

Socio-economic Aspects of Recreational Use of Forests in Lithuania

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Abstract

This study clarifies recreational use of Lithuanian forests according to basic socio-economic characteristics (number of visitors, their objectives, problems, and economic assessment). Sociological surveys of inhabitants were conducted and methods of contingent valuation of forest recreational functions were applied. It was determined that the top primary recreational activities were simple relaxation (general sightseeing, hiking and walking, general relaxation) in the forest and picking mushrooms and berries. Survey results revealed that the intensity of visiting the forests for recreational purposes in 2012 was approximately 33.4 million visits per day. Over the past twenty years, transportation to the forest for recreational or commercial purposes changed from the dominant public transport usage to travel by personal vehicles. According to the survey results, a considerable number of respondents (88 %) would not agree to be charged for a visit to the forest, the rest would agree to be charged on average 1.02 EUR per day. Extrapolating the application of this tax provides a value of 34.15 million EUR for recreational functions of the Lithuanian forests.

Key words: forest, recreation, socio-economic aspects

Introduction

In recent decades, the awareness of multifunctional forest use has increased; special preferences by society are given for forest recreation (European Communities 2002, Bell et al. 2007, Simpson et al. 2008, Pröbstl et al. 2009; Ciezewska et al 2010). According to Pouta et al. (2000), the availability of data on recreation supply and demand will enable more accurate market analysis and service planning from an economical point of view whereas from a social point of view, efficient multifunctional forest management should be based on the evaluation of social costs and benefits (Tyrväinen 2001, Bestard and Font 2010, Colson et al. 2012, Otto et al. 2012).

In Lithuania, recreational forestry was developed at the Department of Forestry of the former Lithuanian Forest Research Institute emphasizing recreational issues as follows: establishment of recreation territories, silvicultural management systems, the optimization of forest spatial and varietal structure, the impact of visitors on ecosystems, and the assessment of forest recreational resources and use (Riepišas 2007).

Recreational forests cover 64.9 thousand ha (3.0% of total forest land) in Lithuania (Lithuanian Statistical ... 2011). These forests are distributed as follows: forest parks, resort forests, urban forests, recreational forest sites, and forests in the recreational zones of national and regional parks. Recreational forests designated by the Government are most used for recreation while the recreational functions are partly served by forests for other purposes as well.

The most important socio-economic factors influencing development of forest recreation include purposes of visitors, the frequency of visits to forests, the behaviour of visitors, and the economic value of forest recreation (de Groot et al. 2002, Sklodowski et al. 2013). According to investigations of recreational use of forests in Lithuania (Riepišas 1990), the prediction of recreational use intensity was approximately 21.0 million visits per year in 1995, 22.5 million visits per year in 2000, 24.0 million visits per year in 2005, and 25.0 million visits per year in 2010. It was found out that the top primary recreational service provided by the forest was picking mushrooms (26.0%) and berries (16.0%). Hiking (22.0%), forest watching (17.0%), visiting beach-

es and water shores for recreation (10.0%), fishing (5.0%), and hunting (3.0%) also accounted for a considerable part of the total time spent in forests. Only 1% of total time spent in the forest by visitors was spent collecting herbs, nuts, or other non-wood forest products of plant or animal origin.

Investigation performed by E. Riepšas in 1994 revealed that the area within 5 km radius from the residence was the most intensively used for recreational purposes on workdays while, it was within 5-20 km radius from residences on day-outings, and it reaches more than 80 km on holidays. It was found that only 8% of visitors go for daily recreation at a distance of more than 50 to 80 km from the residence while on holidays, only 10% of visitors go for forest recreation less than 1 km from their residences. In 1984 in Lithuania, 49% of visitors used public transportation going to the forest for recreation and 25% used personal vehicles.

It should be noted that in 1975, A. Končius has attempted to evaluate forest recreational services using ratings by the number of visitors in forests as follows: national parks, resort forests, forest recreation sites, and others. According to S. Mizaras (2006) investigation of the recreational value estimation, which was based on the data of Riepšas' investigations using a travel-cost methodology, the forest recreation comprised 15.4% of total annual value of forests in Lithuania.

