alters the nature of decisions or of the actions implemented to reduce their environmental disbenefit and render them more sustainable (Wood, 1995)	1995	Effective EIA alters the nature of decisions or of the actions...	...an ultimate objective providing decision makers with an indication of the likely consequences of their decisions
f) The objective of this (SEA) Directive is /…/ to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, /…/, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment. 'Environmental assessment' shall mean the preparation of an environmental report, the carrying out of	2001	Objective of SEA is to contribute to the integration of environmental considerations into the decision making	SEA means preparation of an environmental report, carrying out consultations and taking the results into account in decision making

Definitions of EIA, SEA and Natura Assessment	Year	Environmental benefits-oriented assessment and decision making (environmental benefit approach)	Process-oriented assessment and decision making (normative approach)
consultations, the taking into account of the environmental report and the results of the consultations in decision-making and the provision of information on the decision (SEA Directive 2001/42/EC, art 1, art 2 b)			
g)Strategic environmental assessment (SEA) is a process for assessing environmental impacts in strategic decision making above the project level. Increasingly, socio-economic impacts are also included (Fischer, 2002)	2002		Process of assessing environmental impacts
h) EIA is a process for taking account of the potential environmental consequences of a proposed action during the planning, design, decision-making and implementation stages of that action (Morrison-Saunders & Arts, 2004)	2004		Process for taking account of potential environmental consequences
i)Environmental assessment can be seen as an information process which is external to the decision-making process but which aims to incorporate a given set of environmental values into a decision (Haq, 2004)	2004		Process which aims to incorporate environmental values into a decision
j) SEA is currently understood to be a process for identifying and addressing the environmental (and also, increasingly, the associated social and economic) dimensions, effects and consequences of PPP and other high-level initiatives. This	2005	Preferably SEA should make a contribution to the formulation of and development of alternatives, rather than focusing only on their impacts	Process for identifying and addressing environmental, social and economic dimension, effects and consequences of

Definitions of EIA, SEA and Natura Assessment	Year	Environmental benefits-oriented assessment and decision making (environmental benefit approach)	Process-oriented assessment and decision making (normative approach)
approach should take place before decisions are made, when major alternatives are open. Preferably it should make a contribution to their formulation and development rather than focusing only on the impact(s) of their implementation. (Dalal-Clayton & Sadler, 2005)			PPP and other initiatives.
k)SEA is the process of evaluating the environmental impacts of proposed policies, plans and programmes in order to inform decision-making (Implementing Strategic…, 2005)	2005		SEA is a process /…/ to inform the decision maker
l) SEA is a systematic decision support process, aiming to ensure that environmental and possibly other sustainability aspects are considered effectively in policy, plan and programme making. Effective SEA works within a structured and tiered decision framework, aiming to support more effective and efficient decision-making for sustainable development and improved governance by providing for a substantive focus regarding questions, issues and alternatives to be considered in policy, plan and programme (PPP) making. SEA is an evidence-based instrument, aiming to add scientific rigour to PPP making, by using suitable assessment methods and techniques (Fischer, 2007)	2007	SEA aims to ensure environmental and possibly other sustainability aspects are considered effectively in policy, plan and programme making. Aims to support more effective and efficient decision-making for sustainable development and improved governance by providing for a substantive focus regarding questions, issues and alternatives to be considered in policy, plan and programme (PPP) making. SEA is an evidence-based instrument, aiming to add scientific rigour to PPP making, by using suitable assessment methods and techniques	

Definitions of EIA, SEA and Natura Assessment	Year	Environmental benefits-oriented assessment and decision making (environmental benefit approach)	Process-oriented assessment and decision making (normative approach)
m) The purpose of an EIA is to identify and evaluate systematically the potential impact of a project or program (Rogers *et al.*, 2008)	2008		Purpose to identify and evaluate potential impacts
n) EIA is a method where one evaluates the expected effects of a policy programme in order to allow preventative adjustments (Crabbé & Leroy, 2008)	2008	EIA is to allow preventive adjustments	

The definitions under *a, c*, *e, f, j, l* and *n* could be regarded as 'environmental benefits-oriented'-definitions of EA, whereas the definitions under *b, d, g, h, i, k* and *m* describe the important elements of EA process that have to be followed but are not explicitly expecting to alter the nature of the project or plan and the decision to reduce its environmental detriment neither to make the results of the assessment binding in decision making. A small number of definitions (*a*, *c*, *e, f* and *j*) comprise both components – environmental assessment has to induce a change in the project or plan by following certain steps in a process to provide information for decision making.

Comparing the definitions of EIA and SEA in the respective directives, we may also observe a difference in defining the purpose of the assessment and the effect of EA on the design of the project or plan and on decision making. While the SEA directive provides the objective of SEA to *contribute* to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, then the EIA directive requests that the member states *must* take the results of consultations and information gathered pursuant to the EIA procedure into consideration in the development consent procedure. Thus, the SEA Directive regulation seems much less prescriptive than the EIA Directive on the effect that EA has to have on the final outcome. However, the purpose of SEA to contribute to the sustainable development could also be interpreted in a prescriptive way, since according to the directive non-sustainable decisions are not anticipated. The environmental change-inducing aspect of SEA has also been observed by researchers. For example, João (2005) stresses that SEA "…must *improve*, rather than just *analyse* the policy, plan or programme". Also McCluskey & João (2010) refer to the functions of SEA to "identify positive environmental impacts of strategic action and enhance them". Thus SEA should be regarded as a tool for improving strategic action. From these

perspectives, both EIA and SEA could be regarded as environment-benefit-oriented-assessments. However, different views on the expected outcome of the EA exist among researchers and practitioners. Some researchers argue that if an EIA fails to alter the nature of decision to reduce environmental disbenefits, it is a waste of time and money (Wood, 1995), whereas, for example, George & Kirkpatrick (2007) regard the process-led approach of impact assessment "a good governance" issue, since it aims at avoidance of uncertainty, the accountability for regulatory actions and outcomes, and eventually transparency and consistency in decision-making. Crabbé & Leroy (2008) consider EIA as a tool that "…policy makers can use to weigh up policy alternatives." Interviews with EIA practitioners by Kruopiene *et al.* (2009) revealed a strong expectation for EIA outcome to reduce any environmental impact. Fischer (2007) points out that among other things, environmental assessment is an evidence–based instrument, aiming to add scientific rigour to the formation of policies, plans and programmes, by using suitable assessment methods and techniques.

Regarding the legal definitions of EIA and SEA, it should be noted that they address the assessment process of pre-decison phase, rather than the post-decision phase – the follow-up of EA, which is to uncover whether the actual impacts of the development correspond to those that were predicted. This deficiency of the legal definitions to include the follow-up phase of EA has been noted by several researchers and practitioners (e.g. Arts *et al.*, 2001; Morrison-Saunder & Arts, 2004; Harmer, 2005).

In this thesis, an effective EA process anticipates change in the design of a proposed project or plan and affect the decision making towards producing environmental benefits. The outcome of EA needs to be audited in the follow-up phase.

3.2. COMPONENTS OF ENVIRONMENTAL ASSESSMENT EFFECTIVENESS

The Environmental Assessment process can be represented as a series of iterative stages and although they are outlined in a linear fashion (see Lee & Wood, 1987; Glasson *et al.*, 1994; Screening, 2001; Scoping, 2001; EIS Review, 2001), EA is usually a cyclical activity, with feedback from later stages to earlier ones (Glasson *et al.,* 1994, Glasson, 1999). When discussing EA and its effectiveness it is useful to divide the process into two stages based around the principal consent decision for a development proposal (either a project or plan). The *pre-decision* stage incorporates the early stages of the EA process prior to proposal implementation (i.e. screening, scoping, impact prediction and the consent decision or adoption of a plan) (Morrison-Saunders & Arts, 2004). The *post-decision* stage of a proposal, including post-decision monitoring and auditing, is known as follow-up and is concerned with the various components of the plan or project life-cycle after the decision has been taken (e.g. final design, construction, operation and decommissioning; project and environmental management) (Morrison-Saunders & Arts, 2004).

