

Integrating Place-Specific Social Values into Forest Planning – Case of UPM-Kymmene Forests in Hyrynsalmi, Finland

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In participatory forest management planning, the perceived values of local inhabitants concerning the area under planning are collected. The results may, however, depend on the methods used. In this study, values of residents of Hyrynsalmi municipality concerning the nearby forests owned by UPM-Kymmene Ltd. were evaluated with a questionnaire consisting of general value questions and mapping of social values of forests. The data was collected from a public meeting and from a mailed survey from randomly sampled people and from members of municipal council. The aims of the study were to 1) test the social value mapping method in commercial forests in a rural-urban interface as well as to examine the benefits and drawbacks 2) in place-specific and non-specific data collection, and 3) in different data collection methods, from the viewpoint of forest management planning. We noted that while all respondents can claim to represent local values, different data collection methods produced statistically significantly different local values. This needs to be accounted for when planning a participatory process. In operational forest planning, place-specific information is more useful than questions concerning the general values, while the latter may help in defining forest policy goals. The social values mapping method is also relatively easy for the participants. However, in the studied case about one fifth of the area was delineated by the participants per each positive value. The answers were quite scattered, suggesting that most of the area had some social values for local people. This indicates that utilising a social values mapping method in planning needs further development in rural areas, where distinctive patches can not be easily detected.

Keywords collaborative planning, experienced values of forests, social value mapping, survey

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1 Introduction

Planning of natural resources often include numerous stakeholders. The stakeholders are defined to be “any group or individual who can affect, or is affected by, the achievement of a corporation’s purpose” (Freeman 1984). They could be the persons like forest owners, farmers, forest workers or local inhabitants, or stakeholder groups such as tourism and recreation services, organizations concerned with nature conservation, rural communities, hunters associations, sporting and recreation associations or wood and forest industry (International Labour Office (ILO) 2000). Each of them can have different objectives concerning the use of forests or other natural resources.

Public participation means that citizens are involved in the environmental or natural resource decision-making that has an effect on them (e.g. Loikkanen et al. 1997). Public participation is also seen as part of sustainable development. It can be assumed that the final decisions are made with more competence, when local knowledge is included and expert knowledge is scrutinized by the public (Webler et al. 1995). Furthermore, the legitimacy of the final decision may be better, when the different stakeholders are involved in the decision making. In Finnish forestry, participatory planning has been used for instance in the strategic forest planning of Metsähallitus (formerly Forest and Park Service) (e.g. Wallenius 2001, Hiltunen et al. 2008) and urban woodlands owned by cities and municipalities (e.g. Sipilä and Tyrväinen 2005, Tyrväinen et al. 2007a).

Especially in urban forests participation has been seen as important. Urban forests are seen as a contribution to the quality of life in cities (Bonaiuto et al. 2003, Chiesura 2004). In urban areas, people especially value recreation opportunities, contacts with nature, stress relief and aesthetic experiences as well as improvement of the home and work environment (Tikkanen 1996, Tyrväinen et al. 2005). Economic values such as employment or incomes from city forests have not been seen as important, in particular in larger cities in Finland (Tikkanen 1996). In rural areas, where access to nature is easy and forests are plenty, people may have values markedly different from those in cities. Therefore, the social

values need to be addressed locally in each planning process.

The strategic management goals including production of amenity values of forests are often not well articulated even in municipal forests, however. More than half of the forests owned by municipalities are classified as economic forests and only one third as recreation forests. A quarter of municipalities do not have any areas classified as recreation forests, although they may include areas very important to local residents (Kuntien... 2007). Management may be intensive aiming mainly for timber production, although the forests may also be actively used for recreation and offer many social values to the residents. Intensive forest management and in particular regeneration causes loss of recreation and landscape values (e.g. Tyrväinen et al 2001, Silvennoinen et al. 2002, Karjalainen 2006). This may lead to conflicts due to negative attitudes towards proposed management actions. Yet, participatory forest planning has not been systematically utilised by municipalities, except for what is required by law of land use planning.

The information required for participatory planning can be obtained, for instance, using collaborative planning groups, public hearings or mailed surveys (e.g. Wallenius 2001, Van Herzele et al. 2005, Janse and Konijnendijk 2007). These methods have their own pros and cons. Surveys based on a random sample provide representative information on the population, but the public responding may be uninterested and uninformed (e.g. Lauber and Knuth 1998). In public hearings, the people attending may be well-informed and interested, but as the hearings are not based on sampling, there is no guarantee on the representativity of the opinions (e.g. Lauber and Knuth 1998). It may be that the hearing only reflects the views of well-identified interest groups, or that only opponents of the propositions attend to the meetings (Heberlein 1976). However, there is also evidence that the opinions gathered with public hearings have been “in most respects” similar to the results of survey (O’Riordan 1976). Moreover, the methods used in collaborative planning processes should be cost-efficient and easy to apply.

One of the key criticisms raised in participatory planning has been that the participants had been given too optimistic a view of their pos-

sibilities to affect the final plan (e.g. Sipilä and Tyrväinen 2005). Furthermore, the questions of how to involve 'silent groups' more in planning and how to combine social information with other information used in forest planning have been raised. The spatial information related to forests typically includes forest stand inventory and ecological data. The values and preferences of local residents or visitors to an area, if gathered through surveys or public hearings, are not typically referenced to a spatial location. Therefore, they are difficult to integrate with other types of data sources. In order to enhance the utilization of social information in planning, approaches to spatially locate public-perceived values of forests and other nature areas have been recently introduced both in rural and urban areas (Hytönen et al. 2002, Reed and Brown 2003, Brown 2005, Tyrväinen et al. 2007a, 2007b).

