

**MANAGEMENT OF PRIVATE  
FORESTS REGARDING THE OWNERS'  
ATTITUDES TOWARDS FOREST  
PRESERVATION: CASE OF SLOVENIA**

**Lidija Zadnik Stirn, Špela Pezdevšek Malovrh, Janez Krč**

**University of Ljubljana, Biotechnical Faculty  
Ljubljana, Slovenia**




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# Framework - introduction

In the frame of the symposium theme: How to harvest more and better preserve forests, we concentrate on the **case of Slovenia**.

- Forests are symbol of Slovenia and essential element of the landscape.
- Forests are for Slovenia, which lacks other natural resources, of great economic importance.
- Forests cover **58% of total area** (approximately 1,2 million ha). The forested area is increasing over time, in 1947, for example, only 43% of total area was covered by forests.

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- As Slovenia is a mountainous country, forests occur in **higher and steeper locations** which are less suitable for agriculture and where its **protective role is even more important**
  - Forests, as renewable natural resource with a multiple role, have been ranked among important wealth which management specifies even Constitution. The Forestry Act of Slovenia from 1993 **regulates the protection, silviculture and use of forests.**
  - **Management** and use of forests, **irrespective of ownership**, must be performed on the ecological, social and productive basis in accordance with the principles of environmental protection. Forest management plans are elaborated by Forest Service.