By following the definitions in Table 1 and the steps in EA process, scholars have identified several key components of Environmental Assessment effectiveness (e.g. Sadler, 1996; Morrison-Saunders & Arts, 2004; Fischer & Gazzola, 2006; Fischer, 2007; Buuren van & Nooteboom, 2009 and others). For example, Sadler (1996) has derived, from an extensive review of assessments worldwide, four criteria for an effective EA, applicable both to EIA and SEA. These are:

(1) appropriate timing in initiating the assessment so that the proposal is reviewed early enough to allow scoping for development of reasonable alternatives;

(2) clear, specific directions in the form of terms of reference or guidelines covering priority issues, timelines, and opportunities for information and input at key decision-making stages;

(3) quality information and products fostered by compliance with procedural guidelines and use of "good practices"; and

(4) receptivity of decision makers and proponents to the results of the EA, founded on good communication and accountability.

Fischer & Gazzola (2006) and further replicated in Fischer (2007) analysed 45 publications on SEA and derived eight criteria from the scholarly literature on SEA effectiveness (Table 2). Compared to the EA definitions (Table 1), SEA effectiveness criteria by Fischer & Gazzola do not ultimately aim at bringing change into the planning process. Applying these criteria, it is not explicitly anticipated that SEA would finally propose an environmentally sound or sustainable option for decision making, or that such an option is even desired. Fischer (2007) developed further these effectiveness criteria by adding context criteria that among others include cost criteria. The author argues that the criteria supporting effective SEA application consist of procedural aspects, as well as appropriate methods and techniques that have to have appropriate funding, time and support. T. Fischer also stresses the importance of the context-related enabling criteria, such as established institutional framework, awareness of environmental problems and the existence of a sustainable development framework that provides for SEA objectives. The importance of context in environmental assessment and strategic decision making has been stressed by Emmelin (2006). Fischer (2007) underlines the important role of well-established traditions of cooperation between authorities and the public, as well as the implementation of project-level EIA that collectively enables the building of an effective SEA into the current system. Emmelin (2006) calls it 'professional and organizational culture'.

Fischer (2007) also argues that the effectiveness criteria form a single package and that the absence or non-consideration of any of these criteria may pose a barrier to an effective SEA. Morrison-Saunders & Arts (2004) make their own attempt to provide a clear set of specific criteria of an effective and well-performed EIA that according to the authors could also be applied to SEA (Table 2). The authors pose review questions, via which the evaluators judge the effectiveness and performance

of overall EIA. These criteria can be utilised both at the planning phase of the EA process as well as in the follow-up phase to review the success of EA.

Buuren Van & Nooteboom (2009) have formulated three criteria for evaluation of the effectiveness of SEA. According to the authors, an effective SEA:

- enables decision-making based on authoritative and undisputed information on the environmental consequences of each alternative choice (content);
- contributes to the inclusiveness of the collaborative dialogue, and thus to the realisation of support and legitimacy by achieving consensus and frame-reflection (process); and
- contributes to the timeliness, transparency, and quality of the overall decision-making process (procedure).

Thus, these criteria point out three components of Environmental Assessment effectiveness: content, process and procedure.

Based on these criteria (content, process and procedure) presented by Buuren Van & Nooteboom (2009), the criteria of EA effectivenesss proposed by other authors could also be categorised accordingly. A sample of criteria of EA effectiveness by four authors is described in Table 2.

Table 2. Criteria of Environmental Assessment effectiveness, examples from literature

Category of quality criteria	Buuren Van & Nooteboom, 2009	Fischer & Gazzola, 2006	Morrison-Saunders & Arts, 2004	Sadler, 1996
Content	Enables decision-making based on authoritative and undisputed information on the environmental consequences of each alternative choice		-Impacts were as predicted or forecast? -Mitigation measures or management plans worked as intended? -Environmental objectives, criteria or standards were met by the project as implemented? -The implementation of the project did not result in significant	Quality information and products fostered by compliance with procedural guidelines and use of "good practices"

Category of quality criteria	Buuren Van & Nooteboom, 2009	Fischer & Gazzola, 2006	Morrison-Saunders & Arts, 2004	Sadler, 1996
			environmental damage a) during construction, or b) in the initial start up or operation phase? -Other environmental and community benefits were realised as described?	
Content and Process		SEA should provide sufficient, reliable and usable information in a cost and time efficient manner SEA should be integrated and sustainability-led, supporting a pro-active planning process that is driven by clear goals and objectives; apart from environmental aspects, SEA should also consider economic and social aspects.	-The EIA process was within the usual % cost range in relation to the overall capital investment in proposal development	

Category of quality criteria	Buuren Van & Nooteboom, 2009	Fischer & Gazzola, 2006	Morrison-Saunders & Arts, 2004	Sadler, 1996
Procedure	Contributes to the inclusiveness of the collaborative dialogue, and thus to the realisation of support and legitimacy by achieving consensus and frame-reflection	SEA should be carried out with professionalism and those conducting it should be made accountable	- On balance, the EIA process was effective when judged against the three basic yardsticks: a)substantive – terms of reference and basic objectives were achieved; b)procedural – the process conformed to established or accepted principles, provisions and procedures; c)transactive – results and environmental gains were achieved cost-effectively	Appropriate timing in initiating the assessment so that the proposal is reviewed early enough to allow scoping for development of reasonable alternatives; Receptivity of decision makers and proponents to the results of the EA, founded on good communication and accountability
		SEA should document and justify how environmental and sustainability objectives are considered in PPP practices in a transparent and simple manner; in this context, quality control is said to be of great importance		
		SEA should be stakeholder-driven, explicitly addressing the public's inputs and concerns, ensuring access to relevant information of the PPP making process		

Category of quality criteria	Buuren Van & Nooteboom, 2009	Fischer & Gazzola, 2006	Morrison-Saunders & Arts, 2004	Sadler, 1996
Procedure (cont.)		SEA should be flexible and adaptive to the PPP process		
		SEA should be effective in ensuring environmental aspects are given due consideration in policy, plan and programme (PPP) making		
	Contributes to the timeliness, transparency, and quality of the overall decision-making process	SEA should be iterative, being part of an ongoing decision cycle; it should inspire future planning through the potential amendment of strategic decisions; in this context, SEA needs to be applied in a tiered manner with effective project EIA within an established PPP framework		Clear, specific directions in the form of terms of reference or guidelines covering priority issues, timelines, and opportunities for information and input at key decision-making stages

As demonstrated in the above table, the criteria under process-category have received more attention by researchers than the content-category. Fischer & Gazzola (2006) provide some quality criteria that may correspond to content and process category simultaneously.

Stoeglehner *et al.* (2009) look at the effectiveness of SEA from the perspective of direct/indirect effectiveness, on the one hand, and from a democratic/environmental

effectiveness on the other hand (Table 3). The authors regard the distinction between direct and indirect effectiveness based on outputs of SEA. Direct effectiveness demonstrates the achievement of the SEA goal to improve environmental quality and to include environmental knowledge in decision making while indirect outputs include changes in attitudes, improved awareness, but also changes in institutional arrangements and traditions. A democratic/environmental dimension of effectiveness is derived from the understanding that the planning and decision making process is embedded into the country's political system which in turn defines and frames objectives, including environmental objectives, and implements the political decision.

Table 3. Environmental Assessment effectiveness by Stoeglehner *et al.* (2009)

	Democratic effectiveness	**Environmental effectiveness**
Direct effectiveness	Political choice of means that fulfil environmental objectives SEA implemented by the administration as politically decided	Improving environmental quality Inclusion of environmental knowledge in planning and decision making Single- and double-loop learning
Indirect effectiveness	Change in sense of democracy Double-loop learning	Institutional development Double-loop learning Changes in attitudes

The collection of EA effectiveness criteria in Table 2 and Table 3 demonstrates a wide diversity of criteria to which an effective EA must correspond. The main criterion, however, is the measure of accomplishment of the objective of EA in a transparent and participatory process. Since public engagement and discourse are characteristic features of environmental assessment, it is important to measure the participatory effectiveness of EA. The criteria of such effectiveness are the level of information exchange, public discourse, values exposure, transformative learning, enhancement of skills, and trust among the stakeholders. Quality of information and documents, as well as the competence of experts and authorities are criteria featuring the rational effectiveness of EA and decision making process. However, according to the EC review in 2003 (European Commission, 2003) and 2009 (European Commission COM(2009) 378 final), many member states have pointed out that the lack of sufficient quality in the information used in the EIA documentation is a problem.