In northern Europe, the social mapping method was first introduced into regional land-use planning in Stockholm, Sweden, where interviewees could indicate important areas and describe their values. The approach was also applied in identifying values for parks and green areas in Stockholm (Ståhle 2002). The method was further developed for Finnish conditions for strategic green area planning purposes by Tyrväinen et al. (2003, 2007a) and later on applied in general urban land-use planning (Pelkonen and Tyrväinen 2005) and in identifying local residents' values of nationally valuable landscape areas (Tyrväinen et al. 2007b). A similar type of approach called landscape value mapping has been introduced in the U.S and in Australia in planning of national forests and tourism development areas (see overview in Reed 2005).

In this study, the social values of forests owned by UPM-Kymmene Ltd. in a rural municipality of Hyrynsalmi, were analysed. UPM-Kymmene mostly strives for good profits from their forestry. They are also interested in acquiring acceptability for their actions in the area, especially since it may indirectly affect the profitability. The company has been avoiding cuttings nearby the Hyrynsalmi municipality centre. As these forests have high economic value for UPM, cuttings were planned in 2005, and people objected to the plans in the local newspapers. Therefore, the company wanted general information concerning the values of the

residents, as well as information concerning the location of most valuable areas.

The data was collected with a questionnaire from a public meeting arranged by the company and from a mailed survey from randomly sampled people and from members of municipal council. The questionnaire consisted of two separate parts: general value questions and mapping of social values of forests. The aims of the study were to 1) test the social value mapping method in commercial forests in a rural-urban interface as well as to study what are the benefits and drawbacks 2) in place-specific and non-specific data collection, and 3) in different data collection methods, from the viewpoint of forest management planning. For the first aim, we tested how well the social values mapping method, developed for urban areas, suits in commercial forests. The usefulness of the collected information, as compared to the general value questions is discussed. Moreover, we compared the opinions collected with different methods, and discuss the usability of these methods for forest planning cases in future. If these three methods provided similar information, it would be possible to only use one of them in the future. If the methods, however, provide different information, it needs to be asked which of them is most useful, or would several data collection methods be needed also in future cases.

2 Material and Methods

Hyrynsalmi municipality is located in Northern Finland. Its area is 1422 km² and there are about 3000 residents. UPM-Kymmene Ltd. owns ca. 950 hectares nearby the municipality centre. Company has four forest holdings in the area: Salmi, Lietejoki, Isto, and Konivaara (Fig. 1). The municipality centre is located between the Lietejoki and Salmi holdings (Fig. 1). There is residential area in the immediate vicinity of most of the Lietejoki area, and the most southern parts of Salmi holding. These areas are probably used frequently for recreation for their easy accessibility. The other holdings are separated from the immediate vicinity of the municipality centre by Emäjoki River, which goes between Salmi and Konivaara and also between Lietejoki and Isto.

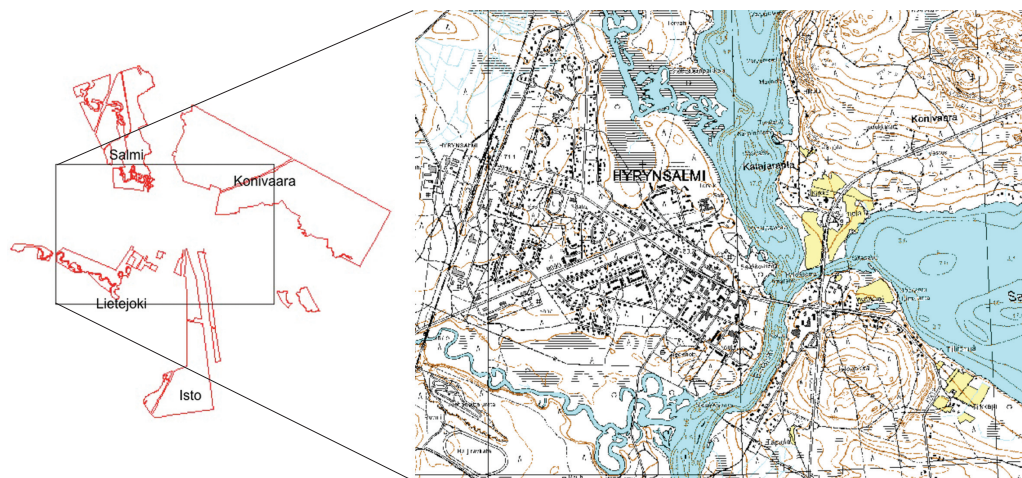


Fig. 1. The holdings of UPM-Kymmene around the Hyrynsalmi municipality centre and a close-up of the municipality centre and the Emäjoki River between centre and Konivaara and Isto holdings.

Konivaara holding thus also forms the scenery from the municipality centre, across the river. Konivaara is on average about 3 km from municipality centre, and Isto about 6 km. These areas are probably not used as often by the residents, because of their more distant location. Each of the holdings has its special characteristics. In Salmi holding, for instance, there is a common swimming beach and some historically important places (i.e. constructs from the war time), in Lietejoki holding a recreational forest path following a small Lietejoki river.