In Lithuania, investigations on recreational use in the context of economic and social aspects revealing the dynamics of recreational forest use have not been done yet. Because social and economic factors of forest recreational use are dynamic, there is a demand for a more current and accurate evaluation that will promote multifunctional forest management. Consequently, a survey of Lithuanian inhabitants was determined to be the most suitable approach. The aim of this research was to analyse the essentials of the social and economic aspects of forest recreational usage in Lithuania. Societal surveys regarding recreational activities of Lithuanian people were conducted to characterize their socio-economic recreational usage of the forests. A contingent evaluation approach was used to determine the economic value of forest recreation services. In this study, we have combined and compared the data from the questionnaires created by Prof. E. Riepšas and the data from our questionnaires that were developed in 2006 (published for the first time) and in 2012.

Material and Methods

The 2006 survey of Lithuanians regarding recreational forest use

To perform this survey we used an undenominational-quantitative sample. All inhabitants of Lithua-

nia aged 15 years old and more were set as the study population totalled 2,676,300. Sample size was determined using the following formula (Kardelis 1997):

$$n = (t^2 \cdot s^2) / \Delta^2 = (1.96^2 \times 60) / 4^2 = 864, \quad (1)$$

where: n – is the number of cases in sample group; t – is t -test that was determined using the table of critical values for Student's t distributions, therefore, 95.0% reliability was selected ($p = 0.05$; $t = 2$); s – is the sample standard deviation; Δ – is allowable inaccuracy.

It was ascertained that in Lithuania, 864 respondents are required to represent the population aged over 15 years old. The number of respondents in counties was determined comparing to the total population. The questionnaire was prepared to obtain information on the characteristics of respondents and a set of questions on forest visits, i.e. the visiting frequency, reasons, opinion about prohibition on visiting, recreation facilities, and informational signs tools for recreation. The statistical analysis SPSS software was used to process the data from the questionnaires. Frequency table analysis testing by χ^2 was used.

The 2012 Survey of inhabitants of Lithuania regarding recreational forest use for contingent evaluation

The following six questions were formulated for the survey to collect information regarding recreational forest services:

1. How often do you visit a forest for recreational purposes? (Response categories: several times a week; once a week; several times a month; once a month; 3-4 times a year; 1-2 times a year; less than once a year);

2. How far away is your residence from the forest that you visit the most? (Response categories: less than 1 km; 1-5 km; 6-20 km; 21-50 km; 51-80 km; more than 80 km);

3. What transportation do you use to get to the forest you prefer the most? (Response categories: by personal vehicle; by public transport; by bicycle, by walking; other);

4. If you are going to visit a forest by personal vehicle, what is the average number of fellow-travelers accompanying you? (Response categories: 1; 2; 3; 4; more than 4);

5. What is the main reason for your visits to the forest? (Response categories: relaxation in the forest; picking mushrooms (for non-commercial purposes); picking berries (for non-commercial purposes); picking herbs (for non-commercial purposes); collecting nuts (for non-commercial purposes); hunting (for non-commercial purposes); other purposes related to recreation);

6. What daily fee would you consider appropriate for a visit to the forest?

The professional services of a survey company, “*Sprinter Tyrimai*”, were secured to administer the questionnaire to Lithuanian population using a public opinion and market survey. The survey was performed on March 27-31, 2012 using the Omnibus method. The standardized questionnaire was administered by professional interviewer. During the survey, 1,007 respondents between ages 18 and 75 were interviewed representing all Lithuanian counties in both urban and rural areas. A multiple-stage stratified stochastic sampling method was applied to obtain statistically significant data (90.0% reliability). Consequently, all Lithuanian inhabitants had an equal probability of being interviewed. Survey data was analysed using the same statistical methods as it was in 2006.

Contingent valuation

Contingent valuation method (CVM) is an economic, non-market based valuation method based on survey data to evaluate resources that are beneficial to humanity, but have no actual market value, such as the natural environment or the value of recreation (Kramer et al. 2003, Majumdar et al. 2011). The following question of two available addresses environmental worth as perceived by the user (Helles 2000):

1) How much would you be willing to pay to increase certain environmental worth, for instance to preserve or establish or increase recreational value of the forests?

