

Kimmo Jalava

Quality of Environmental Impact  
Assessment in Finland



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# Quality of Environmental Impact Assessment in Finland

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Kimmo Jalava

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## ABSTRACT

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Diss.

Environmental Impact Assessment (EIA) is a political procedure designed to aid and guarantee environmentally sound decision-making for development projects. The main objectives of EIA are to avoid any environmental problems that development may cause and to promote sustainability. The main research objective of the thesis is to evaluate the quality of Finnish EIA and to outline the possibilities that different evaluation approaches offer for EIA quality control and practice improvement. EIA quality is evaluated in the theoretical context of compliance studies, in which EIA is usually analyzed from a rationalistic/empiristic perspective and in that of effectiveness studies utilizing EIA theory, drawing mainly from the constructivist perspective and from communicative planning theories. The meanings of various quality aspects are analyzed according to a framework in which EIA effectiveness, quality, and practice are seen as intertwined themes. In regards to the main objectives of EIA, the significance of various quality aspects attached to practice is quite relative, which is a challenge for EIA quality control and evaluation. In terms of methodology, this thesis is based on combination of qualitative and quantitative approaches. The thesis argues that the Finnish EIA system enables high-quality EIA processes. A vast amount of environmental information is produced, and EIAs allow various interpretations of development's probable consequences to emerge. In respect to EIA's objectives, it is argued that rather than aiming to impact prediction accuracy, it is more important to understand what types of impacts are plausible. EIA can aid and function meaningfully in terms of environmental threat formulation and communication. The unique situation of each EIA emphasizes the importance of practitioners' experience in assessment work and process guiding. The thesis concludes that EIA content and compliance evaluation form a reasonable basis for EIA quality control and evaluation. Contextually attached qualitative case studies are useful in deepening and broadening the understanding how EIAs are actually used.

Keywords: Effectiveness; Environmental Impact Assessment; Practice; Quality.

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## LIST OF ORIGINAL PUBLICATIONS

The thesis is based on the following original articles, which will be referred to in the text by their Roman numerals I-V. The articles are presented in order of topic instead of chronological order of publication in order to better support the research objective. My responsibilities regarding the articles are as follows.

Article I is comprised of two quality studies that focus on Environmental Impact Assessment (EIA) content and process quality. The studies are combined into one article. My responsibility regarding the study with Sanna Pasanen was to review the Environmental Impact Statements (EISs) together with her; supervise her master's thesis, together with professor Markku Kuitunen; and further analyze and discuss the findings. I also chose the review criteria that were used and tested in the study. The idea for the study with Mikko Saalasti was mine, and I also outlined the main contents of the survey and supervised his master's thesis, together with Markku Kuitunen, and further analyzed and discussed the findings. I was the corresponding author of the article.

Article II is based on an idea developed during a multidisciplinary research project called EFEIA (Effectiveness of Environmental Impact Assessment). The article considers the potential significance of speculation regarding EIA outcomes. My responsibility in the article was to conduct the empirical analysis of EISs and create concepts regarding the uncertainties and risks as a corresponding author. Ismo Pölönen wrote the legal parts of the article, and Pekka Hokkanen analyzed the public comments from the competent authorities' statements.

Article III is based on my master's thesis and on an idea from Markku Kuitunen. The article presents an experiment with a method called the Rapid Impact Assessment Matrix to communicate the assessment results of small-scale projects and plans. I tested the method in panel meetings with Markku Kuitunen and Kimmo Hirvonen.

Article IV focuses on EIA follow-up and the learning it may generate. The findings of the article are based on the empirical document analysis that was performed with Anne-Mari Haakana for the purpose of the article and Anne-Mari Haakana's master's thesis. I was the corresponding author.

Article V is a synthesis of studies conducted in the abovementioned research project EFEIA. The article was mostly written by Ismo Pölönen based on the findings originally presented in dissertations from the fields of legal and political science by Ismo Pölönen and Pekka Hokkanen, respectively. My responsibility regarding the article was to provide insights related to the 'quality of environmental impact statements' and 'effectiveness' sections.

- I Jalava K., Pasanen S., Saalasti M. & Kuitunen M. 2010. Quality of Environmental Impact Assessment – Finnish EISs and EIA professionals' opinions. *Impact Assessment and Project Appraisal* 28: 15-27.
- II Jalava K., Pölonen I., Hokkanen P. & Kuitunen M. 2013. The precautionary principle and management of uncertainties in EIA – analysis of waste incineration cases in Finland. *Impact Assessment and Project Appraisal* 31: 280-290.
- III Kuitunen M., Jalava K. & Hirvonen K. 2008. Testing the usability of Rapid Impact Assessment Matrix (RIAM) –method in comparison of EIA and SEA results. *Environmental Impact Assessment Review* 28: 312-320.
- IV Jalava K., Haakana A-M. & Kuitunen M. The rationale for and practice of EIA follow-up: analysis of Finnish Road Projects. *Manuscript*.
- V Pölonen I., Hokkanen P. & Jalava K. 2011. Effectiveness of the Finnish EIA system – what works, what doesn't, how it could be improved? *Environmental Impact Assessment Review* 31: 120-128.

# 1 INTRODUCTION

## 1.1 Environmental Impact Assessment

The term “environmental impact assessment” can refer to any actions that aim to evaluate the effects of development on the environment. Environmental Impact Assessment (EIA) is a political procedure that is defined in law. In Finland, EIA is specified in national legislation (EIA Act 468/1994, EIA Decree 713/2006) that implements European Union regulations, namely the EU directive on the assessment of the effects of certain public and private projects (2011/92/EU) and its amendment. In Finland, EIA is applied to large development projects, which may have significant environmental impacts (the list of project types and thresholds for applying are included in EIA Decree). Furthermore, EIA can be applied to any other project if it is considered likely to have significant environmental consequences.

The objective of EIA is to help tackle environmental problems before they occur (Glasson *et al.* 2012). It is also suggested that EIA should be a tool used not just to avoid problems but also to promote more sustainable forms of development (Cashmore *et al.* 2004, Jay *et al.* 2007, Morrison-Saunders and Retief 2012). In any case, the main purpose of EIA is to consider the probable environmental consequences of planned actions in advance.

Globally, EIA regulations are typically procedural (Sadler 1996, Wood 2003, Pölönen 2007). EIA consists of actions and tasks that are considered to be useful in achieving EIA’s abovementioned purpose, i.e., to ensure the appropriateness and environmental feasibility of a planned project. EIA systems are designed to set frameworks and responsibilities for impact evaluation. Each national EIA system is specifically suited to its context (Sadler 1996, Wood 2003). Despite the variation among systems, it can be argued that the principles and procedural needs regarding assessments are usually quite similar and that the principles underlying the systems are well-founded and agreed-upon (Wathern 1988, Wood 2003, Glasson *et al.* 2012).

In practice, EIA procedure is intended to support knowledge gathering and research about the potential environmental impacts. Depending on the national system, the characteristics of the process may take various forms, but typically, the information gathered in EIA should be compiled into a conclusive output, which is often called an environmental impact statement (EIS) (Sadler 1996, Wood 2003, Glasson *et al.* 2012).

Typically, EIAs are designed to consider environmental impacts in a very holistic manner. In the Finnish EIA Act, the definition of environmental impact is very wide. According to the Act (468/1994), “environmental impact” refers to “the direct and indirect effects inside and outside Finnish territory of a project or operations on a) human health, living conditions, and amenity; b) soil, water, air, climate, organisms, and biological diversity; c) the community structure, buildings, landscape, townscape, and the cultural heritage; d) utilization of natural resources; and e) interactions between the factors mentioned in items a) to d).”

In addition to the wide definition of impact, the Finnish EIA legislation contains a detailed list of EIS content requirements. In short, the statement should describe the planned location for the project; describe the project, along with its technical and location alternatives; assess the probable environmental effects the project may cause; and present the possible means of minimizing or avoiding these impacts. The content requirements are meant to ensure that the project plans and their probable consequences can be evaluated holistically. This is done to ensure their environmental feasibility and find the most appropriate design for their realization (Steinemann 2001, Pölonen 2007, Glasson *et al.* 2012).

The EIA results should be presented in a popularized manner in order to ease communication about the impacts. The Finnish EIA procedure ends when a competent authority provides a statement regarding the EIS. The competent authority’s statement is a conclusive document that summarizes the characteristics of the EIA, evaluates its possible shortcomings, and also summarizes public opinions expressed about the EIS. In Finland, EIA is not a decision-making procedure but a process that is intended to produce information for planning and decision-making. The formal decisions are made according to other legislation (Pölonen 2007, Jantunen and Hokkanen 2010, Hokkanen and Jantunen 2012).

In Finland, the main responsibility for impact evaluation is assigned to the developer of a proposed project. The developer will not necessarily have expertise in managing EIA studies, and usually, he or she will use the services of environmental consultants, who carry out the assessment work in practice. Competent authorities have a responsibility to guide and coordinate EIA processes. These three actors are usually the main stakeholder groups and have the main responsibilities in any EIA system (Wood 2003, Glasson *et al.* 2012). Typically, EIA systems also ensure that various other parties and stakeholders can be involved in the evaluation (Hokkanen 2007); occasionally, this is also considered to be an objective of EIA – ensuring the public can participate in the

planning of development projects that will affect their environment (Jantunen and Hokkanen 2010).

The EIA legislation provides rather flexible framework for the assessment practices. It states that the assessments must evaluate certain factors and assigns the responsibilities to the stakeholders, but to large extent, it does not specify the actual practical tasks – the legislation has been created without knowing exactly what to prescribe in terms of actions. EIA has a purpose and a form but not methodological discipline. It has been recognized that adaptivity and flexibility are two of the strengths of EIA (Pope *et al.* 2013), but at the same time, these features pose a challenge regarding EIA quality evaluation and practice improvement. Legislation provides definitions and regulates procedural steps, but it leaves much room for interpretation. No single universal “EIA theory” that can be implemented practically exists. Rather, EIA theory consists of several theories and theory levels (Lawrence 1997, Morgan 2012), largely drawing from theories and models of planning and decision-making (Morgan 2012). In the literature, EIA has often been described through the dichotomy between “science” and “art” (Wathern 1988). Despite a growing body of EIA literature and research, it remains theoretically loose. It remains unclear how to operationalize the assessment tasks in the most appropriate way and thus achieve EIA objectives effectively (Wathern 1988, Lawrence 2003, Glasson *et al.* 2012).

## 1.2 EIA Quality Research

This study stands in a relatively young and diverse tradition of EIA research. Since the introduction of first EIA system in the United States in 1969, various forms of EIA legislation have been adopted elsewhere, with an estimated 140 countries currently having an official EIA system (Glasson *et al.* 2012). Strictly speaking, EIA research can refer to study of these systems and cases within them or, more broadly speaking, to the principles of environmental impact assessment.

EIA research is often purposeful; it aims to increase our understanding what EIAs are and what their implications are. Lawrence (1997) has stated that EIA theory building can be characterized via two main elements: explanation and prescription. Explanation seeks to contribute regarding “how things are,” i.e., what EIA is. Prescription aims to explain how things “ought to be,” i.e., what EIA should be. In EIA quality research, both of these elements must be considered, and the theoretical advancements of both of these areas have affected the EIA quality studies that have been conducted throughout the years.

The term “effectiveness” has been used in EIA research to describe, for example, whether EIA works as intended (Sadler 1996) or to describe the real-world results of impact assessments (Cashmore *et al.* 2009). From a quality evaluation perspective, how the objectives and possible impacts of EIAs are understood and characterized is essential, and EIA theory is crucial in this understanding.

Sheate (2012) has found that early EIA quality/effectiveness studies were often based on compliance evaluation and were frequently conducted in the EU, especially after the early years of implementation. These quality studies often focused on evaluating the quality of the process, especially the outputs of the process, namely EISs (Sheate 2012). In terms of theoretical foundation, this type of evaluation rests largely on a rationalist assumption that the provision of high-quality information is a prerequisite for sound decision-making. It is assumed that following a certain process will ideally result in obtaining the desired information, the general characteristics of which can be defined and judged according to set criteria. It could be argued that under this line of thinking, the purpose of EIA is largely objective assessment; EIA is considered to be an expert-driven applied science, in which facts and values can typically be separated (Cashmore *et al.* 2004, Rozema *et al.* 2012). Recent developments in EIA theory, however, have questioned the sufficiency and validity of this approach.

In theoretical EIA debate, the rationalist, or positivist, view has been challenged, especially by the critical social scientific view, which relies on constructivism. This view suggests that rationality does not function in the realm of EIA, because it does not reflect how decisions are made (Weston 2010, Sheate 2012), and that multiple rationalities and objectives may come into play regarding EIA (Cashmore *et al.* 2010). This view emphasizes the fact that all aspects of EIA are political; there is always a plurality of views on how the process operates or should operate, what the power relations between the stakeholders are, and what the process achieves or should achieve (Cashmore *et al.* 2010, Morgan 2012). If these are not reflected upon, it is impossible to say what sufficient and good information is. With this in view, the purpose of EIA must be a transposition of social values (Wilkins 2003, Rozema *et al.* 2012). EIA is described as a civic science, and the meaning of facts is constructed through participatory governance because values are not separate from facts (Cashmore 2004). This theoretical debate has led many authors to call for a wide range of values and knowledge to be involved in EIAs, as well as promoting the idea that social learning can be a benefit of EIA (Jha-Takur *et al.* 2009, Cashmore *et al.* 2010, Sheate 2012, Partidario and Sheate 2013). The value of EIA should not and cannot be seen solely in terms of causality – EIA is an instrument that has other dimensions than “better information – better decisions.”

One challenge of quality research is that each EIA is a unique process; on one hand, a detailed explanation of what happened in a certain process may be useless in terms of prescription, and on the other hand, the recognition of previous success does not guarantee future success if a similar approach is taken. EIAs are conducted via a tension between the rationality of precaution, which emphasizes thorough impact examinations, and that of efficiency, which requires avoiding unnecessary tasks (Lawrence 2003, Snell and Cowell 2006). From an environmental effectiveness point of view, it is impossible to say what a sufficient level of detail for such examinations is. The web of consequences that a development action generates can be very complicated, and not all of the



consequences can be predicted in a rigorous manner, both for practical and technical reasons (Beattie 1995, Treweek 1999, Morris and Therivel 2009).

Still, it is argued (Morgan 2012) that the practice of EIA is tightly rooted in rationalist-inspired thinking, relying strongly on technical factors, and that participatory and collaborative approaches are not gaining the attention that the theoretical debate suggests they should receive. The purposes of EIA should not be seen as unchangeable but must be recognized as personalistic and irreducibly plural (Cashmore *et al.* 2009). This plurality also makes every mechanistic EIA process and process evaluation incomplete and partly explains why it often appears flawed when evaluating the success of EIA solely against a certain model or theory of a process and its implications. This view does not offer a clear alternative to partial evaluations. Rather, it argues against benchmarks that omit the context-dependent situational uniqueness and the existence of varying realities and rationalities (Cashmore 2004, Elling 2009).

EIA is itself an abstract concept, and many of the pivotal concepts defining EIA are themselves escaping definitions, controversial, subjective, or even paradoxes. EIA is intended to avoid environmental harm and support sustainability, but both of these objectives are controversial and subjective. Harm to one can be a benefit to another, and sustainability means different things to different people (Gibson 2005, Bell and Morse 2008). Significance is a subjective concept (Beattie 1995, Weston 2006), and paradoxically, uncertainty management may reveal new uncertainties instead of reducing them, causing restlessness instead of certainty (Litmanen 2001, Renn 2008). This adds another level of difficulty when creating theoretical benchmark for functional EIA. Considering whether EIA actions and outcomes are achieving or supporting the achievement of EIA objectives requires defining these concepts, which is controversial and may result in narrow interpretations and incorrect conclusions. In addition to relativity of environmental harmfulness or sustainability, it is also seen that the real implications of EIA are difficult to trace. It is never possible to compare the consequences of a development project with EIA and without EIA, and it is usually difficult to determine whether certain decisions are solely due to EIA (Vedung 1997, Hilden *et al.* 2001, Jay *et al.* 2007).

While the theoretical advancements building on constructivism and decision-making theories have increased our understanding of what EIA offers, they have also posed new challenges in evaluating EIA from a practical perspective. Morgan (2012, sharing thoughts with Retief 2010) has stated that because it remains theoretically unclear whether we have a distinct view of what EIA should be comprised of and what its purpose is, how we should judge EIA practice is also unclear. Morrison-Saunders and Fischer (2006) have expressed concern that if plurality and social-economic factors are emphasized in assessments, this should not happen at the cost of traditional rational environmental research focusing on the biophysical environment and aiming to mitigate adverse environmental effects. They remind us that in this regard, EIAs have added value to the planning process and that EIA is a response to real environmental degradation.

## **2 OBJECTIVES**

The research objective of this thesis is to evaluate the quality of Finnish Environmental Impact Assessment (EIA) and to outline the possibilities that different evaluation approaches offer for EIA quality control and practice improvement. The quality and aspects affecting it are evaluated and considered through a number of approaches. These are explained in the next section.



## **3 MATERIALS AND METHODS**

### **3.1 Research Approach**

In this thesis, the main research theme is the quality of EIA, along with the underlying theme of EIA's environmental effectiveness. The research approach of the thesis can be derived from these themes, and how they are conceptualized. First, EIA quality in regard to environmental success is understood as a relative concept. It is assumed that general, unambiguous EIA quality criteria and judgements are impossible. Due to the abstract nature of EIA and the polymorphous nature of its defining concepts, it is believed that partial EIA quality examinations will not sum up to form a whole but that they can complement one another, always leaving room for other interpretations. Thus, it is seen that quality evaluation requires several approaches and yet, will end with relative or unique findings.

More specifically, effectiveness, quality, and EIA practice are considered as intertwined themes as explained in the introduction. This relationship is explained in Table 1, which summarizes why the different evaluations presented in the thesis are conducted. In the evaluations, there is a circular relationship between questions: What is EIA? What should EIA be? Are EIAs worth conducting? The findings are intended to shed light on these aspects. This requires studying the EIA practice by understanding and describing the procedural characteristics of EIA and by elaborating the ways EIAs are used. In this thesis, EIA practice broadly refers to the actions performed and required in EIA processes. An understanding of the practice allows us to consider whether it is theoretically possible to evaluate their meaning against the environmental objectives of the EIA. These define the quality and justification for EIA.

Moreover, it is seen that EIA quality evaluation must consider both theory-practice and practice-theory linkages and how they describe the EIA reality. In fact, it is seen that studying both linkages cannot be avoided, since in the context of EIA, these cannot be separated. Observations about practice are never purely empirical, and no theory is free from experience (Lawrence 1997,

Hirsjärvi *et al.* 1997). As such, inductive reasoning, from practical examples to theory, is not free from theoretical assumptions; and conversely, deductive reasoning, from theory to practice, is not free from practice, because in the case of EIA, theory cannot describe the means in a testable manner. It is considered that every study of EIA, in a given moment, somehow describes what EIA is, as well as, to some extent, what it ought to be.

TABLE 1 The intertwined themes of EIA effectiveness, quality, and practice as featured in this thesis.

Effectiveness	Quality	Practice
EIA creates change for better <ul style="list-style-type: none"> <li>- Prevention, sustainability</li> <li>- Can occur before, during and/or after EIA</li> <li>- Unique, hypothetical, controversial</li> </ul>	Relative against effectiveness <ul style="list-style-type: none"> <li>- Evaluation of whether a practice is good and functioning</li> </ul>	Actions and outcomes <ul style="list-style-type: none"> <li>- Procedural characteristics</li> <li>- Content requirements</li> <li>- How EIAs are used and interpreted</li> </ul>
Must be addressed to understand whether EIAs are worth conducting	Needs to be considered to understand whether practice needs to be changed – what EIA should be?	Needs to be described to understand what is happening in practice – what is EIA?

Thus, the research approach of this thesis is based on combining and analyzing findings of several quality evaluations of the Finnish EIA or aspects of impact assessments in general. The aim is to find answers to the questions addressed in Table 1 by describing and analyzing the current practices and the procedural framework that EIA supports. Through the approaches used in the evaluations, the findings of the thesis are gained via both inductive and deductive analyses. Practice is mainly described and evaluated inductively based on document analysis. Theoretical elements are used and created to deductively structure the empirical findings into generalizations and prescriptions. Specifically, in this respect, procedural requirements have often functioned as a given starting point for analysis. The empirical focus of the research is to large extent on the outputs of the official Finnish system. However, EIA is considered as an idea that realizes in many forms, also outside of official EIA systems. Altogether, the research is the result of a dialogue between these two methods of reasoning; it is a process with a meaning but no clear ending point or strict boundaries.

In the evaluations presented, the approaches are mainly qualitative, but quantitative elements are utilized to describe EIA practices and the views of these practices. The qualitative emphasis for the thesis was chosen since the aim is not to prove how things are but to find out and describe how they are or

should be. As noted above, theoretically, it is believed that the reality of EIA relates to meanings assigned to it. The reality appears as diverse, and cannot be sliced to parts arbitrary, but it needs to be attached to context. Context cannot be understood without explaining it qualitatively (Hirsjärvi *et al.* 1997). The explanations looked for are conditional, and these conditions need to be explained and searched for in the quest to understand reality (Hirsjärvi *et al.* 1997). Thus, also the quantitative elements presented in this thesis are in fact used in a qualitative manner in reasoning; they describe elements of reality from a certain perspective, which gives conditions to their interpretation.

The evaluations provide a limited view of the EIA system and its characteristics. They are intended to function as examples, not only for judging in an evaluative manner the actual or suggested practices, but also as stories of Finnish EIA and impact assessment, in general. This approach has similarities to what Richardson (2005, see also Morgan 2012) advises for practitioners: there may be no universal theory or model for EIA, but the debates on this subject are often elucidating. Under this approach, the quantity of findings is not necessarily important, but it is crucial to find a basis for reasoning. Much of the reasoning presented in the thesis relies on conceptual constructs, and the main study subject is abstract. Moreover, the research approach in this thesis can be said to be built via triangulation, i.e., combining various approaches and methodologies (Hirsjärvi *et al.*, 1997, Hokkanen 2007). Triangulation is useful in situations that cannot be explained with single theory or evaluated against a single criterion or with one method; several perspectives help in evaluating the validity of findings and the meaningfulness of theory-practice dialogue.

Based on the research approach, main themes, and topic, in the broad integrative field of environmental sciences, this thesis can be positioned more towards the social sciences than the natural sciences. Specifically, the thesis can be positioned on the continuum of EIA evaluation studies with the traditional aim of improving EIA practice and quality (Sadler 1996, Wood 2003, Hokkanen 2007, Sheate 2012).

In the following section, the focus and approaches of different evaluations conducted are explained in more detail.

## **3.2 Focus and Approaches of the Evaluations**

### **3.2.1 EIA Content and Process Quality – A Rational View**

In the first approach, the concept of good quality for EIA is mainly drawn from the traditional rationalist view, suggesting that the EIA content and process quality possess characteristics that deserve decontextualized attention. In this evaluation, the criteria for quality were mainly constructed on the procedural and content requirements expressed in EIA legislation and related soft-law guidance. EIA quality is approached from two main perspectives by evaluating

the quality of EISs based on their contents and by evaluating the quality of process implementation (I).

Two methodologies were utilized (I). First, an EIS review for 15 environmental impact statements was conducted using review criteria that had been developed and published by the European Commission (Anon. 2001). Second, a survey was targeted at Finnish EIA consultants and competent authorities to discern their opinions regarding the quality of Finnish EIA. Altogether, 28 EIA professionals completed the survey, which represented 55% of the 51 targets in total. The respondents were comprised of eleven competent authorities and 17 environmental consultants.

The European Commission's EIS review criteria (Anon. 2001, I) helps a reviewer in focusing on the required content of an EIS. An evaluator should consider how successful an EIS is in regard to the following: the description of the project and its alternatives, the description of the environment likely to be affected by the project, the description of the likely significant effects of the project, the description of mitigation, the non-technical summary, and the quality of the presentation.

The survey (I) recorded the opinions of the EIA professionals regarding the abovementioned aspects of EISs and, more generally, the functionality and characteristics of EIA practice. The professionals were asked about the success of comparing alternatives, the role of the developer, the appropriateness of the screening level, the success of scoping and follow-up, and the use and effectiveness of the environmental information produced via EIA. All of these themes were identified as causes of concern based on earlier research (I).

The objective of the approach (I) was to provide insight into the implementation quality of Finnish EIA, with a strong focus on the outputs of the EIA process and the elements that affect the quality of these outputs. For the purpose of this thesis, the findings function as an example about what was gained with an approach that aimed with universal criteria and non-case-specific questions to generate general judgment and to discern opinions about EIA quality and practice improvement.

### **3.2.2 Uncertainty and Risk Management - The Meaning of Constructivism**

In the second approach (II), EIA was studied as a precautionary environmental policy tool in pressure of decision-making - emphasising the planning objective, which requires being cautious in the face of uncertain environmental consequences. The themes of risk and uncertainty were investigated to clarify how they should be handled and evaluated in EIAs. For the purpose of the thesis, in the example approach, an essential feature for EIA quality is that EIA should provide multiple views of possible consequences and their meanings. It is assumed that meaningful knowledge can be constructed and justified only through communicative planning in the given context (II). The aim was to be able to analyze whether and how constructed knowledge regarding risks and uncertainties was expressed in EIAs and how it might later affect the planning process.

Also, in the approach (II), rather than reviewing information through topics and depth and expertize they are dealt with, the recognition of tension that is caused by rationalities of efficiency and precaution and this tension's meaning in decision-making situations is outspoken (as explained in the Introduction). When EIA is suggested to be a tool used to shed light on the risks a development poses, it is seen that EIA should emphasize a precautionary approach to actions taken. This emphasis should promote thorough examinations, including meaningful uncertainty and risk analysis, which should utilize and express multiple of framings.

In the approach (II), the legislative demands for precautions in EIA were outlined, and a theoretical insight was provided regarding the reasons and challenges for societal uncertainty and risk identification. A decision-making perspective was seen to offer a framework via which to determine the significance of these considerations – an uncertainty or risk can be considered relevant if it is related to a decision. An empirical examination (II) was conducted with document analysis for the same EISs and competent authorities' statements regarding the cases as in the first approach (I).

The aim of approach (II) was to analyze whether and how the conclusive outputs of these EIA cases served to caution decision-makers and thus provide another view of the quality of the cases. Although the empirical examination focused on process outputs, the discussion was extended to explore the good risk and uncertainty communication qualities found in the EIAs in question, with the aim of providing general advice for practice.

### **3.2.3 Communicating Impact Assessment Results – Harmful or Beneficial?**

The EIA objectives of avoiding harmful consequences and promoting sustainability include a built-in demand to value the predicted impacts as positive or negative. For the purpose of this thesis, the test results of a method designed to communicate and compare impact assessment results are reported (III). In contrast to the aim where a number of different interpretations of probable consequences of development are qualitatively described (II), the test considers the usability of an application of a method intended to create a reduced, single quantified interpretation of impact assessment results and it evaluates the usefulness of such an approach in the context of EIA.

The rapid impact assessment matrix (RIAM) -method was originally developed to compare the alternatives for a single project or plan (Pastakia and Jensen 1998), but in this test, the method was used to create an overview of so-called “mini-EIAs (for projects) and -SEAs” (i.e., strategic environmental assessments, which are applied to policies, plans, and programs). These mini-EIAs and SEAs were not required by Finnish EIA or SEA legislation. Instead, the funders of these projects and plans required that they support sustainable development and not cause harmful consequences for the environment or human beings.

The basic principle of the RIAM method is that certain characteristics of an impact form the basis for scoring system, which is designed to describe the

environmental harmfulness or beneficiality of the impact in question (Pastakia and Jensen 1998). The approach with an application of method (III) draws from the premise that a project or plan can be classified as either environmentally friendly or harmful based on its most significant impact. Any assessment of significance is subjective, and a three-member panel was used to create an opinion regarding the most significant impact based on the statements written by the Central Finland Official EIA team. The projects and plans were classified based on both their environmental impact and their social impact. Shortly, the scoring system was as follows (Pastakia and Jensen 1998, III): after choosing the characterizing impact of a project or plan, the impact was quantified according to five criteria. The criteria required the consideration of the geographical extent of the impact, the magnitude of change, the permanence of the impact-causing activity, the reversibility of the impact, and the accumulation of impact.

The aim was to test how the method could be applied to analyze, comprehend, and compare the cases and to determine whether RIAM would be useful in presenting the results (III). The test experiences help to describe the challenges and possibilities of the quantification of impacts and their characteristics. They also show how the defining concepts of EIA cause difficulties during evaluation and how a change in conceptual thinking can change reasoning.

### **3.2.4 EIA Follow-Up – The Actual Impacts of Projects**

In the fourth approach, the focus is shifted from the pre-project stage to EIA follow-up (IV). The approach offers a change in perspective from impact prediction to impact observation, and aims to describe the actual follow-up practices from selected cases. This enables discussion of the meaning of actual impact and of prediction accuracy in the context of EIA. Theoretically, EIA follow-up is considered to have many benefits, such as learning from prediction accuracy, help in recognizing surprises, managing uncertainties and risks, and in enhancing the positive effects. However, previous EIA research has suggested that follow-up is often a poorly performed or even omitted element in EIA, being one of the elements of EIA that should be developed to improve EIA quality as a whole (IV).

