

Changes in decision making and cooperation among forest owners: the Lithuanian case

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Abstract: Understanding of the basic determinants of cooperation among private forest owners is of crucial importance to forest owners, private forest owners' cooperatives and other key players in the forest sector. This topic concerns complementary empirical and theoretical studies from the fields of economics and social studies. A recent study shows that private forest owners differ in their attitudes towards forest management and processes of cooperation in terms of the time perspective and, correspondingly, make different decisions in various situations related to forest management. Based on the data from two surveys, this paper shows how private forest owners' views of forest management in Lithuania have developed over the last thirteen years and finds some basic socio-economic aspects that drive cooperation among private forest owners for joint forest management.

Keywords: private forest owner; transition; cooperation; attitude

One of the key tasks for sustainable small-scale forest management is maintaining the balance between the use of renewable resources and the satisfaction of the social needs of private forest owners (PFOs), which might be achieved through cooperation among PFOs. According to the Confederation of European Forest Owners, it is mainly the cooperation through forest owners' associations (or cooperatives) that enables the individual family forest owners to be well informed and participate actively in the wood market. Forest owners' associations (or cooperatives) are a keystone in the dissemination of information and may lead to the successful implementation of policies (CEPF 2017). The theory of cooperatives shows that members have incentives that are not only economic to join or form a cooperative. From an economic point of view, round-

wood production is the dominant activity in which PFOs are engaged. However, acting as the supplier of roundwood, a cooperative might be a good tool for a PFO to coordinate timber flows, gain the best possible price on the market, and satisfy needs and expectations in achieving sustainable forest management.

Early studies by KURTZ and LEWIS (1981) show that the majority of PFOs consider it important to have companies and organizations managed by themselves (forest owners' cooperatives or associations), which, in addition to political representation and protection of the interests of PFOs, can provide forest management and services. If the cooperative is a form of economic organization designed to accommodate the specific characteristics of transactions between forest owners and the market, how

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does it achieve competitive business performance? As argued by BERGMANN and BLISS (2004), cooperation and collaborative management of PFOs would shift part of the management burden onto external bodies or actors with related interests.

Recent studies have increased the knowledge about the patterns of private forestry and cooperation in the sector. In 2017 a broad overview of private forestry development in Estonia was made by PÖLLUMÄE and KORJUS (2017). The review indicates that many forms of cooperation among PFOs have been established; however, all of the cooperatives are struggling in attracting new members or maintaining membership (PÖLLUMÄE, KORJUS 2017). The Finnish case shows that the difference between the decision support services offered and the service interests of PFOs results in the unresolved objectives of PFOs (PYNNÖNEN et al. 2018).

HANSEN (2017) notes that there is room for extension services in Lithuania because forest owners' cooperatives could provide reliable customer-oriented consulting to PFOs. This could address a variety of aspects and services to meet the individual needs and interests of PFOs (HANSEN 2017). Similar results were given by KRONHOLM (2017) in its research of the decision making among PFOs in Swedish forest owners' associations. He identified the need for management activities among the members due to their decreasing know-how in silviculture.

In Lithuania, there are only a few forest owners' cooperatives, and they cover a small share of the roundwood market. Therefore, it is crucial to understand the basic determinants of cooperation among private forest owners and how PFO opinion has changed over time.

Various social and economic aspects and their change, the level of public awareness or even traditions could be decisive in forming a PFO's attitudes towards his forest holding, management decisions or use of property in the future, yet the surveys show that these are not determining aspects but may simply influence decision-making.

This study aims to scrutinize the motivation of PFOs in Lithuania to cooperate by determining the following:

- (i) How the attitude of PFOs towards forest management has changed over the last decade, and
- (ii) What social and economic arguments affect cooperation in forest management decision making.

MATERIAL AND METHODS

Country context

In Lithuania, private forests disappeared in the early 1950s (MIZARAITĖ 2005), and a new era of private forestry started only in 1990, when the formerly private holdings were returned to their original owners or inheritors (BRUKAS 2003). In 2019, the number of PFOs in Lithuania reached nearly 250 thousand, with an average forest size of 3 hectares (NTKD 2019). After two decades of disorder, the land restitution process is coming to an end, with ownership patterns and property rights gaining more social recognition. Nevertheless, decades of prevailing common and state property have influenced society; this has an impact on the current attitude towards private forestry as well as cooperation.