According to several authors, environmental assessment has made a transformation from a positivist assumption that it improved decision-making and effectiveness based on objective and quantifiable evidence (Bartlett & Kurian (1999) to post-positivist and communicative planning and practice (Bina, 2007; Jha-Thakur *et al.,* 2009). Also, for example, Fischer (2007) asserts the participatory role of SEA, by

concluding that SEA is effective, if it provides decision makers not only with better information, but enables attitudes and perceptions to change through participation and involvement, and changes established routines.

Fitzpatrick & Sinclair (2003) give a historic overview of research done on public participation, and derive seven key points from that. The authors claim that public participation facilitates meeting the following goals of EA: it 1) accentuates the effectiveness of the EA process; 2) actualises the principles of democracy; 3) ensures that the project meets the needs of the public, in terms of both purpose and design; 4) assigns legitimacy to a project because the assessment process appears to be transparent; 5) provides avenues for conflict resolution for stakeholders; 6) provides a forum for the submission and inclusion of local knowledge in the EA decision, and 7) provides for a more comprehensive consideration of factors on which decisions are based. The educative and learning potential of EA has been attracting attention from several researchers and practitioners. Moreover, Jha-Thakur *et al.* (2009) argue that there is a growing appreciation of the role of EA not only directly in making policies, plans and programmes more environmentally sound, but indirectly in making the act of learning play a valuable longer-term role in transforming individual, professional and organisational norms and practices in support of sustainable development. The role of EA in public education was recognised by Sinclair & Diduck in 1995, claiming that EA process has a strong public education component. The authors developed further their concept of adult learning by applying a transformative learning approach in 2001 (Sinclair & Diduck, 2001). Transformative learning, explain the authors, is a term that stems from Transformative Learning Theory by J. Mezirow in the 1990's, which describes a learning process of "becoming critically aware of one's own tacit assumptions and expectations and those of others and assessing their relevance for making an interpretation" (Mezirow, 2000). Sinclair & Diduck (2001) summarise that "transformative learning is how adults learn". These dimensions are important for moving towards the goals of sustainability, for which learning is a crucial element, as demonstrated in several research papers. Jha-Thakur *et al.* (2009) argue that the effectiveness of SEA, for example, depends on the type of learners participating in the process and the skills that they have. The authors argue that skills required by planners, consultants and the community differ from each other. The authors group the skills into generic, country specific and case specific skills, regarding the generic skills applicable to all forms of SEA across countries and sectors. Such skills are communication, project management, leadership, team working, stakeholder management, conflict resolution and time management. Examples of country-specific skills could be visual skills and cartographic skills, if mapping is the predominantly used skill in assessments. Case specific skills are related to the specific case (project or plan), for example, a mining project or housing plan, which benefit from geological and hydrological skills or urban planning skills, respectively. Jha-Thakur *et al.* (2009) find it important to know beforehand and consider the types of learners present in a team or the wider public and to adjust the assessment methodology and communication of information accordingly.

Stoeglehner *et al*. (2009) extend the learning process further by arguing that there are two kinds of collective learning processes: *single-loop* and *double-loop* learning, both important elements of measuring effectiveness of EA (see Table 3). According to the authors, single-loop learning is present in cases where negative effects of a planning proposal can be discovered during the planning process, corrected or mitigated, but without amending the underlying objectives of the plan, or changes in values. Double-loop learning, on the contrary appears in planning processes where negotiations over the acceptability of negative impacts results in substantial changes of the overall objectives, purpose and framework of the planning process. According to the authors, single-loop learning is characteristic of the rational model of EA effectiveness, since the latter strives to collect better information for decision making. Double-loop learning that integrates environmental values and objectives into planning process in an iterative way develops better ownership of the process by planners, and a better outcome by the end, argue the authors. EA has been attached to a rationalist assumption that provision of information, including scientific evidence, for the decision making process will inherently improve decisions (Thérivel, 2004; Fischer, 2007). This has been opposed by Sheate & Partidario (2010) who argue that not just information influences decision making but knowledge that is shared and acquired in the discourse. Based on the research of 45 projects Leknes (2001) concludes that the role of EIA depends rather on the character of issue (technical/professional or political) and whether the issue is legally regulated or not. Leknes argues that if the issue is of professional/technical nature and legally regulated EIA has a strong role, whereas in cases where consensus on technical issues is not reached, EIA is used to strengthen the political ambitions of participants. This argument is further supported by Cherp *et al.* (2007) who posit that producing relevant knowledge is not enough; it should also be communicated in an appropriate way, i.e integrated with those knowledge streams that shape strategies. According to O'Neill *et al.* (2008) education involves not simply the appreciation of a set of facts, but also the development of particular intellectual skills and virtues and capacities of perception. The trained ecologist, be he an amateur or professional, is able to see, hear and even smell in a way that a person who lacks such training cannot, argue the authors.

The rationalist view on EA effectiveness is embedded in the definition of EA that is either to bring about a change towards a more sustainable option or to follow a rigorous process with legally binding steps, or both. The rationality issue of EA effectiveness is seen from the understanding that EA should produce information for decision making. Information is collected during the drafting of an Environmental Impact Statement (EIS) and presented in public hearings and consultations, and its validity is evaluated by the competent authority. Environmental assessment has rationalist roots, argues Elling (2008), whereby the presentation of better information will, by definition, lead to better decisions. In turn, it is assumed that the outcome of better decisions will be appropriate environmental protection or enhancement when approved development takes place relative to the alternatives that were considered and rejected or modified during the

EIA process. Bond & Morrison-Saunders (2009) argue that this view was predicated on the rational behaviour of stakeholders and, in particular, of decision makers. However, authors increasingly argue that decision making is not rational, and that EIA has considerably more roles than simply the provision of information. (See, for example, Lawrence, 2000; Leknes, 2001; Morrison-Saunders & Bailey, 2009). Bartlett & Kurian (1999) detail six separate models explaining the role of EIA in decision making, in which the information processing (rational) model is one end of the spectrum of influence; other models include the symbolic politics model, the political economy model, the organisational politics model, the pluralist politics model and the institutionalist model. Research to date has focused on the information processing model, perhaps because it is relatively easy to measure influence, but the evidence suggests that the influence of EIA on decision making using this model is very limited (see, for example, Wood & Jones, 1997). The effect of EA on decision making is in fact a key component of EA effectiveness. According to the EU directives, the results of environmental assessment have to be considered in decision making. However, there are different views among researchers and practitioners regarding how the 'consideration of gathered information and results of public consultations' should be implemented. Elling (2008) in his fundamental piece of work on decision making in environmental assessment argues that the assessment process and the decision making process are separate and have to be kept separate. According to B. Elling, the assessment process, that he calls reflexive process, will provide a kind of platform for communication among the stakeholders, which must be oriented towards *mutual understanding*, while decision making is a process in the construction of *a solution*. The latter is a political process, and "is not the one that decides upon a proposal, but one that draws up a solution". In B. Elling's view, the construction of a solution must occur in a political process following after and clearly detached from the reflexive process. B. Elling argues that the political decision-makers are not bound by the Environmental Impact Statement, but solely by their own convictions, admitting that when publishing a solution which they have reached, they have to explain how the environmental impact stated in the EIS has shaped their decision. For example, decision makers must give reasons why they accept one environmental effect rather than another, why they choose to overlook an assumed effect, how they balance the values at play against each other, and what their environmental objective is behind the decision. The reason for separating the two processes, that B. Elling calls *reflexive process* built on communicative reason and a political decision-making process built on a power-based compromise, is to ensure that the public and the politicians are fully aware of all information available on environmental effects, uncertainties, margins of error etc before politicians work out a solution and produce an outcome.