A document analysis of Finnish road projects was conducted to describe how EIA follow-up was first planned at the EIA stage and how it was then realized during project construction and operation. Road projects were considered a good example of EIA follow-up practices in Finland, because the Road Administration had developed its own EIA practices even before EIA was officially introduced in Finland in 1994. Thus, Road Administration can be considered an experienced developer in the Finnish context. The road authority also faces follow-up pressures from road legislation.

### 3.2.5 The Finnish EIA system - Features for its Functionality

Fifth, for the purpose of the thesis, conclusions are reported from a joint analysis that utilized legal, political, and environmental science perspectives to study the effectiveness of Finnish EIA (V). The summary and analysis of the separate studies (for most part, originally reported by Pölönen (2007) and Hokkanen (2007)) aims to clarify the strengths and weaknesses of Finnish EIA as a preventive environmental policy tool, by providing an overall evaluation of the Finnish EIA system and a description of its essential features.

The focus is on the screening system, i.e., on the question whether EIA is applied appropriately; the quality of EISs; public participation; follow-up; and EIA's link to decision-making. The original findings were gained using legal dogmatic, and comparative law approaches; survey; document analysis; descriptive case studies; and a theoretical framework of deliberative democracy and communicative planning. In addition, findings from an analysis of public participation in two in-depth case studies, facilitated by the abovementioned theoretical framework (Hokkanen 2007), are reported.

According to the research approach of the thesis, the joint approach is intended to provide arguments for quality evaluation and dialogue. Some of the findings of the EISs review and quality survey (I) were used in the joint analysis (V). In this thesis, they are further reflected and presented against findings from other evaluations (I, II, III, IV). First, however, the findings from different evaluations (I, II, III, IV, V) are introduced in Section 4.



## 4 RESULTS

### 4.1 EIA Content and Process Quality

#### 4.1.1 Quality of Environmental Impact Statements

Findings based on the survey targeting EIA consultants and competent authorities and the sample of EISs reviewed suggest that in relation to content requirements, the quality of EISs prepared in Finland is generally good (I). EISs appear to describe the planned projects, their locations, and their impacts rather well in relation to the various environmental components and the regulations concerning them. However, much of the information was considered descriptive in nature, and it was suggested that for decision-making purposes, a more analytical approach would be beneficial. For example, it was noted that the descriptions of the evaluation methods used were often found cursory; uncertainties and risks related to assessment and the deficiencies of the assessment work appeared to be poorly analyzed; and the impact predictions presented were often vague.

Fig. 1 shows a quantification of the competent authorities' and consultants' average perceptions of the quality of the relevant sections of Finnish EISs. Overall, the quality was clearly considered to be rather good among both professional groups. The calculated means for consultants in all question groups were above the Likert scale mean (>2.5). The means calculated for the competent authorities were consistently lower than the means calculated for consultants. The average results show that the consultants considered the quality of EISs to be higher than the competent authorities did.

The findings in the sample review of EISs for waste incineration projects show a similar pattern as the findings of the survey for professionals (I). The review was conducted before the survey, so the survey results did not affect the review result. Generally, it was found that the required content was present in EISs. Of the review sections, "Description of the environment" and "Presentational issues" performed the best. The weakest result was for the



“Mitigation measures and follow up” section, in which none of the EISs in the presentation were evaluated as good.

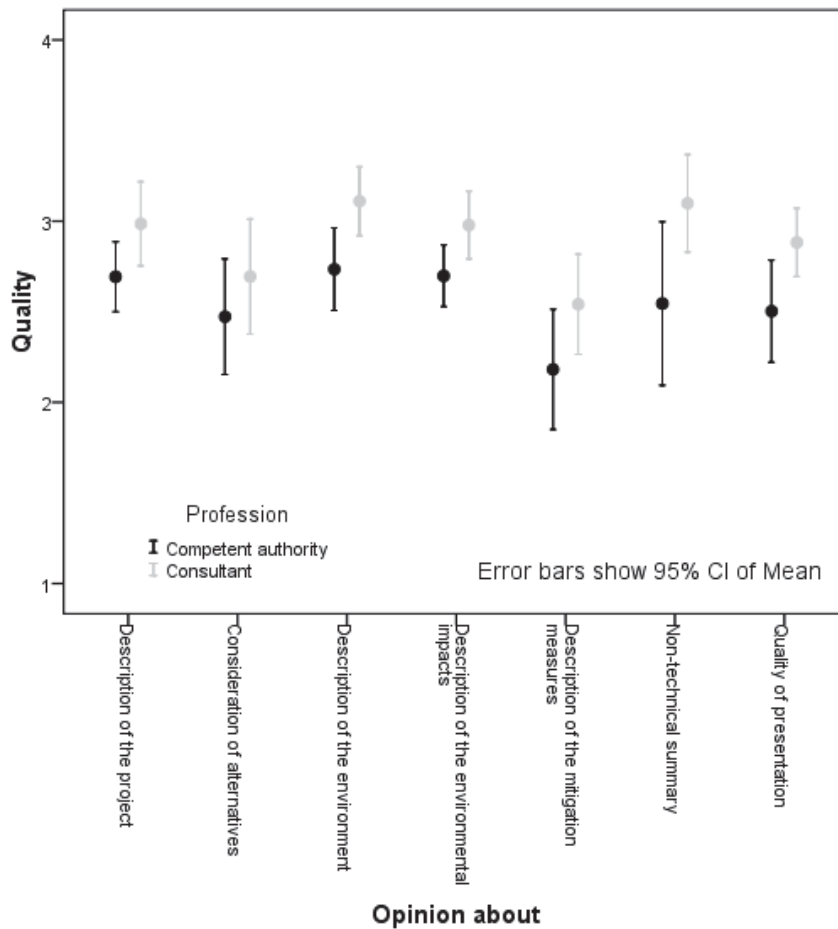


FIGURE 1 Area-by-area perceptions (Mean  $\pm$  SE) of competent authorities and consultants regarding EIA quality as surveyed. The Y-axis scale represents agreement with the statement “the quality is good”, with 1 = disagree, 2 = partly disagree, 3 = partly agree, and 4 = agree. (II)

#### 4.1.2 Quality of the EIA Process

Both EIA consultants and competent authorities seem to consider that EIA is managed well in Finland (I). However, the professionals remind us that not all the processes are successful and that there is variation in quality. They also stated that EIA quality evaluation is difficult. Based on their opinions, no single issue was considered a clear issue of concern in Finnish EIA, but several issues were named that were not always handled successful. Namely, the consideration and comparison of alternatives; the quality of impact prediction;

the consideration of possible mitigation measures; the design of follow-ups; and clear communication within EIS presentations were seen as challenges for practice. In addition, it was noted that more emphasis should be given to the use of EIA results in the decision-making stage.

In general, the success of the consideration and comparison of project alternatives was considered to be case-dependent, specifically depending on the project type. Often, in industrial projects, the developer defines the alternatives, having a main alternative in mind, while in projects such as roads, electric lines, and pipelines, the developer usually presents more alternatives.

As noted, in the Finnish system, the developer is responsible for conducting the EIA. The EIA professionals expressed that this may affect the impartiality of the EIA process, which in turn can affect the alternatives considered and the focus of EIA. Again, generally, this was not considered a problem but rather a natural characteristic of a system that should be recognized. The procedural and content requirements ensure that the scope of EIAs is holistic and broad. In fact, in practice the scopes were considered to be too extensive rather than too narrow, and instead of the developer guiding the focus to a certain direction, through the surveyed opinions it could be interpreted that the fact that the focus of EIA does not necessarily transfer to or from presentation of EISs is rather the worrisome issue (I).

The EIA consultants and competent authorities also expressed that how well the information produced in EIAs is considered in the decision-making stage is case- and stakeholder-dependent (I). Confusion appeared to surround the issue; some respondents said that they did not know whether such information is used. Some of the professionals reiterated that EIA professionals are not actually involved with permit processes. This increases the importance of EIA documentation.

The meaning of EIA follow-up was experienced controversially (I). The proposals for follow-up on impacts that have to be presented in EISs were occasionally strongly criticized; some even expressed that they rarely have any practical meaning. In general, follow-up on impacts was considered important, but it was recognized that the linkage between EIA and follow-up practices is not always clear. In terms of EIA's environmental effectiveness, this was not seen as a crucial issue – if EIA fails, it fails before such decisions are made.

## 4.2 Uncertainty and Risk Management

In the second evaluative approach (II) the purpose of EIA was namely considered to be promoting the precautionary principle. EIA was especially seen as a procedure that can help in considering the environmental risks related to projects and evaluating uncertainties regarding the project consequences.

Based on the overview (II), it was argued that EU and Finnish EIA legislation represent a rather weak version of the precautionary principle. The content requirements for environmental impact statements do not refer to wide

consideration of uncertainties, and the EIA authority in Finland does not require this either. It was noted that EIA legislation leaves the question of how uncertainty analysis should be conducted open to a significant extent. A rigorous and comprehensive study of uncertainties and risks seems to be a matter of good EIA practice rather than a legal duty enforced by the authorities.

From this point of departure, an empirical document analysis was conducted for the EIA process outputs that were considered earlier by using the European Commission's review checklist (I). That review suggested that the uncertainty and risk factors were not thoroughly analyzed and communicated in the given cases; more generally, the EIA professionals had expressed difficulties in practice. For further analysis a theoretical insight was constructed to clarify the challenges of practice (II).

Theoretically (II), it was seen that the sound management of environmental uncertainties is a part of quality assurance. It was also accepted that the idea of risk requires social constructivism – or mutual learning – in order for participants to meaningfully discuss the future scenarios during the planning process. EIA was recognized as potentially enabling these discussions, but it was also suggested that theoretically, there is no single appropriate way to manage uncertainties that are inherent to EIA, which causes challenges in practice. Therefore, it was seen problematic to look for weaknesses in the uncertainty and risk analysis presented in EIAs – a weakness is not necessarily environmentally important. In terms of EIA's functionality, it is easier to describe positive examples of uncertainty and risk handling. Further, it was argued that in EIA, a prerequisite for a meaningful discussion of risk is the successful and convincing formulation of threats.

The document analysis (II) concerning the cases showed that the project developers had dealt with the risk factors in all of the environmental impact statements. In addition, the competent authorities considered the outputs to be legally sufficient. Based on the findings, it was argued that the uncertainty and risk analysis were not extensive, but the EISs also showed that developers had recognized and presented decision-relevant aspects of uncertainty concerning the impacts and planning of the projects. Moreover, the public opinions summarized by the competent authorities in their concluding statements clearly broadened the scope of the issues and approaches. Opposing perspectives on waste incineration and concerns about impact assessments were not excluded from the documents. The reliability and trustworthiness of the expert opinions were also questioned, and this was reported. According to some opinions, the framing of developers' scrutiny was also challenged – public opinions suggested that a certain project type posed a risk at the strategic-waste-management level. In this way, public participation seemed to bring new aspects of risk and uncertainty into view. In some, cases these concerns were also reflected in the competent authorities' statements. However, the public opinions and questions were usually not responded to in the documents.

Two suggestions for quality improvement were made based on the findings (II). First, it was acknowledged that if the approaches applied in risk and uncertainty analysis were used more extensively, this would have

improved the overall quality of considerations. In particular, it seems that in these cases, the ones conducting the analyses could have learned from one another. Certain aspects of uncertainty and risk were recognized in some of the projects, while in others, the same aspects were left unaddressed, though they would have been applicable.

Second, it was suggested that more decision-focused communication would also have improved the quality of the EIA outputs. The example EIAs showed the value of recording insights from various stakeholders, but often, the significance of the various worries, uncertainty assumptions, and risk scenarios were not discussed.

### **4.3 Communicating Impact Assessment Results**

#### **4.3.1 Quantification of Results**

In contrast to the idea to describe multiple rationalities and realities as EIA results, the aim can also be to reduce the interpretation to easily understandable and comparable expression. When the impacts are predicted in environmental impact assessments, the significance of the results in terms of decision-making depends on how the decision-makers view the feasibility of the project.

The quantification of scenarios is one way to aid the communication of assessment results. An experiment (III) was conducted investigating how a quantification method may be used to describe the outcomes of assessments; with preset characteristics, the predicted impacts are attached to values that are calculated to describe their environmental friendliness or harmfulness. As noted earlier, the tested RIAM method was originally designed to be used in comparing the impacts of alternatives for a single project (Pastakia and Jensen, 1988). In the test, the method was applied to compare different projects. Instead of attaching and calculating descriptive values for all the predicted impacts, the values were calculated only for the impact that was considered most environmentally and socially significant.

The test showed how a description of environmental and social friendliness was created, and it also showed that the application of the method does not free the evaluators from the difficulties involved with the lack of information, subjectivity, and vague concepts inherent to the EIA cause.

#### **4.3.2 The RIAM Scores**

The method was tested with 142 small-scale projects, plans, and programs. The cases had not been subjected to a formal EIA process but had gone through an expert evaluation on the part of the official EIA committee of Central Finland. The committee had given a written statement about each case's environmental impacts. Based on the statements and case descriptions, the RIAM-method was used to quantify the written information.

We were able to evaluate 117 of the 142 cases. The remaining 25 cases were not evaluated, because of either the lack of a statement from the official EIA committee of Central Finland or the lack of a case description. The cases consisted of various types of projects, from road construction to education programs. All were applying for funding from the EU. One condition for funding was sustainability.

According to the assessment of environmental impacts, we found 54 cases to be positive, 56 cases to be negative, and seven cases to be neutral in terms of their relationship with the environment. The assessment of social impacts produced 113 positive, four negative, and no neutral cases. Fig. 2 cross-plots the scores for each case and shows how the quantification was used to express the interpretations from written documents.

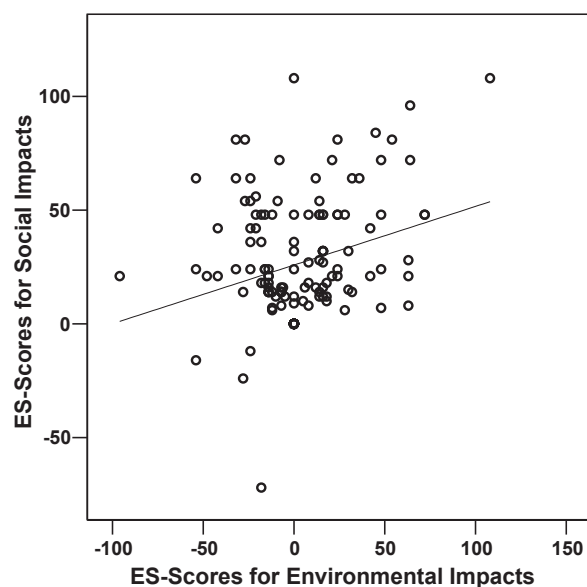


FIGURE 2 The RIAM scores for most significant environmental and social impacts for each case. Each circle in the figure is a case. Regarding their social impacts, the cases were evaluated as being mostly positive (scores above 0), but environmentally, nearly half of the cases were considered harmful (III).

#### 4.3.3 The Notions about the Usability of the Method

Then, the usability of the method was summarized (III). The main value of the method was found to be that it forced the panellists to evaluate the statements systematically and aided them in doing so. It was also noted that for most of the projects, it was possible to provide scores. Secondly, it was suggested that the variation in the scores indicated that the cases assessed were not alike.

The usability of RIAM method applied is strongly dependent on the descriptions of the projects and the analytical results of the environmental assessments (III). In the test, it was noted that the assessments carried out by the Central Finland official EIA committee were mostly quite cursory and approximate. It was suggested that other methods, such as checklists and matrixes, could be useful when combined with RIAM to help panellists take various impact receptors into account.

The usability experiences regarding the scoring criteria were reported as follows (III). The most difficulties were experienced with condition, which describes the magnitude of the relevant change and whether it is considered positive or negative. The test showed that many times, panellists held different opinions regarding what was sustainable and appropriate. However, it was also noted that the panel discussions led to the core idea of EIA: what was known about the effects and what this information meant.

The other four conditions were deemed easier to evaluate, though some difficulties were experienced. Typically, additional definitions of conditions were required: the scores for regional importance were rescaled, and permanent and reversible conditions were also discussed further based on the original criteria.

#### **4.4 EIA Follow-Up**

The holistic definition of environmental impact is a practical challenge for both the prediction and follow-up of impacts (IV). The examination of follow-up practices (IV) showed that in the example cases, the practices were diverse, and the documentation did not show consistent, systematic follow-up realization. From an environmental-effectiveness point of view, it appears reasonable to focus follow-up actions on certain assumed consequences, but in the example cases, it appeared that follow-up implementation was largely dependent on the contextual factors of each case. In contrast to the EIA stage, in which the assessment results are compiled into EISs and the competent authorities provide their statements about them according to procedure, the follow-up reports had no specific form. Often, the follow-up practices relied on the individual projects and resources allocated to them. Reports often focused on project results that were not holistic. Inconsistent practice and reporting were recognized to decrease the potential to learn from EIA follow-up.

The findings indicated that the link between follow-up planning at the EIA stage and actual follow-up practices was weak. The follow-up proposals presented in EISs were approximate, but when the actual follow-up programs were presented, they were more detailed and usually implemented as planned. The findings showed that much of the follow-up focus was on the natural environment and ecological effects. Follow-ups for the social impacts were much rarer, but when social impacts were considered, the emphasis placed on them was usually quite strong. Often, the impact predictions in EIAs were

vague, and the follow-up results were not straightforwardly comparable to them. Often, the predictions did not describe the actual impacts precisely but were rather indications of whether an impact caused by the action was positive or negative. In the follow-up reports, no comparisons were made between results and predictions, but when they were compared for the purposes of the study, it appeared that this predictive valuation was usually successful.

Altogether, the findings support the criticism of the lack of systemacy in Finnish EIA follow-up. In the study, no attempt was made to evaluate the appropriateness or quality of the chosen follow-up methodology or tools. In all cases, the philosophy was that monitoring data were collected as evidence of possible changes in the environment, attitudes, or opinions. However, process-wise, there appeared to be no common mechanism in terms of how the monitoring data were dealt with.

It was concluded that judging whether the diversity and variation in follow-up practices are environmentally meaningful is not straightforward. However, the findings showed that inconsistent follow-up practices limit the preventive and learning functions of follow-up. When the practice is fragmented, the idea of holistic follow-up is lost, which affects the ways in which the theoretical objectives of EIA follow-up can be achieved. Managing uncertainties and risks often involves surprises; with a narrow focus, it may take longer to notice unexpected changes. In the studied cases, it may have been partly misleading to use the term "EIA follow-up" because as it was actually follow-up that originated from several reasons, such as follow-up regulations that existed outside of EIA regulations.

## 4.5 The Finnish EIA System

In the evaluation of the Finnish EIA system (V) the functionality of EIA was described mainly in a positive manner. EIA is considered to have a meaningful role in the environmental policy toolbox in Finland, and it is suggested that EIA is applied to projects of the right size; it is applied to 30–50 significant projects annually. The high thresholds for applying EIA are considered reasonable due to the lengthy process and to the fact that lighter assessment processes are usually carried out for projects that do not trigger an assessment under the EIA act.

It is also concluded (V) that Finnish and EU legislation and guidance on EIA provide an adaptive and flexible framework for assessing work performed under a range of circumstances. The Finnish competent authority system, in which the authority has the task of coordinating the process and supervising it for quality control purposes is considered to be a strength. The system has gained wide acceptance among practitioners and enables one regional authority to specialize in EIA issues and gain expertise in the relevant legal requirements and good practices related to impact assessments.



The findings also indicated that EIA has helped in gaining a broader knowledge base for environmental decision-making and increased the possibilities for public participation in the early planning phases of large development projects. EIA seems to influence project design, as well as the opinions and valuations of various stakeholders, prior to, during, and after the assessment process. However, many of the effects EIA may have were considered indirect and somewhat hidden. For example, harmful project alternatives may be rejected before an assessment, or the communication chains during the assessment may result in project proposal modifications before the application for the license is submitted. In addition, EIA may have effects beyond the project level by informing environmental awareness and catalyzing technical learning for environmental assessment and management. These types of effects are often difficult to identify, but they are an important for the purposes of EIA.

The most significant obstacle for effective EIA was seen to lie outside the assessment process proper, in the decision-making phase. Especially it was argued that while an EIA framework usually produces holistic environmental information about the project and enables the public to participate during the planning phase, due to the lack of legislative action-forcing mechanisms in the decision-making stage, such environmental information may not be considered comprehensively.



## 5 DISCUSSION

The research objective of the thesis was two-fold; to evaluate the quality of Finnish EIA and to further outline the possibilities that the different evaluation approaches offer for EIA quality control and EIA practice improvement. In this thesis, the quality and its aspects were evaluated from several perspectives. Fig. 3 summarizes the elements of quality studied and the structure how EIA was seen to have effects. The arrows in Fig. 3 describe how EIA as part of a planning process should first have effects on the design of a project and then eventually on the project's actual environmental impacts at the realization stage.

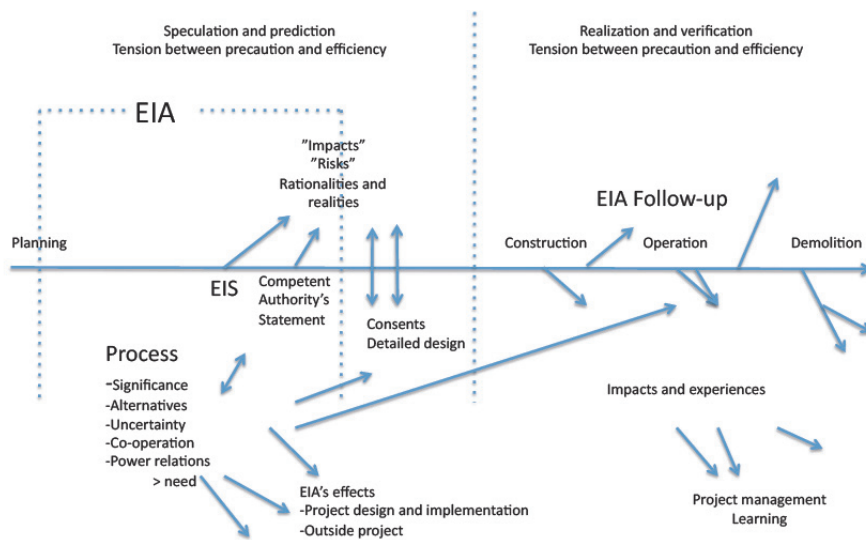


FIGURE 3 The elements seen as effecting EIA quality that were studied in the thesis. The arrows describe the routes via which EIA's effects were considered to occur. The horizontal arrow represents a timeline.

Peterson (2010) has used a distinction between objective-oriented EIA effectiveness and process-oriented EIA effectiveness. The former describes how EIA's environmental and sustainability objectives are achieved. The latter analyzes how EIA processes follow regulations and best practices. Process effectiveness is dependent, for example, on the success of participation, the quality of documentation, and the competence of consultants and authorities. In this thesis, an aim of the research approach was to further consider, how this relationship between the probable achievement of EIA's environmental objectives and the judging of the process success actually functions and affects the evaluation of EIA quality.

The different evaluations offered a view of aspects of Finnish EIA. Based on the findings it can be argued that through EIA processes, a vast amount of environmental information is produced; EIA practice generally results in wide and holistic considerations of projects' relationship with the environment, and these considerations are reported in EIAs' conclusive outputs (I, II, IV, V). In the evaluations the content appeared to respond to the legislative requirements (I, II, IV, V) and to the "good practice" demands expressed in the Finnish and European administrative guidance developed for EIA (I, V).

In addition, the EIA practice seems to follow processes that reflect institutional and professional guidance and procedures. The findings indicate that the Finnish EIA system is well-established, the practice follows the procedural requirements, and both the system and the procedural elements are familiar to its main stakeholders (I, II, IV, V). The Finnish competent authority system, in which the regional competent authorities guide EIA processes and control their quality, is considered to be a strength because it enables authorities to specialize in EIA issues (V). The regulatory framework also supports the existence of EIA professionals who have the potential for professional growth and who generally consider themselves skilful in fulfilling the requirements of EIA (I, V).

Third, the findings (I, V) indicate that the EIA professionals consider the EIA system to function well in Finland and to enable high-quality outcomes. Though variation in procedural success was recognized, no fundamental flaws in the system were identified, and the system appeared to have found wide acceptance among practitioners (V, I). The practical challenges recognized both by stakeholders and in the evaluations (I, II, III, IV, V) were typically familiar based on previous EIA research, which also guided the authors to study them in the first place. These challenges commonly involved issues with changing meanings according to the framework and perspective taken on. Risk communication, uncertainty management, the consideration of alternatives, process impartiality, scoping and focus, impact analysis, and significance were all found to affect the success of EIA and cause problems in processes. The problems were overlooked not due to procedural or institutional reasons but due to practical difficulties. However, theoretically, it appears impossible to offer easily adoptable solutions with which to overcome these challenges. Cashmore *et al.* (2008) have expressed that the desire for "best practices" may be questionable due to dynamic contextual contingencies, and the theoretical

conceptualization as introduced in the thesis seems to be in line with this view. If EIA is seen as functioning within the tension between precaution and efficiency (Lawrence 2003, Snell and Cowell 2006) with changing objectives that cannot be objectively valued, it may be that management advice regarding the issues mentioned above cannot be reduced to universal, detailed guidance.

The evaluations (II, V) also aimed to clarify whether the EIA outcomes result with different interpretations of environmental information. The process and content requirements and the descriptive nature of EISs may enhance the expectations for objectivity and evenhandedness in issue management, which in terms of quality evaluation, may result in ignoring some of the possibilities EIA offers. A satisfactory level is gained with a single-perspective outcome because other issue management possibilities are not even considered. Pöder and Lukki (2011) have suggested that evaluating EIAs through the content of EISs may result in neglecting those elements that, for example, participation could offer to the process. These elements – such as different expertise, different opinions, different interpretations – can be seen crucial in tackling the above-mentioned practical problems. In this respect, the Finnish EIA system was considered flexible and believed to provide opportunities for plural interpretations of projects' impacts and feasibility to be expressed (V, I, II). However, the findings (V, I, II) suggested that despite this, these elements are not always utilized.

The findings of evaluations can also be used to clarify how EIAs serve to help create impact predictions, what their meaning in planning is, and how they should be communicated. Earlier research has occasionally noted that EIAs deal with precise impact predictions only rarely (Arts 1998, Noble and Storey 2005). This view was also shared in this thesis and experienced in the empirical examinations of the articles (I, II, IV). On another note, it has been argued that a large development project causes 'all' impacts, the first impacts being the ones in individuals' minds when they first hear about a project, and a challenge for EIA is to deal with these responses in a purposeful way (Vanclay 2011). This is not to say that prediction accuracy would not be a desirable feature but that prediction accuracy is not necessarily crucial for understanding what is plausible – instead of accuracy more important is to understand the potential severity and types of possible impacts. In this respect, EIAs were considered to be valuable. Though a lack of precise predictions was recognized, EIAs were seen as resulting in descriptions of the impact-causing actions, and various impact categories were considered broadly in the EIA results (I, IV). It was also recognized that for a successful EIA, it would be potentially beneficial to support the construction of various opinions regarding possible harm and the desired future and to try to report these in the conclusive outputs (II). Based on the findings, in this sense, the processes seemed to vary in terms of success, and this was not explained by institutional factors but by the levels of contribution of various stakeholders (I, II, V).

The meaning of type of predictions can also be outlined through the purpose of information. The follow-up (IV) example showed how the follow-up results were not used to verify the predictions but rather for controlling and

management purposes. In the end, at the realization stage of a project, the prediction accuracy is largely an irrelevant aspect compared to the understanding of the actual impacts. The findings also indicate that while EIA supports the holistic consideration of various impacts, the concrete effect of these considerations on the decision-making is often unclear (I, V). It was argued (V) that if legislation has no controlling mechanisms for certain types of impacts, for example, the physical alteration of the environment, it may not be considered in permits. However, despite this lack of clarity, the predictions of EIAs are used in decision-making, and thus, how the possible consequences and their meanings are expressed in EISs has an effect on how they are considered later. Regarding this, Elling (2009) has argued that EIA should not aim to make a decision regarding the best way to implement a project or balance the positive and negative features of a proposal but shed light on various aspects of the project actions and their meaning, along with the conflicts and interests connected to them. Information should be recorded widely, and the decision should be separated from the assessment. In light of the evaluations presented in this thesis that found that the link between assessment and decision-making is occasionally unclear (I, V), Elling's argument can be seen in two ways. First, this separation exists in the Finnish system. According to Elling, this ensures that the evaluators' rationality is challenged by the decision-makers' views. Second, it was suggested that from an environmental effectiveness point of view, Finnish EIA could benefit from a more speculation-oriented approach in reporting, meaning that conflicts and various views can and should be more thoroughly recorded in EIA outputs. The current system, which requires the feasibility of a project be determined based on EIS, may not promote reporting distractive views. From a quality perspective, it could also be argued that because decision-making is separate from assessment, it is important not to aim at a "single result" during evaluation. This reasoning is different from the notion that better integration of assessment and decision-making should be an ideal, but that the two can be seen as a one element of quality control. If EIA's aim is not to "determine the feasibility" but to "create and learn" about the possibilities and threats the project proposal may contribute to, the decision-makers cannot rely on "incorrect conclusions." They must draw their own.