2) What amount of financial compensation would you accept to allow the decrease of environmental worth, for instance to establish exploitable forests instead of protecting them or decreasing recreation value of forests?

The first question was formulated for respondents in this survey. The real value of this resource was determined as an average using questionnaire data and the total value was determined by extrapolation. The national monetary unit Litas (LTL) was converted to Euro at an official fixed exchange rate of 1 € to 3.4528 LTL (Lithuania joined the euro area on 1st January 2015).

Results

Survey of inhabitants’ opinions regarding forest recreation

Characteristics of respondents. 1,021 respondents were surveyed representing all counties in Lithuania. For analysis of survey results, the respondents were divided into the age groups as follows: from 18 to 25 years (11.5%), from 26 to 50 years (53.7%), from 51 to

70 years (30.8%), older than 70 years (4%). Man respondents comprised 54.6% and women respondents 45.4%.

Educational background of the respondents was divided into the following groups: high university (42.2%), high non-university (23.6%), professional (13.1%), secondary (15.5%), basic (3.4%), other (2.2%). Occupations of the respondents included hired employees (58.2%), farmers (7.2%), students (4.7%), retired persons (10.1%), housekeepers (4.8%), entrepreneurs (5.9%), unemployed (5.2%), others (3.9%). Respondents of urban and rural areas comprised 61.8% and 38.2%, respectively. 14.5% of respondents reported monthly household income level up to 57.2 EUR, 39.5% reported an income from 58.2 to 144.8 EUR, 29.9% - from 145.1 to 289.6 EUR, and 11.4% – more than 289.6 EUR. 4.7% of respondents did not want to disclose their income.

Reasons for visiting the forests. Respondents reported visiting the forests for leisure and relaxation in the forest (45.2%), picking mushrooms (66.2%) or berries (44.0%) (Figure 1). A few respondents reported visiting the forests for hunting (2.7%). Women respondents visit forest more frequently picking berries, while man respondents prefer to collect nuts, manage their forest holdings, or prepare firewood.

The frequency of visit to the forests depends on where visitors live and how much they earn. Recreational forest use is more popular among respondents from urban areas than that for those living in rural areas. Recreational forest use is more common among respondents from groups that have average and higher income levels. Rural inhabitants pick berries and mushrooms, manage their forest holdings, and prepare firewood more frequently than urban inhabitants.

Respondents from lower income groups mostly visit the forest to pick berries and mushrooms.

Visiting frequency. Most of the respondents are visiting forest 3-4 times a year (Figure 2). 18.6% of

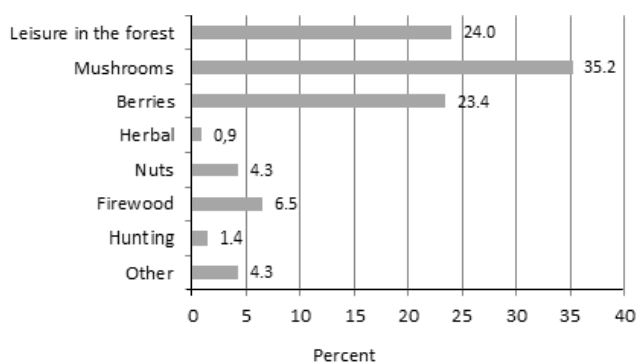


Figure 1. The reasons of respondents for visiting the forest (LMI 2006)

respondents visit the forests several times a month, and 18.0% said they visit about once a month. Minor less number of respondents said they do not visit forests at all. Women respondents visit forests less frequently (3-4 times a year, 26.6%) than man respondents (once a month, 23.6%). Among different age groups, the respondents aged between 18 and 25 years old are the most frequent forest visitors. They reported visiting the forests several times a week (13.7%). Respondents aged 26 between 70 usually visit the forest 3-4 times a year. Respondents aged over 70 say declared that they visit the forests once a month.

Analysis of data on the occupation of respondents shows that hired employees usually visit forests 3-4 times a year (28.8%), entrepreneurs once a month (25.0%), farmers several times a month (24.3%), students 3-4 times a year (33.3%), retired persons once a month (21.4%), housekeepers once a week (20.4%), unemployed persons 3-4 times a year (28.3%), and others once a month (25.9%).