This ideal picture is, however, in contrast to everyday practice reported by many researchers and practitioners. Moreover, Therivel *et al.* (2009) demonstrated that even sustainability assessment does not necessarily ensure high protection of the environment. According to the study results, the local authority planners felt that

the sustainability assessment/SEA process favoured economic and socio-economic factors rather than environmental factors. While B. Elling (2009) expects the decision makers to explain how they came to the solution, R. Therivel and colleagues have demonstrated that decision makers do not explain how or why these trade-offs are made, and do not justify why the environmental protection is not achieved. None of the 45 SEA cases studied by Thérivel *et al.* (2009) gave an indication of the circumstances under which environmental costs would be acceptable in return for social or economic benefits. The limited effect of EA on decision making has also been reported by some researchers (e.g. Cashmore *et al.*, 2004; Thérivel *et al.,* 2009; Heinma & Põder, 2010; Croal *et al*., 2010). This real life situation seems to correspond to the Elling (2008; 2009) concept that EA and decision making are separate. However, the B. Elling concept is challenged by Vicente & Partidario (2006), who, on the one hand, admit that there is a gap between the assessment and the decision making, and on the other hand, make a proposal about how to overcome this gap. According to the authors, the impact assessors try to elucidate technical findings in a comprehensible way to decision-makers, and the decision-makers try to interpret those same findings in light of their own values. In this relationship the gap between the elucidation of the problem and its interpretation (or perception) will be influenced by the space of dialogue between impact assessors and decision-makers where shared values and concerns are debated. Considering that impact assessors and decision-makers (mainly politicians) are two very different groups in society, the difficult task of bridging this communication gap is crucial in integrating environmental values into the decision making process. The gap between environmental assessment and decision making is a communication gap that according to Vicente & Partidario (2006) could be bridged, whereas Elling (2008) regards *the* gap as something natural and objective which should not be bridged. The 'separation' is explained by Dalkmann *et al.* (2004) by the fact that environmental assessment and decision making process are inherently different processes. While the former predicts impacts, the latter is much less streamlined and predicts outcomes, because decision making is about priorities, issues and values, argue the authors. Independent of whether there is a gap or should be a gap between EA and decision making, both options should ultimately ensure that environmental concerns are taken into account and the goal of sustainability is achieved.

4. RESEARCH DESIGN AND METHODS

4.1. EVALUATING THE QUALITY OF EIS AND IDENTIFYING THE POSSIBLE GAPS

Adequate provision of information is essential for decision making. Thus, the high quality of Environmental Impact Statements (EIS), required by EIA and SEA directives, forms the basis for EA effectiveness. The quality of EIS has been evaluated in many countries and the EIA review guidelines have proven to be a valuable tool to do this in a concise and comparative way (e.g. Lee & Colley, 1992; Glasson *et al.* 1994; Canelas *et al*., 2005, Jalava *et al.,* 2010). Repeated evaluations enable the authorities to monitor the progressive improvement in the quality of EIS and to introduce amendments accordingly.

Quality assessment was conducted on 50 completed EIS in the period from 2001–2005, i.e. pre-full-transposition of EU EIA/SEA legislation in Estonia. The EIS were randomly selected from the database and the quality evaluation was carried out by a single reviewer. The methodology of the study is described in detail in Peterson (2010b) **[II]**. The results describe the sufficiency of information in 7 sections of information provision, graded from A to E (i.e. from a highly sufficient level of information for decision making to a completely insufficient level) and tested against the EU guidelines on EIS Review (2001).

4.2. IDENTIFYING THE RANGE OF VARIABILITY OF EIS QUALITY EVALUATIONS AMONG REVIEWERS

The variability of the quality assessment of EIS by different reviewers was tested and then the results of these assessments were analysed. The individual grading among 24 independent reviewers of a single EIS was tested first and then a comparison of the results of 15 individual and 5 group assessments of the same EIS was conducted to reveal possible deviations. The EC Guidance on EIS Review (2001) was applied to evaluate the quality of a single EIS. The full description of the study methodology is described in Peterson (2010b) **[II]**. How to deal with the bias of the highly subjective nature of EIS evaluations is discussed.

4.3. EVALUATING THE QUALITY OF SCREENING DECISIONS ON THE LIKELY EFFECTS OF A PROJECT OR PLAN ON NATURA 2000 SITES

Screening is a crucial stage in the environmental assessment process, because by this process a decision is made whether or not further assessment of a plan or project is required, and by doing so, the likelihood of implementing plans and projects harmful to the environment is decreased. In the Habitats Directive (92/43/EC), it is explicitly stated that the competent authority should ascertain that

no harm will be done to EU sites belonging to the Natura 2000 network before authorisation for further action is granted.

Screening decisions made in the period of 2004-2009 in Estonia were collected and the justifications for the need for EIA or SEA were analysed, paying special attention to the consideration of likely effects of a project or plan on Natura 2000 sites (Peterson *et al.,* 2010) **[I]**. The availability and rationale of justifications in screening decisions was studied based on the EC Guidelines on "Assessment of plans and project significantly affecting Natura 2000 sites" (European Commission, 2002). Conclusions were drawn on the compliance of the screening decisions with the Habitat Directive and EC guidelines.

4.4. IDENTIFYING THE ROLE AND VALUE OF ENVIRONMENTAL ASSESSMENT AMONG STAKEHOLDERS

The perceptions of stakeholders concerning the role and value of SEA were studied in seven national level cases completed in 2001-2004 in Estonia. Expectations of stakeholders involved in the planning of national level strategic documents and in SEA towards the objectives and final outcome of SEA were studied. The aim of the study was to understand the extent of integration of planning and SEA and the importance to the final decision, as perceived by the stakeholders.

The main method of this study was a survey of SEA participants, using a questionnaire and structured interviews, developed by the author. Details of the method are found in Peterson (2004)[**IV]**.

4.5. THEORETICAL FRAMEWORK OF ENVIRONMENTAL ASSESSMENT EFFECTIVENESS

Based on the literature review and the empirical research by the author, a theoretical framework of Environmental Assessment effectiveness was developed. The components of EA effectiveness were identified and their role in the EA was described.

5. RESULTS AND DISCUSSION

5.1. QUALITY OF EIS

The quality of 50 randomly selected EIS, completed and approved in 2001–2005, was assessed by applying EC Guidelines 2002 by a single reviewer. The assessment demonstrated (Peterson, 2010b) **[II]** that the overall quality of sample EIS was satisfactory: 68% of the sample EIS was graded positively (A+B+C) and 32% negatively (D+E). The quality assessment of 50 EIS revealed that most gaps were identified in Section 1 (project description), Section 5 (mitigation measures) and Section 2 (consideration of alternatives). Those sections typically represented the largest share of incomplete information (D+E, ranged from 64.4% to 66.5%) (Table 4). The main reason for the low grades in Section 1 was the poor description of the project plan and timeline; Section 5 generally demonstrated non-specific mitigation measures that often lacked the strong commitment of the developer to implement the measures. The main weakness of Section 2 resulted from the limited number of alternatives proposed and assessed; usually the developer's option and zero-option were the only options proposed. Similar weaknesses were observed in comparative assessments of Greece (Androulidakis & Karakassis, 2006), Portugal and Spain (Canelas *et al.*, 2005), where the lowest grades were also assigned to Sections 1 and 2.