In this light, it can be argued that methods that integrate or reduce information should be used with care in EIA result communication. The test involving the RIAM method (III) showed how even most of the small-scale projects and programs were usually considered to have impacts. In the usability test, the practical problems faced were considered due to the lack of knowledge about impacts (receptors, the kinds of impacts) and due to controversies in evaluating their significance. The description gained with this method is one interpretation, a projection of speculation or reasoning, which cannot be reproduced or proven to be correct. In the test, it was suggested that the value of this method is not seen in the result it generates but in the discussions it promotes and understanding the characteristics of impacts and their meanings. However, because an integration of impacts and their significance requires

some rationality in order to prevail, it is controversial to move from discussions to decisions. On a large scale, this controversy seems to define EIA, and every EIA result is to some extent a similarly incomplete construct (I, V). When the processes end with the outputs and a requirement to draw conclusions regarding the “feasibility” of a project, many of the controversial ideas and thoughts may not filter further into project design or permit considerations, especially if they are not dealt with in the EIA conclusions (II, V).

Together, it can be argued that Finnish EIA is usually successful in describing the planned development but would occasionally benefit from a stronger emphasis on precaution (I, II, V). This does not necessarily mean more detailed research about possible impacts but more thorough and open discussions about what actually is known or unknown regarding the consequences. These discussions would benefit from more decision-focused communication – uncertainty and risk communication should involve discussions about the significance of various worries, uncertainty assumptions, and risk scenarios. Furthermore, based on the examples (IV), EIA follow-up could be better utilized to produce more valuable information for forthcoming EIAs, not necessarily for more precise predictions but for experience regarding consequences. The scattered follow-up practices mean that information about actual consequences may be left unutilized.

In total, the findings indicate that the regulatory and administrative framework for Finnish EIA enables high-quality EIA processes to occur. A wide environmental impact concept and the multidimensional content requirements for EISs contribute to a holistic understanding of a project’s likely impacts and contribute to environmental protection. The unique situation of each EIA emphasizes the importance of experience in assessment work and process guiding. The examples showed how Finnish EIA allows learning and consequence consideration (II, IV, V). The benefits of such considerations are not always certain, but their importance is clear based on uncertainty management and the purpose of EIA, which is to support sustainability (II, V). Moreover, based on the articles’ insights (I, II, III, IV, V), it can be argued that the clearest way to improve the practice of Finnish EIA lies in how EIAs are utilized by the practitioners and stakeholders during the individual EIA processes, not in changing the institutional framework.

Against this view, the meaning of different evaluations can also be further considered. First, according to the research approach of the thesis, the aim was to describe and analyze EIA practice in the theoretical context of compliance studies and that of effectiveness studies, which seeks to explain, whether and how EIAs actually effect in improved environment. Theoretically it was suggested that the latter effect cannot be proved, but that it can and needs to be used as a reference for EIA quality. The actions taken in EIA should be evaluated against whether they contribute to the actual environmental objectives. However, this aspect can always be considered as an opinion, and needs to be argued in the specific planning context.

The compliance evaluations resulted with findings of which meaning could be described as verifying that certain actions in EIAs were taken and

considerations performed. In this sense, they are a reasonable approach after for example system implementation (Sheate 2012), or in studies where aim is to consider, for example, whether the contents and scope of EISs generally evolve when the system matures (Landim and Sanchez 2012) or in general comparison of contents and procedures (Barker and Wood 1999). The difficulty of using compliance evaluation criteria is that, in many respects, they do not provide a clear standard, but are guidance for evaluation, which in the end require the evaluator to decide which features are important and adequate.

Since it also seems that the guidance cannot be developed towards a “standard” and clear advice for practice, the more important it appears for practitioners to be able to reflect their actions against different interpretations of reality and debates concerning theoretical aspects of EIA. Similarly to compliance evaluation, however, it may be that context-dependent case studies cannot either provide universal advice for future practical solutions. On the other hand, they may help in understanding how EIAs are used and provide elaborations of sustainability and environmental harm in a given context. This way, studies may help practitioners to understand the context in which they are operating and to develop their own actions. These studies can also provide a common-knowledge base to be used in compliance evaluation, by helping to bind the universal criteria to actual contextually attached views of certain development.



## 6 CONCLUSIONS

In this thesis, the quality of Finnish EIA was examined from several different perspectives. Based on the findings, it can be concluded that Finnish EIA and its features can be considered an established system that enables good-quality outcomes and generally works towards its environmental objectives. However, it was expressed that EIA quality evaluation is a challenging task and that, from the point of EIA's environmental effectiveness, EIA quality can be considered a relative concept.

From the perspective of EIA quality research, it can be concluded that EIA content and compliance evaluation still appear to form a reasonable basis for EIA quality control and evaluation. The content requirements and the principles of the procedural elements cannot be deemed irrelevant to the theoretical objectives of EIA. They help to create a common language for processes and frame communication, which should theoretically increase the collaborative understanding of the complicated web of consequences development may cause. However, with this evaluation approach evidence of actual environmental effectiveness is difficult to gain. In fact, in the case of EIA, its true effectiveness may be altogether out of reach of universal evaluation approaches.

The challenges and problems that are unavoidable in EIA procedures appear to be familiar to practitioners and the research community. The importance of decontextualized quality evaluations that are performed to increase the understanding of mechanisms that would improve the effectiveness of environmental impact assessments in regard to these well-known problems can be considered questionable. Evaluation using general criteria can verify that certain aspects are dealt with, and it can be used in comparison of the features of similar cases. However, using this methodology, it appears difficult to provide new views of how EIA processes actually work or should work.

Contextually attached qualitative case studies, which describe and analyze how EIAs help in creating plural interpretations of environmental consequences, appear to be useful in deepening and broadening the

understanding how EIAs are actually used. Like experience, case studies can also help practitioners to learn about various perspectives and about the possibilities EIA may offer. Discussions about sustainability, risks, and uncertainties cannot be decontextualized. They need to be communicated and constructed and evaluated uniquely in each EIA if a purposeful process is desired.



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## YHTEENVETO (RÉSUMÉ IN FINNISH)

### Ympäristövaikutusten arviointimenettelyn laatu Suomessa

Ympäristövaikutusten arviointimenettely (YVA-menettely) on poliittinen ohjauskeino, jonka tarkoituksena on parantaa ympäristönäkökohtien huomioonottoa suurten yhteiskunnallisesti merkittävien hankkeiden suunnittelussa. YVA:n tavoitteena on ennaltaehkäistä ympäristöongelmien syntyä ja tukea ympäristöllisesti kestävää kehitystä. Suomessa YVA-menettelyä ohjaavat ja koordinoivat yhteysviranomaiset (ELY-keskukset ja ydinenergiահankkeissa TEM). Suunnittelusta hankkeesta vastaava taho on velvollinen tekemään hankkeestaan ympäristövaikutusten arvioinnin. Hankevastaava käyttää arvioinnissa yleensä apunaan ympäristökonsultteja, jotka ovat erikoistuneet YVA-selvitysten tekoon.

Suomessa YVA-menettelyä ohjaa lainsäädäntö, joka pohjautuu EU:n YVA-direktiiviin (2011/92/EU). YVA-laki (468/1994) ja YVA-asetus (713/2006) sisältävät menettelylliset määritelmät ja reunaehdot toimenpiteille, joita YVA:ssa edellytetään. Lain mukaan ympäristövaikutus tulee menettelyssä käsittää laajalaisesti hankkeen suorina ja epäsuorina vaikutuksina ihmisten terveyteen, elinolosuhteisiin ja viihtyvyyteen; maaperään, vesiin, ilmaan, ilmastoon, eliöihin ja biologiseen monimuotoisuuteen; yhteisöjen rakenteisiin, rakennuksiin, maisemaan ja kulttuuriperintöön; luonnonvarojen hyödyntämiseen; sekä edellä mainittujen tekijöiden keskinäisiin suhteisiin niin Suomen rajojen sisällä kuin ulkopuolella. Lainsäädäntö ei sisällä yksityiskohtaisia vaatimuksia siitä, kuinka arvioinnit tulisi suorittaa.

Tässä tutkimuksessa suomalaisen YVA:n laatua tarkastellaan suhteessa sen mahdolliseen ympäristölliseen vaikuttavuuteen. Tutkimuksen teoreettisena lähtökohtana on, että ympäristöongelmien ehkäisyn ja kestäväen kehityksen näkökulmasta YVA:lle ei voida johtaa yksikäsitteistä laatukriteeristöä. Laadunarvioinnin mielekkyyden vuoksi näitä näkökulmia ei voida tarkastelusta kuitenkaan hylätä. Tässä tutkimuksessa arvio laadusta linkittyy YVA:n käytännön kuvaukseen ja arviointiin. YVA:n teoreettinen ympäristöllinen vaikuttavuus toimii raamina laadun ja eri laatulementtien arvottamiselle ja hahmottamiselle, ja laatu käsitetään suhteellisena käsitteenä.

Teoreettisesti laaduntarkastelu nojaa kahteen eri YVA:n laatututkimuksen lähtökohtaan. Perustan tutkimuksessa esitetylle tarkastelulle luovat laatututkimukset, joissa tarkastellaan YVA:n toteutumista suhteessa lainsäädännön vaatimuksiin sekä kirjallisuudessa esitettyihin kuvauksiin hyvistä käytänteistä. Tämän tutkimustradition voidaan katsoa nojaavan rationalistiseen näkemykseen, jonka mukaan YVA:lle voidaan asettaa sisältövaatimuksia siten, että YVA voidaan niiden toteutumisen tarkastelun perusteella arvioida joko onnistuneeksi tai epäonnistuneeksi. Tämän tutkimuksellisen lähestymistavan mielekkyys on osin haastettu viimeaikaisissa vaikuttavuustutkimuksissa, joissa nähdään, että YVA:n tavoitteiden kannalta merkityksellisin tieto voidaan luoda vain konstruktiiivisesti. Laaduntarkastelua ei voida irrottaa tapauskohtaisesta kontekstistaan ja laadunarvioinnin kannalta olisi tärkeä myös pystyä todentamaan, kuin-

ka näkemykset ja tieto rakentuvat ja lopulta vaikuttavat YVA-menettelyssä ja sen jälkeen. Tutkimuksessa tämän näkökulman merkitystä pyritään peilaamaan YVA:n sisältövaatimuksiin ja menettelyllisiin piirteisiin sekä niiden toteutumiseen.

Tutkimuksen päätelmät perustuvat viidessä artikkelissa esitettyjen tarkastelujen tuloksiin ja niiden synteisiin. Metodologisesti artikkeleissa hyödynnetään sekä laadullisia että määrällisiä menetelmiä. Pääosin tarkastelut perustuvat kuvaileviin dokumenttianalyysiin, kyselytutkimukseen sekä Euroopan komission julkaiseman YVA:n laaduntarkasteluoppaan ja -kriteeristön käyttöön. Yhdessä artikkelissa testataan vaikutusten arvottamismenetelmää (RIAM) hankkeiden ympäristömyönteisyyden tai -kielteisyyden kuvantamiseksi. Artikkeleiden havaintoja YVA-menettelystä ja siihen liittyvistä käytänteistä tarkastellaan viitekehyksessä, jossa havaintojen merkittävyttä pohditaan suhteessa niiden mahdolliseen ympäristölliseen vaikuttavuuteen. Tutkimuksen näkökulmasta YVA-menettely käsitetään abstraktina kokonaisuutena, jonka todellisia ympäristöllisiä vaikutuksia on vaikea ellei mahdoton todentaa tai mitata.

Havaintojen perusteella todetaan, että suomalaisissa YVA-menettelyissä käsitellään ja tuotetaan laaja-alaisesti suunniteltuihin hankkeisiin liittyvää ympäristötietoa ja tämä tieto raportoidaan kootusti YVA-selostuksissa. Sisällöllisesti YVA:t näyttävät pääosin noudattavan sekä lainsäädännön vaatimuksia että hyvien käytänteiden ohjeistuksia. Lisäksi sekä YVA-järjestelmä että menettelylliset käytänteet ovat vakiinnuttaneet asemansa ja ne ovat tuttuja YVA:n parissa työskenteleville. Sekä YVA-yhteysviranomaiset että YVA-konsultit kokevat, että vaatimuksiin nähden YVA:t ovat ennemminkin laadukkaita kuin huonosti tehtyjä Suomessa.

Yksittäisten menettelyiden osalta laadun todetaan voivan vaihdella, mutta järjestelmästä ei havaintojen perusteella voida osoittaa suuria puutteita. Ympäristövaikutusten arvioinnin käytännön haasteet, jotka tutkimuksessa tunnustetaan, ovat pääosin tuttuja aiemmista YVA:n laatututkimuksista ja niitä voidaan pitää arvioinnin onnistumisen suhteen myös kansainvälisesti yhteisinä YVA:n laatuun vaikuttavina tekijöinä järjestelmästä riippumatta. Yhteistä näille käytäntöä hankaloittaville asioille oli, että niiden merkitys YVA-menettelyssä YVA:n mahdollisen vaikuttavuuden kannalta on vaihteleva riippuen näkökulmasta ja tarkastelurajauksesta. Tällaisia asioita olivat muun muassa hankkeesta aiheutuvien riskien käsittely, seurauksiin ja arviointiin liittyvien epävarmuuksien ja toteutusvaihtoehtojen tarkastelu, menettelyn tasapuolisuus ja rajauksen onnistuminen, vaikutusten ennustaminen ja merkittävyuden käsittely. Teoreettisesti esitetään, että näiden asioiden ratkaisemiseksi ei voida luoda yleispäteviä yksityiskohtaisia käytännön ohjeita, vaan ne on tunnistettava ja huomioitava kussakin menettelyssä tapauskohtaisesti.

Suomalainen YVA-järjestelmä todetaan joustavaksi ja sen nähdään mahdollistavan useiden tulkintojen esittämisen ja luomisen suunnitteilla olevan hankkeen seurauksista. Näitä mahdollisuuksia ei kuitenkaan aina hyödynnetä menettelyissä. Havaintojen perusteella esitetään, että etenkin riski- ja epävarmuustarkasteluissa erilaisten näkökantojen perusteellisempi esiintuminen ja

niistä käytävä jatkokeskustelu mahdollistaisivat tältä osin laadukkaampien arviointien tekemisen. Tähän liittyen todetaan lisäksi, että suurin osa ympäristövaikutusten arvioinnissa esitetyistä vaikutusennusteista on luonteeltaan kuvai-levia ja epätarkkoja. Tässä suhteessa nähdään, että vaikutuksiin liittyvä keskustelu ei ole monin osin mielekäästä, mikäli keskitytään kiistelemään ennustusten tarkkuudesta. Koska YVA:n ympäristöllisen vaikuttavuuden voidaan ajatella olevan arvioitavissa vain siinä kontekstissa, jossa suunnittelu tapahtuu, tärkeämpää olisikin pohtia, minkä tyyppisiä oletetut vaikutukset ovat; ovatko ne vakavia, ja kenen mielestä; sekä miten uskottavia oletetut vaikutusskenaariot ovat. Tätä prosessia ei voi tehdä suljetusti, ja tässä mielessä YVA tarjoaa institutionaalisen mahdollisuuden avoimelle suunnittelulle.

Vaikka YVA:ssa tarkastellaan erilaisia vaikutuksia laaja-alaisesti, näyttää siltä, että tarkastelujen merkitys ympäristöpäätöksenteossa ei ole useinkaan täysin selvä. Havaintojen perusteella esitetään, että YVA:ssa tuotetusta tiedosta vain osa tulee huomioiduksi esimerkiksi ympäristöluvituksessa. Hankkeen rakentamisen ja valmistumisen jälkeen vaikutusten seuranta ei esimerkkien valossa juurikaan käytetä ympäristövaikutusten arviointien kehittämiseksi, vaan ennemminkin hankkeen vaikutusten kontrollointiin ja hallintaan. Seurantakäytännöt lisäksi vaihtelevat, mikä hankaloittaa seurantatiedon mahdollista hyödyntämistä oppimistarkoituksessa.

Yhteenvedona todetaan, että YVA:n lainsäädännöllinen ja hallinnollinen viitekehys mahdollistaa Suomessa tarkoitustenmukaisten YVA-menettelyjen toteuttamisen. Laaja ympäristövaikutusten käsite ja YVA:n moniulotteiset sisältövaatimukset luovat hyvän lähtökohdan hankkeiden vaikutusten hahmottamiselle ja ymmärtämiselle. Kunkin YVA-menettelyn tapauskohtaisuus korostaa kokemuksen merkitystä arviointityössä, sekä tarvetta ohjaukselle erityisesti tilanteissa, joissa hankevastaava on kokematon.

YVA:n laatututkimuksen kannalta esitetään, että YVA:n sisältövaatimukset ja niiden noudattamisen seuranta on edelleen asianmukainen lähtökohta laatutarkasteluille ja -kontrollille. Näiden tutkimusten merkitys YVA-käytänteiden kehittämiseksi on kuitenkin kyseenalainen. Ongelmat ja haasteet tunnetaan, mutta niihin ei ole selkeitä ratkaisumalleja, joilla niiltä voitaisiin välttyä. YVA:n ympäristöllisen vaikuttavuuden ja merkittävyyden arvioimiseksi tarvitaan kontekstin huomioivia tapaustutkimuksia, joissa olisi kyettävä kuvaamaan ja analysoimaan erilaisten näkemysten muodostumista ja esittämistä YVA-menettelyissä. Todellisten vaikutusten seurannan kehittäminen systemaattisemmaksi parantaisi mahdollisuutta todentaa kokemuksia hankkeiden vaikutuksista.

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## **ORIGINAL PAPERS**

### **I**

#### **QUALITY OF ENVIRONMENTAL IMPACT ASSESSMENT - FINNISH EISS AND EIA PROFESSIONALS' OPINIONS**

by

Kimmo Jalava, Sanna Pasanen, Mikko Saalasti & Markku Kuitunen 2010

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# Quality of Environmental Impact Assessment: Finnish EISs and the opinions of EIA professionals

**Kimmo Jalava, Sanna Pasanen, Mikko Saalasti and  
Markku Kuitunen**

This article presents and compares findings of two EIA quality studies conducted in Finland. First a survey was targeted at competent authorities and environmental consultants to investigate their perceptions of the quality of Finnish EIAs. Second, 15 EISs were considered using the European Commission's guidance on review criteria. The results show that the EIA professionals generally consider the quality as good, though they also recognized that the quality varies and suggested certain areas for improvement. In the professionals' opinion the performance of Finnish EIAs could be enhanced, especially with more profound alternative considerations. Based on the results it is also suggested that more efforts should be aimed at increasing the communicativeness of EISs.

Keywords: EIA, EIS, quality review, opinion, Finland

**E**NVIRONMENTAL IMPACT assessment (EIA) is a planning tool with many purposes, but generally the basic idea of EIA is to identify the possible environmental consequences of planned projects in advance and to seek means to prevent negative impacts of development already in the planning phase. In addition, another main objective of EIA is to guarantee participation possibilities for the public and other interest parties.

There is no shortage of EIA and Environmental Impact Statement (EIS)<sup>1</sup> quality studies internationally.

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The basic principles and core elements of EIA are widely agreed and reasonably well founded (e.g. Sadler, 1996; Glasson *et al*, 2005; Lawrence, 2003). EIA quality studies have shown that overall quality of EISs has often improved with time (see e.g. Glasson *et al*, 2005; Barker and Wood, 1999; Arts, 1998) and it is recognized that especially in more mature EIA systems EIA makes a difference to development in various ways (Jay *et al*, 2007; Wood, 2003). Criticism towards the quality of 'the well-known practice' of EIA is still sometimes outspoken and one of the concerns still seems to be the varying quality of EISs (Ross *et al*, 2006). The quality of an EIS is often considered to be one of the main factors influencing the possible effectiveness of EIA. An EIS is the final outcome of an EIA process and it should include all the necessary environmental information related to a project and decision-making (Glasson *et al*, 2005; Wood, 2003).

An EIS review is not just a matter of checking that required contents are produced and that relevant information is presented. A review should also consider the quality and success of the whole EIA

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## An EIS review is not just a matter of checking that required contents are produced and that relevant information is presented

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process. Previous research has identified many factors that may constrain the overall performance of EIA by lowering the quality of assessments. For example, these factors may include issues 'behind the process', like the quality of legal requirements and guidance, experience of practitioners, project type, public pressure and communication of stakeholders (see e.g. Barker and Wood, 1999; Morrison-Saunders *et al.*, 2001; Polonen, 2007; Hokkanen, 2007). Or, they may be issues related more directly to the procedure and stages of EIA. These issues may include, for example, success of screening (Hokkanen and Polonen, 2006; Weston, 2000) and scoping (Snell and Cowell, 2005; Ross *et al.*, 2006), lack of impartiality of the process (Hokkanen, 2007; Glasson *et al.*, 2005), insufficient consideration of alternatives (Steinemann, 2001), and difficulties in determination of impact significance (Lawrence, 2007; Ross *et al.*, 2006) and in the conduct of follow-up (Arts, 1998). Also, concerns about communication of results and their use in decision-making have often been expressed (Jay *et al.*, 2007; Wood, 2003).

This paper approaches the quality of Finnish EIA by focusing on this 'well-known practice of EIA' with a survey targeted at EIA professionals (including competent authorities and environmental consultants) and with a separate review of a sample of Finnish EISs. The methodology is explained in the following section. Then the findings of the two studies are reported. The findings are divided into two main categories: (1) perceptions of the quality of EISs and (2) professional perceptions of the success of certain elements of the process including consideration of alternatives, impartiality, screening, scoping, follow-up and the use of environmental information in decision-making. At the end of the paper the findings are discussed in the light of previous quality studies.

### Methodology

#### Quality review criteria

To aid and to provide focus to EIS review a large number of guidance documents and sets of criteria are published throughout the world. Often the criteria reflect the regulatory requirements and the set objectives of EIA with the aim to ensure that a reviewer focuses on appropriate (i.e. settled) issues. For example, one of the most famous criteria is the

Lee and Colley review package (Lee and Colley, 1992; Lee *et al.*, 1999). This has been used in quality studies, either directly or in a modified form, especially in the British context (Glasson *et al.*, 2005; Gray and Edward-Jones, 2003), but also elsewhere, for example in South Africa (Sandham and Pretorius, 2007). In Finland the EIA legislation implementing the EIA Directive 85/337/EEC entered into force in 1994 and shortly after Hilden *et al.* (1997) published EIS criteria for the Finnish context on behalf of the Ministry of Environment.

In both of the studies reported here the reference for EIS quality was drawn mainly using guidelines and criteria from the guide *European Commission's Guidance on EIA* (European Commission, 2001). The guidance's section 'EIS review' is designed to be useful across Europe, despite the possible differences in specific requirements or EIA practices in different countries. The guidance is said to have been designed to reflect the legislative demands for EIA but also, more generally, 'a good practice of EIA' (European Commission, 2001). Apart from its designed suitability for the Finnish context, the guidance was also chosen for use because of its international availability and to collect experiences of its usability.

The 'EIS review' section consists of general guidelines to perform an EIS review and more detailed questions in the form of a checklist. The general guidelines indicate that the main aim of an EIS is to provide good information for decision-makers and for people possibly affected by a project. A reviewer is advised to focus on certain main characteristics that are seen to contribute to a good EIS (Table 1). The characteristics emphasize the importance of

Table 1. The qualities of a good EIS (European Commission, 2001)

- 
- A clear structure with a logical sequence, for example describing, existing baseline conditions, predicted impacts (nature, extent and magnitude), scope for mitigation, agreed mitigation measures, significance of unavoidable/residual impacts for each environmental topic.
  - A table of contents at the beginning of the document.
  - A clear description of the development consent procedure and how EIA fits within it.
  - Reads as a single document with appropriate cross-referencing.
  - Is concise, comprehensive and objective.
  - Is written in impartial manner without bias.
  - Includes a full description of the development proposals.
  - Makes effective use of diagrams, illustrations, photographs and other graphics to support the text.
  - Uses consistent terminology with a glossary.
  - References all information sources used.
  - Has a clear explanation of complex issues.
  - Contains a good description of the methods used for the studies of each environmental topic.
  - Covers each environmental topic in a way which is proportionate to its importance.
  - Provides evidence of good consultations.
  - Includes a clear discussion of alternatives.
  - Makes a commitment to mitigation (with a programme) and to monitoring.
  - Has a non-technical summary which does not contain technical jargon.
-

the communicative elements of EIS – in other words, a reviewer should pay particular attention to analysis of which issues are raised and how they are presented in the EIS.

In addition, to ensure that a reviewer has a reasonable sense of possible topics to be addressed in EIA, an EIS review checklist is provided in the guide. The list includes 143 questions that are divided into seven different review sections. These are: (1) description of the project, (2) consideration of alternatives, (3) description of the environment likely to be affected by the project, (4) description of the likely significant effects of the project, (5) description of mitigation, (6) a non-technical summary and (7) quality of presentation.

#### The survey design

The survey consisted of two parts. In the first part of the survey 75 statements or questions about different aspects of quality of EISs were presented and respondents were asked to express their opinions quantitatively on a Likert four-dot scale. In the second part of the survey, qualitative, open-ended questions about the quality of EIA and EISs were asked so that the respondents could bring out their subjective views and perceptions of issues in more detail.

In the electronic questionnaire form the questions of the survey's first part were divided into nine groups. Seven of the question groups followed the EIS review section in the European Commission's Guidance. Six of these groups reflected directly the content requirements for EIS and the seventh concentrated on overall quality of presentation in EIS. In addition to these, the respondents were asked to evaluate the importance of these different EIS review sections in the eighth question group and to evaluate their own skills in conducting EIAs in the ninth group (see Table 2 for the titles of question groups and for the main reasons for their inclusion).

In the survey's second part open questions were presented to professionals to broaden the study

scope from contents of EISs to issues affecting the overall quality of EIA. The questions were designed to obtain more in-depth professional opinions about current Finnish EIA practice in terms of how it functioned. Many of the question topics were discerned from doctoral theses in the fields of environmental law and political science by Polonen (2007) and Hokkanen (2007) respectively, in which they recognize many potential weaknesses of Finnish EIA practice.

The survey was conducted by email and was targeted at competent authorities and environmental consultants. (In this paper, when not separated by profession, competent authorities and environmental consultants are together referred to as 'the professionals' or 'the respondents'.) The task of competent authorities is the official quality control of the process, and the environmental consultants usually prepare the EISs on behalf of a developer, who is responsible for the project.

#### The review strategy for the sample of EISs

The sample consisted of 15 EISs for waste incineration projects and they were reviewed using the aforementioned EIS review section of the European Commission's Guidance (2001). The planned boiler sizes for waste incineration plants for mixed municipal waste or for recycled fuel prepared from wastes of other sources<sup>2</sup> were between 15 and 150 MW. All the EISs were found adequate by the Finnish competent authorities and were prepared between 2001 and 2005.

At the time the EISs were published waste incineration faced relatively strong resistance from citizens and environmental non-governmental organisations (Koskinen, 2006; Meloni, 2004). Presumably there would have been public pressure for the proponents to prepare high quality (i.e. convincing) EISs (see e.g. Morrison-Saunders *et al*, 2001). The sample consisted of only one project type, which is a constraint in the sense that the review

**Table 2. The nine question groups of the survey and the main reasons for their inclusion. In the question groups 1 to 7 we asked whether or not certain issues related to the topic are conducted well in the Finnish EISs**

Question group title	The reasons for including the question group
1. Description of the project	It is important to know what kind of a project is being planned, in which context and its characteristics that might influence the environment
2. Consideration of alternatives	Alternatives may have an essential role in avoiding or minimizing negative environmental consequences
3. Description of the environment	The baseline studies are important in recognizing the possible receptors of impacts
4. Description of the environmental impacts	One of the main aims of EIA
5. Description of the mitigation measures	The purpose of an EIS is also to minimize negative impacts (this group also included a question about EIA follow-up)
6. Non-technical summary	An EIS, and especially its non-technical summary, should be understandable by different readers
7. Quality of presentation	As in previous point
8. The perceived importance of the review sections	We wanted to know which of the issues presented in the survey are considered important by the professionals
9. The professionals' self-evaluation of their skills	We wanted to know whether professionals think they have certain strengths or weaknesses in their skills to conduct certain areas in EISs

results cannot necessarily be generalized to other project types. However, in some previous quality studies it has been noticed that the variations in EIS quality do not seem to relate directly to the type of project (Barker and Wood, 1999).

Two reviewers<sup>3</sup> conducted the review. At first the reviewers reviewed the statements independently and then the results were compared and combined in panel meetings. Two reviewers were used to ensure different perspectives on evaluation and also to collect experiences of the use of the guidance. However, it should be noted that the reviewers (the first two authors of this paper) had a similar educational background, with masters degrees in environmental science, which may have contributed to similar opinions in review rather than disagreements. Both the guidance and EIS review itself were unfamiliar to the reviewers beforehand.<sup>4</sup>

For each of the checklist question the grading system presented in Table 3 was used, but the reviewers broadened the scale by using intermediate grades, for example B+ and C-. Not all the questions were answered – the focus was aimed at main characteristics, as advised. In panel meetings the main review sections were given their overall grade based on discussion and the general impressions of the reviewers rather than based directly on the average grade of the section's questions. Overall EIS grades were then calculated from the section grades using the average (E to A were given scores from 1 to 13).

