The heterogeneity of private forest owners affects the wood mobilization from private forests

Darja Stare
Slovenian Forestry Institute, Ljubljana, Slovenia, darja.stare@gozdis.si

Špela Ščap
Slovenian Forestry Institute, Ljubljana, Slovenia, spela.scap@gozdis.si

Špela Pezdevšek Malovrh
University of Ljubljana, Biotechnical Faculty, Department of Forestry and Renewable Forest Resources, Slovenia, spela.pezdevsek.malovrh@bf.uni-lj.si

Matevž Triplat
Slovenian Forestry Institute, Ljubljana, Slovenia, matevz.triplat@gozdis.si

Nike Krajnc
Slovenian Forestry Institute, Slovenia, nike.krajnc@gozdis.si

ABSTRACT

Private forests are influenced by several factors, including owner attitudes, socio-demographic characteristics and market dynamics. This study examines the heterogeneity of private forest owners in Slovenia in relation to forest management. A comprehensive survey was conducted among 1,515 randomly selected private forest owners, 65% of whom owned up to 4.99 ha and 7.47 ha on average. About 75% of the respondents had harvested wood in the last five years, totalling over 80,000 m^3 or an average of 19 m^3/ha. Rural private forest owners had the highest harvesting intensity (12.3 m^3/ha or 88.4 m^3 per household). Although more male respondents participated, the results showed that male owners harvested more intensively. Participation in forest management has stagnated over the past decade. The study concludes that the size of ownership has an influence on active forest management, with more active owners participating in harvesting.

KEYWORDS

Forest management, non-industrial forests, harvesting, characteristics, private forest owners, survey

1 INTRODUCTION

Private forests are influenced by a variety of factors, such as market dynamics, political influences, socio-demographic characteristics of private forest owners, tenure, internal norms, and natural factors. However, the key aspect determining the use of wood from private forests is the willingness and attitude of forest owners towards their land (Češarek et al., 2018; Ščap et al., 2021). Recent surveys provide interesting insights into the priorities of private forest owners. Some 62% of private forest owners surveyed see the main purpose of managing their forests as using wood for their own needs. Meanwhile, 23% of owners who inherited the forest do not have a specific intention for management. Surprisingly, only 6% of respondents manage the forest with economic intention (Ščap et al., 2021).

The fact that the use of wood for own needs is the main objective of forest management explains the finding that most private forest owners, regardless of the size of their forest holdings, prefer to harvest the wood themselves or with the help of family members (Ščap et al., 2021). It is noteworthy that the characteristics of private forest owners change over time. It has been observed that there are more urban owners, older owners, female owners and owners without forestry knowledge (Pezdevšek Malovrh et al., 2015; Kumer and Potočnik Slavič, 2016; Ficko, 2019). Consequently, these owners are more likely to rely on hired forest service providers. This trend is supported by the fact that a significant proportion (41%) of private forest owners who carried out harvesting in their forests between 2015 and 2019 used the services of hired professional contractors (Poročilo o..., 2021). In addition, a study by Ščap et al. (2021) found that among private forest owners owning between 5 and 10 hectares of forest, a significant number relied exclusively on hired forestry services for wood harvesting. Female forest owners made up 68% of this group, while the share of non-employed private forest owners was 62% (Ščap et al., 2021).

Calculations in recent years show that the annual harvest in state forests is about the same as the planned annual harvest, while the annual harvest in private forests is much lower than planned harvesting quantities. There are several reasons why forest management in private forests is lacking. Especially in thin stands, it is the lack of economic profitability (Poročilo Zavoda..., 2022). Due to the needs of the wood industry, there is a desire for greater mobilisation of wood from private forests. To find out the trends, willingness and motivation of private forest owners for forest management, we conducted an extensive survey. Aiming to answer two research questions: a) Are private forest owners really such a heterogeneous group? and b) How do the different groups of forest owners manage their forests? In the following, we present some of the results of this survey.

