Cumulative impact assessment for municipal and regional planning – an outline of a Swedish research project

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Introduction

Research on cumulative effect assessment has shown that small cumulative effects may result in greater environmental disturbances than a single particular action (CEC, 1997). Five general types of cumulative impacts are time-crowded perturbations, space crowding perturbations, synergisms, indirect/secondary effects and nibbling (Peterson et al. 1987). A European comparative study shows that Sweden does not consider cumulative impacts on the natural environment in their assessment of proposed projects (Hyder Consulting, 1999). The report does not explain why Swedish environmental impact assessment does not do so. The Swedish Environmental Code and the Building and Planning Act do not explicitly demand cumulative impact assessment to be conducted, which may be the leading factor behind.

Background

Cumulative environmental impact assessment (CEIA) is a part of environme ntal assessment, especially strategic environmental assessment (SEA). It is the consideration of the multiple environmental impacts of several individual proposed projects and plans on the environment. Odum (1982) refers to the "tyranny of small decisions" and the consequences arising from the continual growth of small developments. While there is no particulate consensus on what constitutes cumulative impact, research literature advocated cumulative environmental assessment (CEA – synonymous to CEIA) as a tool to promote sustainable development (McCold, 1991; Beanlands, 1992; Ross, 1998; Conlan and Rudd, 1998). Canter (1999) states CEA "..is the need to address multiple actions representing potential sources of impact-

causing activities; the consideration of multiple linkages (pathways) between such sources and receptors of impacts, and the recognition that such impacts may be additive, antagonistic or synergistic."

The project presented below is a programme called MiSt (Miljöstrategiska verktyg, Strategic Environmental Tools). MiSt is a long term research programme on tools for environmental assessment in strategic decision making funded by the Swedish Environmental Protection Agency. The object of the research is to study the function of tools that aid in environmental assessment as a key component in strategic decision making. Effectiveness of tools and combinations of tools is studied in local, regional and national planning and decision-making. Understanding and a base for development of tools, recommendations on tool use in different contexts are based in empirical research on cases and key issues.

Aims and objectives

The goal of this project is to investigate hindrance and opportunities for conducting cumulative environmental assessment of projects and plans in Sweden through a series of small interrelated projects. This research has four aims.

- First, a review will be made of the international research on the issue of cumulative impact assessment.
- Secondly a minor field investigation into why cumulative impact is being conducted is performed.
- Thirdly, the research aims to demonstrate a method for conducting cumulative impact assessment that will be possible to use in municipal and regional planning as well as for environmental protection and management.
- The final aim of this research project is to communicate the knowledge gained through attending conferences and publishing the results in international research journals as well as publishing in relevant Swedish media directed at planners, ecologists, etc.

Methods and Intentions

As described above, the intention of this project is to investigate barriers and opportunities for conducting cumulative environmental assessment of projects and plans through a series of small interrelated projects. This will be done by using different methodologies. Previous research by Piper (2001) has shown that there is a clear lack of awareness of cumulative environmental assessment. Given there is general lack of awareness in Sweden too, regarding cumulative environmental assessment, interviews will be used as a means to determine how different public authorities define the concept of cumulative environmental assessment. If there is a difference in the definition or interpretation of how a cumulative environmental assessment should be defined will be explored through these interviews.

Although the concept of cumulative environmental assessment might have different interpretations, it should not be the sole reason for why Swedish project developers are not implementing it. To explore hindrances to cumulative environmental assessment (CEA), we will use a case study approach. Project selection will be done by review and scanning of existing EIA documents regarding plans and projects. For selecting applicable plans/projects we will use the existing EIA library at the Swedish EIA Centre and other sources. We attempt

to find both private sector and public sector initiated project throughout Sweden. Consideration of the location, data and tools available at the time of the project initiation and where cumulative environmental assessment is judged to be necessary, we hope to distinguish different type of barriers.

Examples of projects that we might investigate are:
1. Stjups windfarm project in Hablingbo, Gotland (Rahnberg, 2002), that did not consider the cumulative effects of noise from an adjacent already built windfarm at Holmen;

2. The new road 700 Project in Björklinge, Uppsala, which will link up between the old and the new E4 roads, does not consider the combined noise and air pollution levels of the different road projects.

In selecting other case studies we will, besides covering the aspects landscape and biodiversity, try to consider different regions in Sweden. Review of the EIA documentation and interviews will be made in order to elicit which barriers exist.

Part of the intention of this investigation is establishing awareness of CEA issues for all actors involved in Swedish EIA processes. We intent to establish a seminar on the results of this stage of the work, using the annual conference on EIA held by the Swedish EIA Centre. This will be a means to report back our results to a wider audience including the Swedish Environmental Protection Agency.

Council directives and cumulative impact

Sweden entered the European Union 1994 and thereby committed it self to Council Directive 85/337/EEC (CEC, 1985) on the assessment of the effects of certain public and private projects on the environment. The European Council amended the directive 1997 by the directive 97/11/EC (CEC, 1997). The directive contains a minimum requirement which means that a member state could have higher requirements, but not lower, than what is written in the directive.

In the directives it is written that the information to be provided by the developer in an environmental impact assessment shall include at least *"a description of the project comprising information on the site, design and size of the project"* and *"a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects"*.

In an annex in the directives there is some more information about this description. One part is of special interest in terms of cumulative impact because the concept is mentioned in a footnote in the last sentence of the directive. The footnote goes with the following text:
"A description (1) of the likely significant effects of the proposed project on the environment resulting from:
- the existence of the project,
- the use of natural resources,
- the emission of pollutants, the creation of nuisances and the elimination of waste,
and the description by the developer of the forecasting methods used to assess the effects on the environment."