Both urban and rural inhabitants usually visit forests 3-4 times a year. Respondents with higher income levels visit forests more frequently. 28.1% of respondents with incomes higher than 579.2 EUR / month reported visiting forests several times or at least once a week.

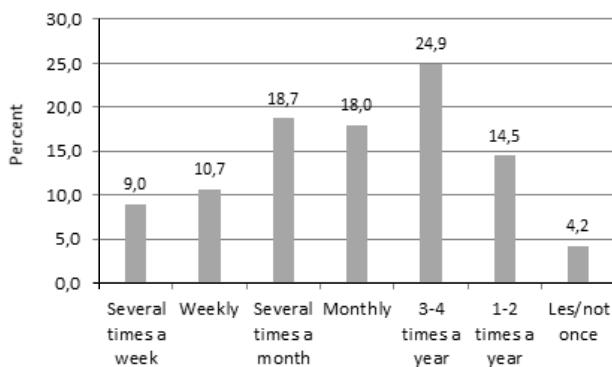


Figure 2. Frequency of visits to the forest (LMI 2006)

Other questions. The opinion of respondents regarding free access to forests breaks down as follows: access should not be restricted – 77.0%; access should be restricted – 14.2%; do not know – 7.2%, declined to answer – 1.6%.

The opinions of respondents about facilities such as relaxation areas, bicycle paths, cognitive paths, and other recreational facilities was that facilities are insufficient – 79.9%, sufficient – 8.7%, do not know – 9.9%, declined to answer – 1.5%.

The opinions of respondents about the number of informational signs and references in the forests

was that signage is insufficient – 66.9%; signage is sufficient – 19.8%, do not know – 11.3%, declined to answer – 2.1%.

Questionnaire for contingent valuation

Characteristics of respondents. 1,007 respondents were surveyed. For analysis of survey results, the respondents were divided into age groups as follows: from 18 to 25 years (15%), from 26 to 35 years (20%), from 36 to 45 years (21%), older than 55 years (25%). Man respondents comprised 48% and women respondents 52%. Educational background of the respondents was divided into the following groups: high university (18%), high non-university or secondary (70%), did not complete secondary (12%). Occupations of the respondents were: managers (2%), professionals and officers (28%), workers (26%), small entrepreneurs (4%), farmers (2%), unemployed (10%), retired persons (17%), students and schoolchildren (7%), housekeepers (4%).

Residency of respondents:

- residing in larger cities (43%);
- residing in other urban areas (27%);
- residing in rural areas (30%).

Monthly household income level per person: 26% reported income up to 144.8 EUR, 44% reported an income from 145.1 EUR to 289.6 EUR, 20% - from 289.9 to 434.4 EUR and 10% – more than 434.4 EUR.

Reasons for visiting the forests. The results of the survey (Figure 3) showed that the forest is mostly visited for rest and relaxation in the forest (36%), collecting mushroom (26%), and berries (18%). It was concluded that collecting forest products is more common among female respondents and older rural inhabitants. Recreational visits are more common among inhabitants with higher income levels and visitors from larger cities.

Visiting frequency. To evaluate the frequency of respondents' visits to the forest for recreational pur-

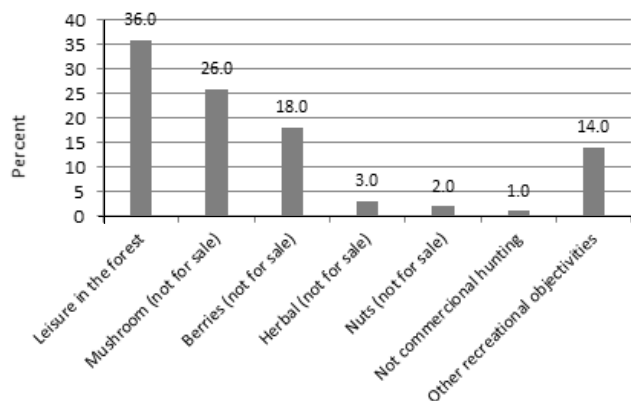


Figure 3. The reasons for the visit to the forest (Mizaras et al. 2012)

pose, the following question was asked: How often do you visit the forest for recreational purposes? The results revealed (Figure 4) that visits to the forest for recreation are mostly by inhabitants of higher income levels and inhabitants from rural areas. 82% of inhabitants visit the forests at least once a year. It was concluded that largest share of inhabitants (32%) visit the forests 3-4 times a year. We estimated that on average the forest is visited ten times a year per respondent, and the total number of visits is as high as 33.4 million a year.

