

**ASSESSMENT OF PRIVATE FOREST OWNERS'
COOPERATION IN ESTONIA**

EESTI ERAMETSAOMANIKE KOOSTÖÖ ANALÜÜS

PRIIT PÖLLUMÄE

A Thesis
for applying for the degree of Doctor of Philosophy in Forestry

Väitekirj
filosoofiadoktori kraadi taotlemiseks metsanduse erialal

Tartu 2015

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**Doctoral Thesis of the
Estonian University of Life Sciences**



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LIST OF ORIGINAL PUBLICATIONS

The thesis is based on the following papers; in the text references to them are given in Roman numerals. The papers are reproduced by the kind permission of the publishers.

- I **Põllumäe, P.**, Korjus, H., Kaimre, P., Vahter, T. 2014. Motives and Incentives for Joining Forest Owner Associations in Estonia. *Small-scale Forestry* 13 (1): 19 – 33.
- II **Põllumäe, P.**, Korjus, H., Paluots, T. 2014. Management Motives of Estonian Private Forest Owners. *Forest Policy and Economics* 42: 8 – 14.
- III Sarvašová, Z., Zivojinovic, I., Weiss, G., Dobšinská, Z., Drăgoi, M., Gál, J., Jarský, V., Mizaraite, D., **Põllumäe, P.**, Šálka, J., Schiberna, E., Šišák, L., Wolfslehner, B., Zalite, Z., Zalite, T. 2015. Forest Owners Associations in the Central and Eastern European Region. *Small-scale Forestry* 14 (2): 217-232.
- IV **Põllumäe, P.**, Korjus, H. 2015. Forest owners' cooperation in Estonia: the role of formal institutions. Submitted to *Forest Policy and Economics*.

The contributions from the authors to the papers are as follows:

	I	II	III	IV
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Study design	All	HK, PP	All	HK, PP
Data collection	PK, TV	PP	All	PP
Data analysis	PP	All	All	PP
Preparation of manuscript	HK, PK, PP	All	All	HK, PP

HK – Henn Korjus; PK – Paavo Kaimre; **PP** – **Priit Põllumäe**; TP – Teele Paluots; TV – Tarmo Vahter; All – all authors of the paper.

ABBREVIATIONS

CEE	Central and Eastern Europe
EMÜ	Eesti Maaülikool (Estonian University of Life Sciences)
ENFP	Estonian National Forest Policy
FAO	Food and Agriculture Organization of the United Nations
FOA	Forest owners' association
FOC	Forest owners' cooperative
FOO	Forest owners' organization
IAD	Institutional Analysis and Development
LMSA	The Forest Owners Association of Lithuania
LRF	The Federation of Swedish Farmers
MCPFE	Ministerial Conference on the Protection of Forests in Europe
MEGOSZ	Association of Hungarian Private Forest Owners
NFP	National Forestry Program
NIPF	Non-Industrial Private Forest
PCA	Principal Component Analysis
PFO	Private forest owner
RO	Regional Organisation
RVNL	Council of Non-State Forest Owners' Associations of Slovakia
SFM	Sustainable Forest Management
SVOL	Association of Municipal and Private Forest Owners of Czech Republic
US	United States
WCED	World Commission on Environment and Development

1. INTRODUCTION

Forests are an important source of different goods and services. They provide a wide range of benefits including both marketable goods (e.g. timber) and goods which go beyond the complexity of markets (e.g. biodiversity, carbon sequestration). With such resources in hand, the sustainability of their use is a question that has raised a long time ago. Even more, the question itself has become more on more complex because of the development of the meaning what makes the use of forests sustainable (Clark, 2011).

Sustainable development is defined as *“the development that meets the needs of the present without compromising the ability of future generations to meet their own needs”* (WCED, 1987). The Sustainable Forest Management (SFM) concept nowadays is based on the same principles and is defined as: *“The stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems”* (MCPFE, 1993). Shannon *et al.* (2007) conclude it *“is a conversation about the future”*. But yet once a sustained timber yield approach, SFM has developed into a complex system of different considerations and objectives.