A few modifications were made to the question list and to the section division. Four questions were added to the original 143 questions after checking the requirements for the Finnish EISs from Section 10 of the Finnish EIA Act. The added questions dealt with the project's relationship to use of natural resources and land use plans. The review sections (1) and (2) were dealt with as one and the sections were partly renamed. Therefore, the review sections presented in the results are as follows: (1) Description of the project and its alternatives, (2) Description of the environment, (3) Description of the environmental impacts, (4) Mitigation measures and follow-up, (5) Presentational issues and (6) Non-

technical summary. These changes were minor and did not affect the way the European Commission's criteria are meant to be used.

## Findings

### *Quality of EISs: quantitative responses from professionals*

*Background information* Altogether 28 professionals answered the survey, which was 55% of the total 51 targets. The respondents comprised 11 competent authorities and 17 environmental consultants. All the respondents were highly educated; 5 held Bachelors' degrees, 19 held Masters' degrees and four held Doctors' degree. The degrees were mostly from fields of natural sciences and included different environmental studies. Only three of the respondents had not formally studied any environmental issues. Ten of the respondents were female and 17 male. One of the respondents did not state his or her sex. Altogether, the group of respondents was rather small. Therefore it should be recognized that individual opinions were given special attention in reporting.

The experience of the respondents varied; usually the number of EIA cases a respondent had been involved with was from 5 to 20 (Figure 1). The least experienced respondent had participated in 2 EIAs and the most experienced in more than 100 cases.

*Professionals' perception of the quality of EISs* Figure 2 shows the average perceptions of competent authorities and consultants of the quality of the sections of Finnish EISs listed. Overall the quality is clearly considered to be good rather than bad in both professional groups. The calculated means for consultants in all question groups were above the Likert scale mean (>2.5). The means calculated for competent authorities were consistently lower than the means calculated for consultants. In five question groups the means for competent authorities were above the scale mean. In the question group 'Consideration of alternatives' the mean (2.47) was slightly below the scale mean and in the question group 'Description of the mitigation measures' more clearly so (2.18). The error bars for 95% confidence interval of means (i.e. mean ± standard deviation × 1.96) are shown in Figure 2.

Because of the rather small sample size, especially in the group of competent authorities, it was not clear whether the assumption of normality of data was tenable in all question groups. Also, because the answers were given on an ordinal Likert scale, the non-parametric Mann-Whitney U-test was chosen to tell whether there were statistically significant differences between the answers given by consultants and by competent authorities. The results were also calculated using the parametric Student's t-test, which found the same differences, but because

**Table 3. A suggested grading system for comparative EIS review in the EC's Guidance (European Commission, 2001)**

A	Full provision of information with no gaps or weaknesses
B	Good provision of information with only very minor weaknesses which are not of importance to the decision
C	Adequate provision of information with any gaps or weaknesses in information not being vital to the decision process
D	Weak provision of information with gaps and weaknesses which will hinder the decision process but require only minor work to complete
E	Very poor provision of information with major gaps or weaknesses which would prevent the decision process proceeding and require major work to complete

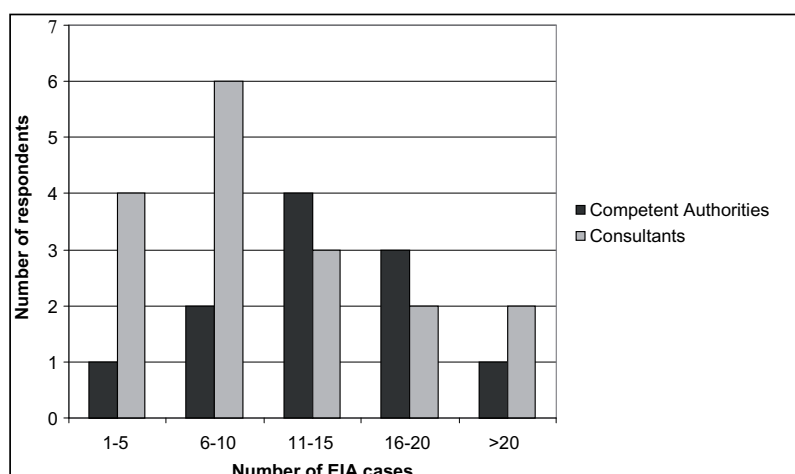


Figure 1. The respondents' EIA experience as the number of EIA cases in which they have been professionally involved

of the mentioned reasons the Mann-Whitney U-test results are reported (Table 4).

As noted above, the average results seemed to show that consultants considered the quality of EISs to be better than competent authorities did. The difference is also statistically significant (see Table 4: row 'all'). Statistically significant differences between the professional groups were also found in the question groups 'Description of the environment', 'Description of the environmental impacts', 'Non-technical summary' and 'Quality of presentation' (see rows 3, 4, 6 and 7 in Table 4).

*Perceived importance of review areas* The respondents were also asked to evaluate the importance of the different EIS review areas (those presented in the survey's question groups 1–7) and also to evaluate the importance of the role of competent authority. The professionals thought that all the areas were

important to conduct, and the role of competent authority was recognized as meaningful rather than unmeaning (the mean 3.2; standard deviation 0.74). 'Non-technical summary' and 'Description of the mitigation measures' were seen as slightly less important than the other areas and 'Description of the environmental impacts' and 'Consideration of the alternatives' were seen as most important. While the differences between averages were small, the standard deviations and therefore the 95% confidence intervals for means were rather large compared to the scale, which shows that opinions varied quite a lot between individuals (Figure 3).

*Self-evaluation of abilities to conduct an EIS* Figure 4 presents the results of the section where the respondents were asked to evaluate the abilities of the professionals to conduct an EIS. In general, the professionals seem to consider themselves skilful and, also, in most of the areas surveyed, on average the consultants rated the professionals' skills on a higher level than the competent authorities. As a whole the difference is also statistically significant (Mann-Whitney's U-test,  $Z = -2.179$ ,  $n = 28$ ,  $p = 0.029$ ).

Table 4. The statistical significance for differences between the answers given by competent authorities and by consultants. Mann-Whitney U-test,  $n = 28$

	Z	p-value	Statistical significance
1. Description of the project	-1.643	0.100	
2. Consideration of alternatives	-1.020	0.308	
3. Description of the environment	-2.639	0.008	**
4. Description of the environmental impacts	-2.247	0.025	*
5. Description of the mitigation measures	-1.661	0.097	
6. Non-technical summary	-2.240	0.025	*
7. Quality of presentation	-2.493	0.013	*
All	-2.776	0.006	**

\*  $p < 0.05$ ; \*\*  $p < 0.01$

*Quality of EISs: a review result for the sample of EISs*

The overall review result for the sample of EISs for waste incineration projects shows that 12 out of 15 statements were graded satisfactory or good and three of the statements slightly unsatisfactory (Figure 5). Of the given grades the most typical was B-, which was given to eight statements. None of the EISs received either the highest or lowest scores. Generally it was found that the contents required were mainly issued in the statements.

Of the six review sections 'Description of the environment' and 'Presentational issues' performed best. The weakest result was gained in the section 'Mitigation measures and follow-up', in which none

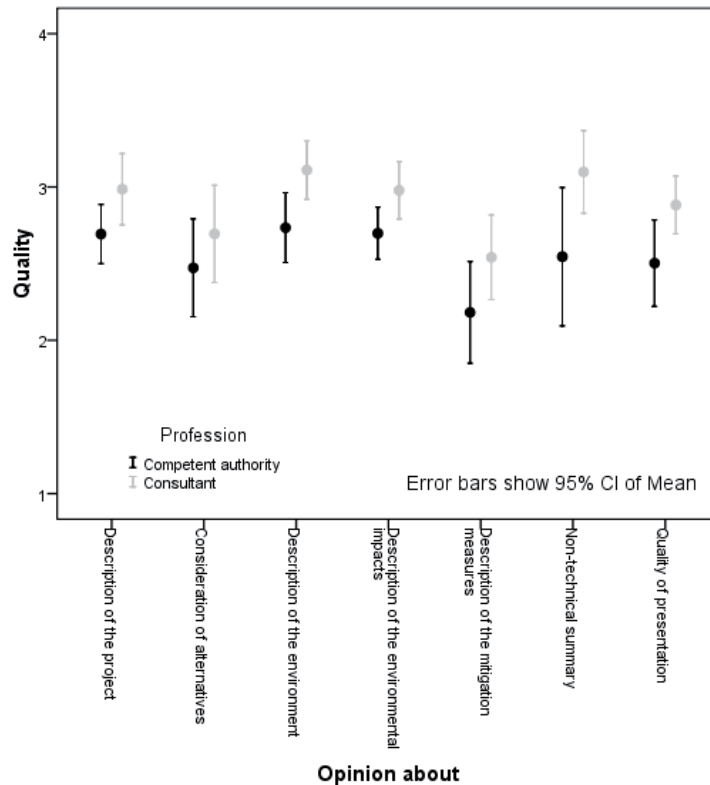


Figure 2. Competent authorities' and consultants' average perceptions of EIA quality area by area as surveyed. The y-axis scale stands for statement 'the quality is good' with 1 = disagree, 2 = partly disagree, 3 = partly agree and 4 = agree

of the EISs was evaluated to be good. In three EISs a non-technical summary was missing. Figure 6 presents the proportional shares of grades in the different review sections. For clarity, in Figures 5 and 6 the grades are divided into three classes: unsatisfactory (grades below C), satisfactory (grades from C to B-) and good (grades from B to A) based on the grade descriptions presented in the European Commission's Guidance (2001).

Most insufficiencies in the section 'Description of the project and its alternatives' concerned the exact description of the planned project. Though the technical alternatives and often two or three location alternatives were introduced, the exact plans were missing – obviously due to early planning phase. For example, 11 out of 15 EISs did not include a layout plan for the energy plant area. In all of the statements the construction and decommissioning phases of the plants were either lacking or described only briefly. Otherwise the projects were described in an understandable manner and their implementation was considered in relation to legislation and various plans and programmes.<sup>5</sup>

The 'Description of the environment' section performed best in the review. In particular the descriptions concerning air quality received good grades. None of the environmental categories (e.g. water, flora, fauna, cultural environment) was found poor.

Yet, this section also included information that appeared irrelevant (i.e. the information was not used in impact analysis). Also noticeable was that new studies or surveys were rarely conducted and most information presented was originally from earlier studies or reports and probably meant for other purposes.

In the section 'Description of the environmental impacts' it was seen that impacts to air quality were emphasized over other impact categories, i.e. air impact analysis was obviously considered significant. The social impacts and opinions of inhabitants of regions near to planned projects were usually given recognition and these were reported. A weakness in this section was that often neither the possible negative nor positive impacts were clearly determined or specified. In addition, regularly it was stated that 'something has no impact on something' (e.g. 'the project has no effects on ground water'), with no clear reasoning presented. Often the methods used for impact predictions were not described in detail.

The weakest review result was gained in the section 'Mitigation measures and follow-up', in which none of the EISs received a good grade. On the positive side, a proposal for a follow-up programme was introduced in all of the statements and they were reviewed to be good. The essential weakness in this section was found with mitigation measures, which were

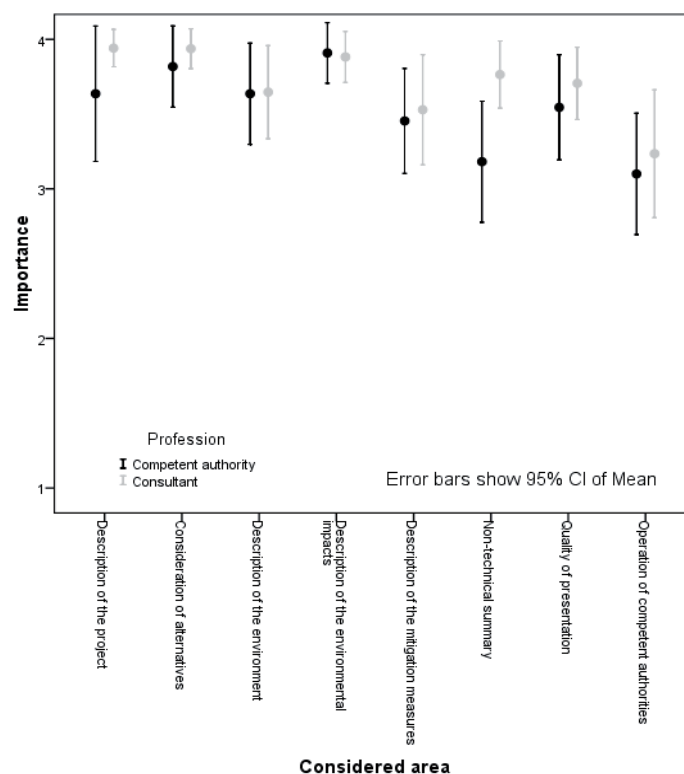


Figure 3. Importance of different EIS review areas and of operation of competent authority as perceived by the respondents. The scale was: 1 = not important, 2 = slightly important, 3 = rather important, 4 = extremely important

often left unspecified. Typically the mitigation measure targets were listed, but technical or practical solutions for mitigation were not described or were not described properly. Usually it was also left unclear what the possible mitigation measures were and which of them were in plans to be put in practice.

'Presentational issues' performed well in the review, though both reviewers concluded that there was also a lot to be improved. Generally the statements were readable and avoided jargon or language that was too technical. Tables, indexes, appendices, pictures and maps were used to support the texts, but use of these supportive elements varied. For example, some of the statements had good pictures of the planned locations but maps were not used well, or vice versa. The biggest presentational deficiencies were seen to be the lack of views and explanations (i.e. it was not expressed clearly why the issues that were reported were reported) and presentation of grounds for conclusions in the statements.

Of the 'Non-technical summaries' ten were of satisfactory grade and two good. The overall result was weakened as in three of the statements the summaries were missing. Basic information about the projects and their impacts were presented in all the summaries, but the meaning, the background and the purposes of EIAs and EISs were not described properly or at all, which reduced the usefulness of the summaries.

Overall, the reviewers considered the following weaknesses to be the most significant problems in EISs:

- Descriptions of the methods used were often cursory.
- Uncertainties and risks related to assessment and deficiencies of the assessment work conducted were poorly analysed and communicated.
- Impact predictions were often vague.
- Grounds for conclusions were often poorly presented.

#### *Success of the process: qualitative responses from the professionals*

As noted earlier, the second part of the survey concentrated on finding out professionals' opinions especially about certain selected issues 'behind the quality' in practice of Finnish EIA, where success is difficult to evaluate if only EISs are looked at. In addition, we hoped the 'open' format of this part of the survey might produce development ideas for better EIAs. A synthesis of the answers is given below. Each topic is briefly introduced before the answers are given.

*Consideration and comparison of alternatives* If environmentally sound alternatives are overlooked or

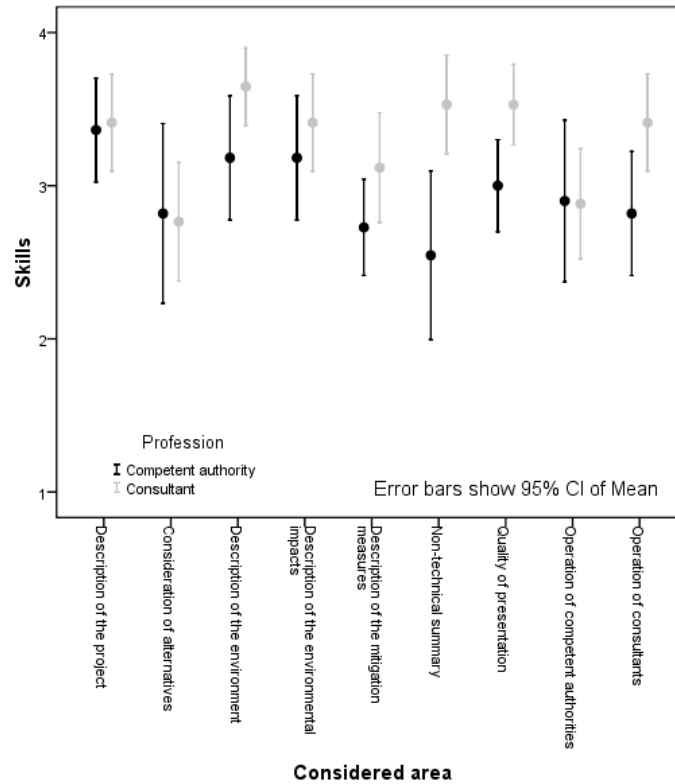


Figure 4. Competent authorities' and consultants' self-evaluation of their skills. The scale is: 1 = cannot be done, 2 = can be done, but not very well, 3 = can be done rather well, and 4 = can be done very well

not even considered in the EIA process, it is fair to ask whether or not EIA can achieve its purpose to provide sufficient information for environmentally sound decision-making (see e.g. Steinemann, 2001). Polonen (2007, 2006) studied the issue in the

Finnish system from the point of view of legal requirements and concluded that in Finland the developer has a rather large role and power to determine alternatives from his or her own initiative, which may constrain the search for appropriate and best

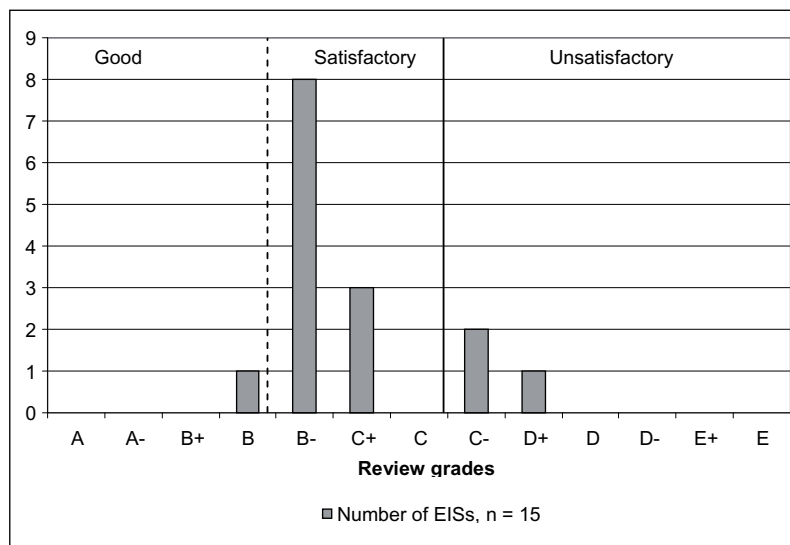


Figure 5. The overall review grades for EISs. See Table 3 for grade descriptions



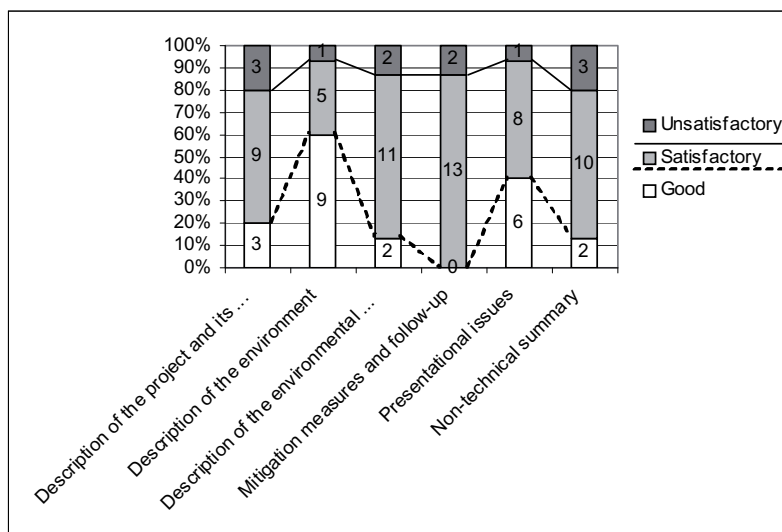


Figure 6. The proportional shares of unsatisfactory (below grade C), satisfactory (from C to B-) and good (from B to A) grades in the review sections

solutions. Polonen (2006: 487) also considered the Finnish requirement concerning the study of the alternatives rather loose. There is an explicit requirement for a developer to study reasonable alternatives, but developers are not always enforced to do so in practice.

When the respondents were asked to evaluate whether enough attention is being paid to impartial alternative considerations and to alternative comparisons the answer was both yes and no. In most of the responses it was mentioned that the issue is relatively case-dependent, depending especially on the type of the project. It was seen that in industrial projects the developer often defines the alternatives while having a main alternative in mind, while in projects like roads, electricity lines and pipelines the developer usually presents more 'real' alternatives, and these are considered more impartially. Some of the answers expressed a concern that examination in EIA often concentrates on a main alternative and that EIS is prepared to justify the choice, but some saw this as a natural part of a game in which the developer is only one stakeholder with a full right to drive his or her own interests.

Another aspect that could be raised from the answers, though not mentioned in many, is the timing of EIA. In certain cases the planning of a project has started with finding a location with certain conditions. If EIA starts after the location is decided it obviously changes the nature of EIA from the perspective of possible alternatives – then EIA usually concentrates on proving whether the project is feasible on the location in question.

*Partiality of developer* Substantially, EIA should be an impartial process. However, in Finland a developer is responsible for producing the information to be presented in the EIS. Hokkanen (2007) has

shown that the issue of impartiality of the whole EIA process can be strongly related to the role and actions taken by a developer during EIA. According to Hokkanen, and also for example Saarikoski (2000), a developer can either enhance or inhibit other stakeholders' contributions to EIA and its results.

When it was asked whether the respondents had noticed if developers had tried to affect EIA results because of their interests, the answers differed in the same way as they did for the question about alternatives. Quantitatively, there were seven yes answers (sometimes this has happened) and seven no answers (never happened) to the question. The rest of the respondents took a position somewhere in between: they had a doubt but were not sure. However, the respondents did not express a worry about severe incidents; for example, none of the answers mentioned that results had been altered intentionally to falsify the outcome. Rather it was reported as 'a human-action' to favour one's own interests and therefore not to seek disadvantages from one's own project. Here, there was no clear distinction between the opinions of competent authorities and consultants. Overall, the possible impartiality of a developer in the EIA process was not seen as a big problem, but as something that should be recognized as a possible problem.

*Screening level* Screening is the process where a decision is taken on whether or not EIA is required for a particular project. Currently certain types of large development projects are subject to EIA in Finland based on the listing in section 6 of the Finnish EIA Decree and no project with probable significant negative environmental impacts is excluded automatically. In his thesis Polonen (2007) identified possible defects with non-implementation of EIA in Finland. First, he found indications that in cases where the possible negative impacts were uncertain,

EIA was usually not required, though his studies also indicated that in newer cases more emphasis on uncertainty was given. Second, Polonen considered it noteworthy that EIA had never been implemented in large-scale forestry projects.

The professionals did not provide back-up for Polonen's specific notions, though it cannot be concluded that they disagreed with him. The respondents were asked whether or not the screening level in Finland is appropriate and the answer was almost unanimously yes. Overall, the respondents expressed the opinion that in their current shape EIAs should not be required from any smaller projects than they already are. In a few answers, it was suggested that EIAs with looser requirements could be required if EIA is considered too heavy an instrument, though these situations were not specified in the answers. A few answers also suggested that EIAs could be used more extensively in town planning.

*Scoping of EIAs* Scoping in EIA is essentially the stage where the contents and extensiveness of environmental information to be gathered and reported in EISs are outlined. Snell and Cowell (2005) have seen scoping as balancing between a precautionary approach and efficient decision-making. Basically, if scoping fails in EIA, it may mean that excessive resources are spent on minor impacts or irrelevant issues, or that too little attention is given to potentially significant impacts (Wood *et al.*, 2005; Sadler, 1996).

The respondents saw the scopes of EIAs as generally either appropriate or too extensive in Finnish EIA cases. In the case of too extensive EIAs the problem was considered to be the lack of focus in reporting rather than unnecessary issues in EIA. In some of the answers it was underlined that EISs often suffer from irrelevant information reported in a lengthy way. Therefore, more emphasis was hoped for concerning focus on issues seen as significant and on clear reporting.

*Follow-up* Follow-up is often considered the weakest part of EIA and its development within EIA systems seems to have received growing attention recently in many countries (Polonen, 2007; Morrison-Saunders and Arts, 2004; Sadler, 1996). Polonen (2007: 253) considered that the lack of systematic follow-up in Finnish EIA is undoubtedly a weakness from the environmental effectiveness point of view.

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**Most of the respondents clearly expressed an opinion that not enough attention is paid to follow-up of the impacts of the projects**

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He suggested that requirements in legislation concerning follow-up should be more specific and specifically that they should include an obligation for follow-up.

Most of the respondents clearly expressed an opinion that not enough attention is paid to follow-up of the impacts of the projects. The proposals for follow-up programmes normally presented in the EISs were criticized heavily: they were seen as poorly designed and rarely to have any practical meaning. In one answer it was said that 'everybody knows this problem'. Many answers indicated that the issue is difficult to solve, and lack of follow-up know-how by practitioners was recognized.

In contrast, some of the respondents expressed an opinion that enough attention to follow-up is already paid in EIAs. These opinions considered that planning follow-up is not a critical stage in EIA but an issue to be solved when actual permits for a project are under consideration.

Overall, the issue of follow-up was seen controversially. In their current state follow-up proposals in EISs were seen as either unnecessary or meaningless in practice. One way to interpret the answers is that the respondents did not see a rationale for follow-up or, if they saw one, it was insufficient. We conclude there was a general idea why follow-up should be conducted, but the practice was not answering the question in a satisfactory way.

*The use and effectiveness of environmental information produced in EIA* In the end, it is not the quality of the information presented in an EIS that makes 'the difference' in the environment but the quality of the decisions made after the information is read and heard. This has been one of the crucial topics in EIA research lately, and often it is concluded that EIA's contribution to decision-making or project design is moderate rather than substantial (see e.g. Jay *et al.*, 2007; Cashmore *et al.*, 2004; Wood, 2003). Also, in his thesis Polonen (2007) concluded that legislation in the EU and in Finland does not guarantee that assessment results are transferred successfully to decision-making.

In our survey the respondents were asked whether the results of impact assessments are adequately taken into account in environmental decision-making (i.e. permit processes) in Finland. The answers indicated that this depends on the case and the stakeholders. In some cases the answer is yes, the information is clearly considered. However, many of the answers noted that more emphasis on EIA in decision-making should and could be given. Also, some of the respondents said that they do not know whether or not the information is used. In one comment it was mentioned that information may be considered but these considerations are not reported in decisions. A few other comments said that the linkage between EIA and decision-making is weak because the EIA professionals are not actually involved in permit processes – only the documents.

*General comments on development of EIA in Finland from the respondents* Respondents were asked to name an issue whose development should be given more emphasis in Finnish EIA. No single issue was raised above all others, though the significance of alternative considerations was emphasized slightly more often than other issues. Issues related to the following were mentioned:

- Consideration and comparison of alternatives.
- Consideration of mitigation measures.
- Design of follow-up.
- The quality of impact prediction, and especially consideration and prediction of cumulative impacts and social impacts.
- Clear communication and quality of presentation.
- The use of EIA results in decision-making.
- Simplification of EIA and environmental permit processes and their stages.

The first five issues are clearly issues to be considered 'in EIA'. The last two could be categorized as issues 'after EIA' and 'outside EIA'.

In their general comments the respondents indicated that the quality of EIAs varies in Finland – some are good, some are not. One of the respondents mentioned that it was therefore quite difficult to answer the first part of the survey. However, in a few individual comments an overall judgement was given: EIA is managed well in Finland and clear improvement in its quality has occurred since its implementation.

## Discussion

The quality review of EISs was mainly based on searching for weaknesses from the reports – as recognition of deficiencies may generate efforts for improvement. But many issues relating to EIA can never be comprehensively examined; there are no clear end points to the level of detail required, and which impacts should be examined and how (see e.g. Lawrence, 2007). Despite existing (and used) guidelines and criteria, the judgement of the 'satisfactory level' is ultimately subjective. By lowering the ambition level it is easier to achieve good results and vice versa.

The findings reported in this paper showed that the EIA professionals judged the Finnish EISs to be

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**The findings reported in this paper showed that the EIA professionals judged the Finnish EISs to be generally good**

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generally good. The separate example sample of EISs reviewed was also considered to be at least satisfactory. Overall both the professional groups saw the strengths and weaknesses in EISs similarly (see the section on Findings). However, the consultants seemed to consider the quality to be better than the competent authorities did. Intuitively, this is reasonable, as ideally it is the quality controllers' task to be critical, and consultants should be able to defend their work.

In our study we did not take a critical stand to consider whether the current requirements are fit for purpose or if they could be improved. Rather we assumed that the concept of EIA is generally proved to be functional and also that there is a consensus on what an EIS should constitute (see e.g. Wathern, 1988; Glasson *et al.*, 2005). The findings reported did not reveal any 'new weaknesses' in EIA quality that have not been reported in earlier studies (e.g. in the Finnish context see Hilden *et al.*, 1997), but they show a perspective on the current Finnish practice.

EIA is a learning process and the quality and the adequacy evaluation of EIS largely depends on the knowledge and expertise of reviewers. The relevance of EIA can be increased in particular by training its practitioners and participants (Mostert, 1995; Lawrence, 2003; Barker and Wood, 1999). In the past, many suggestions have been made to improve the quality of both the EISs and their reviews. For example, use of multidisciplinary teams and experts for better understanding of complex issues are seen as needed (Pinho *et al.*, 2007; Androulidakis and Karakassis, 2006). Also, more support material such as project-specific guidance is suggested (Pinho *et al.*, 2007; Gray and Edwards-Jones, 2003), but at the same time there are warnings that 'too much guidance' may end up unused (Waldeck *et al.*, 2003; Ross *et al.*, 2006).