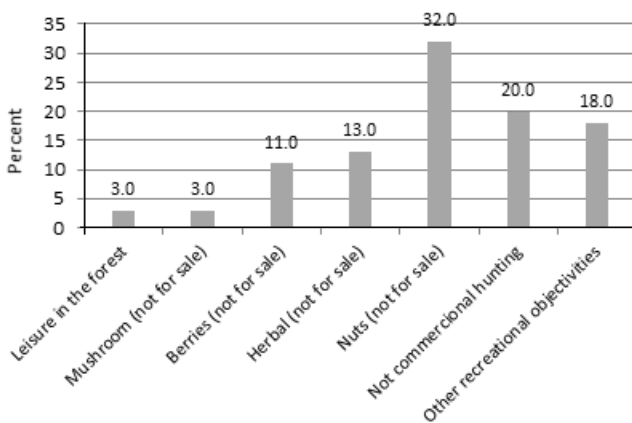


Figure 4. Periodicity Frequency of visits to the forest (Mizaras et al. 2012)

Proximity. The biggest share of inhabitants visit forests located within 6-20 km from their place of residence. The lowest frequency (7%) of visiting forests is for forests located 51-80 km from the place of residence. Forests located farther than 80 km from the place of residence were visited by 18% of inhabitants. These proportions can be explained by the fact that people visit forests located around resorts, sightseeing opportunities, and other places of interest. Forests located farther than 50 km from the place of residence are mostly visited by man inhabitants up to 45 year old, by inhabitants with higher income levels, and citizens of larger cities. The average distance from the place of residence to the forest was 27 km.

Means of travel. The most frequent mean of transportation for visiting forests was the personal vehicle (69%). Other means reported were walking (17%), bicycle (8%), public transport (5%), and other means (1%). The personal vehicle is used mostly by man inhabitants, by inhabitants with higher income levels, and visitors from larger cities. Bicycles are used more usually by younger respondents and inhabitants with lower income levels. Woman respondents, older people, and rural inhabitants more frequently reach the forest by foot. To determine the number of people using personal vehicles, a question about the usual

number of passengers in the car was included in the questionnaire. 45% of respondents reported four (4) or more persons for each trip and only 1% of respondent reported going to the forest alone. More than four people were selected by younger respondents from urban areas and respondents with lower income levels. On average, 3.3 people travelled to the forest by personal vehicle.

Willingness to pay. A question about the willingness to pay for a day of staying in the forest (Figure 5) was included in the questionnaire.

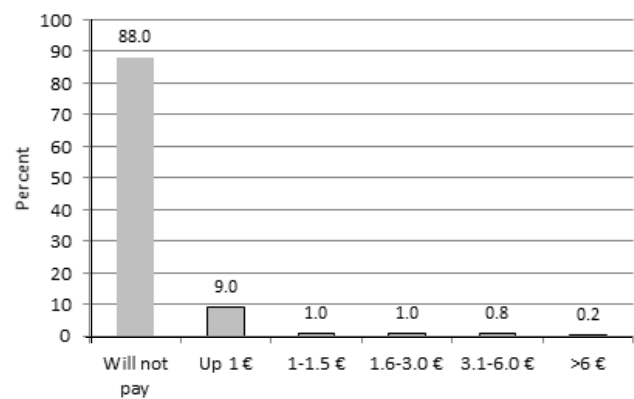


Figure 5. Value of a one-day visit to the forest (Mizaras et al. 2012)

12% of respondents agreed to pay a fee to visit the forest. The greatest share (9%) selected the lowest fee – 0.87 EUR per one-day visit. The fee was mostly acceptable to respondents aged between 26–35 years, those with higher income levels, and respondents from larger cities. The average calculated value of a one-day visit was 1.02 EUR.

