

Voting methods in strategic forest planning — Experiences from Metsähallitus

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Abstract

Voting methods were used by Metsähallitus in a real strategic participatory planning case in a regional working group context. The general aim of the study was to find out whether learning and collaborative decision making could be adequately supported by using the voting methods in the regional stakeholder group. Approval voting (AV) was used to select the evaluation criteria of the alternative strategies, Borda count method and cumulative voting were used to rank the stakeholders' decision criteria and the multi-criteria approval (MA) voting was used to multi-criteria evaluation of the alternatives. Plurality voting was used in public meetings to point out the best plan candidate. In general, the voting methods used were found to be easy to understand and their results transparent, which makes them user-friendly in the participation context. The applied voting methods also promoted learning and decision making in the planning process. Other lessons of the study stresses the key role of the plan alternatives in taking over the planning situation and in learning the trade-offs between different goals. Participants' preference elicitation should not be carried out before the trade-offs have been learned. Furthermore, instead of using criteria averages as approval borders in the MA voting, the approval borders should be specified by the participants of the working group.

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1. Introduction

Metsähallitus (the Finnish Forest and Park Service) was established in 1859 to manage the forests owned by the state of Finland. Today, the total area of such public lands is about 9 million hectares and that of public waters is about 3 million. State-owned forest lands are located mainly in the northern and eastern parts of the country, and they are used for multiple purposes. About 3.4 million hectares are under commercial forestry, the rest (about 5.6 million hectares) being nature conservation areas, wilderness areas, areas dedicated to some special use, and poorly-productive commercial forests outside forestry activities. Metsähallitus has been entrusted with the care and management about 25% the total forest resources of

Finland and about 7–8% of the annual cut, its absolute annual cut being about 4.5 million m³.

Metsähallitus was a state department until the year 1994, when it was transformed into a state-owned enterprise also providing public services in nature conservation and recreation. These public services are financed *via* the state budget. In 2003, Metsähallitus had a total turnover of about 240 million euros (€), the share of public services being about € 30 million. The net income of its commercial activities amounted to about € 70 million. About € 50 million was paid to the owner and the rest, about € 20 million, Metsähallitus invested in developing the enterprise. The total number of Metsähallitus staff (salaried staff, workers, entrepreneurs) is about 3000 people. The Finnish Parliament sets the general goals and guidelines of management through acts and decrees. The foremost acts concern land-use (establishment of nature protection areas) and the position and tasks of Metsähallitus as a state-owned enterprise, which also provides public services (Laki Metsähallituksesta, 2004). More detailed supervision is carried out by the supervising ministries,

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the Ministry of Agriculture and Forestry and the Ministry of the Environment, in both the short and the long term.

The management planning task of natural resources in Metsähallitus is a multi-goal planning situation involving several different objectives and many stakeholders and other participants. The level of nature protection, the intensity of wood production and the allowable annual cut, the facilities for recreation and ecotourism, the needs of traditional livelihoods, and the societal impacts on the communal level are the key objectives needing to be fitted together and to be decided in the course of planning. In order to respond to these challenges Metsähallitus developed participation and forest planning methods in the 1990s.

Metsähallitus introduced participation into Finnish state forestry in the mid-1990s to enhance the role of citizens and stakeholders in forest management decisions (Loikkanen et al., 1999). Participation provided a lot of information, especially on the attitudes and the values of the local people and stakeholders, but also on local specialities, both in natural resources planning processes and in cases of landscape ecological planning. Participation was a step towards more sustainable forestry in social terms (Loikkanen and Wallenius, 1997; Niemelä et al., 2001; Wallenius, 2001). Simultaneously with the introduction of participation, natural resource planning (NRP) and landscape ecological planning (LEP) methods were developed to replace traditional forest planning in the mid-1990s. Natural resource plans were strategic long-term plans in terms of land-use, allowable cut, and other guidelines on a regional scale; landscape ecological plans, on the other hand, focused on sustaining biodiversity at the landscape level within the framework of NRP (Wallenius, 2001; Korhonen et al., 1998). Seven NRP plans and 112 LEP plans were conducted during the years 1996–2000 covering all Metsähallitus' estates.