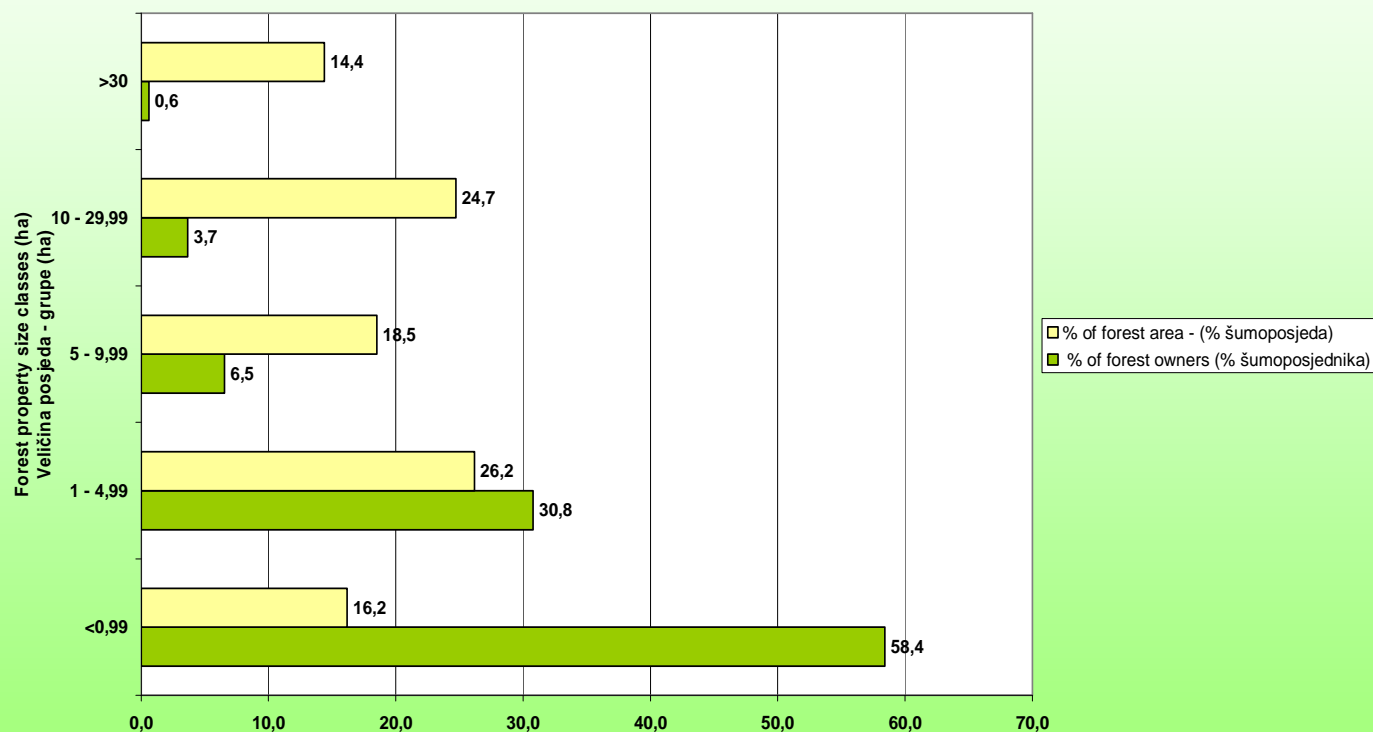
# Forest ownership

The problem of how to harvest more timber and simultaneously preserve forests is here explored from the private forest owners' perspective due to the prevailing share of privately-owned forests in Slovenia, and also in Europe.


Private forest management and preservation is in Slovenia far from optimal. The **major obstacles** for professional silviculture, optimal operation practices and consequently better preservation of private forests are supposed to be:

- In Slovenia 73% of forests are privately owned by a large number of owners, approximately 300.000

- Private forest estates are small, with an average area of only 2,6 ha, and fragmented, in average the owner has 3 separate plots



Structure of the forest estate and forest area by size classes

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- Forest owners are **unaware of the importance** of wood (more to harvest) and importance of nature preservation (better to preserve forests), what is related to their deprived activities in forests
  - Further, only approximately one percent of private **forest owners are associated** to forest owners' **associations**.

Namely, forest organizations and associations have the responsibility for conservation, sustainable and pronatural management also of private forests and act as counselors for private owners.

# Research problem


With the aim to improve private forest management and preservation we:

- acquired [data from institutional sources](#) (Land and Property Register of Republic Slovenia, management plans completed by Slovenian Forest Service,.....): the register of private forest owners, their forest property size, number of forest plots, number of co-owners and their way of living regarding the household (living in the same household or different households), forests natural diversity, allowable cut, necessary silvicultural and preservation works - are they performed or not (for years 1999-2008)

- carried out **SWOT analysis** - investigated factors which could influence the private forest owners to join forest associations and organizations
- performed a **survey**; we carried out a stratified sample by property size; 700 questionnaires were sent out, and 322 returned – not normally distributed by property size

	Stratum (ha)				
	Up to 0.99	1 to 4.99	5 to 9.99	10 to 29.99	Over 30
n	19	90	64	91	58
%	5.9	28.0	19.9	28.3	18.0



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- focused into owners' implementation of management (**harvesting, silviculture**), **protection practices** and their attitude towards different forest **associations** and organizations (are they associated or not, or are they willing to associate)
  - selected for analysis the following variables (data): associated – not associated (independent variables), harvest (yes/no), silviculture (yes/no) and protection (yes/no) which are usually taken as dependent variables and express the owners' forest activities
  - performed multivariate statistical analysis with SPSS.



## Assumed hypothesis were:

- harvesting, silviculture and protection are strongly related to better forest management and consequently to better preservation of forests
- private forest owners who cooperate with forest associations and organizations harvest more and preserve better their forest.

# Results

- **There is statistically significant relationship between cooperation, and harvesting,**
- **and statistically insignificant relationship between cooperation and silviculture, protection.**

For example: only 46,3% surveyed owners carry out harvesting; harvesting is performed in larger percentage by owners who cooperate.

Association/harvesting ( $\chi^2 = 3,966^*$ )		
	Doesn't cut	Cut
Associated	46,8%	53,2%
Not associated	58,2%	41,8%
Total	53,7%	46,3%

86,6% of surveyed owners do not perform silvicultural work; there is no difference between associated and not associated. 81,1% of them do not perform protection works, associated carry out less protective work as non-associated.