2 METHODS

To determine the willingness of private forest owners to manage their forests, an extensive survey was conducted among randomly selected households throughout Slovenia. The questionnaire was divided into five sections and the data from the first section was analysed in this study: basic information on forest ownership (area), forest management characteristics and demographics of respondents (gender, age, employment status, education). The survey was conducted online in March and April 2022. In accordance with the sampling procedure, the basis of the sample was the gross sample, i.e. all households,

regardless of forest ownership, for which representativeness was ensured by quotas according to region and settlement type. In addition, there were so-called soft quotas based on the age of the respondents, which ensured that the online survey did not only include a younger population. A total of 1,515 households owning and knowing a forest took part in the survey. The data were analysed using MS Excel and SPSS statistical software, where the basic analysis of the survey data was performed using descriptive statistics (min and max values, mean values) and frequency distributions of variables.

3 RESULTS

The total forest area of the private owners surveyed is 9,889 ha. The smallest forest property of the surveyed owners was 0.1 ha and the largest 600 ha. The socio-demographic background information of the respondents is shown in Table 1.

Table 1. Socio-demographic background information of the surveyed respondents

Attribute	Value		Proportion (%)
Gender	Male		
	Female		
Age	Average (years)	54	
	≤ 30 years		6.5
	31 - 40 years		10.1
	41 - 50 years		20.6
	51 - 60 years		25.2
	61 - 70 years		27.6
	> 70 years		10.0
Place of residence	< 3,000 inhabitants		55.7
	3,000 - 10,000 inhabitants		23.2
	> 10,000 inhabitants		21.1
Occupation	Self-employed and employed		53.6
	Not employed		45.3
	Insured as farmer		1.1
Education	Elementary school or less		4.5
	High school		50.1
	Bachelor's education or more		45.4
Size of forest property	Average (ha)	7.47	
	Modus (ha)	1	
	≤ 4.99 ha		65.4
	5 - 9.99 ha		16.6
	10 - 29.99 ha		13.4
	≥ 30 ha		4.6

3.1 Harvesting characteristics of surveyed private forest owners

The average harvest was 19.03 m^3/ha in 5 years (min 0.03 m^3/ha, max 400.00 m^3/ha). 24.9% of the surveyed private forest owners did not carry out any harvesting in their forest in the period 2017-2021. Depending on where they lived, the most active were private forest owners living in rural areas in settlements with less than 3,000 inhabitants, who harvested an average of 12.3 m^3/ha or 88.4 m^3/household during the period 2017-2021. The least active in terms of harvest volume were private forest owners living in large cities with more than 10,000 inhabitants, who harvested 6.4 m^3/ha or 48.7 m^3/household. Private forest owners who did not harvest during 2017-2021 were referred to as inactive private forest owners and there were 22% of them in the survey. Less active, i.e. those who harvested between 0.01 and 20 m^3/ha during the period, accounted for 54% of the survey respondents. However, 25% of the private forest owners surveyed had harvested more than 20 m^3/ha during the period 2017-2021. In terms of gender of respondents, both men and women have the highest proportion of less active forest owners (Figure 1).

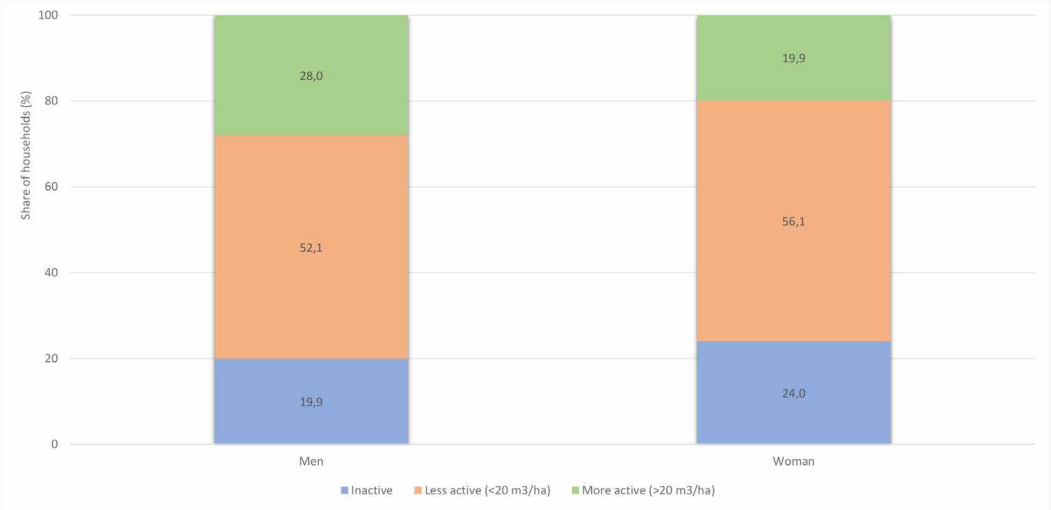

Figure 1. Harvesting activity by gender among private forest owners surveyed in 2017-2021.