The values and meanings of forests to residents of Hyrynsalmi area were analysed with a questionnaire. The questionnaire consisted of two separate parts: general value questions and mapping of social values of forests (see Appendix). The social values mapping exercise aimed at identifying perceived values of forests referenced to a spatial location. The data was collected from a public meeting and from mailed survey, which was sent to randomly sampled people and members of municipal council. In each three cases the respondents answered to the same questionnaire.

The public meeting was carried out first. The meeting was arranged in March 2006, and it was announced in local papers and on municipality notice boards a week before. The meeting was attended by 20 residents, 6 of whom were also council members. Secondly, a random sample

of 200 local residents was selected. As two of the selected persons had attended the meeting, the questionnaire was mailed to 198 residents. Finally, the questionnaire was also mailed to the 13 council members who did not attend the meeting. Each of them were given a week to answer the questionnaire. No follow-ups were sent.

In the first part of the questionnaire, the value of forests in general was inquired. These questions included 13 opinion statements relating to economic, ecological and social values of the forests (see Appendix). Economic issues were further divided to regional economy and employment, and social values to cultural and recreational issues. They were evaluated in scale from -2 to 2 (-2 = Not at all important, -1 = Not very important, 0 = Cannot say, 1 = Fairly important and 2 = Very important). In addition, the people were asked how well they know the company forests, how valuable they find them and how they use the company forests. Last questions were about personal information the respondents, such as age and gender.

The questionnaire was compiled and analysed with SPSS software. The differences between the methods (random sample, persons attending the meeting and council members) and values within each sample were analyzed using sign test and Mann-Whitney U-test. These are suitable for small data sets and ordinal data.

The second part of the questionnaire was the

social value mapping section, which is based on the approach of Tyrväinen et al. (2007a). In that study, the green areas of Helsinki case study were pre-delineated by the experts and given a number. The respondents only gave the number of areas where each social value was found, if such areas existed. In the analysis phase, it is enough to count the occurrence of each number in relation to each value to produce the value maps. However, using pre-delineated areas means that the social values were assumed to be associated to each area as a whole. In urban areas, where small, distinct patches such as parks are valued, this can be justified.

In the case of commercial forests located in urban-rural interface, pre-defined areas were not used. In principle, the stand delineation map could have been used, but in an area this big, the number of different stands could have been several hundreds (mean stand area in Finland is about 2 ha), and identifying valuable ones among those could have been difficult, or at least tedious. Pre-defining bigger areas would also have been possible, but also artificial. Moreover, assuming similar social values associated across large areas might not be justifiable either. Thus, in this study each participant was given a (A3 size) map of the areas owned by the company. Respondents were then asked to delineate areas with specific social values on the map, or mark points with specific social values on to them. They also could say that such areas cannot be found from UPM-Kymmene forests or that they do not know if such areas can be found. The areas delineated by each of the participants were manually digitized with Map-Info program to one map for each social value. Each answer formed a separate layer, so that it was possible to calculate the overlapping areas in different answers. Thus, the method applied involves much more work but could potentially provide more detailed information than the one used by Tyrväinen et al. (2007a).

Tyrväinen et al. (2007a) used a pre-defined set of values based on previous research. The values used were either positive or negative. Positive social values included were beautiful landscape, valuable nature site, forest feeling, space and freedom, attractive park, peace and tranquillity, opportunities for activities and history and culture. Negative social values included were unpleasant-

ness, scariness and noisiness. The values used were partly based on earlier studies, and partly modified for the specific conditions of the studied sub-urban housing area in Helsinki.

In this study, the social values mapping method was further modified in order to suit for commercial and rural area forests, as many of the previously mapped values attached to urban green areas may not apply. For instance, feeling of forest and space and freedom were not included, as the whole area is more or less rural area, with largest part of the area forest. Noisiness and peace and tranquillity were also omitted for the same reason. Attractive parks were omitted as no parks can be found from the company area. As opportunities for activity is associated to outdoor activities within urban green areas such as jogging and cycling, this was also omitted from the studied values. The social values included in this study were beautiful landscape, area for picking berries and mushrooms, history and culture, valuable nature site, favourite forest, experience rich forest, and unpleasantness. Picking areas and experience rich forests were new values included in this study (see Appendix). These were assumed to be able to involve the values not involved in urban areas, such as areas used for hunting, trekking, camping and so on. Favourite forest is different from other classes in a sense that is not assumed to be a value as such, but more like a forest combining one or more of the listed (or not listed) values.

3 Results

3.1 General Values of UPM-Kymmene Forests

The response rate in the questionnaire was 23.7% (47 persons) for the random sample. From the council members, the response rate was 63.2% (12 persons). In addition, the questionnaire was answered by 14 residents attending the meeting, but who were not council members. These three groups were treated separately.

The value statements of the first part were grouped to describe the values concerning recreation (statements a, b, c and d), culture and education (statements i and j), employment (state-

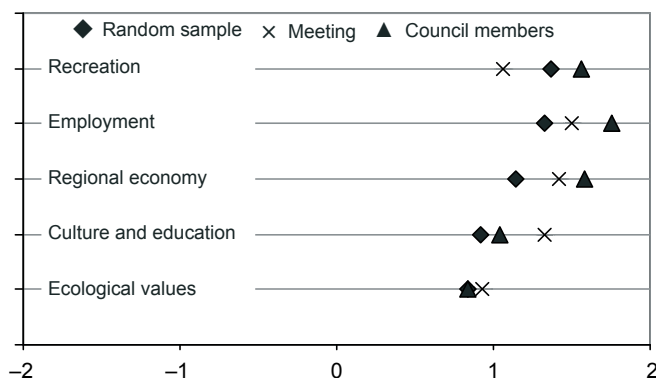


Fig. 2. The mean valuations given to different forest values in different samples. (Scale: -2 = not at all important, -1 = not very important, 0 = can not say, 1 = fairly important and 2 = very important).