Association/silvicultural works ( $\chi^2 = 0,003, p=0,953$ )		
	Doesn't perform	Perform
Associated	86,5%	13,5%
Not associated	86,7%	13,3%
Skupaj	86,6%	13,4%

Association/protection works ( $\chi^2 = 1,271, p=0,259$ )		
	Doesn't perform	Perform
Associated	84,1%	15,9%
Not associated	79,1%	20,9%
Skupaj	81,1%	18,9%



■ Association is important parameter.

Why the owners associate? Using Likert scale (1-5):

- applying for EU funds (4,1)
- information, education (4,0)
- social gathering (3,9)
- cutting and selling wood (3,1)

Why they do not associate?

- too small area (27,1%)
- no need for income from forest (20,1%)
- too old owners (13,6%)

- The owners were also asked about their attitudes towards nature preservation (190 of them expressed positive attitude)

<b>Nature preservation/harvesting</b>			
	Mean	N	Std. dev.
Doesn't harvest	4,11	94	,809
Harvest	3,98	96	,821
Total	4,04	190	,815
<b>Nature preservation/silvicultural works</b>			
	Mean	N	Std. dev.
Doesn't perform	4,02	160	,816
Perform	4,13	30	,819
<b>Nature preservation/protection works</b>			
	Mean	N	Std. dev.
Doesn't perform	4,01	155	,845
perform	4,17	35	,664
Total	4,04	190	,815
<b>Nature preservation/association</b>			
	Mean	N	Std. dev.
Active member	4,03	128	,860
Become an active member	4,14	22	,774
Become member/not active	4,11	28	,737
No	3,78	9	,441
Do not know	4,00	3	1,000
Total	4,04	190	,815

- The owners activity regarding harvesting was analyzed by multiple regression and 5 parameters were statistically significant:

Influence on harvesting		β	St. error.	Wald	df	p- value	EXP β	95% CI	
								Lower	Upper
Growing stock		-,004	,002	5,540	1	,019	,996	,993	,999
Cooperation with other owners		-,316	,129	5,983	1	,014	,729	,566	,939
Getting information		-,419	,208	4,075	1	,044	,658	,438	,988
Influence of institutions	Forest service	,270	,103	6,840	1	,009	1,310	1,070	1,604
	Forest cooperative	,159	,076	4,395	1	,036	1,172	1,010	1,359
<i>constant</i>		-1,453	1,869	,605	1	,437	0,234		

Multivariate model of log regression

$$\text{Logit } P(Y=1) = -1,453 - 0,004 * x_1 - 0,316 * x_2 - 0,419 * x_3 + 0,270 * x_4 + 0,159 * x_5$$

- A quick view in the future of owners' socio-economic status today and after 10 years:

		In 10 years (2019)				
Today-(2009)		Full time farm	Part time farm	Supplementary farm	Aged farm	Non-agricultural farm
	Full time farm	<b>64,8%</b>	22,2%	1,9%	3,7%	7,4%
	Part time farm	5,6%	<b>83,2%</b>	9,3%	0,0%	1,9%
	Supplementary farm	1,2%	10,6%	<b>56,5%</b>	9,4%	22,4%
	Aged farm	18,2%	0,0%	4,5%	<b>31,8%</b>	45,5%
	Non-agricultural farm	7,4%	9,3%	1,9%	1,9%	<b>79,6%</b>



# Conclusions

- associated owners harvest more and execute less silvicultural and protection practices than unassociated owners
- owners who harvest more, and execute more silvicultural and protection practices expressed stronger positive attitudes towards forest (nature) preservation
- owners with strong positive attitudes towards nature preservation are already or intend to become active associated members
- the quantity of timber removal is statistically related to the amount of growing stock, cooperation with other private forest owners, and obtaining information and support from associations.

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