Throughout its history, attention has been paid to improving the quality of EIA in Finland. As mentioned in the section on Methodology, Hilden *et al.*'s EIS review criteria for the Finnish context was published in 1997 (Hilden *et al.*, 1997) and the Ministry of Environment has published support material on the Internet. This is especially for competent authorities but also for other practitioners (Ministry of Environment, 2008). Education for competent authorities has also been organized since 1991 and there have been projects to improve quality (Turtiainen, 2001). It could be assumed that this work has had an effect. The responses to the survey indicate that Finnish professionals generally do not think that it is a lack of professionals' know-how that causes problems in Finland. The basic requirements for EIA are well known and the 'good quality EIAs' show the capability of the system and practitioners.<sup>6</sup>

### *What could be improved?*

In earlier quality studies it has been acknowledged that often the descriptive parts of EISs seem to

perform better than those areas with more analytical demand (Lee *et al.*, 1999; Arts, 1998). In many different quality reviews performance on alternative considerations and mitigation have been considered as a weak area (in eight EU countries: Barker and Wood, 1999; in Britain: Gray and Edward-Jones, 2003; in South Africa: Sandham and Pretorius, 2008). These areas were also found to be the weakest ones in the quantitative part of our survey. In the EIS review the weakest review area was 'Mitigation measures and follow-up'. In the qualitative responses the professionals, in particular, brought out the difficulties with alternative considerations as reported in the second part of the section on Findings.

In Barker and Wood's (1999) study evaluation and identification of impacts were judged weak. Arts (1998) concluded that EIAs have often been criticized for failing their main purpose, impact prediction, and that predictions are usually vague. Here we did not try to evaluate if the predictions are accurate or successful, but based on the sample review it was concluded that often they are rather evasive. However, the professionals did not raise this issue near the top of their concerns and quantitatively this area did not perform poorly in the studies despite the recognized weaknesses.

Designing follow-up was also seen as poorly performed, but as a whole the issue was controversial. Some of the professionals suggested that follow-up of environmental impacts should be designed to occur later in planning, when the possible range for locations and other realization options is smaller.

Beattie (1995) said that in the real world it is not the accuracy of impact prediction but the prediction of potential impact(s) that matters. In other words, it is the projection of the future that is looked at when making decisions, but in practice testing the accuracy of this projection afterwards is not usually very relevant in respect to the 'main decision' concerning development, when the scenarios and the communication about them are thought to be more relevant.

The European Commission's Guidance (2001) strongly emphasizes the importance of evaluation and performance of communicative elements of an EIS (see Table 1). And though the Finnish EISs scored well on 'Presentational issues' in our studies, we feel that the importance of communication cannot be emphasized too much and that this is the main area still in need of improvement and constant attention. As Ross *et al.* (2006: 7) say, 'it is much easier to review a good EIS than a poor one'. Also in our sample review, the EISs that performed well in the review section 'Presentational issues' and had good non-technical summaries performed better in the other review sections.

## Notes

1. EIS can be described differently in different jurisdictions, for example sometimes they are called an EIA Report.

2. For example, wastes from trade, industry and construction.
3. This is not suggested in the EC guidance, but, for example, in Lee and Colley's review package.
4. At the beginning of the independent review each reviewer took 2–3 working days per statement. For the last statements the time spent had shortened to approximately 5 hours.
5. These included for example land use plans, national and regional waste management plans and different environmental protection programmes and treaties.
6. It should be noted that with the approach taken in the studies here the focus was mainly on contents of EISs and on a few issues related to the EIA process from the professionals' perspective. For example, one of the main objectives of EIA, the success of participation, was not evaluated in the study.

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## II

### **THE PRECAUTIONARY PRINCIPLE AND MANAGEMENT OF UNCERTAINTIES IN EIA - ANALYSIS OF WASTE INCINERATION CASES IN FINLAND**

by

Kimmo Jalava, Ismo Pölonen, Pekka Hokkanen & Markku Kuitunen 2013

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### The precautionary principle and management of uncertainties in EIAs - analysis of waste incineration cases in Finland

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## The precautionary principle and management of uncertainties in EIAs – analysis of waste incineration cases in Finland

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This article examines whether and how the practice of environmental impact assessments (EIAs) serves the idea of the precautionary principle. The article provides an empirical examination and description of how uncertainties and risks were dealt with in conclusive outputs of EIAs of chosen example cases of Finnish waste incineration projects. The analysis focuses on the time when several incineration projects were in the planning phase in Finland and the effects of this development were seen as being controversial. The findings of the analysis are evaluated against a legislative and theoretical framework. The challenges and strengths of the practice are identified. The article suggests that EIA as an environmental policy tool can promote the pursuit and the application of the precautionary principle. In addition, uncertainty analysis and risk communication in EIA could benefit from a shift towards more collaborative knowledge-making.

**Keywords:** the precautionary principle; environmental impact assessment; uncertainty; risk

### Introduction

The problem with risk is that it is an abstract concept that refers to the future. It is not entirely here at the present moment; instead, it depends on a multiplicity of choices, which are made at the present moment. It is never entirely concrete and it always leaves room for different interpretations and debate. Parties involved in these debates, such as scientists, experts, journalists, lay people, power companies, or social movements avail themselves to different resources in an attempt to establish their views over the views of others, but looking from sociological perspective they all take part in social construction of risk, which is an ongoing process full of inconsistencies and contradictions. (Litmanen 2001, p. 45)

The precautionary principle can be defined as environmental protection based on precaution, even where there is no clear evidence of harm or risk from an activity (Bell & McGillivray 2006). As a term, 'the precautionary principle' is familiar from legal contexts, and many different definitions in the literature exist (see e.g. Comest 2005). Instead of understanding the principle as a rule or code for action, Renn (2008) and Tannert et al. (2007) remind us that the principle should be considered as 'a state of mind' which helps decision-makers to be more sensitive to uncertainties, ambiguities and ignorance related to development. The principle does not provide clear guidance for practice, and therefore it is sometimes criticized for being administratively inconvenient (Calman & Smith 2001; Comest 2005). In fact, from a philosophical perspective, Sandin (2007) has concluded that there is no precautionary principle, in the sense of a principle that can help in solving problems, but that it can bring the decision, or decision horizon, into focus. Earlier, O'Riordan and Jordan (1995) suspected that the precautionary principle may not exert the influence it deserves because the concept does not show much coherence other than the spirit of challenging the past course of development.

The environmental impact assessment as an environmental policy tool reflects the precautionary principle in part because it seeks to identify and reduce the uncertainties and negative impacts associated with development (De Sadeleer 2002). It can also be argued that the environmental impact assessment (EIA) should encourage or demand a precautionary approach to development where needed. Within the range of environmental management tools, the EIA is ideally the procedure where uncertainty factors and possible environmental risks should receive constant attention (Lawrence 2003). The EIA system functions as a regulatory framework for actions that should aim to create a more detailed and analysed picture of the situations in which proposed development projects are planned. An EIA procedure is a framework for conducting the mixture of research and information, knowledge gathering and analysis to promote more environmentally friendly decisions. In fact, the EIA could be considered a form of 'post-normal science' (for more about the concept, see Ravetz 2004), which has an organized idea of its purposes but has no methodological discipline or possibility to provide testable answers to its ultimate questions. Overall, the EIA is a tool to reduce and/or make visible the risks related to a planned development project. All information gathered and presented in an EIA increases the knowledge about a project and its possible effects. In this way the information reduces the uncertainty surrounding the plans and its effects, and aids in risk evaluation. On the flip side, it has been noted that this reduction is often flawed in practice, leaving socio-interactive aspects of uncertainties unexamined (Duncan 2008, 2013) or, more generally, EIAs are seen to fall short in descriptions of uncertainties or their management altogether (Tennoy et al. 2006).

In this article we examine whether and how the EIA serves the idea of the precautionary principle. We believe

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that provision of information may lead to better decisions, but as is apparent later in the text, we believe that EIAs need space for constructivism and that focusing on decisions can be a pragmatic way to promote communication. We also understand that EIAs are inescapably concerned with power. Methodologically the main focus is on the empirical document analysis, which describes how risks and uncertainties in EIAs were dealt with in chosen example cases of Finnish EIA practice. The descriptive analysis is provided by looking at conclusive EIA outputs for waste incineration projects from the time when the development was seen as being controversial in Finland but when interest in incineration was on the increase.<sup>1</sup> The observations are mirrored against the legal and theoretical framework, which is intended to clarify the research philosophy adopted in this article. EIA implementation is not directly compared with some of its idealized models, but rather the implementation is considered as balancing between different rationales of efficiency and precaution. Legal and theoretical elements of the framework show the tensions between these rationalities. Our framework does not form direct criteria for comparison; instead the aim is to increase the understanding of the problems noted in practice (of the approach, see Snell & Cowell 2006). Then, based on the findings of the document analysis, the article discusses whether and how EIAs could have been used more extensively as a precautionary environmental policy tool in the example cases.

### The research framework

#### *Legislative demands: the precautionary principle in EU and Finnish EIA law*

The precautionary principle has had a growing role in environmental law and it has been incorporated into several international environmental conventions.<sup>2</sup> European Union law also reflects the approach in several ways. The precautionary principle is anchored in Article 191(2) of the Treaty on the Functioning of the European Union. In addition, the principle is explicitly or implicitly incorporated into various environmental directives. One of those is the EIA Directive,<sup>3</sup> which is implemented through the Act (468/1994) and Decree (713/2006) on Environmental Impact Assessment Procedure in Finland.

Both the EIA Directive and Finnish EIA legislation contain two concrete elements of the principle. Firstly, a precautionary approach is included in the screening requirements. Under EIA Directive (Art. 2(1)), the assessment must be carried out if the project is likely to have significant effects on the environment. The wording indicates that clear evidence of a significant impact is not needed to trigger an EIA. In addition, Article 4(3) of the directive requires that the national screening system must take into account the selection criteria set out in Annex III. These criteria contain, among others, 'the risk of accidents, having regard to particular substances or technologies'. Correspondingly, the Finnish EIA legislation requires that the project must be subject to an assessment if it is probable that it will have significant

environmental consequences (Section 4 of the EIA Act). The selection criteria for screening are also congruent with the directive (Section 7 of the EIA Decree and Pölonen 2007).

The precautionary approach is also included in the content requirements for the environmental impact statement (EIS). The information to be included in it is specified in Annex IV and Article 5(3) of the EIA Directive. The specification contains a description of the likely significant effects of the proposed project on the environment and an indication of any difficulties (technical deficiencies or lack of know-how) encountered by the developer in compiling the required information. The wording of the directive does not refer to consideration of uncertainties or risk assessment as such, and it indicates that the environmental impact statement need only cover the technical deficiencies or lack of know-how, which the developer has determined.

In addition, the Finnish legislation uses flexible terms in defining the content of an EIS. However, it goes further than the EIA Directive in terms of precaution. By virtue of Section 10 of the EIA Decree, an EIS must contain, on a sufficient scale, an estimate of the environmental impact, any deficiencies in the data used and the main uncertainty factors – including an assessment of the possibility of environmental accidents and their possible consequences.

It is noteworthy that the European Court of Justice has not had an active role in addressing the quality issues related to EIA documents (Commission 2003; Pölonen 2007; Commission 2010). In addition, in the Finnish system the courts have had a very limited independent role in forming the minimum requirements for EISs. The Finnish Supreme Administrative Court has given significant weight to the opinion of EIA authority while reviewing the adequacy of the environmental impact statements (Koivurova & Pölonen 2010).

As a result, the EIA administration plays a crucial role in defining how the uncertainties should be addressed in the EIA at the minimum in Finland. So far the legal duty to provide information related to uncertainty factors has not led to situations where an EIS would have been considered inadequate (see also Pölonen 2007). This indicates that the administration does not interpret the EIA legislation very rigorously in terms of risk assessment.

In all, as a point of departure for the analysis in this article, the EU legislation seems to represent rather a weak version of the precautionary principle. Although the Finnish EIA legislation goes further with its requirements, altogether the legislation leaves significantly room for the actual realization of precautionary considerations.

#### *Theoretical concepts: uncertainties and the idea of risk*

Failing et al. (2007) have noted that sound management of uncertainties in environmental risk management is a part of quality assurance. In the context of EIAs, Lawrence (2003, p. 427) has suggested that the issue of uncertainties is not well handled: 'the problem is a combination of confusion regarding the nature of uncertainty and the

related concepts of risk and health effects and ambivalence concerning the most appropriate approach for managing uncertainties in the EIA process'. In EIAs, countless uncertainties can be identified and it can be argued that there is no one right way of action in deciding how uncertainties and risks should be addressed in EIAs (Lawrence 2003). Thus, it seems that, although the EIA itself has been developed to provide a more organized way of addressing these, the practice is often criticized for not answering this call.<sup>4</sup>

Looking from perspectives of definitions and characteristics of risk and uncertainties, the reasons for these recognized difficulties and claims can be outlined. First, both risks and uncertainties are polymorphous concepts and their significance changes according to the frame and perspective taken. Second, although the idea of deliberation is understood to be the key to wider considerations of them, there is no absolute line to cross for general satisfaction. In holistic EIAs, frames vary and different ways of knowing come into play, and when there is no readily a common way or language to talk about them, even finding one is a challenge.

In order to clarify the concept of risk, Renn (2008) has stated that all concepts of risk feature the distinction between possible and chosen action. The risk refers to the future: the idea is that potential negative or positive consequences may occur and they are all associated with options for taking actions. This is also the core of the EIA: to describe alternatives for the planned development and to evaluate their sensibility. Eräsaari (1997) has noted that, rather than a definable concept, risk is an idea that is useful when we try to square the controversy between knowing and uncertainty. According to him, risk offers us a chance to talk about environmental problems, for example.

Risks are created and selected by people and are mental constructs. They can be approached from several perspectives, for example, the technical (probability), the economic (monetary value), the social (values) or the psychological (fears, willingness to take risks). However, risks are also real. The reality is that, for certain reasons, human lives may be lost, health impacts or other actual harm can be observed or the environment is damaged, for example. This reality and the experience of it are the basis for the thoughts that something, usually undesirable, might happen, for a perception of risk. (Renn 2008).

The perception of risk is both individual and collective. Litmanen (2001) suggests that risk perception is a social process where norms and rules govern social behaviour affecting individuals' judgements on what dangers are threatening, what risks are worth taking and how they are confronted. In addition, risks can be both material and abstract, and while there are no unanimous risk perceptions, they also tend to change over time. It is essential that, in order to discuss the acceptability of a risk, the threat it poses needs to be clarified for or constructed by those discussing it. It can also be argued that, in the EIA, a prerequisite for a meaningful risk discussion is the successful and convincing formulation of the threats.

However, the effects of threat formulation can also be unexpected. Eräsaari (1997), has declared that political

rhetoric of risk with its problem framings only reduces a large amount of uncertainties into a seemingly calming illusion. On the other hand, Litmanen (2001) reminds us that, by formulating and exposing a risk, we can also cause a monster capable of causing social unrest. These views encapsulate some pivotal problems EIAs face when their usefulness and functionality are considered. If the purpose is to manage risks in a holistic way, both reduction and imaginative speculation are needed, but their outcomes may not necessarily serve the purpose of 'being more sure of the consequences'. Moreover, it does not help the situation that the 'illusion' of risk cannot often be judged to be correct or incorrect.

A claim of risk is always associated with uncertainty. In fact, in an EIA, risk offers a perspective of significance to uncertainty analysis. Yoe (1996, p. 5) has defined that 'uncertainty describes any situation in which we are not absolutely sure'. However, in decision-making situations not all uncertainty counts. Failing et al. (2007) suggest that, in the deliberative decision context, it is only those uncertainties that are linked to actual choices that matter; others are usually of little use.

In order to evaluate whether an uncertainty matters, it must be recognized. Different typologies may help in identifying different uncertainty types and provide guidance on what type of tasks should be performed in evaluation. For example, De Jongh (1988) has suggested that the approach to dealing with uncertainties in EIA should consist of at least both the techno-scientific and the socio-scientific elements. The former should focus on identifying and reducing the defined uncertainties mainly through predictions, while the latter should focus more on the subjective elements of EIAs, such as relevance or significance. A more thorough attempt to create help for evaluation can be found from der Sluijs et al.'s (2003) guidance on uncertainty assessment and communication to be used in environmental assessments. In their concept they emphasize that, when selecting an appropriate approach, the purposes need to be considered. In their view, problem framing is essential and typologies and uncertainty matrixes are suggested to provide a common language for viewing uncertainty. The typology (modified by der Sluijs et al. 2003) that they suggest to be useful in uncertainty analysis consists of five dimensions for identification: (1) 'location' describes where uncertainties occur; (2) 'level' describes where uncertainty manifests itself on the spectrum between deterministic knowledge and total ignorance; (3) 'nature' describes whether uncertainty stems from knowledge imperfection or if it is a direct consequence of inherent variability; (4) 'qualification of knowledge base' refers to level underpinning and packing of the information (e.g. data, theories, models, methods, argumentation) and characterizes their reliability to a certain extent; and (5) 'value-ladenness of the choices' refers to the presence of the values and biases in the various choices involved.

Moreover, a slightly different approach can be drawn from Tannert et al. (2007), who have proposed a taxonomy of uncertainties and decisions, which can be used for analysing the nature of uncertainty and evaluating

responsibilities and the opportunities to reduce it. Their idea is that objective uncertainty can be divided into epistemological and ontological uncertainties and subjective uncertainty to moral and rule uncertainties. Epistemological uncertainty is uncertainty that can be reduced by research and is thus a moral responsibility. Ontological uncertainty is caused by stochastic features of situation, usually involving complex technical, biological and social systems. These are characterized by nonlinear behaviour, which makes it impossible to resolve uncertainties by reasoning or research. In these cases it is impossible to make entirely rational decisions, but past experience and probabilistic reasoning can provide some guidance on how the systems may react. The subjective uncertainties in part are often the real reasons behind societal anxiety or conflict. The moral uncertainty refers to situations where the decision-maker has a lack of applicable moral rules to follow and they have to follow more general moral rules. The rule uncertainty refers to situations where the decision-maker has to rely on intuition rather than knowledge or moral rules (Tannert et al. 2007).

From a practical point of view, one challenge is that it is difficult, if not impossible, to say what is precautionary enough for the avoidance of harmful environmental impacts in the future. Risk-taking and uncertainty-ignorant practice may be sufficient and may not lead to any harmful consequences. On the other hand, there is no guarantee that relevant uncertainties are recognized, no matter how heavy and thorough an analysis is conducted, and it may be that no project is feasible if the lack of certain proof is considered sufficient grounds for rejection (see e.g. Foster et al. 2000; Lawrence 2003). In an EIA, people have to balance these ends. While studying scoping in EIAs, Snell and Cowell (2006) have noted that the contestability of these rationales of efficiency and precaution problematizes any search for deficits in implementation; therefore, rather than trying to compare implementation with some of its idealized model, it may be more worthwhile to try to explain practice in terms of its tensions between these different rationales.

In addition, in order for an impact assessment instrument to be effective, recent thinking has emphasized the role of impact assessments (IAs) as a socio-political process rather than just an informative knowledge-based process (Cashmore et al. 2008; Jha-Thakur et al. 2009; Partidario & Sheate 2013). This notion largely draws on the conception that, in the context of planning, meaningful knowledge is seen as a collaborative construct. It is considered that IAs should provide opportunities for all interested stakeholders not only to have a voice, but also to have the chance to learn and create new knowledge. The linear knowledge transfer from those who know to those who do not has been found to be problematic in IAs because, when it comes to the future, nobody knows for sure.<sup>5</sup> When views are diverse and different things are seen as important, nobody should take the power and stance to determine what counts alone.

In our view, the desire for more collaborative IA processes does not mean that traditional expert-driven

research is not seen as necessary, but a different approach to how information is gathered and evaluated is. The traditional way in EIAs, where knowledge is produced to be used by others, often ends up in criticism. This is also typical of traditional scientific research – argumentation holds until weaknesses are found. In the realm of EIAs, weaknesses are rather easy to point out, but whereas in science a weakness usually means that findings do not hold, in EIA the effect is not necessarily the same. For example, with regard to a critical voice, it is often suggested that the concept of uncertainty is weakly communicated in EIAs (Lawrence 2003; Tennoy et al. 2006) and sometimes a worry is expressed that decision-makers and other stakeholders in EIAs are often not appropriately made aware of inherent uncertainty that is unavoidable in the process (Tennoy et al. 2006). This worry is reasonable, but the paradox of balancing and the nature of the concept usually prevent us from saying how things should be done or even whether the lack of quality is significant.

Therefore, the wrong type of criticism does not necessarily improve outcomes. When a requirement for action is blurred, it can be more fruitful to concentrate on the positive aspects of the work of others than on the negative. Within IA, Sheate and Partidario (2010) and Partidario and Sheate (2013) use the term ‘knowledge brokerage’ to describe the approaches they believe are needed in assessments so that they would serve their intended purposes better. In general, they believe in different forms of participant engagement, positive planning and mutual learning, and remind us that we should also look beyond decision-making events – IA processes should be seen more as possibilities for learning than they now are. For example, Duncan (2013) has recently suggested that IAs need institutional spaces for uncertainty disclosure and that facilitating negotiation and deliberation could engender greater legitimacy and credibility for IA outcomes.

In this article the conceptualization for the risks and uncertainties functions as a research tool in recognition of the handling of uncertainty and risk aspects in the descriptive analysis of the conclusive outputs of the EIA cases. The legal and theoretical elements of the framework are summarized in Figure 1.

### **Analysis of EIA practice from the precautionary perspective**

#### ***EIS review in the Finnish EIA system***

In the Finnish EIA system, quality control for EISs is, in the first instance, a duty of the competent authority (Centres for Economic Development, Transport and the Environment). An EIS is the report where the developer collects the results of the assessment of a project’s impacts. At the end of the EIA procedure, the centre, acting as a competent authority, reviews the adequacy and completeness of the EIS and gives its statement on the assessment. A competent authority’s statement is the main output of the EIA process where the quality of an EIS is

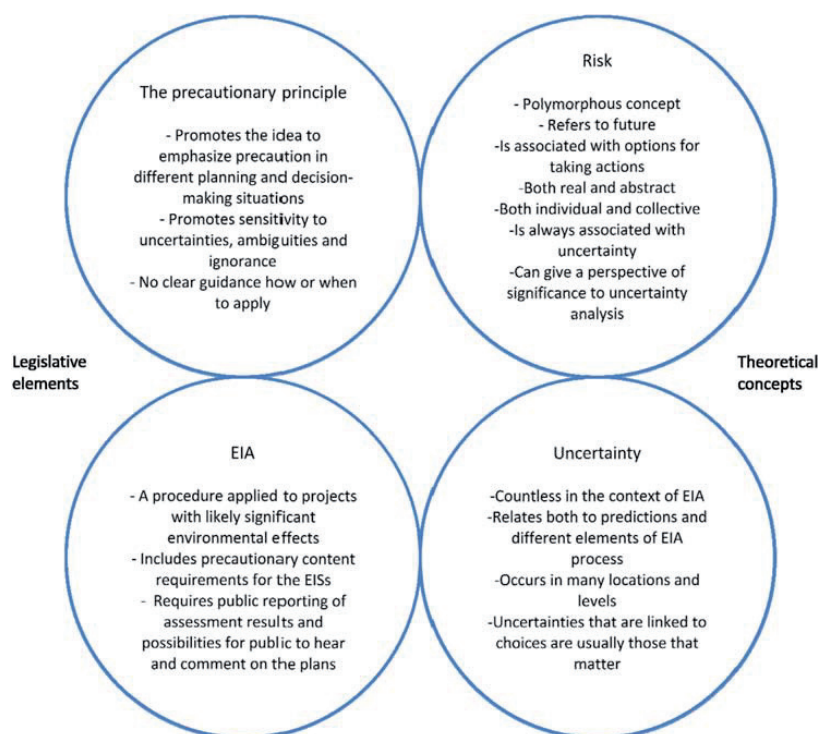


Figure 1. The research framework.

considered. Before the review, a draft EIS is often submitted to the competent authority for unofficial comment.

The public (interested citizens and organizations), municipalities and other authorities also take part in the quality control of the EIS. They have an opportunity to make comments on the EIS and the competent authority must take these comments into account while considering the adequacy of the EIS. The EIA as an environmental policy tool reflects the recognition that information gathered and grounded with rational methods is not necessarily a sufficient basis for planning and for the decision-makers. One of the functions of public participation in EIAs is to broaden the knowledge base for planning and decision-making. Participation emphasizes the role of local knowledge and traditional ecological knowledge in the planning processes. It helps to ensure that different perspectives on planned actions and their potential impacts are accounted for. Ideally, participation should also contribute to the identification and, if possible, reduction of uncertainties associated with development. Consequently, it can be argued that precautionary thinking is strongly included in the concept of participation.

Usually, competent authorities attach all or most of the received opinions and comments to their statement. Courts have placed significant weight on the opinion of the competent authority when reviewing the adequacy of environmental impact statements. The case law of the

Supreme Administrative Court indicates that it views the competent authority as the primary controller of the quality of EIAs (Pölonen et al. 2011).

The assessment procedure is completed when the competent authority delivers the EIS and its own statement and the other opinions on the EIS to the developer. The EIA is linked to the permit procedures, so that no consent according to any act can be granted unless the EIA has been carried out. The linkage between the EIA and decision-making is also strengthened by a requirement of the EIA act that relevant information gathered during the EIA process must be taken into consideration in the permit procedure.

As a whole, the competent authorities play a central role in quality control of EISs and in guiding the EIA procedure in Finland (see also Hokkanen & Jantunen 2012). Ideally, the procedure and the review system should take different perspectives of assessment into account and allow communication between different stakeholders. In the EIA guidance<sup>6</sup> the authorities are encouraged to pay attention to and demand that developers clarify uncertainty aspects of planned actions.

#### **Background for the cases: role of waste incineration in EU and Finnish waste policy**

Waste management issues have played an important role in European Union environmental policy from its very beginning (see e.g. the first environmental action



Table 1. The waste hierarchy in EU waste policy (European Commission 2007).

1	Prevent waste in the first place	Best option
2	Reuse the product or components	
3	Recycle the material	
4	Recover the energy (waste incineration)	
5	Dispose of the product (landfills)	Worst option

programme, 1973–1977). European waste policy is largely based on a ‘waste hierarchy’ (Table 1), which was clarified in the revised Waste Directive 2008/98/EC. According to this hierarchy, the prevention of the generation of waste is the first priority, followed by the preparing for reuse and recovery of waste, and finally, by the safe disposal of waste (Article 4(1) of the Waste Directive 2008/98/EC). Priority amongst recovery operations should be given to re-cycling<sup>7</sup> over other recovery operations such as energy recovery.<sup>8</sup> This is based on the argument that material recovery has a greater effect on waste prevention than energy recovery (COM(96) 399 final; European Commission 2007).<sup>9</sup> However, it should be noted that the hierarchy of recovery methods should be applied with flexibility, taking into account the options that deliver the best overall environmental outcome (see Article 4(2) of the Waste Directive).

The waste hierarchy is implemented and promoted through several legal provisions which have direct and indirect effects on the role of incineration in EU waste policy. Among others, the Landfill Directive (99/31/EC) sets limits on landfilling and hence creates a need for waste prevention, reuse and recovery. It seems to have significant implications for the role of incineration, because it introduces substantial restrictions on the amount of biodegradable waste going to landfill. Article 5 of the directive requires that the waste strategies of EU Member States must ensure that the amount of landfill-disposed biodegradable waste decreases in weight to 75% from 1995 levels by 2006, to 50% by 2009 and then to 35% by 2016. In Finland, the recent waste policy seems to be directed by the assumption that these explicit demands are rather difficult to achieve without a significant increase in waste incineration levels (Koskinen 2006; Ministry of Environment 2007). This has raised the question of whether compliance with the Landfill Directive, through a considerable increase in waste incineration, leads to waste management contrary to the waste hierarchy. It is perhaps not surprising that one of the main arguments against energy recovery as a major waste management option is the argument that the existence of incinerators discourages waste prevention and recycling (see e.g. Suomen luonnonsuojeluliitto 2008).

In addition to the implementation of the Landfill Directive, the increasing interest in waste incineration in Finland can be explained by the low number of existing incineration plants. In the early 2000s, there was only one plant for mixed municipal waste in use in Finland, whereas similar plants were quite common in other European countries at the time (Meloni 2004; Koskinen 2006; Cewep 2007). One of the reasons for the situation was the

former legislation on waste incineration (which set strict environmental requirements on incineration plants if the waste fuel exceeded 30% of the energy fed to the boiler). Because of the legislation, preference was given to co-incineration plants instead of plants for mixed municipal waste (Koskinen 2006). However, the situation has seen some change, and in 2010 there were three plants for mixed municipal waste, 10 co-incineration plants and one plant for hazardous waste in use in the country (Ministry of Environment 2010).