Within the dynamic institutional environment in the Baltic States, a number of issues of concern arise within the private forest sector. The main issues, at least in Lithuania, are related to the growing number of PFOs, small average area of private forest holdings, and lack of self-organizational business-driven structures among PFOs. Lithuanian private forestry could be characterized as very fragmented. This is illustrated by the structure of private holdings: the smallest (up to 1 ha) holdings that make up less than 6% of the total private forest area are managed by 39% of PFOs. Holdings from 1 to 10 ha make up 55% of the total area and are managed by 55% of owners; holdings from 10 to 20 ha make up 16% of the total area and are managed by 4% of owners; and holdings larger than 20 ha make up 23% of all the private forests and are managed by 2% of owners (STATE FOREST SERVICE 2019).

Lithuania is not the only country in Europe with a mosaic structure of forest holdings and PFOs. LUKMINĖ and ŠILINGIENĖ from Lithuania, VILKRISTE from Latvia and TEDER from Estonia (2018), together with other authors, have recently explored forest property rights in Europe, including the Baltic states. The authors concluded that there are tight links between the scope for decision making among PFOs and the socio-political background as well as geographic distribution. Additionally, these differences are relatively small within the Baltic region; however, they differ remarkably from other regions within Europe (NICHIFOREL et al. 2018). PFOs' socio-economic behaviour in

Lithuania in relation to sustainable forest management has been widely explored by MIZARAS and MIZARAITĖ (2015) in their comprehensive study. They showed that the most important aspects of the forest to PFOs are economic (39%), ecological (32%) and social (29%).

Nevertheless, PIVORIŪNAS (2013) argues, trust is one of the key determinants of cooperation in forestry since high trust societies tend to develop greater social drivers of cooperation and consequently enjoy greater economic growth, particularly in the transition to a post-industrial economy. Increasing evidence shows that social cohesion is critical for societies to prosper economically and for development to be sustainable (PIVORIŪNAS 2013).

PFOs in Lithuania may be served not only by forest owners' cooperatives but also by other private companies rendering a variety of specific services targeted at PFOs. According to market experts, the share of private origin roundwood traded by forest owners' cooperatives was approximately 5–10% (about 300 thousand m³) of the total roundwood trade, although no official data are available to support this figure. Forest owners' cooperatives in Lithuania are trying to find their niche in the service and roundwood supply markets; however, it is not an easy task to achieve.

Meeting expectations is one part of the puzzle. Another is the pure legal and administrative environment in which the private forestry operates. A study by RAUPELIENĖ and PETRAUSKAS (2014) concluded that tax systems arranged with respect to cooperatives did not motivate PFOs to establish or run forest owners' cooperatives in Lithuania. The legal and tax framework, the Law of Cooperative Enterprises, does not create favourable conditions for cooperative activities. Moreover, measures such as the Afforestation of Agricultural and Non-Agricultural Land and Forest-Environment Payments can support only private persons (land or forest landowners), not legal enterprises (RAUPELIENĖ, PETRAUSKAS 2014).

During the period between 2006 and 2013, only one newly established forest owners' cooperative was registered in Lithuania (PIVORIŪNAS 2013). According to the data from the State Enterprise Centre of Registers (SECR), 4 forest owners' cooperatives in Lithuania operate under the Law of Cooperative Enterprises in 2019. Other six forest owners' cooperatives have either been transformed to limited liability enterprises or gone bankrupt (SECR 2019).

Other Eastern European countries are facing similar patterns. HRIB et al (2018) from the Czech Republic found that PFOs are still very reluctant to cooperate in private forest management. The insufficient motivation for joining the forest owners' cooperative is attributed to the lack of funding from the government (HRIB et al. 2018).

On the other hand, GARGASAS and RAMANAUSKAS (2009) concluded that cooperatives are not as effective as other forms of business (for example, limited liability companies); thus, there are many doubts as to whether state institutions should support such businesses. All doubts dissipate, however, when the benefits of cooperatives are assessed (GARGASAS, RAMANAUSKAS 2009).

PFO surveys

In this study, the data and results of two private forest owners' surveys with an interval of 13 years between them were used and analysed. One of the surveys was conducted in 2003 by PIVORIŪNAS and LAZDINIS (2004), while another by the public opinion research company FACTUS (2016) under the contract of the Ministry of Environment of Republic of Lithuania in 2016.

