



Stakeholder engagement in scenario development process – Bioenergy production and biodiversity conservation in eastern Finland



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ABSTRACT

In this study participatory approaches were used to develop alternative forest resource management scenarios with particular respect to the effects on increased use of forest bioenergy and its effect on biodiversity in Eastern Finland. As technical planning tools, we utilized a forest management planning system (MELA) and the Tool for Sustainability Impact Assessment (ToSIA) to visualize the impacts of the scenarios. We organized a stakeholder workshop where group discussions were used as a participatory method to get the stakeholder preferences and insights concerning forest resource use in the year 2030. Feedback from the workshop was then complemented with a questionnaire. Based on the results of the workshop and a questionnaire we developed three alternative forest resource scenarios: (1) bioenergy 2030 – in which energy production is more centralized and efficient; (2) biodiversity 2030 – in which harvesting methods are more nature friendly and protected forests make up 10% of the total forest area; and (3) mixed bioenergy + biodiversity 2030 scenario – in which wood production, recreation and nature protection are assigned to the most suitable areas. The study showed that stakeholder engagement combined with the MELA and ToSIA tools can be a useful approach in scenario development.

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1. Introduction

In the Millennium Ecosystem Assessment (MA, 2005) scenarios are described as "...plausible and often simplified descriptions of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces and relationships". This definition implies that scenarios are not predictions of the future, but are rather the tools for perceiving it in a more concessive manner. According to Rounsevell and Metzger (2010) scenario analysis characterizes the future in a structured way that allows imaginative thinking. Evaluation of the future is by its very nature uncertain – uncertainties can be related to a variety of factors such as demographic change, economic development, and technological change (Arets et al., 2008; Alcamo and Henrichs, 2008); scenarios are nonetheless one way to provoke open policy discussion (Van der Heijden, 2005; Chakraborty, 2011).

There are various definitions of the term 'scenarios' and scenarios have been used in various ways (see e.g. Bradfield et al., 2005; Van Notten et al., 2003); in this study scenarios are seen as tools for future studies, and are to be used by policy makers to describe the alternatives of future development paths that can occur under certain situations determined by given factors and drivers. Scenarios can be categorized, for example, in typology as exploratory scenarios (descriptive extrapolations of the future), normative scenarios (desirable or avoidable development pathways) and business-as-usual scenarios (baseline of current trends) (Rounsevell and Metzger, 2010). Arets et al. (2008) also note that baseline scenarios are essential in the scenario development process and these baseline scenarios should be distinguished from policy scenarios. Scenarios can be used as bridges that connect science and policy by visualizing aspects at different temporal and spatial scales within the context of particular certain environmental problems (EEA, 2001; Alcamo, 2008). Scenarios are usually built to meet either the environmental or the policy needs, not both (Alcamo, 2008). Nevertheless, Alcamo (2008) sees that scenarios can provide a link between policy makers and scientists, since

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science and policy are firmly tied to one another. In this study we try to develop scenarios that can be utilized both in environmental management and in policy decision making.

Storylines are an essential part of scenario development. They are the qualitative and descriptive component of a scenario, and reflect the drivers of change or describe the outcomes (Rounsevell and Metzger, 2010). By using storylines it is possible to present a more precise view of the future by offering also qualitative information compared to views that presents solely quantitative data. In general, the aim of scenario storylines is to increase creativity, rigor and credibility, and provoke discussion (Rounsevell and Metzger, 2010). Suspending disbelief is also seen as an essential attribute in scenario analysis which can occur when participants fill narrative gaps and create causal relationships in the scenario development (Frittaion et al., 2010).

Scenario storylines were used, for example, in the work of the Intergovernmental Panel on Climate Change (IPCC, 2000). Storylines and model calculations form together a qualitative and quantitative approach that can have a significant role in environmental change assessment by functioning as a framework for the whole process. The SAS (story-and-simulation) is an approach in which storylines describe the key events, and then models reinforce the storylines with numerical estimates of future environmental indicators (EEA, 2001). Although the SAS approach tends to be costly and time consuming, the supplement of the methods and firm stakeholder interaction enhances the acceptance of the scenarios as credible and authoritative (EEA, 2001; Rounsevell and Metzger, 2010). This has also been called the mixed method approach (Burke Johnson et al., 2007). Chakraborty (2011) points out that qualitative methods generate alternative objectives which cannot be reached solely by quantitative analysis.