ments e and f), regional economy (statements g and h) and ecological values (statements k, l and m see Appendix). The respondents belonging to the random sample valued most recreation, then employment, regional economy, culture and education and least ecological values of forests (Fig 2). The value difference between recreation and ecological values in the sign test is statistically significant ($p=0.001$), but the difference between employment and culture and education was not ($p=0.094$). On the other hand, the respondents attending the meeting valued most employment, then regional economy, culture and education, recreation and least ecological values (Fig 2). The value difference between employment and ecological values is significant in the sign test ($p=0.046$), but the difference between recreation and employment was not ($p=0.073$). The council members also valued most employment, then regional economy, recreation, culture and education and least ecological values (Fig 2). The difference in sign test between employment and ecological values was again significant ($p=0.033$), but the difference between employment and culture and education was not ($p=0.145$). Thus, in each group there was a significant difference only between the extremes.

When the groups were compared to each others, Mann-Whitney's U test showed that recreation was valued significantly more by the random sample of residents than by the residents attending the meeting ($p=0.016$). Likewise, council mem-

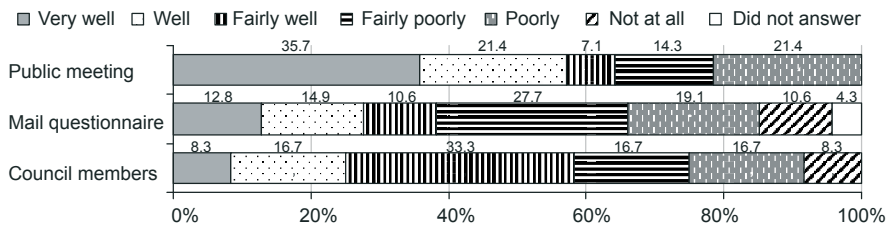
bers valued recreation significantly more than the residents attending the meeting ($p=0.010$). Council members also valued employment and regional economy significantly more than the random sample of residents ($p=0.041$ and $p=0.009$, respectively). Other differences were not significant.

The differences between the groups can also be seen from the Spearman correlations ρ between the ranks of the values. The ranks obtained from random sample had correlation 0.9 with the rank obtained from council member answers (significant with $p=0.037$). On the other hand, the ranks obtained from the people attending the meeting and the random sample were not significantly correlated ($\rho=0.4$ and $p=0.5$), neither were the ranks obtained from the meeting and council member opinions ($\rho=0.7$ and $p=0.18$). Thus, people attending the meetings had significantly different values concerning the forests compared to other groups. Yet, each of these groups could claim that they represent the values of local people.

When the groups were analyzed in more detail, it could be noted that people attending the meeting valued fishing and hunting markedly less than the other groups (Table 1). However, also the variation in the opinions was great concerning this question. The people attending the meeting valued nature conservation markedly more than the other groups and about this statement they also had very similar attitudes, compared to the other groups. On the other hand, they valued pristine-looking

Table 1. The means and standard deviations of the statements among the different samples

	Random sample		Public meeting		Council members	
	Mean	Sd	Mean	Sd	Mean	Sd
Possibility to pick berries and mushrooms	1.60	0.80	1.50	0.85	1.83	0.39
Possibility to outdoor recreation	1.53	0.95	1.54	0.52	1.67	0.49
Well-tended forests and environment	1.40	0.77	1.14	1.23	1.67	0.49
Possibility to fish and hunt	0.96	1.23	0.07	1.38	1.08	1.08
Forest incomes and forest work for Hyrynsalmi people	1.34	0.73	1.43	1.02	1.75	0.45
Possibilities for work in the forest for Hyrynsalmi people	1.32	0.75	1.57	0.85	1.75	0.45
Hyrynsalmi as a target area for tourism	1.20	0.89	1.54	0.66	1.67	0.49
Wood as raw material for Finnish forest industry	1.11	0.92	1.36	0.84	1.50	0.52
Observing nature and learning from it	1.13	0.95	1.36	0.84	1.00	1.13
Forest as a part of cultural history	0.70	1.14	1.29	0.61	1.08	1.08
Forested landscape	1.07	0.99	1.3	0.825	1.5	0.9
Nature conservation for plant and animal species	0.89	1.04	1.4	0.497	0.67	1.3
Little traces of people and pristine-looking forests	0.58	1.25	0.1	1.406	0.33	1.3

**Fig. 3.** Answer distributions to question “How well you know the company forest nearby the municipality centre” in different samples.

forests less than other people, but there was a lot variation in this issue also (Table 1).

The groups differed from each other also with some other interesting aspects: people in random sample and council members did not think that neighbours should be listened when deciding about forest treatments (means 0.087 and -0.167 , respectively), but people attending the meeting believed that neighbours should be listened (mean 0.929). The difference was also statistically significant in Mann-Whitney’s U-test ($p=0.050$ in both cases).