Table 4. Quality of the EIS sections, results of 50 EIS in Estonia (based on Peterson, 2010b)

Section (no of review questions)	Grade A	Grade B	Grade C	Grade D	Grade E
1. Description of the project (49)	2.2	14.0	17.3	18.7	47.8
2. Alternatives (5)	0.8	13.3	23.4	18.0	44.5
3. Description of the environment likely to be affected by the project (22)	1.3	31.4	32.4	13.1	21.8
4. Description of the likely significant effects of the project (38)	0.4	11.9	32.5	22.0	33.2
5. Description of mitigating measures (10)	0	10.8	24.7	19.5	44.9
6. Non-technical summary (7)	5.0	20.5	24.5	13.5	36.5
7. Quality of presentation (12)	11.5	35.9	25.0	10.6	17.0

Legend: A, B, C – adequate information, D and E – inadequate information

Recent evaluations of Finnish EIA reports revealed consideration of alternatives was regarded especially poor by the evaluators (Jalava *et al*., 2010) and that typical shortcomings were unfocused reporting and poor attempts at communicating assessment results to a non-technical audience (Pölönen *et al*., 2010). Based on the evaluations in different member states, it could be concluded that common deficiencies may exist in EIS across EU. The reasons for poor quality EIS are widely debated among researchers and practitioners. Apart from the competence of experts, the main argument relies on the fact that the proponent, the direct beneficiary of the project, leads the defining and framing of the issues to be addressed in the EIS. Also Hokkanen (2008) and Jalava *et al.* (2010) refer to such a potential bias in the EIS, since a developer can either enhance or inhibit other stakeholders' contributions to EIA and its results. Kruopiene *et al.* (2009) have indicated subjectivity in forecasting of impacts largely caused by the dependence of EIA experts from the developer's objectives, since EIA practitioners are hired and paid by the developer. Providing alternatives has been identified by Pölönen (2006) as an area where the proponent has a significant role and power to limit the search for the best option. Insufficient consideration of alternatives has been caused by the leading role of developer-hired experts, claim Kruopiene e*t al.* (2009). The possible reasons for doing so are attempts to speed up the process and save money, since expanding the list of options would increase the need for time and information for assessment. This has obvious financial implications for the proponent.

5.2. VARIABILITY OF SCRUTINY OF EIS QUALITY AMONG REVIEWERS

The bias of EIS evaluation is much discussed by researchers and practitioners. For example, Kontic (2000) argues that not only is there a possibility that the general public may exhibit systematic bias, but experts may also do so because risk assessment itself requires some value judgments. Given the availability or unavailability of facts and their associated degree of uncertainty, nobody can be viewed as unbiased, argues B. Kontic.

The subjectivity of evaluations of the EIS quality was tested in two experiments (Peterson, 2010b) **[II]**. The information provided in a random sample of 50 EIS was evaluated by a single reviewer. The second experiment addressed the variability of both an individual and a group evaluation. A comparative analysis of the individual and group assessment showed that the latter resulted in several sections of the EIS receiving lower grades than the initial grades from the individual assessment (Table 5). The group was eventually more critical of the details (relevant review questions) than the individual reviewers; however, the final overall grade of the EIS increased after the group assessment. For example, the positive grades assigned by the individuals accounted for 60% of the total grades, whereas the group upgraded the positive results to 80%. The upgrade happened at the expense of increasing the C grade that corresponded to the "adequate provision of information with any gaps or weaknesses in information not being vital to the decision process". This might be

called a borderline effect, since the grade C stands between the complete (A+B) and incomplete (D+E) information for decision making. A relatively large share of grade C, among relevant questions, may be an indication of nearly incomplete information in the EIS or "just satisfactory" level of performance. In turn, this may indicate the need for additional information before a decision can be made. The paper (Peterson, 2010b) **[II]** draws the attention of the reviewers to identify the key issues (significant impacts) that are crucial to understand and to mitigate the adverse effects of the project (that might cause environmental damage), rather than any mean grade for a section or subsection of an EIS. An EIS cannot be graded positively if any of the key information is incomplete, warns Peterson (2010b) **[II]**. The reviewers explained that the quality assessment of EIS of a complex project with various emissions (air, water, waste) with multiple environmental effects, required wide expertise that was not available to a single expert/reviewer (Peterson, 2010b) **[II]**. The reviewers pointed out that, in group discussions, they often changed their initial perspectives about several issues described in the case-EIS. Thus, the group assessment had wider scope and was more comprehensive than their individual assessment was initially. The results from the individual and group assessment show that the issues specific to particular sections of the case-EIS were addressed in more detail within a group. This may have been due to the wider technical expertise available in the group, or evolved for other reasons like group-polarisation first described by J. Stoner in 1961.

The results of the quality assessment of a single EIS by 24 individual reviewers largely corresponded to the same pattern of inadequacy of information as the assessment of the 50 EIS: the information on the project (Section 1) was regarded as the most incomplete (where the largest share of relevant questions was graded D or E). Sections 4 and 5, which contained information on likely effects and mitigation measures, respectively, were the next lowest graded sections in the EIS. The low grades of these sections were attributed to missing or poor provision of information on cumulative impacts (Section 4) and mitigation measures (Section 5). The information provided in Sections 2, 3, 6 and 7 was considered relatively complete.

Table 5. Overall quality grade of the case-EIS by 15 independent (Ind) and 5 groups of 3 reviewers (Groups) (Peterson, 2010b)

Overall quality grade	**No of reviewers** *Ind*	*Groups*	**%** *Ind*	*Groups*	**Sufficiency of provided information, %** ***Ind***	***Groups***
A	0	0	0	0	60	80
B	1	0	6.7	0		
C	8	4	53.3	80.0		
D	6	1	40.0	20.0	40	20
E	0	0	0	0		
Total	**15**	**5**	**100**	**100**	**100**	**100**

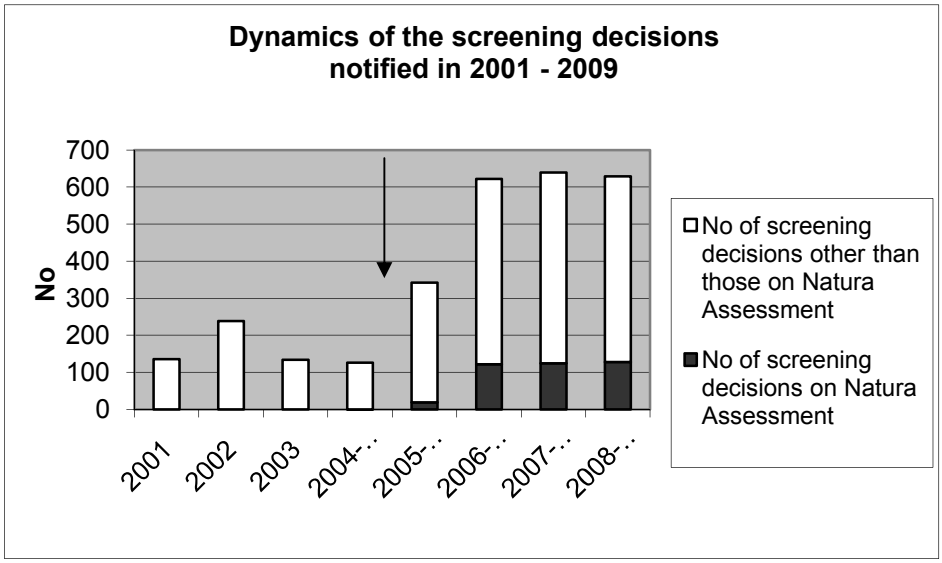
Finally, based on the study, it is concluded that the EC Guidance on EIS Review (2001) seems to work well for a wide spectrum of projects and for the quality assessment of their EIS, since the share of relevant questions was rather high in all exercises conducted in this study. The merger of two Guidelines, one on the EIS review under the EIA Directive and the other under the Habitats Directive Article 6 (3) and (4) could be considered, since in many cases the Natura Assessment documentation usually forms an integral part of the EIS and thus the quality review of both assessments could be performed with the help of a single review package.