Discussion

An exceptional result of the 2012 Survey was clarification of respondents’ attitudes about their willingness to pay for recreational use of the forests. By extrapolation of the value provided by respondents to all annual visitors (33.4 millions), the total annual value of recreational forest use in Lithuania is 34.2 million EUR. The majority of respondents in Lithuania are not willing to pay for recreational use of the forests.

The research shows that the contingent valuation method for valuation of forest functions is controversial. There are a lot of discussions in international scientific literature on this topic. The theoretical approach of contingent valuation was initially proposed by S.V. Ciriacy-Wantrup (1947) to estimate non-marketable value. In practice, the method was introduced in 1963 by Davis to estimate the value of hunting and tourism ar-

eas. The importance of the methodology increased after its use by the USA Government in 1980 to estimate the value of environmental damage. There was also a need to evaluate resources that were not actually in use. It was impossible to use market tools, and the contingent valuation method was proposed for such purposes (Klemperer 1996, Ecosystem valuation 2000).

The contingent valuation method has been widely used in the USA for cost–benefit analysis (CBA) of the environmental impact of projects. Water and landscape quality, recreational possibilities, diminishment of biodiversity, and protection of salmon can be mentioned as examples (McCool et al. 1986, Gorrod and Willis 1997, Ardila et al. 1998, Tyrväinen and Väänänen 1998, Riera 2001, Lawrence 2003, Babu and Suryaprokash 2004, Blicharska 2005, Kaae 2010, Börgert 2013). Although the use of this methodology is constantly increasing, there are some remaining problems, such as high research costs and some others like (Helles 2000):

- The questions are hypothetical. For example, if access to the forest is free, the question about willingness to pay can seem strange or even outrageous;
- The respondents are biased because of the selected range of answers in the questionnaire;
- Strategic responses, when people are not willing to reveal their willingness to pay.

The problems mentioned were also valid for the survey under discussion.

Comparing the reasons of respondents for visiting forest between surveys performed in 2006 and 2012, the increase in forest use for leisure was determined (from 24% to 36%) while the number of visits for picking mushrooms decreased from 35% to 26%. Survey results revealed a considerable increase in recreational forest use for other purposes. It shows that the reasons for forest visiting are becoming more diverse. Lack of private forest ownership and low level of forest utilisation during the Soviet period have affected the public values, so that forest is primarily seen as a source of recreation and natural values. After Lithuania gained its independence in 1990, the changes in recreation forest use were related to economic development and shifting public opinion against forest utilization (Mizaras et al. 2006). According to determined tendencies the potential and importance of recreation might further increase in the future.

Conclusions

1. Recreational use of Lithuanian forests expressed in annual visitor days is increasing.

2. Among different forest recreational uses, the most popular are relaxation in the forest and picking mushrooms and berries. However, the objectives of

recreational forest are changing: forest use for leisure increased from 24% to 36%, use for harvesting mushrooms decreased from 35% to 26%, and use for other purposes increased from 4% to 14%.

3. During the last years, the most common means of travelling to the forest has shifted from public transport to personal vehicles.

4. Most of respondents prefer free access to forests and indicate insufficient numbers of recreational facilities (resting places, cognitive paths, informational signs, etc.).

5. Inhabitants with higher incomes and rural inhabitants are the most frequent visitors to the forests. Forests located farther than 50 km from places of residence are mostly visited by men up to 45-year-old, by inhabitants with higher income levels, and citizens of larger cities. The groups of respondents mentioned usually use their personal vehicles to visit the forest. Picking mushrooms and berries is more common among women respondents and rural inhabitants aged over 36 years. Recreational visits are more common among inhabitants with higher income levels and visitors from larger cities.

6. There is the prevailing opinion in Lithuania that visitors should not have to pay for visit the forests. The average value respondents were willing to pay is 1.02 EUR per day. According this value, the total annual value of recreational forest use in Lithuania is 34.2 million EUR.

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