First survey was conducted during October – December 2003, using telephone survey method, which at that time was considered as ensuring highest rates of responses. Respondents were selected randomly from non-associated (not members of forest related cooperatives or associations) forest owners. They were grouped according to the managed forest size: up to 5 ha, 5.1 to 25 ha, 25.1 to 50 ha, 50.1 to 100 ha and over 100 ha. In total 462 respondents were selected, however 12 persons refused to participate in the survey. Questionnaire was formulated by a panel of private forest sector experts and included both closed and open-ended questions. For some of the questions, the respondents were allowed to provide multiple answers (PIVORIŪNAS, LAZDINIS 2004).

Another, more comprehensive survey was conducted during September – November 2016. Aiming to ensure highest rates of responses, different techniques were used to interview 1009 PFOs: 516 face to face meetings, 299 by telephone, 194 filled in on-line survey. 59 questions were formulated referring to six topics: forest management, arising problems and possible ways to solve them, level

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of silvicultural knowledge, knowledge about European Union aid, status and need for association or cooperation, demographic data including forest holding size. Respondents were grouped according to the managed forest size: up to 1 ha, 1.1 to 3 ha, 3.1 to 5 ha, 5.1 to 10 ha, 10.1 to 20 ha, over 20 ha (FACTUS 2016).

It is important to highlight, that in 2003 survey non-members of cooperatives and other forest-related associations PFOs were selected, while in 2016 survey all PFOs were chosen as target group. However, only 2.9 % respondents of survey conducted in 2016 indicated that they belong to the cooperative, therefore their answers should not significantly bias study results. Furthermore, questions related to cooperatives were analysed excluding PFOs who are members of cooperatives, as in 2016 survey this section has separate data for members and non-members of cooperatives.

Questions formulated in both surveys were analysed and similar as well most important were selected for comparison. In the study, the answers to these main questions were used:

- What do you plan to do with your forest holding?
- What forest management activities are done in your forest?
- What is the value of the forest?
- Are you considering joining a forest owners' cooperative?
- What are your forest management objectives?
- What is your forest management experience?
- Who should represent the interests of PFOs?
- How do you understand the word “cooperative”?

In the study only those survey results (answers), which were indicated as statistically significant ($P < 0.05$), were used. To determine how the attitude of PFOs towards forest management changed over the last decade, a case study approach was used as a research strategy. Additionally, the status of the Lithuanian PFOs was explored within the framework of the needs assessment approach. According to the definition of WITKIN and ALTSCHULD

(1995), a need is considered a discrepancy or gap between the current state of affairs in regard to the situation of interest and the desired state of affairs.

Changes in the responses to the same questions of two surveys were analysed, determining differences that occurred over a 13-year period. A shift in PFO attitudes was revealed through these aspects: disposition of forest land, forest management activities, forest value, and cooperative forest management. As the respondent sample was different between the surveys, the percentage values of answers were compared.

RESULTS

Disposition of forest land

The majority of respondents in 2016 considered the forest a long-term investment, and they intended to expand (36.0%) or maintain the same size of the holding (41.2%). In 2003, the answers to the same questions were 28.9% and 57.3% (Table 1).

In 2016, 85 participants (14.2%) intended to sell their holdings in the nearest future for a price that would satisfy them. The majority of the respondents who intended to sell the forest were PFOs who owned relatively small forests: 31 survey participants (5.2%) had up to 5 hectares of forest land and 33 (5.5%) had 6-10 hectares of forest land. Thirteen years earlier, only 2.6% of all respondents indicated that they would sell forest holdings either before or after harvesting.

According to the survey in 2016, 8.5% of respondents indicated that they did not know what they wanted to do with their forest holdings not only in the near future but also in the long term, compared to the 11.1% who answered similarly in 2003.

PFOs hold forests in Lithuania as a long-term investment, and the majority of them intend to transfer their forest holdings to future generations, expand the existing forest holding or at least main-

Table 1. Changes in plans of forest disposition

Question asked	Response option	Frequency of response in year (%)	
		2016	2003
What do you plan to do with your forest holding?	Will increase	36.0	28.9
	Will maintain	41.2	57.3
	Will sell	14.6	2.6
	I do not know	8.5	11.1

Table 2. Changes in forest management activities

Question asked	Response option	Frequency of response in year (%)	
		2016	2003
What forest management activities are done in the forest?	Forest management plan prepared	29.6	17.6
	Final felling done	11.7	13.6
	Sanitation felling or thinning	37.5	26.2
	Reforestation	17.0	10.2
	No activities	8.7	27.6

tain the same size holding. Those who are willing to sell their property are few; however, the number of PFOs that were thinking about selling land in 2016 increased more than five times compared to 2003. This pattern could be the outcome of the financial slow-down in Lithuania between 2008 and 2011, when many citizens were selling their real estate to cover debts. On the other hand, almost 10% more PFOs in 2016 declared the intention to increase the size of their forest holding compared to 2003, which could indicate the success of private forest management as sustainable and profitable.