5.3. QUALITY OF SCREENING DECISIONS

Screening is a crucial stage in the environmental assessment process, because by this process a decision is made whether or not further assessment of a plan or project is required, and by doing so, the likelihood of implementing plans and projects harming the environment is decreased. In the Habitats Directive, it is explicitly stated that the competent authority should ascertain that no harm will be done to EU sites belonging to the Natura 2000 network before authorisation for further action is granted. The study showed that the EC guidelines (European Commission 2000, 2002) have given Member States relatively broad scope for interpretation of the Natura Assessment, which is reflected in varying descriptions of the Natura Assessment process and its steps in the national guidance documents. Based on the review, it could be concluded that two main approaches to screening exist: (i) screening is either a rapid examination of the likely impacts associated with the proposed plan or project, alone and in combination with other plans and projects, or (ii) screening is a relatively comprehensive assessment, having many characteristic features of the appropriate assessment. The rapid approach is recommended, for example, by the German Federal Ministry of Transport (2004) guideline. The EC Guidelines (European Commission 2000; 2002) regard screening as a well-justified and documented process based on a step-wise data analysis.

A five-year review of screening decisions in Estonia (Peterson *et al*., 2010) **[I]** demonstrated, however, that the Habitats Directive and the respective EC Guidelines (2000; 2002) are poorly applied. The majority of the EIA and SEA screening decisions in 2004–2009 did not consider the impacts on Natura 2000 sites. Only one out of every six screening deciscions, considered such effects. Furthermore, those decisions, that did consider effects on Natura 2000 sites, addressed primarily the location-induced aspects of the proposed plan or project, with respect to their location of the relevant Natura 2000 site. Less than one third of decisions considered location, likely effects and their significance together. In the rest of the cases, the reasoning was missing or unclear. Since the study demonstrated important deficiencies in the screening stage of the Natura Assessment, the Estonian EIA Act urgently needs to be modified to comply fully with the requirements of the Habitats Directive and to ensure that the conservation objectives of nearly 600 Natura 200 sites in Estonia are not compromised.

Based on this study, it is concluded that regulatory measures play a significant role in the Natura Assessment. Although nature conservation legislation in Estonia (including EIA/SEA) was expected to be fully transposed by 1 May 2004 (the day the country joined the EU), implementation of Article 6 of the Habitats Directive was not enforced fully until the passage of the new EIA Act in April 2005. This is evidenced by the rapid increase in the number of notifications of screening decisions that addressed the Natura Assessment in 2005–2006 (Figure 1).



Note: In the period 2001–2005 (until the new EIA Act was enforced), only decisions requiring the initiation of the EIA/SEA had to be made public (decisions not requiring the EIA/SEA did not have to be reported); thus, the "total no. of screening decisions" marks only the number of decisions requiring the initiation of the EIA/SEA. The arrow marks the year 2005 when the newly revised EIA Act was enforced and the notification of all screening decisions became mandatory.

Figure 1. Dynamics of the screening decisions, total and those addressing the Natura Assessment notified in 2001-2009

The results of this study demonstrate that there is an urgent need to refine those questions the screening process must address, following the 2002 EC Guidance in the EIA Act. The list of information that needs to be included in the screening decision as prescribed currently by the EIA Act should be further supplemented with the information on screening of the likely effects on the relevant Natura 2000 site(s). This information, as demonstrated by the study, is currently largely missing.

5.4. PERCEPTIONS OF THE ROLE AND VALUE OF ENVIRONMENTAL ASSESSMENT AMONG STAKEHOLDERS

The results of the study on the role of SEA in Estonia as perceived by participants and stakeholders (Peterson, 2004) **[IV]** demonstrated that SEA was rapidly making its way as a tool for forecasting environmental impacts and communicating them to diverse stakeholders and, to a lesser extent, for integrating environmental concerns into strategic decision making. The first observation was that expectations regarding the objectives of particular SEAs vary among groups of stakeholders. These different expectations may lead to confusion and misunderstanding later in the process. It is proposed that the specific objectives of SEA are discussed early by the proponent, the experts and the interested stakeholders to avoid confusion and delays. For example, Runhaar & Driessen (2007) have identified several constraints on effective public engagement, such as civil servants' lack of awareness and training, lack of expertise within the general public on EA issues, lack of public interest in cases where the EA issues are discussed at more abstract levels (like in SEA), limited capacity to invest time and resources in the assessment, and the absence of impact reports for the evaluation and comparison of options.

The perceived effects of SEA were not in line with the original expectations of the stakeholders and also varied among different stakeholders. The most prominent perceived effect of SEA related to its ability to modify the content and composition of the policy document. According to the study results SEAs also had a major effect on identification of stakeholders, their further involvement in the process of drafting of policy documents and the education of all process participants. However, SEA had limited impact on the setting of the scope and objectives of the policy document. Since SEA in Estonia follows the 'strategic EIA' paradigm (Partidario, 2007), the findings of this study suggest, in line with Fischer (2002) that even this 'traditional', less flexible model results in some benefits of SEA application (albeit limited). Most stakeholders considered that positive effects of SEA can be enhanced if SEA starts early in the policy document drafting process, which is currently not the case in Estonia. The main problem faced both by public authorities and experts in the SEA process was to identify whether an SEA is required. This confusion is caused by the lack of legal definition of a plan and programme and the ambiguity of hierachy of strategic documents. On a different level of planning, not explored in this article, it also causes uncertainty in deciding whether an SEA of local and regional development plans is required.

Once an SEA has been launched, adhering to the given timeframe and keeping within the budget usually becomes a notable problem. Public authorities find management of public meetings, communication with stakeholders and reaching consensus among interest groups a demanding task. Defining appropriate environmental objectives and criteria for a particular plan or programme was regarded as the greatest challenge by SEA experts. On the basis of these findings, the following measures are proposed for strengthening the SEA system in Estonia:

- Once the development of policy documents and corresponding budgets is planned, the SEA process and its budget need to be planned as well;
- It is strongly recommended that an SEA is formally initiated by the same executive order as the drafting of policy documents;
- To make the screening process transparent and effective, the definition of plans and programmes and their mutual hierarchy need to be legally established. Legal definition will provide a clear system of policy documents subject to SEA;
- The objectives of SEA need to be agreed among participants and communicated to them in the early stage of the SEA process to avoid controversies during the SEA process and false expectations of the results of SEA;
- Since national environmental objectives are too general for sector-specific SEAs, it is proposed that each sector develop and adopt its own environmental objectives to provide a framework for SEA methodology and further impact assessment;
- It is recommended that SEA training programmes are developed for public authorities in charge of SEA in their sector, to build their in-house capacity on SEA and in public communication, in particular.

The Estonian SEA process was also described as being more like an EIA rather than a "strategic" SEA by Peterson (2004) **[IV].** The poor integration of the plan and SEA was also reported by Mardiste and Peterson (2004) **[III]** in the case of drafting the Single Programming Document that defines the types of projects and activities that would be financed from EU Structural Funds.

5.5. GENERIC COMPONENTS (DRIVERS) OF ENVIRONMENTAL ASSESSMENT EFFECTIVENESS

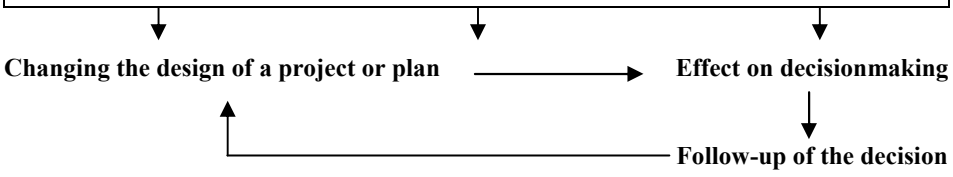
Regardless of the nuance-rich definitions of EA as provided in Table 1 and the variety of definitions of EA effectiveness (Table 2 and Table 3) we may find common features of effectiveness for both types of the environmental assessment (EIA and SEA): i) environmental assessment needs to be an *open/public process*, that aims to provide not only the decision maker, but also all other participants involved in the process with ii) *information* about the proposed development/option and the associated impacts on the environment; and about the iii) *designed measures* for avoidance and mitigation of the significant impacts, as well as measures that maximise the public good, environmental benefit, in particular; iv) *prior to the decision* on the development consent or a plan. Less attention, however, has been paid to the post-decision stage of EA, the follow-up of EA. The latter is expected to verify the results of EA in practice and should be given much more significance in evaluating EA effectiveness than it currently has.