The people attending the meeting believed that there are valuable nature sites in the company forests more than random sample or council members (means 1.57, 0.94 and 1.08, respectively). The difference is, however, not significant ($p=0.102$). On the other hand, people in random sample and council members more often held the company forests as ordinary forests (means 1.02 and 0.75, respectively) than the people attending the meet-

ing (mean 0.5). This difference was neither statistically significant ($p=0.097$). People attending the meeting also knew the forests of UPM-Kymmene better than the other groups: 57% of them claimed that they know the forests well or very well, while only 28% of the people in the random sample, and only 25% of the council members claimed to know them as well (Fig. 3).

One notable issue in the questionnaire was that all groups think that residents of Hyrynsalmi use the company forests much for recreation (means for random sample, meeting and council members were 0.89, 1.42 and 0.58, respectively) while they did not find the forests so important for their own recreation (0.37, 0.92, 0.17). In random sample, the difference was highly significant based on the sign test ($p=0.005$), weakly significant for people attending the meeting ($p=0.063$), and not at all significant for council members ($p=0.344$).

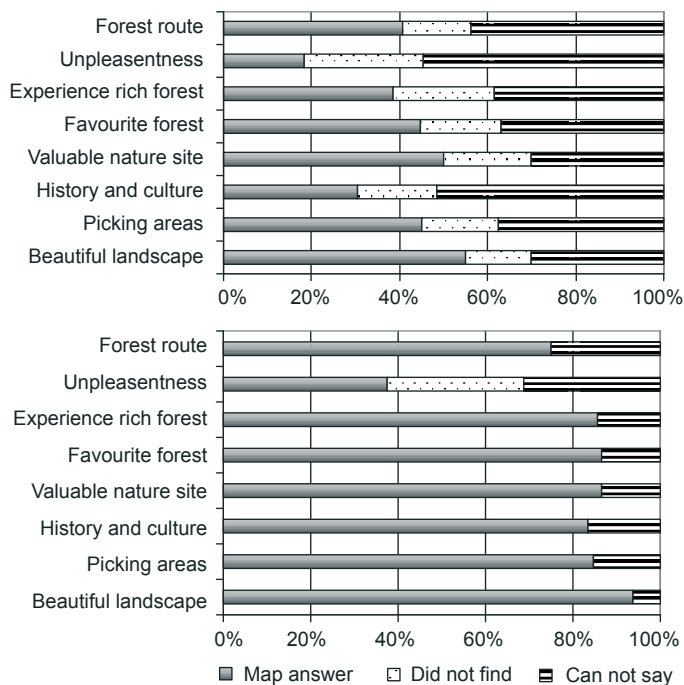


Fig. 4. Number of different types of answers to the social mapping exercise a) in the random sample and b) among the people attending to the meeting.

3.2 Place-Specific Social Values of UPM-Kymmene Forests

The people attending the meeting were more active in delineating and marking the different social values in the maps than the random sample. In the mapping exercise, also the council members who attended the meeting are included. For the most popular social value, beautiful landscape, 75% of the people in the meeting found at least one area or a point, while in questionnaire mailed to the random sample of people, only 47% found at least one area or a point (Figs 4 a and b). Unpleasant areas were found least: 30% of the people found such point/area in the meeting and 13% in the random sample.

In the social values mapping exercise large part of the area was delineated by at least one participant but only small part of the area was delineated by several participants. For instance, in the mailed questionnaire, people delineated altogether 338.8 hectares as areas for picking berries and mushrooms, i.e. almost 36% of the

area (Fig 5). Only 25.8 hectares (2.7% of the area) was delineated by at least two participants. The people at the meeting delineated altogether 82.8 hectares, and at least three persons delineated 82.8 hectares (8.7% of the total area). The picking areas delineated by people in random sample and people in the meeting were fairly similar in Northern Konivaara and Isto, but quite different in the other two holdings.

Valuable nature sites were delineated 136.2 hectares in the mailed questionnaire (Fig. 6), and 103.5 hectares in the meeting. In the random sample 1.1 hectares was delineated at best by nine persons. In this case, the answers given by the people in the meeting and the people answering the mailed questionnaire coincided best.

These answers also coincided quite well with the mapped experience rich forests (85–95% of delineated area in Lietejoki holding) and beautiful landscape. Beautiful landscapes were delineated at 304.7 hectares in the random sample, of which 81.3 hectares were delineated by three or more persons, and 1.0 hectares was delineated by 6



Fig. 5. The areas delineated for picking berries and mushrooms in the random sample.



Fig. 6. The areas delineated as attractive (valuable) nature areas in the random sample.

persons (Fig. 7). In the meeting, 159.4 hectares was delineated, of which 0.6 hectares by four or more people. Some people also found unpleasant areas (154 hectares in the mailed questionnaire, 10.3 hectares in the meeting), but the answers of different people did not coincide at all.

As favourite forests, altogether 206 hectares were delineated in the mailed questionnaire, of which 53.7 hectares by at least two and 9.2 hectares by at least three persons. These favourite forests concentrated in Salmi (122 ha) and Lietejoki (65 ha) holdings, while none were found in Konivaara. In the meeting, people delineated altogether 187.7 hectares, and only 3.2 hectares was delineated by two or more persons. Of these, largest part (125 ha) was in Southern Konivaara, but 56 hectares also in Lietejoki. Thus, the favourite forests of the participants did not much coincide with the picking areas, but coincided well with the valuable nature sites, experience rich sites and beautiful landscapes, especially in Lietejoki holding. Therefore, picking areas seem to be less important than the other values.