An important part of forestry is forest ownership and rights associated with it. Ownership rights are broader agreements of society about certain rights and duties that go with the ownership of a property. Hence, ownership evolves together with the changing goals of the society (Gootee *et al.*, 2011) and forms a complicated matrix of claims as different rights to a single object may be allocated to different social groups (Schlager and Ostrom, 1992). For example management restrictions (e.g. clear felling regulations) might apply to a forestland for the benefit of a broader group of beneficiaries (e.g. the forested area is important for biodiversity) although it is owned privately. Therefore ownership and property rights play an important role in the use of forest and forest-related resources.

The existing structure of forest ownership is a result of approximately 25 years of changes and developments. Estonia was occupied by the Soviet Union in 1940 which resulted in land nationalization. After World War II collective farms were established leaving people without rights to private land use and forest management. During the Soviet occupation, about 60% of forests were managed by the state, 38% by the collective farms and 2% by the military (Meikar and Etverk, 2000); thus, previous farm forests were managed and utilized under Soviet principles. Up to 1990s no major changes occurred in the ownership of forest resources.

In 1991 comprehensive changes in land ownership were obvious in Estonia. Private land ownership was re-established and now the restitution and privatization process is near completion. During these processes forestland ownership changed significantly. Now forestland covers 2.2 million ha (51% of the total land area) in Estonia and 47% (i.e. 1,038,000 hectares) of forests belong to private forest owners (Raudsaar *et al.*, 2014). Forest land undergoing privatization still accounts for 12% of forest area. Approximately 93,000 private individual persons and 4,000 enterprises and organisations (Forinfo, 2011) own respectively 746,000 ha (74%) and 292,000 ha (26%) of private forest land in Estonia (Raudsaar *et al.*, 2014). Forinfo (2011) shows that 56% of private individuals and 46% of private organisations own forest properties up to 5 hectares which indicates a high level of ownership fragmentation in Estonia which is also characteristic to transition countries in Central and Eastern Europe (III). Ownership fragmentation could lead to inefficient forest management (Schlueter, 2008) and the provision of different forest benefits could be hindered. The sustainable management of these private forest comes into question. One possible solution to overcome this fragmentation problem is the cooperation of forest owners as it helps to increase production and on the other hand, reduce some negative externalities (Mendes *et al.*, 2011). Most often the emergence and formation of forest owners organisations (FOO) is seen as an effective tool for bringing small-scale forest owners together.

FOO started to develop in Estonia already at the beginning of the 1990s. Although cooperation between forest owners occurs on a voluntary basis the government can use certain policy tools to make cooperation more attractive to owners (Põllumäe and Korjus, 2012). Despite this, FOO membership is still not a common practice in Estonia as only 6% of forest owners are FOO members (NFP 2011-2020, 2010). The MCPFE (1993) concept of SFM was mainly introduced to the Estonian legislation in 1997 through the development of the Estonian National Forest Policy (ENFP, 1997). The ENFP also outlines several issues that have been the basis for forest policy developments since e.g. the role of the state in supporting private forest owners. During the two National Forestry Program (NFP) periods (2001-2010 and 2011-2020) several issues of private forestry have been tackled. One focus has been in promoting of forest owners cooperation and the development of FOOs. In the latter case the NFP (2010) puts forward that 500,000 hectares should be covered with forest owners with FOO membership by 2020 (the baseline being 150,000 ha). The document also highlights that during the 10-year period these forest owners should deliver 5 million m³ of timber to the market while the baseline is 65,000 m³ (NFP 2011-2020, 2010).

This thesis is a synthesis of papers discussing the problems and development of private forest ownership and owner cooperation in Estonia. As research on this topic has been lacking in Estonia for long time, the state of art is also explored in this study (I). Forest owners' cooperation is largely a forest policy matter but it also has a strong social content. Therefore forest owners' values, objectives and motives towards forest management and cooperation are studied (II). A European perspective on the developments is given (III) and policy situation, problems and perspectives are explored (IV).