For a deeper understanding, it might be important to explore issues such as who has the power of decision making within the family of the PFO, what information is available, who is the prime source of information, and who has the responsibility of decision making.

Forest management activities

The most popular forest management activities carried out by PFOs in 2016 were sanitation felling and thinning (37.5%), followed by forest management plan development (29.6%). Thirteen years earlier, the answers to the same questions were 26.2% and 17.6% (Table 2).

It should be noted that starting in 2016, reforestation was carried out by only 17.0% of the respondents. Another worrying fact is that in 2003 27.6% of PFOs carried out no activity in the forest, compared to 8.7% in 2017.

The number of PFOs with forest management plans increased from 17.6% in 2003 to 29.6% in 2016.

Analysis of the forestry activities by the size of forest holdings shows that felling activities are most intensively carried out by PFOs who hold more than 20 hectares of forest land and least actively by those PFOs who own up to 5 hectares of forest. The main activities carried out in forests is one or

another type of felling that resulted in the production of roundwood, mainly for own use. There has been a relatively large change in the number of forest management plans produced for private forest holdings in recent years. This could be explained by intensive legislative enforcement, derived by the policy of the Ministry of Environment, also by the increase of sustainable forest management awareness among PFOs.

It should be noted that in the thirteen years, the number of sanitation felling and thinning in private forest of Lithuania had increased dramatically. A simple explanation for this pattern could be that the hurricane type of winds known as Anatolyj and Ervin had destroyed large amounts of forest stands in Lithuania, especially in its southern and eastern parts. This resulted in an increase in the intensity and number of the above mentioned felling. However, such a situation also has a positive side, as forest management activities in private forests during the decade have increased by three times compared to 2003. The most intensive forestry activities in addition to the preparation of forest management plans, felling and reforestation were landscaping, maintenance of firebreaks and drainage ditches, and road repair.

Finally, the forest management analysis shows that the intensity of reforestation has also increased remarkably (from 10.2 % to 17.0 %) which may be due to the high penalty rates for not reforesting felling areas within five years after the felling has been done.

Forest value

Having analysed the gathered information from the 2016 survey, it is obvious that PFOs see the aesthetical value of forest holdings as the most important aspect (50.0% of the answers). Provision of timber, mainly fuelwood for personal needs, was a

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Table 3. Changes in forest value

Question asked	Response option	Frequency of response in year (%)	
		2016	2003
What is the value of the forest?	Investment	29.0	12.9
	Hunting	9.0	2.2
	Aesthetics	50.0	36.9
	Environmental protection	39.0	21.8
	Roundwood for personal needs	44.0	15.6
	I do not know	20.0	10.7

very common answer (44.0%) as well. Environmental protection and biodiversity values were highlighted by 39.0% of PFOs (Table 3).

In comparison, in 2003, PFOs in Lithuania generally thought that their forest provided aesthetic value (36.9%) and environmental protection (21.8%). Slightly less than one-third (28.5%) prioritized economic aspects of forest ownership (forests were often considered a source of income and roundwood for personal needs as well as a sound investment).

In 2003, 10.7% of PFOs in Lithuania indicated that they “did not know what to do” with their forest, whereas in 2016, this share almost doubled to 20.0% of the responses. Moreover, the value of hunting and engaging in outdoor activities (entertainment) and other activities in forest holdings was most often mentioned as irrelevant in 2003 and 2016.

In general, in 2003, as well as in 2016, younger PFOs managed private forests because of roundwood sale as a source of income. Self-provision of timber for personal needs remained important over these thirteen years because 81.2% of the respondents used wood as fuel for their own needs.

PFOs’ level of forestry knowledge has observably improved year by year. One of the arguments for this is the increasing number of PFOs who value the forest as a good way to invest money and protect the environment (both answers scored two times more than in 2003). The reason for the improved awareness in private forestry could be that increasing numbers of PFOs are obtaining professional advice from PFO associations, forest owners’ cooperatives and local divisions of the State Forest Enterprise.

Strangely, in recent years, the number of PFOs who do not know how to value the forest has nearly doubled, compared to the results of the survey delivered thirteen years ago. One of the arguments explaining this change could be the general pessimism towards the management of the different kinds of properties the PFOs own, represented only in part by forest.