Mendoza and Prabhu (2005) mention three benefits of participatory planning: (1) stakeholders are usually familiar with a particular topic, and they can provide more detailed inputs to the process; (2) active participation increases the chance of successful adaptation of the decisions; (3) participation can strengthen the integrity and credibility of the work at hand and the decisions to be made. Bell et al. (2012) add that the participatory approach is a chance for different stakeholders to provide input into the research process.

Blackstock et al. (2007) describe participation as a situation where new ideas and knowledge are allocated among the participants – this is also called social learning. Hiltunen (2012) notes that participants will learn and achieve a better understanding of the whole issue during the planning process. Social learning is seen as a way to interactively produce and collect individual and situational factors of human behavior (Maarleveld and Dangbégnon, 1999). Kok et al. (2006) point out, that the workshop setting can act as a stimulus for social interaction and learning (see also Blackstock et al., 2007). According to Burns and Cheng (2005), understanding what and why decisions are made is one key outcome in stakeholder interaction. Stakeholders are often used only for final evaluation in the collaborative processes; hence Burns and Cheng (2005) believe that this can lead to a situation where stakeholders feel that the actual decisions are already made before their involvement. If the stakeholders are engaged in the planning and development of the process, and not only in the final evaluation, wider acceptance might be achieved.

1.1. State-of-the-art of participatory scenario development in Finland

Participatory scenario development has been used in Finland already since a few decades. Seppälä et al. (1980) proposed that the Finnish forestry sector faces two limitations: wood as a raw

material is becoming a scarce factor of production, and the possibilities to increase production are rather limited. A wide-ranging and comprehensive scenario study of Finnish forest clusters was published by Seppälä in 2000. Calculation models, qualitative scenarios and expert views were used as building blocks in mapping the future of the Finnish forest cluster. The aim of the study was to present outlooks for forestry (carbon sinks, wood fuel, tourism, information technology, chemical industry, construction industry) until 2020. In addition, the Finnish Forest Research Institute has released a report concerning the operational environment of Finnish forestry (Hetemäki et al., 2006) where the future views of the operational environment of forestry until 2015 are presented. General, and also some detailed policy actions are presented, even though the aim is rather to analyze different alternatives for the background of decision making. Speculations of the future of the forest sector and strategies for well-being are presented and the report notes a shift towards a bioeconomy.

In summary, participatory and problem-oriented approaches are tools for integrating knowledge, illustrating the future and the human impacts on, for example, biodiversity (Spangenberg, 2007; Swart et al., 2004). Hiltunen (2012) considers participation in natural resource planning (NRP) as guidance and facilitation for participants' decision making by helping to focus on the most important issues and also considering the personal preferences of participants. Often in a participatory process (e.g. Hiltunen, 2012) scenario alternatives are fixed and stakeholders are involved in evaluating proposed scenarios only towards the end of the process rather than in creating their own scenarios. However, in this study the focus was to develop new alternatives, focusing on future bioenergy production and biodiversity conservation.

1.2. Aims of the study

The utilization rate of woody biomass in eastern Finland is expected to increase in the near future as set out in several regional, national and European policies and strategies (Ministry of Economic Affairs of Finland, 2008; European Commission, 2009; Regional Council of North Karelia, 2011). At the same time we are losing our diversity of species at an unprecedented rate and most habitats are unsuitable to maintain biodiversity (Rassi et al., 2010). The EU target of halting biodiversity loss aims to improve the status of European ecosystems and reverse the process of loss of important habitats and species (European Commission, 2011). However, it is not immediately obvious that targets for increasing the use of bioenergy and biodiversity conservation can be achieved at the same time, as they are often seen as conflicting issues in forest resource planning (Eggers et al., 2009; Verkerk et al., 2011; Pedrioli et al., 2012). Therefore, there is a need to analyze possible conflicts and trade-offs and to identify the most sustainable resource use alternatives. This study applied participatory methods to analyze the question of whether it is possible to increase bioenergy production without harmful impacts on biodiversity. This study presents a case of developing forest resource use scenarios in Eastern Finland. By utilizing a participatory approach combined with a forest resource projection model we aim to describe a means to conduct a scenario building process. We explored whether it is possible to improve existing scenarios by involving stakeholders in an early phase of the process during the development of new scenario alternatives for forest use.

2. Material and methods

The study area consisted of five Forestry Centre areas in eastern Finland: Kainuu, North Savonia, South Savonia, North Karelia and South-East Finland. About 87% of the area is covered by boreal

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