A new national waste strategy for Finland was accepted in spring 2008. According to the strategy, energy recovery from waste will be increased. Waste incineration is considered an acceptable management tool as long as recyclable materials are not incinerated (Ministry of Environment 2008). Regional waste and land use planning, including SEAs, project-specific EIAs and environmental permits, will solidify the broad frameworks in the national waste strategy. These processes will play a vital role in the future of waste incineration, waste prevention, reuse and recycling.

The empirical analysis in this article focuses on the early 2000s, when interest in waste incineration as a waste management option was on the increase in Finland. At the time, different stakeholders saw the project type and its role amongst other management options as controversial, and discussions about its effects often resulted in conflicting views; the projects were seen as both harmful and beneficial (Meloni 2004; Koskinen 2006; Saarikoski 2006). Saarikoski (2006) has suggested that opponents and proponents of waste incineration had a fundamental difference in focus, the former wanting to address the question of waste minimization, with the latter already focused on incineration as an appropriate waste management option. As such, the situation could be considered a classic example of a situation where the whole justification of a project is questioned. In these types of cases, EIAs often face criticism of and dissatisfaction with their focus, which by definition is at project-level. In addition, Jalava et al. (2010) evaluated the quality of these projects’ EIAs that were completed between 2001 and 2005. In their study they used the European Commission’s guidance and review checklist (European Commission 2001) to evaluate the fulfilment of the content requirements of the projects’ EISs and also the quality of the contents. From that viewpoint, they deemed the outputs to be more positive as regards quality than negative. The EISs showed that project developers had considered the required contents, but from a critical perspective it was noted that the EISs proved to be more descriptive than analytical. This relative finding, however, did not generate many practically useful conclusions. In general, the study concluded that outputs and speculation about impacts could have been improved through better communication amongst stakeholders. In the following sub-sections, these example cases are looked at from a slightly different perspective – the empirical examination aims to describe how risk and uncertainty issues were presented in these EIA processes’ conclusive outputs in order to give effect to the precautionary principle. The research material consists of

15 environmental impact statements and competent authorities' statements about the EISs.

**Consideration of uncertainties and risks presented by the developers in EISs**

It appeared that the developers and the consultants had shown recognition to both uncertainties and risks in the studied EISs. 'Uncertainties' and 'risks' as concepts were understood and presented separately by the developers and were not mixed together to confuse readers. However, we did not find any clear evidence of extensive uncertainty analysis or risk analysis in any of the statements. Instead, the developers described examples of risks related to proposals as well as different uncertainty forms and sources that may affect the results of the assessment.

What was common for the risk descriptions was that they were described as situations with something (possibly) happening with possible or probable negative consequences. The risk descriptions were qualitative and mostly there were two types of risks explained. First, a distinct group of risk descriptions focused on different incidents

that may occur during the construction phase or operation phase of a plant. For example, accidents such as fires, chemical leaks and methane explosions were mentioned as being possible. The consequences of such events were usually not specifically outlined. Instead, some prevention measures against these situations were listed, including, for instance, alarm systems, staff training, technical safety solutions and surveillance guidance.

The second type of risks found to be explained were the risks related to the predicted impacts. These explanations showed that different types of environmental risks were considered. For example, threats to scenery, air quality, surface and ground water, species on site and human health were evaluated. Typically the air emissions were described as being the most significant cause for probable impacts and it was usually predicted with calculations that the emissions for different components will remain below boundary limits and therefore they will not cause harm. If these impacts were described, they tended to be mentioned at a general level – for instance, by describing how emission components may cause health problems to humans.

Table 2. Uncertainty considerations related to certain topics presented by the developers in the examined EISs.

		Uncertainty considerations														
		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15														
Uncertainties were considered insignificant in relation to the EIA results																
Uncertainty was disclosed as existing but it was not seen to affect the EIA results severely																
Significant uncertainty was recognised causing major difficulties to evaluation of consequences																
Information about:	EIS no:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Overall conclusions																
Effects during construction phase																
Description of the environment																
The outlook of the power plant																
The quality and amounts of waste fuels to be used																
Definition of the area where the waste is generated																
Effects of recycling and reuse																
Use of chemicals																
Effects of fuel production																
Effects on nature																
Effects on ground water																
Effects on surface water																
Effects of noise																
Emissions to air																
The choice of gas cleaning systems																
Odours																
Effects of transport																
Social impacts																
Attitudes towards project																
Health impacts																
Future land use in proximity																
Effects on local economy																
Effects on landscape																
Effects and/or use of ash																

Altogether, these findings indicate that the risks were explained in the EISs mainly using the same expressions as used in the content requirements of the legislation. At the same time less effort was accorded to handling of other risk types or to considerations with changing perspectives.

The common way developers described uncertainties was to explain that assessment always includes assumptions and generalizations, and it was usually noted that uncertainty exists in EIAs at many levels. It was also acknowledged that a lack of data and information can cause uncertainty and inaccuracy in assessment results.

In addition, in all of the EISs, the significance of uncertainties related to specific evaluated impacts was considered. In practice, this meant that an opinion about the reliability of information presented was announced. In 14 statements an overall statement was given: despite the fact that it was considered, uncertainty does not significantly affect the general EIA conclusions. Table 2 represents our interpretation of those instances where a developer clearly expressed that a certain issue had been considered in relation to some form of uncertainty. The table shows that in only four of the EISs (numbers 1, 2, 3 and 7) were these considerations explicitly explained under the heading 'uncertainty' for more than three topics (in addition to the main conclusion).

In many cases choice-dependent uncertainty was recognized, but it was not seen to affect the evaluation or its results significantly (see the dark grey boxes in Table 2). Typically this uncertainty was seen to disappear after a choice was made. For example, in some instances it was mentioned that, owing to an early planning phase, the outlook and the size of a power plant building could not be described exactly. In some cases it was announced that the choice of the gas cleaning system would have an effect on the cleaning results.

In two statements uncertainty related to a certain evaluation topic was said to have affected the evaluation in a way in which a proper assessment considering the issue was not possible (see the black boxes in Table 2). In one case it was acknowledged that the health impacts of power lines were not properly evaluated because there was no clear evidence of their effects. On a general level this issue was also referred to in other statements. In the second case it was recognized that the effects of ash could not be properly evaluated because the amounts and qualities of ash being generated were unclear.

Regarding the consequences of the whole project and despite recognized uncertainties, the main conclusion expressed in every EIS examined was that the proposed project is feasible. However, in two different projects, one alternative in both was deemed unfeasible. In the first unfeasible case, the planned location was deemed inappropriate owing to public resistance and cultural values. In the second case the alternative was a coal plant, which attracted more public opposition than the main alternative – a bio fuel plant (wood, peat and construction waste as fuel). Thus, it could be argued that in these cases the conclusions were affected by the formulated threats: the first option that was not recommended posed a risk to landscape and the second one presumably to climate.

The developers did not question the feasibility of the proposed project because of strategic reasons (or because of

uncertainty or risks related to strategic choices) in any of the EISs – the projects were considered to be in accordance with both regional and national waste plans in 14 statements. In one statement no clear position was taken.

In all, combining the findings from all the EISs, the developers' uncertainty considerations covered a variety of uncertainty aspects. The significance of uncertainty aspects was also evaluated. However, there were remarkable differences in the extent of presentation of uncertainty considerations between the different statements.

### *Consideration of uncertainties and risks by the public*

The competent authorities considered the EISs to be legally sufficient, although in four statements they acknowledged that some extra studies would be required later in the planning process. Public comments presented in the competent authorities' statements show that supporters of projects had usually not spoken out, but anti-project sentiments were common – including frequent questioning of suggested project locations. There were a total of 174 public opinions summarized by competent authorities in their 15 statements. The issue of uncertainties was often dealt with in comments, and notions about insufficient data and reliability problems with assessments were widely addressed in the opinions.

Citizens were mostly worried about incineration emissions to air and water. It was noticeable that the public often expressed doubts about emission calculations and estimations. People questioned the information presented to them in terms of reliability and bias. Another common theme was doubts about the effects of transport during both the construction and operation phases.

In addition, a concern about the impartiality of EIA practitioners, and indeed those questioning the idea and principles of waste incineration, was regularly expressed. The former underlined the distrust between pro-project practitioners and others, usually by criticizing the technology-oriented thinking and by questioning the trustworthiness of the presented information. The latter type of opinions reflected criticism that citizens had towards waste management solutions; incineration was seen as the wrong option, and not as a potential energy or waste management solution. This indicates that those who criticized this issue also criticized the planning by saying that the question should have been solved when planning the strategy.

The competent authorities had taken into account the opinions of citizens in their statements, although often only by listing them. There was no evidence of extensive analysis of public opinions and concerns. However, the issues raised during participation were given weight in a few of the final statements. The inference of public participation can be seen in two ways. First, the competent authorities brought out some shortcomings in the EISs based on opinions, and second, they acknowledged that for some projects extra studies on impacts would be needed in later planning. As a whole, the public opinion took stands

both by questioning objective features of assessment and by questioning the problem frame as presented in the EISs. The public participation also seemed to bring to light subjective uncertainty aspects relating, for example, to fears and anxiety experienced in affected communities both individually and collectively.

### Concluding remarks

In this article, the legal requirements functioned as a point of departure for analysing the EIA practice from the precautionary perspective. The EU legislation on environmental impact assessment represents a rather weak version of the precautionary principle. The content requirements for environmental impact statements do not refer to consideration of uncertainties and risk assessment as such. The Finnish EIA legislation goes further by requiring information related to uncertainty factors, but it leaves the question of how uncertainty analysis should be conducted open to a significant extent.

Based on the document analysis of this article, it can be noted that the developers had encountered risk and uncertainty aspects in all the environmental impact statements and that the competent authorities considered the outputs as being legally sufficient. The public opinions summarized by the competent authorities clearly broadened the scope of issues and approaches. It was apparent that opposing perspectives on waste incineration and concerns about impact assessments were not excluded from the documents. The reliability and trustfulness of expert opinions were questioned and this was reported. According to some opinions, the framing of developers' scrutiny was also challenged. In this way, the public participation seemed to bring new risk and uncertainty aspects into the view. In some cases these concerns were also reflected in the competent authorities' statements. However, the public opinions and questions were usually not answered in the documents.

Thus, it could be argued that the stakeholders in these EIAs dealt with the concepts of risk and uncertainty, but the issues could have been more thoroughly discussed if emphasis on precaution was preferred with probable costs to scheduled efficiency. At least two suggestions can be made based on this study. First, more efforts could have been used in the analyses presented in the EISs – the described approaches used more extensively would have improved the overall quality of considerations. In particular, it seems that in these cases the developers and the consultants could have had a possibility to learn more from each other between the cases. Particular uncertainty and risk aspects were recognized in some of the projects, while in others the same aspects were left unaddressed, although apparently they would have been applicable. Second, more decision-focused communication would have probably improved the quality of the EIA outputs. It can be assumed that one initial step towards improving the uncertainty and risk analysis in these cases could have been for the developers or competent authorities to respond more precisely to the publicly declared concerns.

Moreover, a collaborative collection of different risk aspects and estimates of uncertainties related to them could offer valuable information for decision-makers. In the end, this is what the EIA is about – projections about the future and an evaluation of the effects of different choices on them. It does not mean that collaboration would need to find an agreement; rather, no one is overridden. In these cases and if simplified a little, the developers showed and believed with some certainty that their projects would not cause harm. In their opinion the minor risks they cause are worth taking. Their opinion was questioned in terms of reliability, and had they explained or responded to concerns or engaged with other stakeholders more thoroughly, they would have probably ended up with a more profound analysis and gained some extra respect. On the other hand, other stakeholders offered the view that, from a wider perspective, the cumulative effects of the projects may be, in an obviously uncertain worst case scenario, catastrophic if the whole waste management policy fails. Although it could be argued that this handling is beyond the scope of EIAs, from the uncertainty and risk perspective it is not – especially as it appeared that discussions related to risk at the strategic level were buzzing. In these types of situations, EIA could offer a valuable opportunity to create a knowledge base for strategic level discussions beyond a single project decision.

In all, according to our research framework, it was assumed that risk and uncertainty analysis are challenging owing to the fact that both concepts are polymorphous and have elements that escape definitions. Anyhow, it can be concluded that in these cases EIAs showed the potential to give effect to these considerations and expressed the spirit of the precautionary principle. We support Duncan's (2013) notion that uncertainty analysis could benefit from a shift towards collaborative knowledge-making. In practice, this could be contrary to the political climate, which seeks to speed up planning processes, but we believe that both during the processes and in retrospect, EIAs could be used more effectively for learning and understanding what kind of concerns or hopes a certain development may generate. Like Ravetz (2004) and recently Partidario and Sheate (2013), we also believe that respectful and positive attitudes towards different ways of knowing and not knowing may be a way forward in improving the practice of impact assessments.

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## Notes

1. At the same time, in many other European countries waste incineration has been quite common. The context and background are described in more detail in the section 'Background for the cases: role of waste incineration in EU and Finnish waste policy'.
2. See e.g. Framework Convention on Climate Change (1992), Convention on Biological Diversity (1992) and Protocol on Biosafety (2000).
3. Council Directive on the assessment of the effects of certain public and private projects on the environment 2011/92/EU. The European Commission has recently introduced a proposal (COM(2012) 628 final) for substantially amending the EIA Directive. The proposal has relevance to the precautionary principle, especially in the form of adapting the EIA to challenges of climate change and disaster risks.
4. In the Finnish setting, for example, a recent survey showed that the EIA professionals named the issue as one of the general challenges still needing more attention in EIAs (Jalava et al. 2010).
5. More strongly put, Cashmore et al. (2008) have suggested that environmental assessments do not actually operate within a conventional model of causation where analysis of consequences and publication of results should lead to informed consents and design decisions.
6. For example, the European Commission's Guidance on EIA (European Commission 2001) and Finnish guidance for EIA review by Hilden et al. (1997) and EIA support material published on the Internet by the Ministry of Environment (2011).
7. Recycling refers to the recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. Article 3.117 of the Waste Directive.
8. See also the preamble (point 29) of the Waste Directive, which points out that the Member States 'should support the use of recyclates, such as recovered paper, in line with the waste hierarchy and with the aim of a recycling society, and should not support the landfilling or incineration of such recyclates whenever possible.'
9. See also website of the European Commission (<http://ec.europa.eu/environment/waste/>).

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### **III**

## **TESTING THE USABILITY OF RAPID IMPACT ASSESSMENT MATRIX (RIAM) -METHOD IN COMPARISON OF EIA AND SEA RESULTS**

by

Markku Kuitunen, Kimmo Jalava & Kimmo Hirvonen 2008

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## Testing the usability of the Rapid Impact Assessment Matrix (RIAM) method for comparison of EIA and SEA results

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### Abstract

This study examines how the results of Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) could be compared using the Rapid Impact Assessment Matrix (RIAM) method.

There are many tools and techniques that have been developed for use in impact assessment processes, including scoping, checklists, matrices, qualitative and quantitative models, literature reviews, and decision-support systems. While impact assessment processes have become more technically complicated, it is recognized that approaches including simpler applications of available tools and techniques are also appropriate.

The Rapid Impact Assessment Matrix (RIAM) is a tool for organizing, analysing and presenting the results of a holistic EIA. RIAM was originally developed to compare the impact of alternative procedures in a single project. In this study, we used RIAM to compare the environmental and social impact of different projects, plans and programs realized within the same geographical area.

RIAM scoring is based on five separate criteria. The RIAM criteria were applied to the impact that was considered to be the most significant in the evaluated cases, and scores were given both on environmental and social impact. Our results revealed that the RIAM method could be used for comparison and ranking of separate and distinct projects, plans, programs and policies, based on their negative or positive impact.

Our data included 142 cases from the area of Central Finland that is covered by the Regional Council of Central Finland. This sample consisted of various types of projects, ranging from road construction to education programs that applied for EU funding. © 2007 Elsevier Inc. All rights reserved.

### 1. Introduction

One of the purposes of Environmental Impact Assessment (EIA) is in advance to identify and evaluate the important environmental consequences of proposed projects. As a concept of EIA, the impact should be documented and predicted as well in advance as possible (e.g. Canter, 1996; Morris and Therivel, 2004). EIA is

also a process that provides information about the proposal to decision makers (Ridgway, 2005). Both of these targets benefit if decent EIA methodology is used to present and organize the high number of variables that an assessment process may produce. It is especially important to understand how distinctly the separate variables have impact on the environment, depending on their nature as either natural or human-induced, extensive or small-scale, cumulative or non-cumulative, local and national planning or generally essential or inessential.

The early emphasis on natural environmental consequences of capital projects has since been enlarged to

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encompass not only the ecological, but also the social, health, and economic effects of projects, policies, programs, plans, technologies or activities. The challenge thus presented of organizing and comparing the essential results has increased continuously. Even before the introduction of EIA, the concern of the developed world for the environmental effects of industrialization pushed the environmental and developmental issues together (Bruhn-Tysk and Eklund, 2002). The World Commission on Environment and Development, also known as the Bruntland Report, brought together environmental and developmental aspects that emphasize sustainable development and the integration of environmental aspects with economic and social aspects.

During its thirty-six year existence, EIA has, as a result, developed from a tool emphasizing ecological damage to a broad instrument, whose context in environmental policy combines a comprehensive number of topics ranging from nature conservation to diverse social and economic issues. At the same time, legislative and procedural improvements have occurred rapidly as the original conceptual foundation of EIA has received limited attention (Lawrence, 1997a). At the global level, environmental policy is experiencing a general move away from a protection of current environmental resources towards a broader promotion of sustainability (Morris and Therivel, 2004). One result of this development is a policy instrument entitled Strategic Environmental Assessment (SEA), which is a tool for impact assessment of the environmental consequences of certain plans and programs, for example in the EU (see Directive, 2001/42/EC).

The importance of theory building in the area of EIA has been brought up many times (see e.g. Lawrence, 1994, 1997a,b; Cashmore, 2003; Cashmore et al., 2004). Lawrence (1997a) formulates the problem of EIA theory as a result of three decades of practical development from “the state of the art” situation to the present situation that is much better than previously. Even so, it is unrealistic to expect EIA to act as a tool for sustainable development, unless its role within this concept has been comprehensively considered and incorporated into its theoretical foundations (Cashmore et al., 2004).

Though, the idea of sustainability is included in the principles of European Union’s regional development trust. It is demanded that the projects or plans or programs funded by the trust must support sustainable development (EU-tukien hakuopas, 2001). In Finland, the assurance that this principle is followed is applied in different ways depending on the regional authority. In

Central Finland, the task is given to the official EIA committee of the Regional Council. These small-scale EIAs and SEAs are not required by Finnish EIA or SEA legislation other than that the proponents must be aware of the consequences of their actions (the so called “knowledge requirement”, see Finnish EIA Act, Section 25 and Finnish SEA Act, Section 3). Normally, no EIA or SEA is carried out for these kinds of actions, and in this manner, the EU’s regional development trust funded projects, plans and programs are the exception to the rule.

The European Union’s intention is to improve economic and social cohesion within its area.

The Eastern Finland Objective One Program and Western Finland Objective Two Program are part of this regional policy, which is carried out with the aim of organizing cohesion funding. General provisions for the structural funds are explained in Council Regulation (EC) No. 1260/99. The Objective One Program is defined as a funding program directed at stimulating underdeveloped regions to improve their development and structural adaptation. The Objective One Program is concerned with regions with under 75% of the average gross national product per capita of the European Community. In Finland and Austria, the criteria also include sparsely populated areas. The Cohesion Funding Organizations of such areas include the European Regional Development Fund (ERDF), European Social Fund (ESF), European Agricultural Guidance and Guarantee Fund (EAGGF), and the Financial Instrument for Fisheries Guidance (FIFG) (Euroopan komissio, 1999).

When a proponent is applying for funding from the Regional Council of Central Finland for a proposed project, the application has to include an evaluation of its possible environmental consequences. The evaluation is presented in a single-page form. After that, the official EIA team of the Central Finland Region presents its statement on the case, its probable environmental effect, and its suitability for funding. In principle, funding will not be approved if the proposal is expected to cause negative impact, either on the environment or on human beings.

## 2. The aims of the study

There are many tools and techniques that have been developed for use in impact assessment processes, including scoping, checklists, matrices, qualitative and quantitative models, literature reviews, and decision-support systems, most of them developed in practice (see e.g. Canter, 1996; Morris and Therivel, 2004;

Munier, 2004). While the EIA process has become more technically complicated, it is recognized that approaches including simpler applications of available tools and techniques are also appropriate (Canter, 1996).

When planning this study, the aim was to test an easy-to-use method that could be applied to interpreting the results of both EIA and SEA, so that assessment results could be compared. Though EIA and SEA differ in many ways (see e.g. Munier, 2004, 11, Glasson et al., 1994), both procedures have a similar purpose when considering the clarification and presentation of possible environmental impact of the suggested or planned actions.

In the area of multi-criteria analysis, the Rapid Impact Assessment Matrix (RIAM) is a tool to organize, analyse and present the results of a holistic environmental impact assessment (Pastakia and Jensen, 1998). Pastakia's and Jensen's (1998) RIAM method was originally developed for comparison of alternatives within one project, but in this study we chose RIAM for detailed examination and discussion because of its experts: it is simple and its evaluation criteria are general. Based on those characteristics, the assumption was that RIAM could also be used and applied in classifying different projects, plans and programs by their different environmental and social impact.

Altogether, our data contained 142 separate projects, plans and programs for which funding was applied from the Objective Programs in the area of Central Finland. The sample consisted of various types of cases including technical construction, development, educational and cultural proposals (Table 1). The aim was to test how the

method could be applied to analyse, comprehend and compare the cases and whether RIAM would be useful in presenting the results of the environmental impact statements given by the official EIA team of the Regional Council of Central Finland.

### 3. Implementation and method

The basic principle of RIAM is that characteristics of impact form the basis for scoring (Pastakia, 1998; Pastakia and Jensen, 1998). In this test, the assumption was that the EIA team's environmental impact statements would clarify whether a certain case has mainly negative or positive environmental impact, according to which it could be categorized as an environmentally friendly or an environmentally harmful project, plan or program. Thus the cases were classified according to the impact that was considered to have the most significance.

In the original RIAM, impact is divided into four categories, 1) physical and chemical, 2) biological and ecological, 3) social and cultural, and 4) economic impact. This helps to identify impact. As our aim was to categorize the cases according to their environmental and social impact, we classified the first two groups as environmental impact, and the latter two groups as social impact.

Any assessment of the significance of impact is subjective, which means that in spite of the formula and guidelines, the assessment may produce varying results depending on the assessor. To ensure that more than one viewpoint was considered during the evaluation process, an expert panel was formed to perform the evaluation of the statements. The expert panel consisted of three persons (all the authors).

The panel met ten times and discussed all the cases systematically for a total time of approximately 56 h. Before the meetings, each member of the panel had acquainted himself with the general idea of the method, the more detailed criteria and the information available on each case. Case information included 1) the stakeholders' application for the funding, 2) the funding decision for the case, and 3) the statement of the Central Finland official EIA team that was issued after their assessment.

The expert panel scoring was given in the same order as the original official assessments had been performed. During the first meeting, the panel assessed 20 cases in an eight-hour period. This amount of time was needed to discuss the criteria and to monitor equal assessment of each case. The amount of time per case was reduced when there appeared to be similarities between cases.

Table 1  
The branch of business and the mean funding they received (35.2% was funded in all)

	$N_1$	$N_2$	Funded	Funding (K Fmk)	
				Mean	SD
1. Energy	6	4	0	–	–
2. Agriculture, forestry or fishing	24	20	7	404.5	6.7
3. Environmental management	8	7	3	425.0	3.5
4. Tourism and leisure time	33	23	11	451.7	5.0
5. Water treatment	10	10	6	2 462.5	14.9
6. Road construction	13	12	4	3 713.3	10.1
7. Development of countryside	10	9	6	172.0	1.6
8. Development of populated areas	19	18	6	3243.1	41.6
9. Other projects	19	14	4	199.1	2.1
Together	142	117	50	1394.4	22.7

$N_1$  refers to the total number of the projects,  $N_2$  refers to the number of assessed projects. SD stands for standard deviation.

**4. Assessment criteria**

The scoring followed RIAM’s original five criteria, as presented by Pastakia and Jensen (1998). However, with the aim of repetitive assessment, we specified the evaluation order for each criterion to match our test. According to these orders, the assessment and usage of that method is also a hopeful possibility in future studies. The basic formula for the RIAM is (Pastakia and Jensen, 1998):

$$(A1) * (A2) = (AT)$$

$$(B1) + (B2) + (B3) = (BT)$$

$$(AT) * (BT) = ES$$

where

A1 is the importance of impact.

This sector was assessed in relation to the coverage of the impacted area. For example especially in the context of social impact, regional importance may be larger than that of environmental impact.

Scores	Description
4	Important to national/international interests. Here the impact coverage area was understood as being almost the whole of Finland or a larger area, or that the impact target was seen as being nationally or internationally important (e.g. because of its rarity in the European Union).
3	Important regionally. Here the coverage area was a single region or several regions. For example, Central Finland with its immediate surroundings.
2	Important to areas immediately outside the local context. Here the coverage area was larger than that of point formed impact. Usually, the area included more than one municipality. In Central Finland, there are 30 municipalities altogether.
1	Important only in the local context. Here the impact was only point formed.
0	No geographical or other recognized importance.

**A2. Magnitude of change and effect.**

In this sector, the amount of impact was determined as the extent of change caused by the project. Assessment of this sector was based mainly on the statement of the EIA team of the regional council.

Scores	Description
+3	Major positive benefit
+2	Significant improvement in status quo
+1	Improvement in status quo
0	No change in status quo
-1	Negative change to status quo
-2	Significant negative disadvantage or change
-3	Major disadvantage or change

Assessment of the direction of impact depends on from whose point of view it is evaluated.

**B1. Permanence of the impact-causing activity.**

The impact is defined as permanent if the activity or project is intended to be a permanent one and it affects the original status quo.

Score	Description
3	Permanent: The project or activity causing impact is meant to be a permanent one. Some examples from our data: Nature trails, snowmobile routes, canoe routes, roads, building, harbour, power line, drain, water-pipe, plan, fishing area, continuous education activity.
2	Temporary: The project or activity causing impact is temporal. Some examples from our data: Outdoor events as festivals, rehabilitation of watersheds, villages, residential areas or environmental restoration, completion of construction, educational (single courses). Depending on their realization, impact may also be permanent, such as an extension or a modification to a building.
1	No change/not applicable

**B2. Reversibility of impact.**

The reversibility of impact signifies a situation in which the original state will be restored after the activity is finished.

Scores	Description
3	Irreversible impact: The impact is irreversible, if the original state is not restored after the activity is finished. Such activity has changed the environment permanently or for a long period of time. Some examples from our data: Roads, buildings and power lines. The social impact was irreversible, if health or living conditions of the people subject to the impact were changed permanently.
2	Reversible impact: The impact is reversible, if the original state will be restored after the activity is finished. Some examples from our data: Nature trails, camping, snowmobile or canoe routes, restoration activity, repair building.
1	Not applicable: Targeting the impact is impossible, e.g. the impact of educational activity is difficult to determine as reversible or irreversible.

Whether the main impact of the project has or has had both reversible and irreversible impact, each type of impacts should be considered on a case to case basis.

**B3. Accumulation of impact.**

Scores	Description
3	Impact is cumulative or synergistic. The project or activity probable has combined impact with other projects or activities in the same area. Examples from our data: noise pollution, air pollution and wastewater emissions, e.g. to the watershed of soil. In the context of social issues, impact in general is often cumulative.
2	Impact is non-cumulative
1	No change/not applicable



The environmental scores (ES) were classified as follows (Pastakia, 1998; Pastakia and Jensen, 1998):

Environmental score	Range bands	Description of range bands
+72 to +108	+E	Major positive change/impact
+36 to +71	+D	Significant positive change/impact
+19 to +35	+C	Moderately positive change/impact
+10 to +18	+B	Positive change/impact
+1 to +9	+A	Slightly positive change/impact
0	N	No change/status quo/not applicable
-1 to -9	-A	Slightly negative change/impact
-10 to -18	-B	Negative change/impact
-19 to -35	-C	Moderately negative change/impact
-36 to -71	-D	Significant negative change/impact
-72 to -108	-E	Major negative change/impact

Non-parametric testing was used for the statistical analysis, as the RIAM method does not give continual scores.

## 5. Results

### 5.1. RIAM scoring and project character

The data included 142 projects, plans and programs from the area of Central Finland that is covered by the Regional Council of Central Finland. We were able to evaluate 85% (117/142) of the cases. The remaining 25 cases were not evaluated, either due to the lack of a statement from the official EIA team of Central Finland or the expert panel was not able to form an impression on the project based on statements and other information. The data covered various types of projects, ranging from road construction to education programs, that EU funding was applied for (Table 1).

According to the environmental impact, we found 54 cases to be positive, 56 cases negative, and seven cases neutral in their relationship with the environment. The social impact assessment produced 113 positive, four negative, and no neutral cases respectively (Fig. 1).

The RIAM scores varied from -91 to 108 for environmental impact, and from -72 to 108 for social impact. The environmental impact was as often negative as it was positive, whereas social impact was mostly positive (Fig. 2). However, the scores obtained were dependent largely on the character of the project (Figs. 3 and 4). The water treatment projects received the most positive scores and the road construction projects the most negative scores for environmental impact (Table 1). However, social impact did not vary significantly regardless of the distinct character of different projects.