All in all, the answers coincided best in Lietejoki holding. For instance, in the meeting, 81% of Lietejoki area was delineated as experience rich forest, 80% as valuable nature site, 79% as beautiful landscape and 83% as favourite forest. In other holdings, the percentages were much smaller. For instance, southern Konivaara had no experience rich forests at all, nor beautiful landscapes. Instead, 23% of the area was delineated as picking area, 40% as favourite forest and 5% as valuable nature site. Isto holding had 0–20% of the area delineated for different values. Cultural and historical sites were concentrated in Salmi holding (83% of the area delineated) and picking areas to northern Konivaara (93% of the area delineated). In random sample, the results were fairly similar, except that picking areas were more scattered (17%–61% of each holding delineated).

4 Discussion

One aim of this study was to analyze if the information obtained from a questionnaire sent to randomly selected local inhabitants and questionnaire filled in a public meeting or by the local council members gives similar information for participatory planning. The opinions of the people attending to the meeting differed markedly from those of other groups. The Spearman correlation of the importance order of values was not significant between these people and other groups. The most evident difference was that the people participating in public meeting valued recreation significantly less than other groups.

Although the opinions expressed in the survey had significant Spearman correlation with the opinions of council members, there were also differences between these two groups. In the mail survey, recreation was valued most of the issues considered. The council members valued most employment and regional economy, and there was a significant difference in both respects to the random sample.

The people at the meeting claimed that they know the forests in question well, while the other groups did not. They also had more clear views than the other groups, for instance a larger proportion of them delineated social values on the maps than of other people. On average 80% of the people attending the meeting delineated some areas, but from the random sample, 40% of those who answered, answered “cannot say” to the mapping questions. This, however, may also be due to possibility to give better instructions in the meeting. The results confirm the observations of Lauber and Knuth (1998), who also observed that the active people attending meetings had much clearer views and better information on the issues at stake than people at large.

The better knowledge of the areas does not explain the differences in values between the groups, however. When the opinions of persons claiming to know the areas well within each group were compared to those of people who did not know the areas well, there were no statistically significant differences. Thus, it is more likely that the differences between the activities are due to the differences in values attached to forests: the



Fig. 7. The areas delineated for beautiful landscape in the random sample.

people who are more concerned about nature conservation than the average resident, is also more likely to attend meetings.

The data set in this study is, however, fairly small. Only 20 persons attended to the meeting, and 47 persons answered to the mailed questionnaire. Furthermore, the response rate in the mailed survey was only 23.7%. The low response rate was partially caused by the fact that no follow-up letters were sent to remind the respondents about the survey. The response rate among the council members was good, 63.2%. It may be that the random sample does not represent the opinions of truly average resident of Hyrynsalmi much better than the opinion of the people in the meeting: it is always possible that the people most concerned with issues like nature conservation or employment were most likely to answer to the questionnaire. Yet, as there was a significant difference between the random sample and the opinions obtained from the meeting, it can be concluded that average person in Hyrynsalmi most likely has different values than the people

attending the meeting.

Thus, while all the respondents of the questionnaire can claim to represent local values, people active enough to come to public meeting have different values than the other two groups. Therefore, for collecting information on the local values, mailed survey seems a better method. On the other hand, for collecting local knowledge like locations of key-biotopes etc., the public meeting might be the best method. Therefore, a combination of these two seems a good option also in the future. This would enable utilising the good characteristics of both data collection methods, and also the way to avoid the pitfalls of either of them.

The problem of usability of the general value questions, however, remains. Information about general values may help in defining strategic management goals, while place-specific information helps in understanding which areas should be given priority from recreational point of view. This helps the operational level planning.

The most popular social values in Hyrynsalmi,

in terms of number of answers, were beautiful landscape and valuable nature site. The popularity of the valuable nature sites is also notable as ecological values were not valued very much in the questionnaire, and in those statements that were deemed to describe ecological values, forested landscape was given higher scores than nature conservation or pristine forests. However, the area of valuable forest sites (136 ha in random sample) was much lower than for beautiful landscapes (304 ha in random sample), indicating that they do not mean the same thing. Yet, it can be assumed that the valuable nature site is not necessarily directly related to places suitable for nature conservation or pristine forests, but describes more general nature value. Even though the words used are no professional language, the interpretations of different people are different. The valuable nature site was explained to be a place where there is special feeling of nature, which might mean an attractive nature site more than ecologically important nature site. This is the interpretation given also in the figures of this paper.

The pre-defined set of values may be seen as a deficit of the method. For instance, it may be that people of rural areas also would have appreciated peace and tranquillity as well as urban people, and these were not included as the whole area was deemed peaceful. Similarly, values related to hunting, game feeding or fishing that could have been considered representing opportunities for activity for rural people were excluded. The pre-defined set of values could only have been avoided by asking people to delineate freely selected values. This might, however, have been a very demanding task in the case of random sample. The response rate could have been even lower, if people had not been confident about what was expected of them, at least the values would have required a lot of explaining. It would also be even more difficult for the managers to interpret the results, as people might mean different things while they use same words or same things and use different words. The best option also in the social values mapping could, therefore, be the combination of a public meeting and a questionnaire: the people in the meeting could be asked to define their set of values and describe what they mean by them in their own words. Then, it would be possible to instruct them properly for the task. These answers

could then have been classified with methods of qualitative research (e.g. Hytönen et al. 2000). Then, the people in the mailed survey would answer to questions concerning these values. The value list, however, needs to be refined in the future studies and probably giving the respondents a possibility to add their own value to the list would be useful.