Today the main management planning tool of Metsähallitus forests and other natural resources is renewed natural resource planning (NRP) that combines the former NRP and LEP by means of thematic impact assessment. The goal of NRP is to work out a balanced management concept for the forests and other natural resources fulfilling all dimensions of sustainability. The plans are formulated for regions, whose areas range from about 0.5 million hectares to about 3 million hectares. These plans are renewed at intervals of ten years and reviewed midway through the period (Asunta et al., 2004). Planning projections are conducted over time spans of 30–40 years, but the strategy will be fixed only for the first 10 years. This is due especially to difficulties in foreseeing how the goals concerning natural resource use will change in the future. In addition to specifying the strategic guidelines for the use of natural resources on regional scale in the long term, NRP serves also as a tactical plan in the sense that the plan alternatives are tactically and operationally valid to be implemented.

The planning problems related to NRP are quite complicated and they include several, often contradictory, goals. This is why some methods of multi-criteria decision making (MCDM) have been tested by Metsähallitus during the past few years. For example, the very first tests of MCDM methods in participatory planning of state forests were performed by applying the AHP (Kangas and Matero, 1993) and the HERO optimization (Kangas et al., 1996). Interactive Decision Analyses (IDA)

based on defining partial utility functions for the criteria and weighting the criteria in an interactive process has been used and studied in several real planning cases (Pykäläinen and Loikkanen, 1997; Heinonen, 1997; Pykäläinen et al., 1999, in press). Also, the A'WOT method has been tested (Kurttila et al., 2000; Pesonen et al., 2001) and use of outranking methods such as Electre and Promethee (e.g. Brans et al., 1986; Roy, 1991) has been studied to some extent (Kangas et al., 2001).

A lesson of participation in Metsähallitus is that, especially in the participation context, it is very useful to keep the process as simple as possible. Key elements, like the goals and the framework of the planning process, plan alternatives and their outcomes, should be expressed in tangible, practical terms that everyone can comprehend. Concerning the participants' goals, values and wishes, the lesson has been that it is often difficult for people to express them exactly and using specific professional terminology. It is easier to tell about those items at the general level, in everyday language, and allowing for some degree of uncertainty in expressions. The role of planning alternatives and decision support tools in NRP is to help the participants to take over the planning situation, to focus on the key issues, to support the participants' own goal setting, and to facilitate the stakeholder group's decision making. For decision makers in Metsähallitus, the decision support tools should provide better information on the participants' preferences and on the mutual priority of the relevant alternatives in the planning case (Asunta et al., 2004).

The present study tackles these challenges of participatory decision making by testing voting methods in strategic forest planning in state-owned forests in Finland. Voting methods as such have gained positive assessments as decision support tools in dealing with natural resources problems (e.g. d'Angelo et al., 1998; Shields et al., 1999). In Finland, Laukkanen et al. (2002) introduced multi-criteria approval (MA) into tactical forest management planning. Later on, MA was applied in deciding sustained harvesting in group decision context (Palander and Laukkanen, 2003; Laukkanen et al., 2004).

Our application represents the first time (at least in Finnish forestry) when voting methods are used to support real decision making in a real, large-scale strategic participatory forest planning process. In this case, approval voting is used to select the evaluation criteria; Borda count method and cumulative voting are used to rank the stakeholders' preferences; and the multi-criteria approval is used for multi-criteria evaluation of the alternatives. Plurality voting is used in public meetings to point out the best plan candidate.

Voting methods offer a straightforward, transparent and easily understandable way to collect different parties' preference information and to include that information into the planning process. The general aim of using voting methods is to support collaborative learning and decision making in a regional stakeholder group. The general aim of the study is to find out whether this goal can be really achieved; do the voting methods adequately serve the participants of the planning process in formulating their decision proposals for the planning organization? The answer to this question is strived for by working as the planning consultant of the planning process, making observations

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