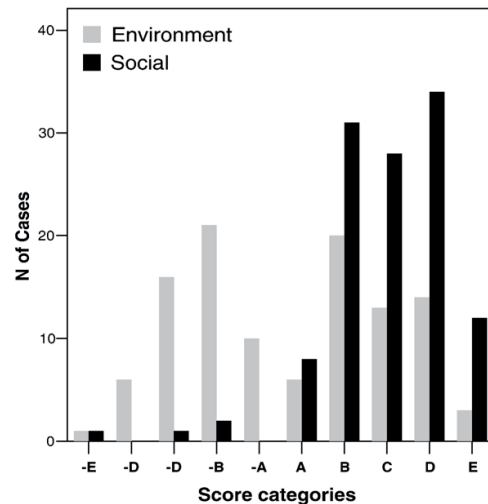


Fig. 1. The scores for environmental impact and the scores for social impact presented using the score categories from -E to +E.

Any significant correlation ( $r_s=0.14$ ,  $n=142$ ,  $p=0.09$ ) was not found between the environmental scores and the social scores, which implies that these indexes measured different issues (Fig. 2). However, all projects receiving positive scores for their environmental impact also received positive scores for social impact. There were only four projects that received negative scores for their

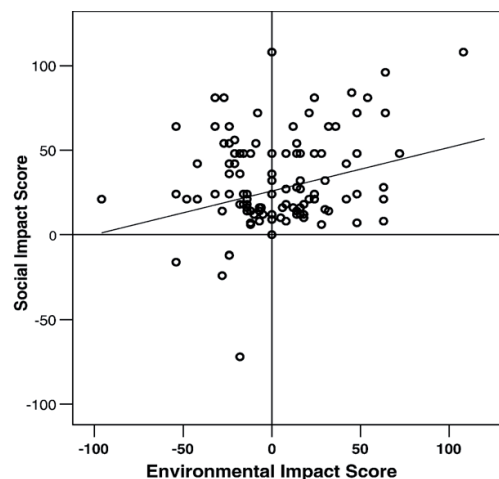


Fig. 2. Relationship between the scores for environmental impact and the scores for social impact.



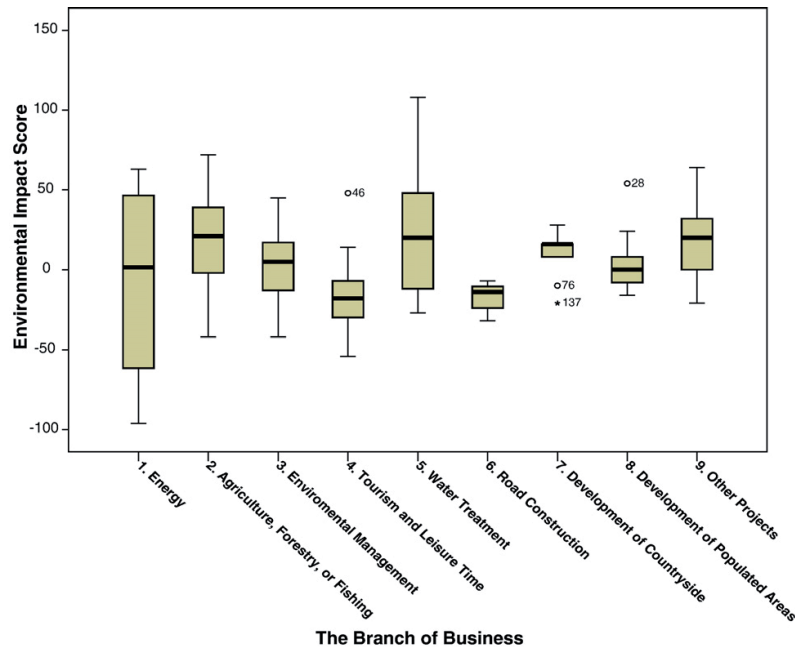


Fig. 3. Environmental impact scores among separate branches of business.

social impact. Each of them received negative scores for their environmental impact as well, and was concerned with tourism and leisure time. No projects were found to have positive environmental impact and negative social impact.

### 5.2. Funding and scores

From a total of 142 projects that applied for funding, 50 projects (35%) altogether received funding. The ES scores of these projects did not correlate with the amount of funding received, either for environmental impact scores ( $r_s=0.001$ ,  $n=50$ ,  $p=0.99$ ) or for social impact scores ( $r_s=0.20$ ,  $n=50$ ,  $p=0.16$ ). In consequence, the projects did not stress environmental issues more even when more money was allocated to them (Figs. 5 and 6).

## 6. Discussion

### 6.1. Usability of the RIAM method

Our results revealed that the Rapid Impact Assessment Matrix (RIAM) could be used as an instrument to compare the environmental and social impact even

when the projects are very different, and not bound by the options of only one project. The usage of the method could be summarized as follows. Firstly, it was possible to score most of the projects. Secondly, score variation meets the fact that the cases assessed were distinct from each other. This indicates that the method did not overly aggregate the data.

The RIAM method both helped the panellists and forced them to evaluate the statements systematically, even though the outcome can be regarded as imprecise, if one considers that a project can be labelled environmentally friendly or harmful based only on its most significant impact. So it can be argued that if the outcome presents the matters it should, but one has to also remember that this implies a selection of values and evaluative decisions. Therefore, the value of this method could be seen as being a framework for the panellists to work with.

Used in this way, the RIAM method is then dependent on project descriptions and results of environmental assessments. The method does not exclude other methods such as checklists or other matrices. On the contrary, those methods could be useful when combined with RIAM as they provide the raw material for the expert panellists to find all the necessary variables to be taken into account for assessing the importance of different

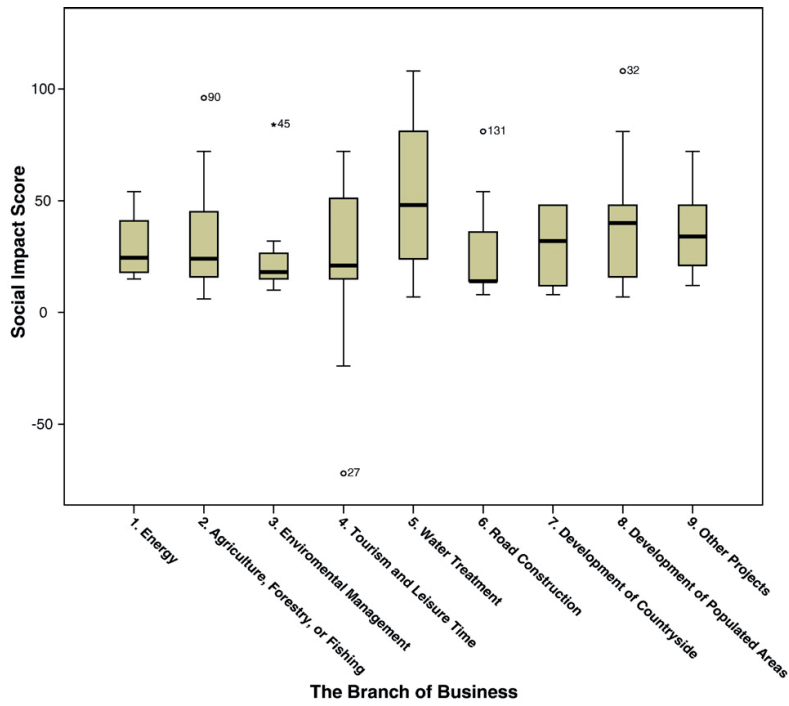


Fig. 4. Social impact scores among separate branches of business.

variables. This would also improve the transparency of the method and its evaluation decisions. In this trial, the chosen impact was not recorded in any way, so that

afterwards the panellists only had an impression of what impact was considered, if some was besides those presented in the EIA team statements.

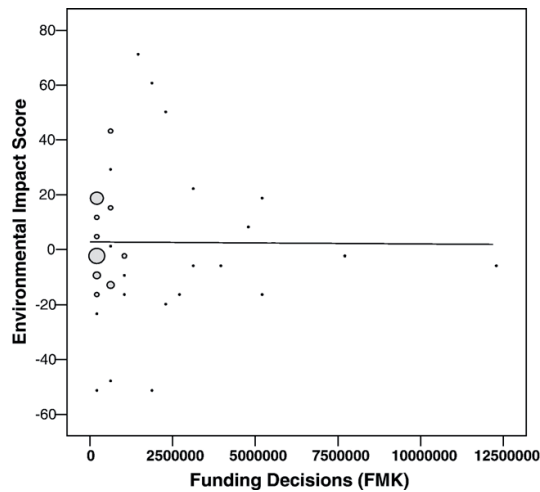


Fig. 5. Funding (Fmk) when compared with environmental impact scores.

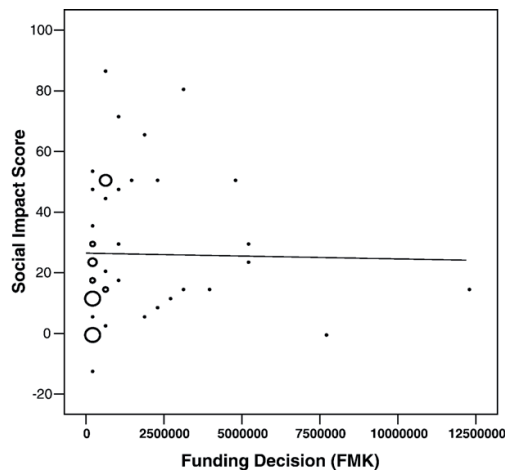


Fig. 6. Funding (Fmk) when compared with social impact scores.

From the beginning of the test, it was both noticeable and recognized that the assessments carried out by the Central Finland's official EIA team were mostly rather cursory and approximate. This is understandable given that no formal EIA was carried out in such cases. The committee had based its assessments on case descriptions presented by the proponents. So it was possible that when describing cases, impact was not considered at all which a reason for leaving 25 cases unevaluated was. In that sense, a certain guidelines or checklists for these kinds of EIAs, although not required in Finnish legislation, could improve assessment quality and, for example, RIAM might be helpful when considering the nature or characteristics of impact.

## 6.2. Considerations concerning the criteria

The formula and scoring used were adopted from Pastakia and Jensen (1998) and no other weightings were considered, as the aim was to test the principles and the usability of the criteria and the method in this new way. Some points concerning the criteria are summarized as follows.

### 6.2.1. Condition A1

*Importance of impact* was assessed here in relation to the coverage of the impacted area. It was considered necessary to scale importance with the data used and compared. Importance was also depended on the impact type, for example, regional importance in particular may be greater than environmental impact in the context of

social impact. The principle for this condition appeared to be clear to the panellists.

### 6.2.2. Condition A2

*Magnitude of change or effect* described whether impact was seen as positive or negative, and included a demand for evaluation of desirable progress. Such definition is naturally subjective, but it is not arbitrary when impact is reflected against certain objectives. That is one of the themes discussed recently concerning EIA research (see e.g. Wilkins, 2003; Alton and Underwood, 2003; Lawrence, 1997b), and on many occasions it is stated that such objectives could be based on sustainability, or that the focus in EIAs should be on sustainable development. In practice, this has proved to be a complicated issue and this was also apparent in this trial — for example, the panellists often held different opinions on what was seen sustainable and appropriate.

When evaluating the B criteria, most of the difficulties occurred when significant impact seemed to vary and whose characteristics also varied. As an unambiguous solution for this type of situations was not developed, case by case judgment had to be used instead.

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**IV**

**THE RATIONALE FOR AND PRACTICE OF EIA FOLLOW-UP:  
ANALYSIS OF FINNISH ROAD PROJECTS**

by

Kimmo Jalava, Anne-Mari Haakana & Markku Kuitunen

Manuscript

V

**EFFECTIVENESS OF THE FINNISH EIA SYSTEM - WHAT  
WORKS, WHAT DOESN'T, HOW IT COULD BE IMPROVED?**

by

Ismo Pölonen, Pekka Hokkanen & Kimmo Jalava 2011

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## The effectiveness of the Finnish EIA system – What works, what doesn't, and what could be improved?

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## ABSTRACT

The article summarises the results of a multidisciplinary research project on the effectiveness of the Finnish EIA system. It examines the main strengths and weaknesses of EIA as a preventive and participatory environmental management tool. The study concludes that EIA has achieved a meaningful role in the environmental policy toolbox in Finland and has clearly enhanced the possibilities for high-quality environmental decision making. The research cites the liaison authority system as a clear strength of the Finnish EIA system in its enabling a single regional authority to specialise in and gain wide experience on EIA issues. In examining potential weaknesses of the regime, the article concludes that the key constraint on EIA effectiveness is inadequacy of the action-forcing mechanisms at the decision-making phase. The primary means to improve the effectiveness of EIA would be to strengthen the legal provisions on development consents. On the whole, the research indicates that the EU and Finnish legislation and guidance on environmental impact assessment provide a good framework for effective utilisation of the instrument.

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## 1. Introduction

Environmental impact assessment (EIA) can be characterised as a preventive environmental policy and management tool. It has been adopted worldwide to consider the environmental effects of projects, plans and programmes in a comprehensive and systematic manner. Another of its key functions is to provide a forum for public participation. Environmental impact assessment broadens the information base for decision making and, ideally, leads to sustainable planning, policy and development choices.

This article summarises the results of the research project "Effectiveness of Environmental Impact Assessment (EFEIA)", carried out by the authors from 2005 to 2008.<sup>1</sup> It provides a synthesis of the project's sub-studies and extends the analysis of the topic. The main objective of the EFEIA project was to analyse and improve the effectiveness of environmental impact assessment in Finland.<sup>2</sup> The research proceeded from the hypothesis that, despite its innovative

aspects, Finnish EIA legislation and practices contain gaps that weaken EIA's performance as a preventive and democratic environmental policy tool. Our assumption was that EIA was still not being used to its full potential.

The EFEIA project drew on multidisciplinary collaboration amongst three disciplines: the legal, political and environmental sciences. In terms of methodology and theory, it utilised mainly the legal dogmatic and comparative law approaches, surveys, document analysis, case studies, and the theoretical framework of deliberative democracy and communicative planning. The function of the legal dogmatic approach was to interpret assessment-related provisions in the law and to determine the relationship between EIA and other environmental legislation. The approach also sought to identify possible inconsistencies relating to impact assessment within the EU and Finnish legislation. Comparative law was used to outline ideas from other jurisdictions that could be transferred into the Finnish EIA system.<sup>3</sup> Surveys and document analysis served to evaluate the quality of EIA practices, with the particular focus being screening decisions and environmental impact statements (EIS). The theoretical framework of deliberative democracy and communicative planning facilitated the analysis of public participation in EIA and was applied in two in-depth case studies.

With reference to the research carried out in the EFEIA project, we examine the main strengths and weaknesses of EIA as a preventive

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and participatory environmental management tool. Additional aims are to increase understanding of the mechanisms by which EIA influences decisions and behaviour and to identify legislative means that could enhance the environmental effectiveness of the instrument. The focus is on the Finnish EIA system but the conclusions drawn from the research will reflect partly the functioning of the EIA Directive.<sup>4</sup> Furthermore, the results are likely to be relevant in many other countries, for the core principles and requirements of EIA are similar in various jurisdictions.<sup>5</sup>

The paper focuses on EIA screening, the quality of the environmental impact statement, public participation, EIA's link to decision making, and follow-up. Before the analysis of these key elements of an effective EIA system, we present some historical aspects of Finnish EIA and explain how we have approached the contested concept of effectiveness in this research.

## 2. Introduction of EIA legislation in Finland

The concept of environmental impact assessment first received consideration in Finnish environmental discussions at the beginning of the 1980s, inspired by the international discourse on EIA. The first official report concerning the need to include EIA in Finnish environmental planning was published in 1982.<sup>6</sup> The report indicated that the existing norms on impact assessment were insufficient in many respects and that EIA should be included at various levels of planning and decision making. The report was not viewed favourably by all, and it took several years before the law-drafting process was activated.<sup>7</sup> The proposal for two-phase public participation in EIA was one of the main sources of political dispute when the EIA Act was being prepared. In particular, interest groups representing industry and agriculture took a very critical stand on the proposed legislation. They were concerned that obligatory EIA would result in unreasonable economic burdens.<sup>8</sup>

The crucial driver in the preparation of EIA legislation in Finland was the country's political and economic integration into the European Community. Without the pressure from EC law, enacting the national EIA legislation would clearly have taken longer. Finland became a member of the European Union in 1995. However, the terms of the European Economic Area (EEA) Agreement concluded between the EFTA and EC countries required national EIA legislation to be in force already in January 1993. In addition, the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention, 1991)<sup>9</sup> called for the implementation of legislative measures.

The EIA Act (Act on Environmental Impact Assessment Procedure 468/1994) entered into force in September 1994 and implemented the EIA Directive as well as the Espoo Convention.<sup>10</sup> The Act was revised substantially in 1999 and 2006 due to implementation of Directives 97/11EC and 2003/35/EC, which amended the original EIA Directive of 1985. Complementing the EIA Act as the other principal component of Finnish regulation on impact assessment is the Decree on Environmental Impact Assessment Procedure (EIA Decree, 713/2006).<sup>11</sup>

## 3. The concept of effectiveness

Traditionally, a core question of research on the effectiveness of environmental policy tools has been whether the instrument works, is used as intended and meets the purposes for which it is designed. The term "effectiveness" is often understood as referring to achievement of policy goals.<sup>12</sup> Recently, however, dissatisfaction has been expressed with the adequacy and relevance of this approach. Scholars have observed that a normative approach to studying effectiveness does not necessarily acknowledge plural interpretations of the objectives, design and use of assessment instruments.<sup>13</sup> Among other things, it has been argued that measuring effectiveness with a goal-directed orientation easily leads to "one-dimensional" rationalism, which controls and narrows views.<sup>14</sup>

Despite this criticism and challenge, it can be argued that specific policy goals were the impetus for statutory EIA and that analysing the fulfilment of those objectives is one possible and meaningful way to approach the issue of effectiveness. It is our view that it is well reasoned, at least from a legal perspective, to trace the objectives of the instrument from the EIA legislation. Section 1 of the EIA Act expresses the objective of the statute as follows: "The aim of this Act is to further the assessment of environmental impact and consistent consideration of this impact in planning and decision making, and at the same time to increase the information available to citizens and their opportunities to participate."

When comparing this articulation of the objectives to the outcomes of EIA there are clear grounds to argue that EIA has fulfilled its objectives. The implementation of the Finnish EIA Act has improved the assessment and consideration of the environmental consequences of large development projects by requiring comprehensive environmental studies and introducing a holistic approach into the assessment practices. Before the passage of the EIA Act, the fundamental problem of Finnish environmental legislation was that the environmental effects of projects were assessed within the limits of sectoral permit statutes. Sector-based legislation made it impossible to consider environmental effects holistically. The EIA Act was the first Finnish environmental statute that called for a comprehensive assessment of environmental consequences.<sup>15</sup> Furthermore, it is evident that EIA has enhanced the opportunities for public participation. Its adoption increased the amount of environmental information available to citizens and strengthened their possibilities to participate in environmental planning of a project in its early phase.<sup>16</sup>

Nevertheless, there are reasons to claim that section 1 of the EIA Act reflects poorly the environmental goals of the instrument. It is noteworthy that the Act does not mention as one of EIA's goals the prevention of significant harmful environmental consequences. This substantive objective is included in the EU directives on impact assessment and also in the Espoo Convention.<sup>17</sup> Since the Finnish EIA Act implements the EIA Directive and the Espoo Convention, it would be highly dubious to argue that the Finnish law does not share the same goal as these supranational norms. Moreover, there are

<sup>4</sup> Council Directive of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment 85/337/EEC, amend. 97/11EC, 2003/35/EC and 2009/31/EC.

<sup>5</sup> See also Wood (2003).

<sup>6</sup> KM 1982:46.

<sup>7</sup> For more extensive treatments of the drafting of the Finnish EIA legislation, see Hokkanen (2007) p. 131, 138–143, Pölonen (2007) p. 32–33 and Sairinen (2000), p. 155–176.

<sup>8</sup> Hokkanen (2007) p. 145 and Sairinen (2000) p. 165–176.

<sup>9</sup> 30 ILM 802 (1991), in force as of September 10, 1997.

<sup>10</sup> In addition, several other acts concerning environmental permits were amended due to implementation of the EIA Directive.

<sup>11</sup> This EIA Decree (713/2006) replaced the earlier EIA Decree (268/1999). The original EIA Decree (792/1994, repealed) was issued in 1994.

<sup>12</sup> Sadler (1996)s. 37, Mickwitz (2003) p. 421, Hilding-Rydevik (2006) p. 77–93 and Similä (2007) p. 13 and 54–55. Depending on the theoretical framing, "effectiveness" can be understood more broadly as EIA may have impacts beyond policy goals. See Bartlett and Kurian (1999), p. 415–433, Cashmore et al. (2004), p. 295–310, Cashmore et al. (2008), p. 1233–1248 and Morrison-Saunders and Bailey (2009), p. 285.

<sup>13</sup> Cashmore et al. (2010), Heinma and Pöder (2010) p. 272.

<sup>14</sup> Elling (2009), p. 121–131.

<sup>15</sup> Pölonen (2007) p. 33–35.

<sup>16</sup> Hokkanen (2007) p. 89, 104 and Pölonen (2007) p. 34–35. See also Section 7 of this article.

<sup>17</sup> The preamble of the EIA directive, Article 1 of the Strategic Environmental Assessment Directive (2001/42/EC, SEA Directive) and preamble and Article 2(1) of the Espoo Convention indicate clearly that the instrument is founded on the preventive approach and its aim is to prevent significant environmental harm. The SEA Directive (2001/42/EC) also mentions the aim of providing for a high level of protection of the environment.



reasonable grounds to consider sustainable development as an objective of EIA legislation on the general level.<sup>18</sup>

On balance, it is problematic to evaluate the effectiveness of Finnish EIA merely by comparing the wording of the EIA Act and the outcomes of the instrument; as such, this type of comparison ignores the substantive purposes of EIA and a high degree of effectiveness is achieved by setting a low level of expectation. On the other hand, formulations of EIA objectives that include substantive purposes cause major complications for any study of effectiveness. First, it is extremely difficult to assess to what extent EIA has prevented significant harmful environmental impacts or enhanced positive impacts. The challenge is both to recognise the impacts and to differentiate the impacts of EIA from the effects of other factors, such as other environmental statutes, interaction between stakeholders beyond the scope of EIA, technological innovations, and the markets.<sup>19</sup> Second, if we focus on sustainable development in an effectiveness study, we face major difficulties in understanding or explaining what the objectives might be.<sup>20</sup>

We addressed the above-mentioned challenges of effectiveness research by shifting from determining the actual effectiveness of EIA to identifying the mechanism behind the impacts of EIA and the factors which make the instrument either more or less effective as a preventive and participatory environmental management tool. This approach was considered more feasible, one that could produce meaningful research results.

#### 4. The quality of the screening system

An effective EIA system should provide comprehensive coverage of projects likely to have significant adverse effects on the environment.<sup>21</sup> It is also vital for effectiveness that screening to determine the need for an assessment is properly implemented. The legal dogmatic and empirical studies indicate that the Finnish EIA screening system as a whole functions well.<sup>22</sup> EIA has wide-ranging coverage and the thresholds seem to be at high, but reasonable levels. Annually between 30 and 50 projects undergo the assessment prescribed by the EIA Act. In the Finnish system, a lighter version of environmental assessment is applied to smaller projects in the form of environmental permit processes,<sup>23</sup> with a full-blown EIA, which takes 14 months on average, being justified for only the most extensive projects.

Yet, the Finnish screening system seems to contain one notable gap: EIA has not been applied to forestry, which has been the main cause of biodiversity losses in the country.<sup>24</sup> Despite the significant environmental effects of large-scale forestry operations,<sup>25</sup> in practice this type of

project is not included on the list of activities requiring an environmental impact assessment. Finland's EIA Decree (section 6) sets an extremely high threshold for conducting an assessment where forestry is concerned. One must be carried out if a natural forest, defined as a unified area of more than 200 ha, is altered by removing the tree stock permanently or by replanting the area with tree species not indigenous to Finland. In practice, this means that an assessment is never required for forestry projects based on the list in the EIA Decree. However, forestry projects should be screened on a case-by-case basis to determine the need for EIA.<sup>26</sup> In the Finnish system any type of project may be subject to an assessment based on a screening decision.<sup>27</sup> An activity must be subjected to an assessment if it is likely to have significant adverse effects on the environment as defined in the criteria in section 4 of the EIA Act and section 7 of the EIA Decree.<sup>28</sup>

Finnish screening practice has been analysed extensively from the quality and coherence perspectives.<sup>29</sup> In a study of 318 cases – extending from 1994 to 2006 and covering all cases where EIA was required – not one screening led to a forestry project being assessed. Moreover, the competent authorities rarely even considered the question of whether a forestry project should have been subjected to an assessment. Indeed, there were only two cases in which a screening statement was issued on a forestry project – one involving a forest road case, the other drainage. It would seem that Finnish EIA legislation is not being correctly applied to forestry projects.

There are certain factors that may explain the non-application of EIA to forestry projects in Finland. One reason could be a tendency to associate the assessment requirement only with infrastructure and industrial projects.<sup>30</sup> Another explanation may be that large-scale logging operations are not subjected to any permit procedure in which the need for an EIA would be considered. It follows that when no permit is needed, there is no opportunity to appeal a decision on the grounds that an impact assessment has not been carried out.<sup>31</sup>

It is pertinent to ask whether the non-implementation of EIA in the field of forestry breaches EC law. Some forestry-related projects are listed in Annex II (1(d) and 10(e)) of the EIA Directive: initial afforestation, deforestation for the purposes of conversion to another type of land use than forestry, and road construction. The European Court of Justice (ECJ) has consistently held that the scope of the EIA Directive is wide and its purpose very broad, and has interpreted the wording of Annexes I and II in an expansive manner.<sup>32</sup> Even if the Directive's provisions are interpreted broadly, they do not seem to cover forestry activities practiced in Finland, such as clear cutting with reforestation. The EC legislator has excluded certain kinds of activities from EIA, and such exclusions should be respected when interpreting the law.<sup>33</sup> Consequently, it seems that non-implementation of EIA requirements in the case of forestry can be mainly attributed to the

<sup>18</sup> The very wording of the U.S. National Environmental Policy Act of 1969 reflects this fundamental aim. According to section 101 of the NEPA, "The Congress [...] declares that it is the continuing policy of the Federal Government [...] to create and maintain conditions under which man and nature can exist in productive harmony, and fulfil the social, economic, and other requirements of present and future generations of Americans." On the immediate and indirect purposes of EIA, see also Jay et al. (2007 p. 288). They note that EIA's original, substantive aim of contributing to more sustainable forms of development has been rediscovered.

<sup>19</sup> See also Similä (2007 p. 55), who points out that it may be very difficult to compare environmental outcomes to the goals of open-ended or framework-type regulation.

<sup>20</sup> See e.g. Bell and Morse (2008) p. 11–14 and Gibson (2005) p. 38–62.

<sup>21</sup> See also Heima and Pölder (2010) p. 273.

<sup>22</sup> Hokkanen and Pölonen (2006), Käyhkö et al. (2007) and Pölonen (2007).

<sup>23</sup> For example, some 1000 projects undergo environmental assessment annually within the environmental permit process under the Environmental Protection Act (86/2000). Ympäristöministeriö (2008). This figure does not include the permits issued at the municipal level for the smallest projects, but only those granted by the state authority.

<sup>24</sup> It should also be noted that the Forest Act (1093/1996) and other statutes applied to forestry projects do not include the core elements of EIA (holistic ex ante consideration of environmental consequences and wide public participation).

<sup>25</sup> Duffy (2004 p. 175) notes that in addition to fisheries and agriculture forestry is a sector which worldwide is associated with enormous impacts. He calls these sectors "orphans of EIA", which have not benefited from systematic environmental analysis and management.

<sup>26</sup> In the Finnish EIA system, assessment is applied either systematically (based on the project list in the EIA Decree), or on a case-by-case basis (case-specific EIA). In individual cases, the Regional Environmental Centre decides on the need for an EIA.

<sup>27</sup> Bill for an EIA Act (HE 319/1993 vp.) p. 15 and Pölonen (2007) p. 99.

<sup>28</sup> The screening criteria include, among other considerations, a) cumulative effects, b) sensitivity of the area affected and c) the probability, duration and reversibility of the impact.

<sup>29</sup> Käyhkö et al. (2007). The empirical material and results of this study were further analysed in Pölonen's dissertation (2007).

<sup>30</sup> See also Cashman (2004) p. 87.

<sup>31</sup> Pölonen (2007) p. 270–271.

<sup>32</sup> See e.g. cases C-72/95 (Kraaijeveld), C-227/01 (Commission vs. Spain), C-2/07 (Abraham).

<sup>33</sup> See also the recent case C-156/07 (Salvatore Aiello), which shows that, despite the extensive interpretations, EIA is not required for a project that does not fall within one of the categories of projects listed in Annexes I or II. According to the Court, Article 2 (1) of the EIA Directive "must be interpreted as not requiring that any project likely to have a significant effect on the environment be made subject to the environmental impact assessment provided for in that directive, but only those referred to in Annexes I and II to that directive, under the conditions set out in Article 4 thereof and subject to Articles 1(4) and (5) and 2(3) of that directive".

national legislation. Any violations of EU law seem to be restricted to the cases involving the construction of forest road networks.