However, it is also probable that omitted values coincide with some others: it may be, for instance, that places for picking berries are selected based on the peace and quiet in addition to the probable or known crop of the berries. Then, the important areas will be delineated, even though the values would not be quite correct for the case.

The social values indicated on the maps were quite scattered. Most of the area was delineated to represent at least one social value. Instead, different people delineated mostly different areas, and the delineated areas coincided even for a few people only in very small areas. An exception to this is the holding closest to the municipality centre, Lietejoki, providing attractive scenery and outdoor environment nearby a river, where the answers coincided fairly well. This pattern can be understood by the fact that some social values such as beautiful landscapes can be shared with other people, and some values such as picking berries and mushrooms are not preferred to be shared with too many others. Dispersion of values may be problematic from forest managers' point of view: if the whole area is important to a few residents, it is practically impossible to leave these areas unmanaged, for instance. The accepted management, however, depends on the type of social values and therefore, occurrence of different values does not mean equal need for specific management restrictions.

Moreover, a possible reason for relatively scattered values may be that the social values of people in rural areas are to certain extent different from people in cities. In studies conducted in suburban areas the three most appreciated values have been peace and quietness, beautiful landscapes and sense of being in a forest (e.g. Pelkonen and Tyrväinen 2005, Tyrväinen et al. 2007a), but research knowledge related to use motives of rural population is limited. Rural people as well as urban people might seek solitude and beautiful landscapes, which are repeatedly appreciated

qualities in recreation and landscape preference studies (Tyrväinen et al. 2001, Silvennoinen and Tyrväinen 2001, Bell et al. 2007). As in rural areas there are little people and large number of suitable places, there are not so popular places like in big cities, however. The requirements for space are probably different to urban people, who have to adapt to restricted amount of open space and nature areas in their near-home environment. It makes accounting for the important places in planning much harder in rural areas.

On the other hand, it may also mean that the whole area can be managed, given that the values involved are accounted for. For instance, thinnings and tending of young stands may only increase the recreational value of the forests (Silvennoinen 2002, Tyrväinen et al. 2003). In such a case, the social values map would be most useful for managers, if it could be connected to information of acceptable management practises with respect to each of these values.

If the values of rural people are not fundamentally different from those of urban people, the scattered answers might be caused by relatively low number of responses (about 30) to maps compared to responses to studies conducted in urban areas, where several hundred people indicated the areas. The method thus needs relatively large audience/user groups to work well in the sense that most important areas can be detected. On the other hand, as the areas were manually delineated in this study, including several hundreds of answers would have been extremely laborious.

The quality of forests, as well as their accessibility also affect to the type of recreational use and perceived values. In this study, the forest areas were located on average 1–10 km away from the municipality centre, so that these forests contribute to the quality of the home environment only for a part of the residents. The areas evaluated with social values mapping need to be truly familiar to the respondents, in order to produce meaningful answers. For the area as big as the one analysed here (950 hectares), this may be impossible, at least on a very detailed level. Therefore, in this kind of case, the “broad lines” concerning the social values might be the best that can be got. Then, the details are left for the managers.

It might be that the answers had been concentrated more, were the areas delineated beforehand.

Then, however, it might be that many areas had been given values they do not actually have. Giving readily delineated areas is much easier in a city, where parks and woodlands are separate entities in the mostly built environment. Parks are also smaller and may be more homogeneous areas than commercial forests, so that they can more easily be seen as a unit.

It is also questionable how well the residents could read the map in order to identify places in rural areas compared to urban areas. In urban area roads, constructions and other land marks help in identifying specific areas, but in rural forests understanding the scale and identifying special locations might be more difficult. Therefore, the good quality of the map illustrating important landmarks for residents, such as location of the housing areas, roads, watercourses is important. In the case study, the rivers surrounding the centre may have helped in locating many of the sites. The maps used in the study were colour-prints produced from the GIS system of the company on one A3 sized paper. Thus, the scale of the maps was so small (1/20000) that it has probably enhanced the delineation of large areas. In the future, producing as illustrative maps as possible should be pursued.

All in all, the social values mapping seem as a very interesting prospect also in participatory planning of commercial forests. It may be that the mapped social values are more in accordance with the way people think about their environment than the more abstract MCDM methods used in planning (e.g. Pykäläinen et al. 1999, Pykäläinen et al. 2007). The main advantage of the method is that it describes the experienced qualities of forest for strategic forest planning purposes in a place-specific format. For forest planners, the thematic maps reveal what values a particular forest area possesses and where those areas are located. The results need to be interpreted, however, in a local context reflecting the existing supply situation, management practises and the quality of the forest areas.

The method makes it possible to bring the values of residents into the decision-making process in such a way that they become more comparable to other values. Social information in map form provides an opportunity for multiple analyses and comparisons with other inventories

and expert assessments. For instance, the social values maps could be connected with maps of forest resources, so that it would be possible to see how valuable the sites with greatest pressure are from forestry point of view. Similarly, this information could be connected with the thematic maps of past forest operations, which would give a good impression of how people respond to the environments provided by current forest management practises.

Moreover, the method is suggested to offer a comprehensive basis for understanding perceived values within the study area, mainly because of the non-technical language and systematic approach to collecting and analysing the data. The survey with a systematic approach reflects also the opinions of larger user groups, not often able to participate in public hearings, thus increasing the usability of the results in current planning systems. Until today, social information concerning peri-urban or rural forests has been somewhat difficult to integrate into planning procedures, or it has been looked upon as something less important type of data compared for example to ecological values. If social information is considered as valuable source of information in planning, environmental quality of forests for local residents can be enhanced, and possibly some potential conflicts related to forest management activities can be avoided.