One of the most highly valued aspects the forest brings to PFOs is the possibility to supply timber for personal needs or for sale. The importance of this value has dramatically improved in the last decade and could be partly explained by the increase in the gas and oil prices for heating and electricity production in Lithuania.

Cooperative forest management

The survey in 2016 showed that PFOs in Lithuania do not feel a great need to join a forest owners’ cooperative; only 23.3% of respondents stated that they wanted to join a cooperative, whereas 49.1% of respondents stated that they did not want to (Table 4).

It should be noted that PFOs holding larger forest holdings were more willing to join a forest owners’ cooperative: 58.0% of the respondents holding up to 5 ha of forest did not want to, while only 29.9% of the respondents who had more than 20 ha of forest did not want to, and 46.7% stated that they were thinking about becoming a member of a forest owners’ cooperative. Nevertheless, a considerably large number of the PFOs in Lithuania had no opinion about joining a forest owners’ cooperative.

In comparison, in 2003, PFOs in Lithuania generally responded “don’t know” to the question about whether they wanted to become a member of a forest owners’ cooperative (54.5% of all responses). Almost equal shares of positive and negative decisions about joining a cooperative were given in the survey; with 21.3% and 24.2% of all the answers, respectively, where negative attitudes towards cooperation slightly dominated.

The main reasons to join a cooperative indicated by the respondents, answering the open-ended questions were distributed more or less equally: (1) participate in management (23.8%); (2) be together with other members of the forest owners’ coopera-

Table 4. Changes in cooperation

Question asked	Response option	Frequency of response in year (%)	
		2016	2003
Are you considering joining a forest owners' cooperative?	Would like to become a member	23.3	21.3
	Would not like to become a member	49.1	24.2
	I do not know	27.7	54.5

tive (22.2%); and (3) have more funding opportunities (21.7%).

According to the data, Lithuanian PFOs consider their forest holdings too small to yield economic gains if they joined a forest owners' cooperative, which does not motivate them to cooperate. Admittedly, some PFOs view their property as a base for business activities, while others do not want to prioritize the economic objectives but give them secondary importance. This might suggest that so far, forest owners' cooperatives have not managed to make large profits and therefore do not seem to be attractive cooperation channels. Furthermore, the principles of business development applied in the practice of forest owners' cooperatives testify to the short-term or instable character of the related activities. Hence, the short-term perspective of business might be distinguished as an important aspect determining cooperation in the sector. This causes a major concern in the operation of forest owners' cooperatives and results in the lack of long-term prospects of operation, unwillingness to invest in forestry or negligence of customer service.

The number of PFOs who would like to become a member of a forest owners' cooperative tends to be very stable and accounts for one-fifth of all PFOs.

A negative trend towards cooperation has been observed in the last decade, where half of the respondents declared that they were not going to join a forest owners' cooperative, a share twice as large as the share in 2003. Simultaneously, the number of PFOs with no strong opinion about cooperation has doubled, which shows that the PFOs in Lithuania have already formulated an opinion about forest owners' cooperatives.

For the Lithuanian PFOs who consider becoming members of a forest owners' cooperative, the strongest motives were the scale of forest operations and good image of the company. The PFOs who would not consider membership stated that the argument to join the forest owners' cooperative would be an oral recommendation by a relative or a friend, the possibility to consolidate private forest holdings

or the possibility to participate in management of the enterprise. This could be explained by a traditional mistrust of elderly people in private forest management.

DISCUSSION

GOW and STAYNER (2005) describe the complexity of decision making and cooperation in forestry in their critical review of research on farm adjustment (a euphemism for farmers leaving agriculture). They argue that there are numerous ways in which farmers respond to change in the economic, technical, and institutional environments due to globalization or other powerful impacts that influence or will influence the structures of the farms tremendously. It was proven that adjustment in agriculture and forestry takes place within the social context and is accompanied by social stresses and disruptions; moreover, non-economic aspects usually significantly impact the process of farm adjustment. Social networks can increase productivity by reducing the costs of doing business; thus, certain aspects facilitate coordination and cooperation.

It is evident that the process of decision making is complex and involves many different aspects, individual or community-based environments and other influences, such as family, traditions, religion, and needs. It develops together with the environment in which the decision maker acts. In fact, human beings always find solutions that more or less satisfy their needs and expectations by decision making.