### 5. Quality of environmental impact statements

The quality of an environmental impact statement has consequences for the decision-making process and is one of the key factors contributing to an effective EIA. In the European Union, reviewing of the quality of environmental impact assessments is essentially dependent on national legislation and practices.<sup>34</sup> In the Finnish EIA system, quality control of assessments is, in the first instance, a duty of the regional Centre for Economic Development, Transport and the Environment in its capacity as the liaison authority for EIA. The liaison authority is a designated EIA authority which coordinates the EIA process but does not issue permit decisions related to the project being assessed.<sup>35</sup> This use of a designated EIA authority, which is not a competent authority in decision making but focuses only on EIA issues, distinguishes the Finnish EIA system from the systems in other jurisdictions.<sup>36</sup>

The liaison authority system is a clear strength of the Finnish EIA regime. The authority coordinates the EIA process from the very beginning and thus developers are well informed throughout the process about the requirements and principles of EIA.<sup>37</sup> Furthermore, the liaison authority plays a central role in ensuring meaningful public participation in EIA.<sup>38</sup> The system also has obvious benefits in terms of expertise, for it enables a single regional authority to specialise in EIA issues and gain extensive expertise on the legal requirements, guidelines and good practices related to projects being assessed.

The crucial role of the liaison authority in the Finnish EIA system has been confirmed by court rulings. The Finnish Supreme Administrative Court has given significant weight to the opinion of the liaison authority when reviewing the adequacy of environmental impact statements. The case law of the Court indicates that it views the liaison authority as the primary controller of the quality of EIA. If the liaison authority considers the environmental impact studies in a case adequate, it is very unlikely that the Court will reverse an environmental permit decision due to the poor quality of the EIA.<sup>39</sup>

More specifically, quality assurance works through the statements issued by the liaison authority in the scoping phase and at the end of the process, after the submission of the EIS. In the scoping phase, the liaison authority ensures that all relevant types of environmental impacts and alternative courses of action are taken into account in the plans for the assessment. In this phase, the public (citizens and organisations), the municipalities affected and other authorities are given the opportunity to comment on the scoping document (assessment programme) prepared by the developer and to express their views on the project and on what environmental studies are needed. At the end of the EIA procedure, the liaison authority reviews the adequacy and completeness of the EIS and submits its statement on the assessment.<sup>40</sup> The public, the municipalities and other authorities also take part in the quality control of the EIS: They have an opportunity to provide comments on the EIS, and the liaison authority must take these comments into account when considering the adequacy of the EIS. Besides this formal participation at the scoping and EIS submission phases, the assessment process contains, in practice, a great deal of

informal communication between the developer, the liaison authority and the public. Typically, the interaction among stakeholders goes notably beyond what the EIA legislation requires.

The quality of EIAs in assessment practices has recently been studied by surveys and document analyses.<sup>41</sup> These studies indicate that the Finnish EISs are generally good in comparison to current legal requirements and guidelines. They also show that the Finnish liaison authority system functions well and that the emphasis put on the education of the EIA practitioners has improved quality in recent years.<sup>42</sup> However, it still seems that the quality of EIAs varies widely in some respects and that there are certain aspects of EISs that merit more attention.<sup>43</sup>

Typically, the shortcomings in an assessment consist of unfocused reporting and poor attempts at communicating assessment results to a non-technical audience in the environmental impact statements. In addition, the consideration of alternatives has been implemented in varying ways, and a systematic approach seems to be lacking. The survey showed that the liaison authorities and consultants widely agreed that alternatives are not always considered extensively in Finnish EIAs.<sup>44</sup> In this respect, the shortcomings found in the sub-studies were similar to those revealed in earlier international studies on EIA quality.<sup>45</sup> While there are certain commonly recognised and agreed quality problems, there are also controversial issues where EIA quality is concerned. For example, the poor quality – or even lack – of follow-up proposals in the EISs was not considered to be a problem by all liaison authorities and consultants. Interestingly, some of the survey respondents suggested that planning of follow-up in EIA is unnecessary and should occur only in the later planning and decision-making phases.<sup>46</sup>

An examination of EIA quality issues in comparative perspective indicates that quality control of the assessments can be implemented through varying mechanisms. In the U.S., for example, courts figure prominently in the quality review of environmental impact statements. This 'quality assurance through litigation' approach creates strong incentive for producing high-quality environmental impact statements but it also seems to entail notable negative side effects; it causes delays in planning, as well as direct and indirect costs, and tends to produce irrelevant information ('bullet proof' EISs in anticipation of court proceedings). The U.S. quality control system does not seem to offer elements that could be useful in the Finnish context. However, it can be noted the U.S. courts used more pragmatic and transparent argumentation in the EIA cases than did Finnish courts. Unlike Finnish court rulings, the U.S. judgements often make it clear what the detailed reasons were for considering particular EISs adequate or inadequate.<sup>47</sup> Explicit and practical reasoning by the courts serves to clarify the state of EIA law and increase predictability. It assists the authorities in their work and also gives relevant information to developers about the boundaries of flexible EIA norms.

In the Netherlands, the quality control of EIA is supported considerably by an external agency called "the EIA Commission" (Commissie voor de milieueffectrapportage). The utility of the arrangement seems to be largely based on the Commission's high level of expertise and experience in the field. The competent authorities have given considerable weight to the opinions of the Commission (which have no direct legal effects as such) in, among other activities, preparing

<sup>34</sup> Commission (2003) p. 90–95 and Pölonen (2007) p. 179–186.

<sup>35</sup> The task of liaison authority is differentiated from the other tasks of the Centres for Economic Development, Transport and the Environment.

<sup>36</sup> Pölonen (2007) p. 187–212.

<sup>37</sup> Pölonen (2007) p. 63–65, 187–192.

<sup>38</sup> Hokkanen (2007) p. 261–265.

<sup>39</sup> Case law analysis from the EIA quality perspective see Pölonen (2007) p. 181–184, 192–204 and Pölonen and Koivurova (2009).

<sup>40</sup> Before the review, a draft EIS is often submitted to the competent authority for unofficial comments.

<sup>41</sup> These studies are still partly ongoing. The findings presented here are based on a survey and document analysis by Jalava et al. (2010).

<sup>42</sup> On the educational practices, see also Turtiainen (2001).

<sup>43</sup> The survey, which targeted liaison authorities and environmental consultants, indicated that the liaison authorities and consultants consider themselves skilful and that the reason for low quality EISs does not seem to lie in a lack of know-how. Jalava et al. (2010).

<sup>44</sup> Jalava et al. (2010).

<sup>45</sup> See e.g. Steinemann (2001) and a roundtable discussion by Ross et al. (2006).

<sup>46</sup> Jalava et al. (2010).

<sup>47</sup> Pölonen (2007) p. 204–208, 290–291.

the scoping advice for the developer and reviewing the adequacy of the EIS. In addition, the courts have typically attached high significance to the statements of the EIA Commission.<sup>48</sup>

Taking into account that Finland already has a quality control system that has proven to be workable and seems to have gained wide acceptance among practitioners, there appears to be no need to introduce an external agency similar to the Netherlands' EIA Commission. This kind of quality control mechanism might be too cumbersome and expensive in the Finnish setting. However, for the most complex EIA cases, a lighter and more flexible version of an external adviser might be useful. Such a model could be based on an ad hoc expert panel appointed and coordinated by the Ministry of the Environment.<sup>49</sup>

## 6. Linkage between EIA and decision making

The relationship between EIA and decision making (especially decisions on development consents) is a fundamental question from the effectiveness perspective. It is not exceptional in EIA practice that an assessment is carried out and vast amounts of money are spent on research, but decision makers are not receptive to the information provided or to the suggestions made in the assessment. Consequently, it is often argued that one of the main shortcomings of environmental impact assessment is its weak linkage to decision making. It has been suggested that EIA should be more closely integrated into the processes that it seeks to influence.<sup>50</sup>

This challenge is connected to the procedural nature of EIA legislation. Under EIA legislation, an authority is not obliged to follow the recommendations contained in a completed EIS or required to prevent or minimise a project's negative effects on the environment. EIA law does not contain legal constraints that would prevent granting a development consent to projects even where very serious negative effects are anticipated.<sup>51</sup> On the other hand, the EIA Directive (Article 8) and the Finnish EIA Act (section 13.2) require that information gathered in the EIA process must be taken into consideration in the consent procedure.<sup>52</sup> These provisions require that the competent authority should justify its decision on development consent in the light of the information gained through the assessment process. However, it does not mean that the results of an assessment should be given particular weight in the decision-making process. The duty to give reasons and express how assessment results are taken into account are procedural requirements that do not in themselves strengthen ecological controls.<sup>53</sup>

The situation seems to be similar in the United States and Germany. There has been long-lasting academic debate in the U.S. on whether the EIA legislation contains substantive (action-forcing) elements. Some academics have considered that the law contains certain substantive requirements.<sup>54</sup> This interpretation is logical as regards the preventive intention of the NEPA and the wording of the Council on Environmental Quality regulation, but it has not received support from the case law. U.S. courts have emphasised several times

the procedural nature of EIA obligations.<sup>55</sup> Similarly, the German courts have ruled that – contrary to the viewpoints of some German scholars<sup>56</sup> – the German EIA Act (Gesetz über die Umweltverträglichkeitsprüfung) has not strengthened the substantive environmental norms.<sup>57</sup>

The lack of substantive criteria in the EIA legislation does not in itself imply weakness in EIA as a preventive environmental policy tool. In considering the possible deficiencies of an EIA system, the legal order as a whole must be taken into account. To the extent that the conditions attached to the permit decision(s) are adequate to prevent or mitigate any environmental harm that has been predicted, the procedural nature of EIA is not a problem.

In the Finnish system, the substantive norms concerning project authorisation guarantee that in most EIA cases the essential environmental information gathered in the assessment procedure is efficiently taken into account before the proposed activity can be carried out. This is due to the fact that the majority of the activities subject to EIA also require an integrated environmental permit under the Environmental Protection Act (EPA 86/2000).<sup>58</sup> The preconditions for granting an environmental permit are intended to ensure that significant negative effects on the environment and unreasonable burdens on neighbouring properties are prevented. Sections 41 and 42 of the EPA include a number of environmental requirements that must be met before a permit can be granted.

However, not every piece of information gathered through an EIA can be considered in the integrated environmental permit procedure. This is due to the broad definition of the concept "environmental impact" in EIA legislation<sup>59</sup> and certain limitations in the scope of the environmental permit procedure. The information considered in the environmental permit procedure is mainly that concerning effects related to emission discharges into the air, water or soil.<sup>60</sup> If the harmful environmental effects of a project are caused by physical intervention instead of emissions, these consequences may fall outside the scope of the permit consideration under the EPA.

This discrepancy weakens the linkage between EIA and the permit procedures on certain occasions; peat production is probably the best example. The considerable environmental effects of peat production typically result from the physical alteration of the production area (a peat bog), yet these effects can be only partially – depending mainly on whether the action violates the nature conservation legislation – taken into account in the permit processes under the EPA. The challenge is not only academic but often materialises in practice as well. For example, in the case SAC 2005:27, the Supreme Administrative Court pointed out that peat production may cause harmful effects on nature values, the landscape and the game population but that these impacts could not be taken into account in the permit decision due to the limitations in the scope of permit consideration under the EPA.

In the Finnish context, the gap between EIA and decision making also appears in the case of activities that are not subject to any environmental permit procedure. For example, power lines with a voltage of 220 kV or more and a length of more than 15 km are subject to permit procedures set out in the Act on the Redemption of Immoveable Property and Special Rights (603/1977) and the Electricity Market Act

<sup>48</sup> Pölonen (2007) p. 208–212, 292.

<sup>49</sup> Pölonen (2007) p. 208–212, 292.

<sup>50</sup> See e.g. Deelstra et al. (2003) p. 518 and Jay et al. (2007) p. 298.

<sup>51</sup> Krämer (2000) p. 113, de Sadeleer (2002) p. 89 and Pölonen (2007) p. 156–165.

<sup>52</sup> Furthermore, the EIA Directive (Article 9(1)) requires that the competent authority must make available to the public the following information: [1] "the content of the decision and any conditions attached thereto, [2] having examined the concerns and opinions expressed by the public concerned, the main reasons and considerations on which the decision is based, including information about the public participation process and [3] a description, where necessary, of the main measures to avoid, reduce and, if possible, offset the major adverse effects."

<sup>53</sup> The conclusion can be drawn from the case law of the Finnish Supreme Administrative Court (cases SAC 2005:25, SAC 2005:70, SAC 3.3.2004 t. 419 and SAC 18.6.2003 t. 1519. See also Pölonen (2007) p. 161–165.

<sup>54</sup> See e.g. Yost (1990) p. 547–548, Yost and Widman (2004).

<sup>55</sup> See e.g. *Kleppe v. Sierra Club* 427 (U.S. 390 (1976)), *Vermont Yankee Nuclear Power Corp. v. Natl. Resources Defence Council, Inc.*, 435 (U.S. 558 (1978)) and *Styckder's Bay Neighborhood Council, Inc. v. Karlen*, 444 (U.S. 223 (1980)). See also Yang (2002) p. 533–534 and Karkkainen (2002) p. 342.

<sup>56</sup> See e.g. Sparwasser et al. (2003) p. 169 and Meyerholt (2003) p. 59.

<sup>57</sup> Kloepfer (2004) p. 358 and Meyerholt (2003) p. 59. See also Pölonen (2007) p. 158–159.

<sup>58</sup> Pölonen (2007) p. 166.

<sup>59</sup> See Article 3 of the EIA Directive and section 2 of the EIA Act.

<sup>60</sup> The Environmental Protection Act applies to activities that lead or may lead to environmental pollution and activities that generate waste, and to the recovery and disposal of waste (section 2 of the EPA).

(386/1995). In those procedures, environmental consideration is rather limited. Similar situations apply to some other activities, such as aboveground gas pipes.

On balance, a principal means to improve the substantive influence of EIA would be to supplement the preconditions for granting permits such that authorities have the duty to take environmental matters into account extensively when considering a permit application.<sup>61</sup> The decision-making phase should convert the information provided by EIA into legally binding requirements that ensure, at a minimum, the prevention of significant environmental harm. At the EU level, one possibility might be to include a clear substantive element in Article 8 of the EIA Directive by explaining what “taking into consideration” means. The requirements of the EIA Directive could have elements similar to Article 6, paragraphs 3 and 4, of the Habitats Directive 92/43/EEC.<sup>62</sup> For instance, the Directive could contain the following kind of requirement<sup>63</sup>:

“No authority is empowered to grant a permit for the implementation of a project if the assessment indicates that the project will have a significant adverse impact on the environment” (main rule).

“a permit can be granted if the Member State considers that the project must, in absence of alternative solutions, be carried out for imperative reasons of overriding public interest” (exception).

## 7. Public participation in the EIA process

Public participation is a fundamental part of environmental impact assessment.<sup>64</sup> EIA has been widely seen as a deliberative planning tool which includes the potential for communicative planning, mutual learning and, in particular, opportunities for the public to participate and influence environmental planning and decision making.<sup>65</sup> EIA is meant to be an open process enabling discussion and participation by a variety of actors. It aims to increase the transparency and broaden the information base of environmental policy planning and decision making.<sup>66</sup> It is also an interactive and communicative policy instrument and should facilitate direct participation by offering different ways and forms of participation during the EIA process.<sup>67</sup>

The main strengths of public participation in the Finnish EIA system are general in nature.<sup>68</sup> EIA has created an open arena affording all actors and stakeholders a role in the planning related to

projects with significant environmental impacts. In practice, EIA has made it possible for all members of society, regardless of formal status or role, to take part in environmental planning. For example, a lack of expertise is not an insurmountable barrier to applying a communicative planning style between participants in EIA. As the number of participants with diverse expertise has increased, the information base for planning and decision making has strengthened. Finnish EIA legislation enables collaborative planning and open public participation and in principle creates possibilities for deliberative democracy.<sup>69</sup>

The case studies also suggest that EIA has enhanced the legitimacy of the planning processes and tools used in environmental policy. The participation of stakeholders has made planning more transparent, which has tempered power differentials and facilitated the development of democracy in general. Participation in the early phase of planning and a communicative planning style have made it possible to strengthen the trust between stakeholders, enabling consensus in conflicts and preventing appeals in the later phases of decision making. Participation itself is defined in Finnish EIA legislation as interaction between proponents, authorities and all stakeholders. This definition highlights the nature of EIA as an example of communicative planning if compared, for example, to traditional technocratic planning, where the public have a limited role, if any. Instead of being a mere collecting of information, EIA allows and indeed calls for an active role also on the part of the public.<sup>70</sup> EIA has been, whilst not the only, probably the most visible environmental policy tool in project planning that has underlined the role of public participation.<sup>71</sup>

The above-mentioned arguments in support of the present system notwithstanding, public participation also faces many challenges. The most important of these seems to be the inconsistent utilisation of the public's contribution in decision making.<sup>72</sup> This is mainly due to the structure of the decision-making processes outside of EIA. Restrictions in the sectoral legislation directing the permit consideration may imply that, in particular, the concerns regarding social impacts presented by the public cannot be given weight in the decision making.<sup>73</sup> This stresses the importance of a strategic planning and decision-making phase which is more open to the consideration of social matters and development choices.

The effectiveness of public participation is also dependent on the developer's attitudes towards citizens' involvement in project planning. EIA is essentially an institutional process in which power is divided between different actors, with the developer and the liaison authority having central roles. EIA represents top-down participation in which the developer is capable of influencing the arenas, timetables and agenda of public participation. The high level of institutionalism implies that EIA is rather a conventional participation tool. The priorities and other interests of the developer may lead to a situation where well-reasoned comments provided by the public are ignored.<sup>74</sup> On the other hand, the task of the liaison authority is to ensure that the developer considers the relevant viewpoints and comments presented by the public. The steering function of the liaison authority counteracts the asymmetric division of power between the developer and the public.<sup>75</sup> However, the preventive and democratic aims of EIA are difficult to reach if the developer is not willing to collaborate and legal obligations and the threat of litigation are the only driving forces for participation in EIA.

It can also be concluded that EIA is an open arena that allows political disagreements to form and come into the open. Then again,

<sup>61</sup> Pölonen (2007) p. 172–174. Deelstra et al. (2003 p. 521–522) argue that the effectiveness of EIA is no longer constrained by a lack of legal provisions or by a lack of high-quality impact assessments. Instead, the main constraint is the limited ability of most of the actors involved to take part in a social learning process that effectively addresses complex issues. We agree that producing high-quality assessment documents is no longer the main challenge; rather, we consider that EIA effectiveness could be substantially enhanced by strengthening the legal provisions on development consents.

<sup>62</sup> A similar amendment has been proposed by Bunge (2007) p. 75.

<sup>63</sup> The suggestion for a substantive requirement has been drafted following the logic of the Habitats Directive and the Finnish Nature Conservation Act (section 66).

<sup>64</sup> This is widely underlined in the EIA literature. For example, Wood (2003 p. 275) has stated: “EIA is not EIA without consultation and participation.” In a similar vein, Sinclair and Diduck (2005 p. 53) have asked whether EIA can be legitimated without proper public participation.

<sup>65</sup> E.g. Elling (2004), Petts (2003) and Sager (2001).

<sup>66</sup> Wilkins (2003) p. 409.

<sup>67</sup> EIA can be also seen as an example in the process of developing direct participation in Finland during the 1990s. The decade saw many regulatory reforms to enhance citizens' participation opportunities, partly due to the legitimacy crisis of representative democracy and political parties; see e.g. Sairinen (2000) and Hokkanen (2007).

<sup>68</sup> The findings presented in this section are mainly based on qualitative case studies on a nuclear waste disposal project and highway project. The methods used included document analysis and interviews combined with deliberative democracy theory and policy network analysis. Hokkanen (2007).

<sup>69</sup> Hokkanen (2007) p. 42–43, 54, 249–258.

<sup>70</sup> Hokkanen (2007) p. 42–43.

<sup>71</sup> See also Määttä (2002) p. 44.

<sup>72</sup> Hokkanen (2007) p. 270–271 and Pölonen (2007) p. 278–279.

<sup>73</sup> On this obstacle to EIA (and participation) effectiveness and the means to address the challenge, see also Section 6 above.

<sup>74</sup> Hokkanen (2007) p. 261–265.

<sup>75</sup> Hokkanen (2007) p. 261–265 and Pölonen (2007) p. 63–65, 187–192.

EIA can also be used as an instrument to gather and maintain support for the acceptability of a project or to legitimate the planning and decision-making process. This implies that, in addition to its normative and ideal functions, EIA may have many different political functions: the developer and stakeholders try to use EIA to promote their interests instead of engaging in equal and communicative dialogue. Especially in highly controversial projects developers may use their power in the form of controlling the events organised as part of EIA and using biased argumentation in the EIA documents. If the function of EIA and participation is no more than to legitimate the process and project or control the public, EIA easily creates more distrust and new disputes.<sup>76</sup>

Furthermore, it is noteworthy that, despite the expectations in the 1990s that EIA would increase citizens' participation in environmental issues, the overall activity of the public has remained rather low. EIA has not been successful in activating the large masses of politically passive members of society. The instrument seems to be used by those active individuals who already use all the forms of participation and tools available. In fact, a kind of new political elite has been born, with a few very active citizens often dominating the participation arenas. In this situation, the question of the extent to which the views of those few active citizens represent the opinions of the passive masses is important. In this respect it can be concluded that even a small group can provide innovative arguments and contribute to planning and decision making. In addition, a few active citizens may speak with the mandate of a larger group (for example, in the case of NGOs), which should be taken into account when considering the representativeness of the participants in EIA.<sup>77</sup>

In assessing the value of public participation, it should be acknowledged that each EIA process is unique and carried out in its own political context. Case studies have shown rather wide variation in the aims, implementation and effectiveness of public participation not only between different projects, but also during a single EIA process. The effectiveness of the public's arguments depends on the participation tool chosen and on the timing of the participation. Accordingly, all case study findings related to participation should be examined in their project context, which usually offers the most relevant explanations.<sup>78</sup>

## 8. Follow-up

Follow-up is the last part of an ideal EIA process. It determines the actual outcomes of the project and has the same substantive goal as EIA proper, namely, to prevent and minimise the negative consequences of development.<sup>79</sup> More specifically, the functions of follow-up can be divided into three categories: controlling, learning and democratic. Follow-up is controlling in the sense that it enables a check on whether the ex ante impact predictions presented in the EIS were correct and whether the effects caused by the project fall within the limits set out in the development consents. It enhances systematic reconsideration of what constitutes adequate and cost-effective mitigation measures in the particular case. The learning functions of the follow-up rest on the notion that monitoring furthers our understanding of the causal effects behind the impacts of the project and promotes the development of more accurate prediction methods for future assessments. Providing stakeholders with the results of the follow-up contributes to the transparency of the process and increases the credibility of EIA. The democratic function of follow-up can be strengthened by giving

stakeholders a possibility to express their opinions on the monitoring of results.<sup>80</sup>

Despite clear rationales for follow-up, neither the EIA Directive nor the Finnish EIA legislation contains monitoring requirements. The need for such a requirement was acknowledged already in the preparation phase of the original EIA Directive of 1985. The proposal for the EIA Directive contained the following wording:

The competent authority shall check periodically whether the conditions attached under Article 10 to a planning permission are being complied with, whether they are still adequate, whether other provisions to protect the environment are being obeyed and whether it needs to take further measures to protect the environment from the effects of the project.<sup>81</sup>

However, the follow-up requirements were dropped from the final version of the Directive and the deficiency was not rectified when the Directive was amended in 1997 and 2003. In the Finnish context, the lacking monitoring requirements are, to a degree, supplied by specific acts on permits which require follow-up or authorise the decision maker to set follow-up related conditions.<sup>82</sup> During recent years, the role of follow-up has been strengthened by reforms of road and railway legislation. According to this new legislation, the management authority must systematically monitor the realisation of the assessed and other impacts of the road or railway undertakings and utilise the results of monitoring in assessing the impacts of undertakings and choosing planning decisions.<sup>83</sup> Moreover, the follow-up requirement of the SEA Directive (Article 10) and, subsequently, the Finnish SEA Act (section 12) have reinforced the role of monitoring mechanisms in Finnish environmental legislation.

Despite recent developments, there is still room for improvement in follow-up legislation, for some project types, such as power lines, aboveground gas pipelines and forestry projects, are not subject to follow-up requirements in a systematic way.<sup>84</sup> There seems to be a need for a follow-up requirement in EIA legislation on projects at both the EU and national levels. However, provisions on follow-up should leave room for flexible interpretations so that follow-up could be tailored to each context,<sup>85</sup> even allowing it to be omitted if there are clear arguments that it is not needed. In other words, follow-up should be preceded by screening and scoping. The EIS could give reasoned answers to questions such as: Is follow-up needed for the project; what are the specific impacts which should be monitored; and is there need for participation in the follow-up phase?

## 9. Conclusions

We highlight the following five points as concluding observations. First, we consider that EIA has achieved a meaningful role in the environmental policy toolbox in Finland and seems to be applied to projects of the right size. Adoption of EIA has provided a broader knowledge base for environmental decision making and has increased the possibilities for public participation in the early planning phases. This has clearly enhanced the possibilities for high-quality environmental decision making. EIA has been applied only to the most significant activities (30–50 projects annually), ones which have typically attracted wide public interest. High thresholds for conducting EIA seem to be well reasoned given the length of the process

<sup>76</sup> Hokkanen (2007) p. 263. See also Pölonen (2007) p. 279–280, Sairinen (2000) p. 157 and Tripp and Alley (2003) p. 82 and 87–88.

<sup>77</sup> Hokkanen (2007) p. 262–267. See also Parkinson (2003), who notes that the legitimacy of deliberation is not dependent on the number of participants.

<sup>78</sup> Hokkanen (2007) p. 271–272.

<sup>79</sup> See also Arts (1998) p. 46, Marshall et al. (2005) p. 176 and Pölonen (2007) p. 233–244.

<sup>80</sup> Pölonen (2007) p. 243–244.

<sup>81</sup> COM(80) 313 final.

<sup>82</sup> See e.g. Section 46 of the Environmental Protection Act.

<sup>83</sup> Section 32 of the Highways Act (503/2005) and section 27 of the Railway Act (110/2007).

<sup>84</sup> Pölonen (2007) p. 244–248.

<sup>85</sup> The focus should be on the impacts which have been difficult to predict; e.g. due to the cumulative impacts and on other areas of ex ante assessment where significant levels of uncertainty have been recognised.



(average of 14 months) and the fact that lighter environmental assessment processes are applied to most projects which do not trigger an assessment under the EIA Act. However, our study revealed one notable gap in the coverage of EIA: Despite the considerable environmental impacts of forestry in Finland, EIA has not been applied to forestry projects.

Second, it seems that EIA has various impact mechanisms that play out in many phases of the planning and decision making. EIA has both direct and indirect impacts and the outcomes of EIA are influenced by multiple interactions among diverse stakeholders across large time-frames. Instead of having a one-time impact or single major consequence in the decision-making phase, EIA seems to influence the project design as well as the valuations and opinions of the various stakeholders prior to, during and after the assessment process. In many respects, the impacts of EIA are indirect and somewhat hidden in nature. For example, the wide publicity and processes of scrutiny involved in EIA may lead to the most harmful project alternatives being eliminated even prior to the assessment process. Similarly, communication chains among the stakeholders during the assessment may result in the modification of the project proposal before the application for a license is submitted. Such effects are often difficult to identify, as we do not have a point of comparison where the same application has been submitted without EIA. Moreover, EIA may exert an impact beyond a particular project by informing the values and environmental awareness of the actors and by enhancing the technical means for environmental assessment and management.

Third, the quality of Finnish EIAs is heavily dependent on the work of the liaison authority, which has the designated task of coordinating the EIA process and supervising its quality. It is not a competent authority in decision making but focuses only on supervising the implementation of EIA in its respective region. The liaison authority system, distinctive of the Finnish EIA system compared to other jurisdictions, is a clear strength of the Finnish EIA regime. It enables one regional authority to specialise in EIA issues and gain extensive expertise on legal requirements, guidelines and good practices related to EIA projects. Quality control based on the work of the liaison authority has proven to be feasible and it seems that it has also gained wide acceptance among practitioners.

Fourth, we conclude that the most significant obstacle to the effectiveness of EIA lies outside of the assessment process proper, in the decision-making phase. In other words, the main constraint is not a lack of high-quality impact assessments or inadequate possibilities for public participation but insufficient post-EIA action-forcing mechanisms. Relatively often EIA is not linked to a decision-making process that takes the results of the assessment into account comprehensively. The primary means to improve the performance of EIA as a preventive and participatory environmental management tool is to strengthen the legal provisions on decision making. This means amendments to the provisions on permit and similar decisions. These should impose on the decision maker a duty to issue permit conditions that will prevent and mitigate the harmful environmental consequences and require the authority to reject project applications on environmental grounds if significant environmental harm cannot be avoided by mitigation measures.

Finally, in a conclusion closely connected to the above observations, we submit that EU and Finnish legislation and guidance on environmental impact assessment provide a good framework for impact assessment, one that is adaptive and flexible for a range of circumstances. Despite some shortcomings, the existing regulation on EIA does not seem to be a hindrance to, but rather a catalyst for, effective utilisation of the instrument.

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