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Use of explorative scenarios in environmental policy-making—Evaluation of policy instruments for management of land, water and the built environment

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ABSTRACT

In order to achieve the Swedish Environmental Quality Objectives (EQOs), three action strategies have been adopted by the Swedish parliament. The strategy addressed in this paper deals with the management of land, water and the built environment. The paper reports on a project involving authorities and researchers in which policy measures required for achieving relevant targets for the strategy were gathered, structured and analysed regarding their potential assuming alternative futures. Measures with proposed policy instruments were qualitatively evaluated against one business as usual scenario and four explorative scenarios varying along two dimensions; level of governance and level of embeddedness. The results show a heavy predominance of administrative policy instruments. This policy strategy depends on a future development where such policy instruments are accepted. In order to achieve the EQOs regardless of future developments, more robust packages of measures including a larger variation in policy instruments need to be developed.

1. Long-term perspectives on the Swedish Environmental Quality Objectives

Swedish environmental policy is operationalised through 16 environmental quality objectives (EQOs) adopted by the Swedish Parliament. These objectives define the state and quality of the environment which is considered sustainable in the long-term. The overall goal of the EQOs is to attain a society in which the main environmental problems have been solved within one generation [1]. Although the target year was originally set in the fairly distant future (one generation from 1998), at the time of this study (2006/2007) not many authorities responsible for the EQO had engaged in futures studies [2]. Some future orientated work had been done, mainly centred on projections and predictions [2]. For instance the Swedish Forest Agency, which is responsible for the EQO 'Sustainable forests', has a long time perspective and works continuously with long-term studies. It has performed scenarios with a 100-year time frame concerning e.g. potential sustainable use of forestland, environmental factors and availability of forest fuel [3,4]. Scenarios are also used to some extent in monitoring the progress of the EQOs and in the Environmental Objectives Council's yearly and in-depth (every fourth year) assessments of whether the objectives will be achieved within the given time frame. These assessments mainly include predictions of what is likely to happen, in order to make revisions and add measures and policy instruments to enhance conditions to achieve the objectives.

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However, there is uncertainty about the future development of factors influencing the EQOs. It is difficult or even impossible to know what future developments will be. The probable is no longer probable if conditions change [5] and decisions made in the present will influence what happens in the future [6]. Hence, it is strategically important to assess the progress towards achieving the environmental objectives not only in the light of probable futures, but also other plausible developments. Including perspectives of several futures will enhance possibilities for adaptation and preparedness.

In the EQO assessment process, authorities with overall responsibility for the objectives suggest additional measures considered necessary to achieve the objectives. During the in-depth assessment finalised in 2008, the Council introduced futures studies methodology into the process and a diverse set of possible futures were incorporated into the EQO environmental policy system. The process as a whole is described in [7]. In this paper these explorative scenarios are used to evaluate policy formulation processes concerning the EQOs for the management of land, water and the built environment. The aim is to describe this approach and explore strengths and weaknesses of using explorative scenarios to incorporate an uncertainty perspective in environmental policy-making.

2. The strategy for management of land, water and the built environment

The future studies work in the 2008 in-depth assessment focused on three action strategies that the Swedish parliament has adopted in order to guide efforts to implement the EQOs: 'more efficient energy use and transport', 'non-toxic, resource-saving environmental life cycles' and 'management of land, water and the built environment'. This paper deals with suggested policy measures for the latter of these, the strategy for management of land, water and the built environment (hereafter referred to as the strategy). This strategy aims 'to preserve biological diversity and valuable cultural environments and protect people's health, and to promote environmentally sound spatial planning and sustainable building structures' [8]. The strategy is designed to contribute primarily to the achievement of nine EQOs and to contribute to the achievement of elements of another four EQOs (Table 1). Many of these objectives are difficult to achieve. According to the 2008 assessment, five of the nine primary objectives will be difficult or impossible to reach (see Table 1) and none of them will be achieved without further action [9]. Hence there is a need for new approaches to alter current developments and also to deal with future uncertainties.

3. Why futures studies?

An approach to dealing with uncertainties is futures studies, which do not eliminate uncertainties but can increase awareness of unforeseeable events and expand the room to manoeuvre [5]. Scenarios can provide an organised setting to discuss a wide range of views and perspectives among actors [10], and can thus be used as a tool to communicate and to stimulate cooperation among involved actors. Working with groups of very different futures also addresses uncertainty in that it can enhance possibilities to adapt and prepare for developments other than those most expected and elements of flexibility and diversity can be introduced.

In this paper we adopt a typology of futures studies and scenarios developed by Börjeson et al. [11]. Their categorisation is based on the purpose of the study and the type of question that can be answered. Scenarios are divided into predictive, explorative and normative. Predictive scenarios, such as forecasts, can respond to the question 'What will happen?'. Predictive scenarios try to predict the probable; what is going to happen in the future. Explorative scenarios describe the possible and can respond to the question 'What can happen?'. According to Börjeson et al. [11], explorative scenarios are

Table 1
The strategy for management of land, water and the built environment is designed to contribute to the achievement of EQO 8–16 and elements of EQO 1,3, 6 and 7. The two other action strategies deal with the other EQOs. There are some overlaps, i.e. some EQOs are dealt with by more than one action strategy. The Environmental Objectives Council's [9] forecast for achievement of the objectives is also noted.

EQO	Contribute to	Contribute to elements of	Forecast for achievement 2020
1. Reduced climate Impact		√	Difficult
2. Clean air			Difficult
3. NATURAL ACIDIFICATION ONLY		√	Difficult
4. A non-toxic environment			Difficult
5. A protective ozone layer			Probable
6. A safe radiation environment		√	Possible
7. Zero eutrophication		√	Difficult
8. Flourishing lakes and streams	√		Possible
9. Good-quality groundwater	√		Possible
10. A balanced marine environment, flourishing coastal areas and archipelagos	√		Difficult
11. Thriving wetlands	√		Possible
12. Sustainable forests	√		Difficult
13. A varied agricultural landscape	√		Possible
14. A magnificent mountain landscape	√		Possible
15. A good built environment	√		Difficult
16. A rich diversity of plant and animal life	√		Difficult