2. REVIEW OF LITERATURE

2.1. Forest owners and private forestry as research subjects

Increasing concerns about the sustainable management of natural resources has led to a need for better knowledge about the processes that influence it. Since forests are no longer seen only as economic engines there is even a wider gap in our understanding about the sustainable use of forest-related benefits. In order to be successful in implementing sustainable forest management there is a greater need for the integration between policy and science (Shannon *et al.*, 2007). With a mixture of forest ownership it is important to know the patterns and trends of forest ownership (Butler and Ma, 2011). Even more, forest owners themselves pose difficult questions for forest policy as new forest owners are emerging due to societal change (Kendra and Hull, 2005; Rickenbach *et al.*, 2005) or land reform (e.g. Eastern European countries). In Eastern Europe especially policy processes have to recognize the differences of private and state forests (Siry, 2002) and that small-scale forestry differs from industrial forestry (Herbohn, 2006). Therefore more attention needs to be placed on private forest policy and governance issues and on their impacts on sustainable forest management (Teeter *et al.*, 2002).

Private forest ownership was established in Estonia in the early years of the 20th century. When Estonia was occupied in 1940 all lands were nationalized and after the 2nd World War collective farms were established. In the end of the Soviet period 60% of forests were managed by the state, 38% by the collective farms and 2% by the military (Meikar and Etverk, 2000; Unwin, 1997). Up to early 1990-es no major changes occurred in the ownership of forest resources and thus the focus of forest-related research had been focused on forest management, silviculture and forest planning. Yet in 1993 restitution and privatization had begun aiming to restitute and privatize about half the forests. Together with these processes also the forest industry was privatized (Kallas, 2002).

In Estonia private forestry issues came to the research agenda in the end of 1990-es. It was clear that forest ownership is not only a part of forestry history studies but it is an important part of how land and forest is being managed (Meikar and Etverk, 2000). While most of the research was concentrating on the whole forest sector policy and governance developments (Hain and Ahas, 2005; Kallas, 2002; Lazdinis *et al.*, 2005a; Lazdinis *et al.*, 2005c; Urbel-Piirsalu and Bäcklund, 2009) there has been also research on more specific private forestry issues (Bouriaud *et al.*, 2013; Toivonen *et al.*, 2005). There are also a few studies that explore Estonian private forest owners from a social science perspective by classifying forest owners (Sepp, 2008) and exploring their management motives and objectives (Järvinen *et al.*, 2003). Grubbström (2011) and Jörgensen and Stjernström (2008) have looked upon the emotional bonds of land and forest ownership in Estonia. While the history of Estonia has very much influenced research topics, private forest owners are relatively new subjects in research. Also interest organisations are rarely the subject of forest policy research (Krott, 2005). This provides more opportunities for researchers, but at the same time poses difficulties as many research methods and theories are still to be explored.

2.2. Theories about cooperation

The small size of a forest holding makes forest management inefficient because the income from management is small and irregular (FAO, 2012a). Many forest owners have limited expertise in forest management. The key to increasing the provision of public goods and reducing negative externalities in small-scale forestry is cooperation of forest owners (Mendes *et al.*, 2011). Even more, Kittredge (2005) suggests that cooperation may even result in landscape-level benefits, but at the same time concludes that it is not universally suitable for all forest owners. Nevertheless, there are theories that deal with the formation of associations or cooperation.