The decision to join a cooperative might also be affected by non-economic aspects, such as the demographic structure of a family. However, active and large cooperative membership is a major aspect contributing to a cooperative's capacity to produce socio-economic benefits. Therefore, cooperatives typically aim at the highest possible membership (OLLILA 1989; SCHRADER 1989).

A very limited number of members (who are also the founders) of a cooperative could lead to the

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thought that the members of the founder group occupy the management positions as well as do not communicate well enough with other members and, more importantly, with potential new members. Members may also be reluctant to allow the cooperative to increase its equity base through retained earnings because the retention of earnings translates into lower effective prices for marketed products or higher effective costs of farm inputs.

Lithuania is not unique in this case. A study by LÖNNSTEDT (2014) shows that the Swedish cooperative movement in forestry is facing great challenges as well. The number of members of forest owners' cooperatives and the number of forest owners' cooperatives themselves has been dramatically decreasing. The problem is that larger organizations increase the "distance" between organizations and their members. It is well documented that social aspects are crucial to cooperative organizations. For a cooperative to function, there must be at least some trust between the members: mutual understanding, a feeling of community, common problems, etc. (HAKELIUS 1996). Supporting this assumption, STAATZ (1987) also argued that farmers must have something in common: "with a highly heterogeneous membership, particularly one in which members perceive themselves as being in opposing camps (...), it may be difficult to get members to agree on anything other than running the cooperative as a separate profit center".

Someone could guess that the word "cooperative" itself has a rather negative image among potential members of forest owners' cooperative due to reminding of the Soviet times or being a synonym to the word "agriculture" that according to traditional Lithuanian understanding is not a part of forestry at all. Moreover, lack of appropriate knowledge about cooperative complexity and cooperative as a form of legal type of enterprise with obligations arising from that might look scary to PFOs, who could automatically deny the idea joining the unfamiliar environment or other people for joint actions.

However, the Lithuanian example of very few members of forest owners' cooperatives could lead to the assumption that forest owners' cooperatives try to create barriers to the entry of new members (for example, relatively high entry and annual membership fee). Currently, these cooperatives are involved in providing various forest management-related services to their customers, i.e., non-members. A larger number of new members

would increase the payoff for the forest owners' cooperatives because it would lead to larger timber volumes and stronger negotiating power when marketing its services.

In the broader context of the current private forestry sector, the existing forest owners' cooperatives in Lithuania tend to practice a contract system between the PFO and the forest owners' cooperative; thus, the forest owners' cooperative acts as the contracted forest manager. This approach seems to be natural because when the individual PFO is not able to act efficiently in relation to forest management, a forest owners' cooperative, as a service provider, might be a tool, as it usually acts upon the consensus among PFOs. However, in addition to the lack of know-how for serving the individual PFO needs, the need for new members to join the forest owners' cooperative stands out as another major issue of concern.

This suggests that a cooperative having enough members and representing a sufficient share in the market could improve the match of aggregate production and demand, thus contributing to price stability and coordination for future business performance.

CONCLUSION

The study showed that PFOs' attitude towards forest management over the last decade has changed in some fields, while decisions such as holding forests for long-term investment, intending to transfer forest holdings to future generations, expanding the existing forest holding or maintaining the same size of holding have remained stable in Lithuania. However, comparison of survey responses also indicates that many more PFOs see the forest as a source of investment and roundwood. Furthermore, surveys indicate that more PFOs intensively manage their forests. Some of these activities could be caused by natural disturbances and PFOs' urgent actions to decrease the loss due to damaged trees. Nevertheless, higher numbers of forest management plans developed could indicate PFOs' increasing willingness to explore resources. On the other hand, PFOs are not willing to cooperate, and increasing numbers of PFOs plan to sell their property. It is also important to note that the private forest owners' cooperatives have lost their attractiveness over the last thirteen years, as the number of PFOs who do not plan to join a cooperative doubled.

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It seems that the role of social aspects in the process of cooperation is well underestimated. It is also possible to argue that cooperatives of PFOs in Lithuania have been unable to produce high benefits thus far due to the currently low level of social capital.

In the Lithuanian context, forest owners' cooperatives should try to focus their member recruiting activities on the PFOs who have comparable forest stands, are situated in the same geographical area or live in the same city. In this case, forest owners' cooperatives will be faced with the dilemma of attracting larger numbers of members to be more competitive and at the same time not alienating the majority of members.

Finally, the authors of this study strongly recommend that the results of the case study be considered in forest policy processes at the national and local levels and become a permanent element of continuing forest management planning cycles.

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