These common features of EA could be further categorised into 5 generic components that drive the EA effectiveness: (1) *the purpose of EA*, that is,whether the objective of EA is to produce an environmental benefit or conduct a legally sound process, or both; (2) *the quality of the participatory process of EA*, that is, how, what, and to whom these values and knowledge are communicated in the EA process; (3) *the quality of EA documentation*, that is the adequacy of information provided to the decision maker and the public, (4) *the cost-benefit of EA*, and (5) *the effect of EA on the design of the project or plan and on decision making and its effective implementation*. Thus, the effectiveness of EA could be described as the degree to which the EA process is successful in ensuring the achievement of its objective and purpose. EA effectiveness is dependant on the quality of the participatory process and EA documentation, the level of transformation of the project or plan during the EA and the level of effect of EA on the decision making. The EA effectiveness is also characterised by the achievement of the EA objectives in a time- and cost-effective way. The EA effectiveness is eventually verified by the follow-up of the decision.

Regarding achieving sustainability goals, the decision making would need to comprise both the rational and participatory view on EA effectiveness. We may call an EA effective and well-performed if all the components described in Table 6 apply.

Table 6. Components (drivers) of Environmental Assessment effectiveness

<table>
<tr><th>Environmental benefit-oriented assessment and decision making (Objective-effectiveness)</th><th colspan="2">Process-oriented assessment and decision making (Process-effectiveness)</th></tr>
<tr><td rowspan="2">Environmental/sustainability objectives are achieved, i.e. decision creates environmental benefits (environmental/sustainability effectiveness)</td><td rowspan="2">Legally sound and best practice EA process is followed (regulatory effectiveness)</td><td>Effective information exchange, public discourse, stakeholders' values exposed, transformative learning, enhancement of skills, trust (participatory effectiveness)</td></tr>
<tr><td>Quality of information and documents; high competence of experts and authorities (rational effectiveness)</td></tr>
<tr><td>Environmental/sustainability objectives are achieved in cost-effective way (economic effectiveness)</td><td colspan="2">Legally sound and best practice EA process is implemented in cost-effective way (economic effectiveness)</td></tr>
<tr><td colspan="3">Cost-effectiveness</td></tr>
</table>



Environmental assessment was introduced to counteract destruction of the environment, peoples' livelihoods and resulting economic losses that became politically intolerable. Although legally binding, the impact assessment at all administrative levels and across jurisdictions hasn't resulted in a situation we might consider sustainable to meet the "...needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Report, 1987). Gibson and colleagues (2005) argue that although impact assessment requirements have been imposed and have become more and more rigorous over time, the perception that environmental objectives conflict with financial, technical and political objectives has not disappeared. The authors claim that the assessment requirements have forced the decision maker to consider the environmental implications of proposed projects or plans, and encouraged them to avoid serious environmental harm, but the sustainability issues have been overlooked.

Gibson *et al.* (2005) provide six basic rules for sustainability assessment. These are: (1) where trade-offs must be made, the decision making should still be guided by commitment to maximising net gains; (2) the burden of argument should be put on the trade-off proponent to prove the maximum net gains; (3) avoidance of significant adverse effects; (4) protection of the future by not displacing significant adverse effects from the present to the future unless the alternative is to displace even more significant negative effects from the present to the future; (5) explicit justification and (6) open process where proposed compromises and trade-offs are addressed and justified by engaging stakeholders. The authors, however, admit that few assessments have been guided by an assessment framework which combines specified sustainability criteria with clear guidance on the application of these criteria in trade-off decisions.

The author of the current thesis argues that EA effectiveness criteria in Table 6 could be applied in all phases of EA, i.e. in the phase of planning, implementation and follow-up. The latter is of great concern to the stakeholders. As demonstrated by Peterson (2010a), the participants in the EA process criticised the effectiveness of EA, because there was little or no follow-up of EA conclusions (Peterson, 2010a). The follow-up of EIA results would measure the result-effectiveness of EA - that is, whether environmental benefits were actually generated, and which ones. Such benefits would not necessarily appear immediately after the EA, but possibly after many years, depending on the progress of implementation of the plan or project. The respondents to the Estonian survey, however, also complained about the insignificant effect of EA on the decision making process and regarded this as a significant problem. One of the reasons why stakeholders of EA held this opinion about the effect of EA on the decision making process could be because of different perceptions about the objective and outcome of EA. The Estonian research revealed that stakeholders had different perceptions of the purpose and outcome of SEA, because it was either not agreed at the onset of the assessment or not properly communicated (Peterson, 2004) **[IV]**.

Based on the research, it is argued by the author that EA effectiveness is driven by a full set of EA effectiveness components to be applied in each individual EA process, aknowledging that all components are interconnected and interdependent. Thus, applying an incomplete set of components to an EA could be considered ineffective. It is important to identify and agree on the components at the very start of the process and effectively communicate them to the participants. This EA effectiveness framework could be applied both in the planning and follow-up phase of EA. The applicability of the framework for achieving sustainability goals should be further elaborated and tested.

6. CONCLUSIONS

The research has concluded with the following results:

1. The information on the likely impact of projects and plans is stored in EA documentation. The quality of this documentation plays a key role in providing adequate formation for EA participants, stakeholders and decision makers. Evaluation of the 50 Environmental Impact Statements (EIS) demonstrated a generally satisfactory level of quality, but it varied between different EIS and topic areas. Most gaps were identified in project description, mitigation measures and consideration of alternatives.

2. The quality of EA documentation depends on the competence of experts, but also on the judgement of evaluators of EIS, that is *subjective* as demonstrated by the evaluation of a single EIS by various reviewers. A comparative analysis of individual and group evaluations of the quality of a single EIS showed that the group evaluations resulted in several topic areas of EIS receiving lower grades than the initial individual assessments. It was speculated that a group of reviewers provided a more diverse competence and thus scrutinized the EIS more severely than an individual who might not have been competent in all areas of environmental effects. Based on the results of individual and group assessment of EIS, Estonian environmental authorities could consider the establishment of a group of assessors of EIS at regional level, rather than proceeding with individual assessments. The composition and size of the evaluation group would depend on the scope and complexity of the possible impact of the projects, and on the important values, seen from the participants' perspective.

3. Screening decisions have an important role in meeting one of the key EA objectives - to contribute to environmental benefit and to avoid harming the environment. The role of screening has been increasing due to the need to meet the goal of sustainability which embraces complex issues that cannot be streamlined and easily regulated. The research results demonstrated that, for example, screening of likely adverse effects on Natura 2000 sites was poorly conducted and verified as such. Only every sixth screening decision addressed the likely impacts of projects or plans on Natura 2000 sites, which is in contradiction to the implementation of EU environmental law.

4. The effectiveness of EA depends on the set-up and management of the EA process. The research results showed that participants and stakeholders expect the objectives and the expected outcome of the EA to be clearly communicated at the onset, but also throughout the EA process, to ensure effective integration of EA into planning.

5. A theoretical framework of Environment Assessment effectiveness was developed. Based on the literature review and the empirical research by the author, five interlinked and interdependent components (drivers)

charactistic to an effective EA were identified: 1) clearly defined objectives and purpose of EA, 2) effective participatory and discursive process, 3) high quality documentation, 4) positive effect of EA on the design of the project or plan and on decision making, and verified in follow-up phase, and 5) highly efficient use of time and financial resources. The level of application of these components, i.e. the effectiveness of EA depends on the legal regulation and guidance on the one hand, but also on administrative capacities and expertise on the other hand. The applicability of the theoretical framework of drivers of EA effectiveness, however, needs further to be studied and tested in practice.