A description refers to the footnote were cumulative impact is mentioned:
"(1) This description should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project."

There is no preparatory work (investigation work that is done before new legislation is implemented in Sweden) to the directives that explain the concept cumulative effect in any more detail than what is mentioned above.

The directive on the assessment of the effects of certain plans and programmes on the environments also deals with cumulative effect (CEC, 2001). The text in this directive is somewhat different compared to the directives mentioned above, but the meaning is the same. However, in the Government Bill (Regeringens proposition, 2003) to this directive there is a reference to the annex were cumulative effect is mentioned. This directive is not yet implemented into Swedish legislation, but will be in 21 July 2004. The Government Bill is thus not verdicted but it will probably not change much.

Demand for cumulative impact in Swedish environmental legislation

The Swedish Environmental Code came into force on 1 January 1999. In the Environmental Code there is a separate chapter for environmental impact assessment (chapter 6). The Council Directive on environmental assessment is thereby implemented in Swedish legislation.

In chapter 6 in the Swedish Environmental Code there are regulations for:
- When environmental impact statements are required
- The purpose of environmental impact assessments
- Early consultations and decisions concerning a significant environmental impact
- Extended consultations, including an environmental impact assessment
- Contents of environmental impact statements
- Notification and opportunity to comment
- Approval and consideration of environmental impact statements
- The cost of environmental impact statements
- Plans and planning documents

As mentioned above the description that according to the directive has to be included in an environmental impact assessment should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project. However, apart from a few exceptions this terminology is not found in the Environmental Code. Directive 85/337/EEC (CEC, 1985) and directive 97/11/EC (CEC, 1997) is therefore not fully implemented into Swedish legislation.

Cumulative effect or cumulative impact is not mentioned in the Environmental Code, nor is secondary, short, medium or long-term, positive or negative effects of the project.

However, permanent and temporary are two terms that are mentioned in the Environmental Code:

"Land drainage must not be carried out without a permit. Furthermore, a permit shall be required, to the extent required by the Government, for other measures taken to drain land where such measures are likely to have a permanent adverse effect on flora and fauna",

"'Detriment to human health' shall mean any disturbance that is liable to have adverse effects on health in medical or hygienic terms which are not minor or temporary".

Cumulative impact in two recently performed Swedish studies

The Swedish EIA Centre recently made a study in co-operation with the National Board of Housing, Building and Planning (Boverket). The objective of the study was to investigate the quality of Environmental Impact Assessments (EIA) of Detailed Development Plans (DDP). The result was based on 104 analysed EIA-documents. The outcome showed that only 3 of the analysed EIAs mentioned anything about cumulative effects. The EIAs were made for one tunnel-construction and two for construction of buildings in urban areas. (Olausson and Oscarsson, 2003)

The Swedish Biodiversity Centre performed an additional study in collaboration with the Swedish EIA Centre. The objective was to investigate the implementation of the Convention on Biological Diversity (CBD) regarding EIA (article 14) and to study how impacts on biodiversity is analysed in Swedish EIA-documents. One conclusion from the study was that the quality of EIA-documents concerning impacts on biodiversity is low and must be improved in order to fully implement CBD article 14 in Sweden. The main problem with most EIAs is that long-term impacts on biodiversity are not included. Also this study showed that cumulative impacts very seldom are considered in Swedish EIA-documents. Prediction tools to analyse effects of different projects are not used and normally such methods are not even requested by the authorities. The result is based on 274 analysed EIA-documents from different sectors (industry, roads, railways etc.). (de Jong, Lundmark and Oscarsson, 2004)

Sectors and aspects that will be investigated in the project

The main activities that will be investigated in the project are infrastructure and industry. The situation when two different projects which has the same type of impact might cause cumulative impacts will be studied. However, the combination of cumulative impacts from two or more different types of activities will also be studied because this is perhaps a more common reality.

An overview of Swedish EIA-documents shows that the aspects biodiversity, sound (noise) and landscape are very often described. This makes them to a good starting point in investigating cumulative impacts for Swedish conditions. In general biodiversity is described in EIA-documents in that way that the natural environment is illustrated, especially influence on different habitats. The exact term biodiversity is not that often used. (de Jong, Lundmark and Oscarsson, 2004)

Discussion

One of the expectations we have of this study is to find good examples of how other countries work with cumulative effects in an EIA context. Hopefully we will find examples that are applicable to Sweden provided that the legislation and working methods for EIA in general is comparable.

Another expectation we have is to find a foundation of reasons to why cumulative effects should be described also in Swedish EIAs. This should be possible when examine these countries that actually consider cumulative impacts in their EIA.

Some difficulties with the coming work within this study might be to come upon case studies that cover the selected aspects biodiversity, sound (noise) and landscape. It is easy to find EIA documents that treat these aspects, but it is more difficult to find cases were cumulative impacts are an issue. We hope that the Swedish National Road Administration (SNRA) will come up with some examples for us to study within the sector of infrastructure. The Swedish EIA Centre, where two of the researchers work, has a (Swedish) network with more than 900 members. These members have more or less a connection to EIA in different ways and they will be asked if they know any examples that could work as case studies for cumulative effects.

Another difficulty might be that there is confusion about the concept cumulative and that people, even though they are working with EIA, never have heard the term before. This could be problematic when finding case studies.

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