The average proportion of wood sales of private forest owners surveyed that have been harvested in the last five years is 25.0%. On average, 26.0% of the harvesting operations were carried out by forestry contractors. As expected, the share of wood sales and hired forestry contractors is higher among the more active private forest owners (Figure 2). The highest share of wood sales is among owners who harvested 200 m^3 or more during 2017-2021. The average share of hired forestry contractors is highest among respondents who harvested 700 m^3 or more of wood during the period (63%), followed by the group of owners who harvested between 80 and 199 m^3 of wood at 39.4%.

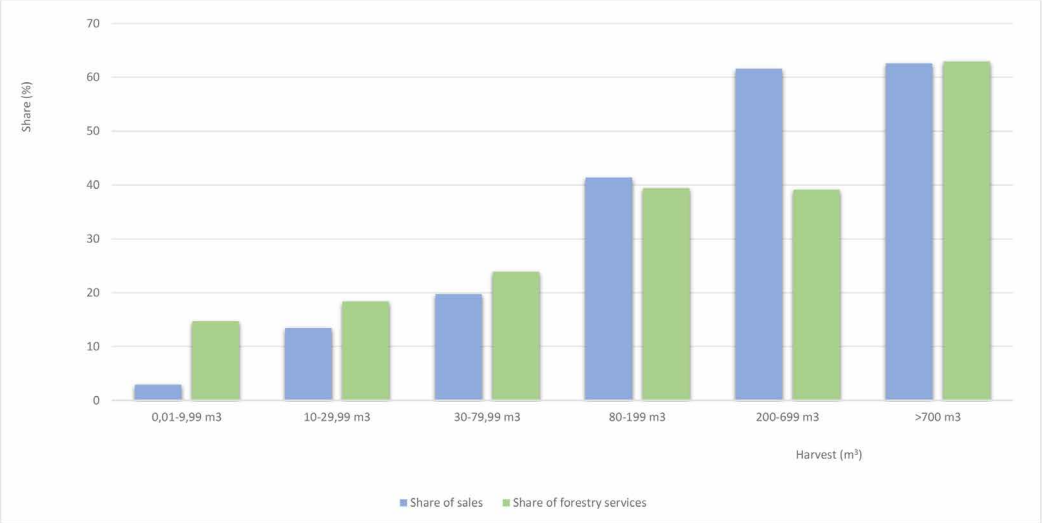

Figure 2. Share of wood sales and forestry services hired by surveyed private owners who harvested in the period 2017-2021, by volume of harvesting.

The private owners surveyed were categorised according to their harvesting intensity and compared according to their plans on future forest management. Among those who have not harvested in 2017-2021, the predominant opinion (64%) is that they will not harvest their forest in the future (Figure 3). In the other categories, the prevailing opinion is that they will continue to manage their forest as usual. Among the households that have harvested 50 m^3/ha or more in the last five years, there is a high proportion (34%) of those who will harvest less in the future, and 45% of those who will harvest same or more intensively than in the period 2017-2021. The remaining 21% will not harvest in the future.