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KOKKUVÕTE. KESKKONNAMÕJU HINDAMISE TÕHUSUST MÄÄRAVAD TEGURID

Keskkonnamõju hindamise erinevate meetodite seadustamisest alates on püsinud küsimus hindamise tõhususe[1] kohta. Nii praktikuid kui uurijaid on huvitanud küsimus, milline hindamine on tõhus ehk efektiivne. Arvestades keskkonnamõju hindamisele antud rolli arendustegevusega kaasneva mõju välja selgitamiseks, hindamiseks ja otsustamisel arvestamiseks on hindamise tõhusus keskkonnakaitse ja säästva arengu võtmeküsimus. Käesolevas töös on võetud vaatluse alla keskkonnamõju hindamise tõhusus (ingl. k. *effectiveness*) ja seda mõjutavad tegurid.

Käesolevas töös mõistetakse keskkonnamõju hindamise tõhususena hindamisele seatud eesmärgi saavutamise tasemena. Keskkonnamõju hindamisena käsitletakse menetlusi, mis on reguleeritud EL keskkonnamõju hindamise direktiividega nii projekti kui strateegiliste dokumentide tasemel.

Töös võeti vaatluse alla keskkonnamõju hindamise tõhusust määravatest teguritest dokumentide, eelkõige hindamise aruannete, ja menetluse kvaliteet.

Euroopa Komisjoni juhendi alusel hinnatud 50 keskkonnamõju hindamise aruannete kvaliteet on küll aastate jooksul paranenud, kuid siiski on jäänud suurematekspuudusteks kavandatavate tegevuste ebapiisav kirjeldamine, millest tuleneb ka eeldatavate mõjude ebapiisav käsitlemine ja alternatiivsete lahenduste ühekülgne analüüs. Paremini on aruannetes käsitletud keskkonnafooni. Autori poolt Eestis läbiviidud keskkonnamõju hindamise aruannete kvaliteedi uuringute tulemused sarnanesid mujal saadud tulemustega. Individuaalse ja grupiviisilise hindamise tulemused viitasid hindamise laialt varieeruvale subjektiivsusele. Grupiviisilise hindamise puhul olid hindajad detailide suhtes kriitilisemad kui individuaalse hindamise puhul, samas kui koondhinde panemisel ilmutasid grupid leebemat suhtumist. Hindajad tunnistasid, et grupis on keskkonnapädevus suurem kui üksikisikul, kellel ei tavatse olla pädevust korraga kõigis keskkonnavald-kondades.

Eelhindamisel on suur roll ettevaatuspõhimõtte praktilise rakendamise seisukohast. Eelhindamise tulemusena otsustatakse keskkonnamõju hindamise vajalikkus ehk kas kavandatava tegevuse (projekti või kavaga) võib kaasneda oluline mõju keskkonnale, mida tuleks vastavalt eelnevalt hinnata. Loodusdirektiivi kohase mõju hindamise (Natura hindamise) eelhindamise otsuste analüüs Eestis aastatel 2005-2009 näitas, et vaid igal kuuel juhul kaalutles otsustaja mõju Natura 2000 alale. Neil juhtudel, kui sellist mõju kaalutleti, võeti aluseks enamasti kavandatava tegevuse asukoht Natura 2000 ala suhtes, jättes mõju iseloomu ja olulisuse tahaplaanile.

[1] Eesti keeles on ingliskeelse mõiste ‘effectiveness’ vasteks ‘tõhusus’ ja ‘mõjusus’. Vastavalt Eesti Keele Instituudi keeleabile on mõisted ‘tõhusus’ ja ‘mõjusus’ eesti keeles sünonüümid.

Keskkonnamõju hindamise efektiivsuse seisukohast on oluline, et kõik asjaosalised teaksid, mis on hindamise eesmärk ja oodatav tulemus, ehk et mis küsimustele otsitakse hindamise kaudu vastuseid. Seitsme strateegilise planeerimisdokumendi koostamise käigus toimunud keskkonnamõju strateegilise hindamise analüüs näitas, et protsessi osapooltel olid erinevad ootused nii keskkonnamõju hindamise mõjule nimetatud dokumentidele kui osapoolte rollile protsessis. Osapooled leidsid, et mõju hindamise eesmärk ja oodatavad tulemused tuleks kohe protsessi alguses kokku leppida ja avalikult teada anda. Segaduste ärahoidmiseks eesmärkide ja ootuste vahel on muuhulgas oluline täpsustada strateegiliste planeerimisdokumentide omavahelist hierarhiat, mis võimaldab osapooltel paremini mõista keskkonnamõju hindamise rolli dokumendi kujundamisel.

Keskkonnamõju hindamise eesmärgid on defineeritud õigusaktides, aga need on edasi arendatud ka uurijate ja praktikute poolt. Keskkonnamõju hindamise definitsioonide analüüs näitas, et keskkonnamõju hindamise eesmärk (seega efektiivsus) võib olla keskkonnahüvede suurendamine, viia läbi juriidiliselt korrektne menetlus või mõlemad. Lähtuvalt sellest, kas hindamine ja otsustamine on keskkonnahüvedele või protsessile orienteeritud, sõltub ka hindamise mõju otsustamisele. Protsessile orienteeritud hindamine ei eelda hindamise tulemuste arvestamist otsustamisel, seevastu keskkonnahüvedele orienteeritud hindamise puhul on eesmärk suurendada keskkonnamõju hindamise tulemuste arvestamist otsustamisel. Keskkonnamõju hindamise mõju otsustamisele jagab uurijad enamjaolt kahte rühma. Esimesse kuuluvad need (nt Wood, 1995; Dalal-Clayton ja Sadler, 2005; Fischer, 2007; Crabbé ja Leroy, 2008), kes käsitlevad keskkonnamõju hindamise eesmärgina keskkonnahüvede suurendamist ja otsustamisel selle arvestamist. Teise rühma kuuluvad need (nt Elling 2008; 2009), kes peavad keskkonnamõju hindamist ja otsustamist põhimõtteliselt kaheks eraldiseisvaks protsessiks. B. Ellingu arvates annab keskkonnamõju hindamine alusinformatsiooni otsustamiseks, kuid otsustaja on oma otsuses vaba. Põhjenduseks toob B. Elling asjaolu, et otsustaja on poliitiline institutsioon, kes teeb oma otsused iseseisvalt mitte siduvalt. Samas eeldab B. Elling, et otsustaja võtab hindamise tulemusi arvesse, kui see protsess on olnud legitiimne ja väljendab asjaosaliste soovi.

Käesolevas töös pakutakse välja keskkonnamõju hindamise efektiivsust määravateks teguriteks järgmised tegurid: 1) selgelt defineeritud eesmärk ja oodatav tulemus, 2) efektiivne osapoolte kaasamine ja ärakuulamine, 3) kõrgekvaliteedilised dokumendid, 4) keskkonnamõju hindamise positiivne mõju projektile või kavale ja otsusele, mille kaudu suurendatakse keskkonnahüvesid, ja mille saavutamist kontrollitakse järelhindamisega, ning 5) kõrge aja- ja kuluefektviivsus. Nimetatud tegureid tuleb rakendada koos. Ühe või teise teguri väljajätmisel ei ole keskkonnamõju hindamise efektiivsus tagatud.

Keskkonnamõju hindamise puhul on tegemist keeruka, paljude funktsioonide ja väljunditega protsessiga, mis seab kõigile osapooltele teatud eeldused. Eelduste puhul on kesksel kohal regulatiivne tõhusus, millega määratakse ära oodatav lõpptulemus ja protsessi kulg. Samas on olulisel kohal dokumentide kvaliteet, mis

omakorda sõltub ekspertide ja ametnike pädevusest, kes dokumente koostavad või läbi vaatavad. Keskkonnamõju hindamisel on oluline avalik ehk sotsiaalne väärtus, kuivõrd hindamise käigus arutletakse väärtuste üle ning toimub süvaõppimine ja oskuste arendamine. Seetõttu on protsessi tõhususe oluliseks eelduseks ka usaldus osapoolte vahel. Keskkonnamõju hindamise protsessi tõhusust mõjutavaid kõiki tegurid tuleks hindamise ja otsustamise puhul arvestada koos, kuivõrd ühe või mitme teguri arvestamine eraldi ei taga säästva arengu eesmärkide saavutamist kohalikul, riiklikul kui globaalsel tasandil.

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