The usefulness of social values mapping exercise could be further increased, if it were combined with qualitative analyses concerning the comprehensiveness of the list of values and the variation in their interpretation by public. Furthermore, the information relating forest characteristics and treatment history to each of these values would be of importance in order to fully utilize the results in planning future treatments. The usability of different types of maps and different scales should be tested. Finally, the range of landscape around the homes of people that is meaningful from the social values mapping point of view should be examined, in order to fully utilize the method.

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Total of 32 references

Appendix. Questions analyzed in this study. The full questionnaire can be found in Haapakoski (2007).

The values of forests in general to local inhabitants						
1. How valuable you do find the following issues. Select the most suitable option.		Very important	Fairly important	Can not say	Not very important	Not at all important
a.	Possibility to pick berries and mushrooms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	Possibility to outdoor recreation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	Well-tended forests and environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	Possibility to fish and hunt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e.	Forest incomes and forest work for Hyrynsalmi people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f.	Possibilities for work in the forest for Hyrynsalmi people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g.	Hyrynsalmi as a target area for tourism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h.	Wood as raw material for Finnish forest industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i.	Observing nature and learning from it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j.	Forest as a part of cultural history	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k.	Forested landscape	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l.	Nature conservation for plant and animal species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m.	Little traces of people and pristine-looking forests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

In the next question the company forests mean the forests owned by UPM-Kymmene Ltd in Hyrynsalmi city (see the attached map, where these forests have been marked with green shade).

3. How well do you think you know the forests of company marked with green in the map?
 Very well 6 ----- 5 ----- 4 ----- 3 ----- 2 ----- 1 Not at all

5. What is your opinions concerning he following statements? Select the most appropriate option		Completely agree	To some extent agree	Can not say	To some extent disagree	Completely disagree
a.	The company forests are just ordinary forests surrounding the village.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	The company forests are mostly untreated forests.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	All forest owners have similar obligations concerning their forests.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	The forest owner decides about the treatments of the forests.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e.	The neighbours should be listened when treating the forests on your own forest estate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f.	The company forests have an effect to the regional economy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g.	There are valuable environmental sites in the company forests.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Select the most appropriate option.		Very much	Fairly much	Cannot say	Fairly little	Very little	Not at all
a.	I use the company forests for recreation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	I have learned about nature and environment from the company forests.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	I have picked berries and mushrooms from company forests.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	The residents from Hyrynsalmi use the company forests for recreation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

In the following, you are asked to point out company forests important for you. In the following table, different possible values of forests are described, and you are asked to point them out using the number of the value.

8. Mark to the green area in the map points and number for different values, e.g. beautiful scenery with • 1. If the beautiful scenery concerns an area rather than a point, delineate the area in question and mark the number inside the area, e.g.

1

If you cannot find such values in company forests, or you cannot say if such areas can be found in company forests, mark the appropriate option.

Number	Value	Cannot be found	Cannot say
1	BEAUTIFUL SCENERY Mark to the map with number 1 places or areas you find beautiful or pleasant.	<input type="checkbox"/>	<input type="checkbox"/>
2	AREA FOR PICKING BERRIES OR MUSHROOMS Mark to the map with number 2 places or areas where you like to pick berries or mushrooms or other natural products.	<input type="checkbox"/>	<input type="checkbox"/>
3	HISTORY AND CULTURE The map already includes several historically or culturally important places. If you know other places that could be of interest with respect to local history or culture, mark them to the map with number 3.	<input type="checkbox"/>	<input type="checkbox"/>
4	VALUABLE NATURE SITE Mark to the map with number 4 places or areas that are valuable nature sites or have special feeling of nature (special plants, animals, beaches etc.).	<input type="checkbox"/>	<input type="checkbox"/>
5	FAVOURITE FOREST Mark to the map with number 5 places or areas that you especially like or where you like to go most often.	<input type="checkbox"/>	<input type="checkbox"/>
6	EXPERIENCE RICH FOREST Mark to the map with number 6 places or areas where you like to go to watch nature (e.g. birds) or where you have had special nature experiences.	<input type="checkbox"/>	<input type="checkbox"/>
7	UNPLEASANTNESS Mark to the map with number 7 places or areas that you find untreated, badly treated or that you otherwise feel would require developing.	<input type="checkbox"/>	<input type="checkbox"/>
	FOREST ROUTE Mark to the map with dashed line (-----) a route that you like to use.	<input type="checkbox"/>	<input type="checkbox"/>

Background information

Background information is needed in order to find how different groups of people feel about forests. This information is strictly confidential.

9. Sex Female Male

10. Year of birth? _____.

11. I have lived in Hyrynsalmi _____ years.

12. My childhood home was in

- City
- Small town
- Rural area

13. Answer yes or no	Yes	No
a. Do you live in Hyrynsalmi permanently?	<input type="checkbox"/>	<input type="checkbox"/>
b. Do you see the company forests from your apartment windows?	<input type="checkbox"/>	<input type="checkbox"/>
c. Is your apartment or house located nearby the company forests?	<input type="checkbox"/>	<input type="checkbox"/>
d. Are you forestry professional?	<input type="checkbox"/>	<input type="checkbox"/>
e. Do you own forest?	<input type="checkbox"/>	<input type="checkbox"/>
f. Are you in the local council?	<input type="checkbox"/>	<input type="checkbox"/>