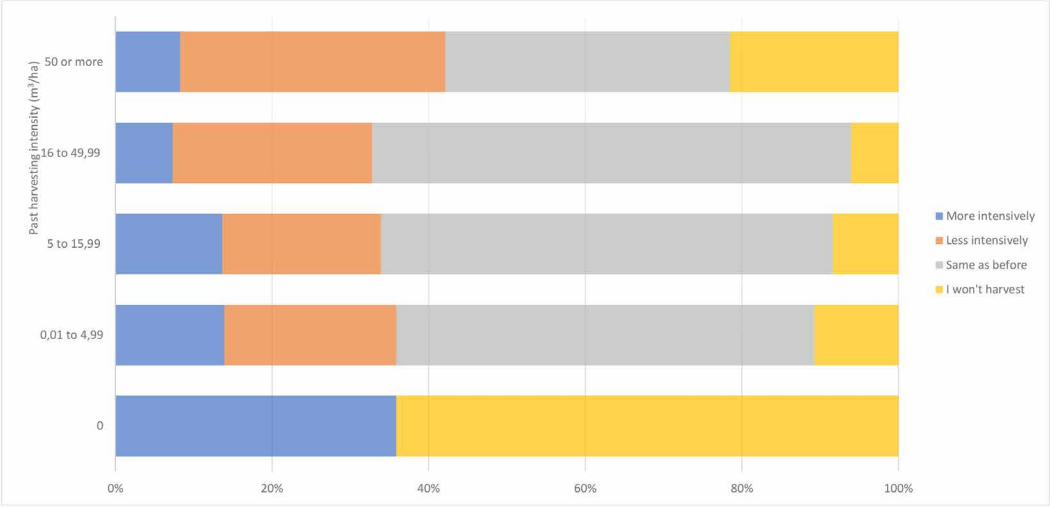

Figure 3. Percentage of households with an opinion on future harvesting intensity, by amount of past intensity.

On average, the surveyed forest owners spend 20.6 days annually on the management of their forest property, which in addition to wood harvesting also includes silvicultural work, the construction of forest roads and other administrative work. Of these, 10.2 %

do not manage their forest, which means that they do not spend even one day per year on forest management. The average forest area of these owners is 4.6 ha and they are dominated by those who did not carry out any harvesting in the period 2017-2021. By size class of forest ownership, owners with 30 ha or more spend the most time on forest management, with an average of 52 days per year. However, smaller forest owners are expected to spend the least time on forest management.

4 DISCUSSION

The survey of 1,515 randomly selected private forest owners was dominated by 65% of owners with forest ownership of up to 4.99 ha and an average forest ownership size of 7.47 ha. In comparison, the national structure of private forest owners is dominated by 67% of private forest owners with a forest ownership of up to 1 ha and an average forest ownership size of 2.6 ha. Of the private forest owners surveyed, 75% have harvested timber in the last five years (2017-2021). In total, they have harvested slightly more than 80,000 m^3 of wood, which corresponds to an average of 19 m^3/ha. Private forest owners living in rural areas (settlements with less than 3,000 inhabitants) had the highest harvesting intensity: an average of 12.3 m^3/ha or 88.4 m^3 per household. This factor is mainly related to the owner's distance from their forest property, i.e. rural dwellers live closer to their forest and motivation for forest management is higher among those who live closer to their forest (e.g. Silver et al., 2015; Bashir et al., 2021). One should note that higher proportion of male respondents than female respondents participated in the survey. However, the results of the survey show that male private forest owners harvested somewhat more intensively during the period under consideration. Studies abroad also confirm that male forest owners harvest more than female forest owners (Kuuluvainen et al., 2014; Ščap et al., 2021).

Results show that the participation of private forest owners in forest management has not increased in the last ten years. According to the Slovenian Forest Service (Poročilo Zavoda..., 2023), the implementation of potential wood harvest does not reach the planned level: in the last years (2020-2022), the registered wood harvest reached on average 60% of the planed annual harvest (in 2020 – 59%; in 2021 – 57%; in 2022 – 64%), and the implementation of planned silvicultural works is even lower. Similarly, results show an average harvest of 19 m^3/ha, which has further decreased compared to the period 2015-2019, when the average harvest was 24 m^3/ha (Ščap et al., 2021). The study concludes that the size of private forest ownership has an influence on active forest management. Larger private owners (30 ha or more) spend the most time on forest management. In addition, more active owners sell more timber and use services more often. Most studies confirm a positive effect of forest ownership size on the interest and intensity of logging and harvesting activities (e.g. Beach et al. 2005; Eggers et al. 2014; Poje et al. 2016; Bashir et al., 2021).

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