In the voluminous “Logic for Collective Action” Olson (1971) describes the purpose and emergence of interest organisations being a real breakthrough in this field (Glück *et al.*, 2010). The underlining

part of his logic is that successful cooperation in an organisation is possible if a collective good is pursued. Any organisational study relies on the purpose of the organisation so that at least one, almost universal, characteristic of an organisation is its purpose of promoting the interests of its members. There is no need to have a cooperative institution when individual action can serve the needs as well, or even better, than the institution. While cooperation can also fulfil other individualistic interests, its main function remains in advancing the common interests of the group of individuals. This is very important in the case of forest owners since as Kittredge (2005) shows the types of landowner cooperation can be very different, ranging from information cooperation to financial cooperation. This logic underpins interests.

In general, an individual is interested in maintaining or enhancing his/her well-being. Being material or immaterial, it is the basis of rational, utility-oriented behaviour (Glück, *et al.*, 2010). In the case of forest owners' cooperation it might be assumed that cooperation helps to enhance the overall well-being of the forest owners. This logic provides the basis for rational policy analysis, which outlines that the choices between alternatives are made based on the yields of benefits and/or lowest costs (Zafirovski, 2003). This largely corresponds to the conventional theory of institutional change where rational actors make choices between alternatives in a competition (perfect markets) situation while the most efficient (transaction cost minimising alternative) solution emerges (Schlüter, 2007). Arts (2012) highlights here that these rational individualistic choices might deliver satisfactory results on an individualistic level, but they might produce negative results on a collective level. Within the theory of collective action Olson (1971) also highlights the importance of group size, since in a group with very high numbers of individuals the problem of "free riding" occurs. As he elegantly puts it: "*The individual member of the typical large organisation is in a position analogous to that of the firm in a perfectly competitive market, or the taxpayer in the state: his own efforts will not have a noticeable effect on the situation of his organisation, and he can enjoy any improvements brought about by others whether or not he has worked in support of his organisation*" (Olson, 1971: 16). In addition to the importance of group size, the size of individual members is

highlighted. For example, forest owners of larger forest areas might benefit more from lobbying actions (e.g. a reduction of land tax) than small-scale owners.

One application or tool for analysing cooperation is the game theory. This theory helps to understand the decision-making process of people in pursuit of their objectives (Osborne and Rubinstein, 1994). Describing cooperation in a game-theoretic context, North (1991) underlines that it is difficult to sustain cooperation when interactions are not repeated, that there is a lack of information especially when the number of “players” is very large. The theory is more often used in analysing interactions between different groups of people in one particular situation (e.g. Shahi and Kant, 2007). For example in many developing countries the process of decentralisation has led to increased interactions between local communities and state authorities. In cases like this Kant and Nautiyal (1994) suggest using game-theoretic approaches while Weber (2012) outlines that institutional analysis and development (IAD) has been successful as well. It seems that in many cases game theory is also applicable to cooperation between individual forest owners (figure 1). For example Amacher *et al.* (2003a) demonstrated empirically how the decision of one landowner could have an impact on other landowners. Thus, many situations in small-scale private forest management may be socially expensive and pose both positive and negative externalities to other forest owners or users. It is a classical “prisoner’s dilemma” where pursued self-interest might lead to negative results in a larger perspective (PFO 2 deflects cooperation and gains more compared to PFO 1, who was hoping to cooperate). By focusing on self-interests, one might not promote the collective interests of the group.

		PFO 1	
		Cooperate	Defect
PFO 2	Cooperate	2	3
	Defect	0	1
		2	0
		3	1

Figure 1. The illustration of “the prisoners dilemma”. Pursued self-interest may deliver less or no benefits on a collective level.

As shown, many potential explanations and theories for forest owners’ cooperation are largely drawn upon the principles of neoclassical economics. The described theories and approaches, however, have some limiting factors. Firstly, they assume (bounded) rationality (Simon, 1955), which in short means that actors have a perfect understanding of the costs and benefits of a particular decision (Schlüter, 2007). Thus they make decisions based on “perfect information” and in their own best interests (utility maximisation). The outcome of a decision is driven by competition and thus a transaction cost minimised outcome will emerge. However, “keeping the costs down” is yet another difficult part to explain within these theories since obtaining “perfect information” is presumably itself a very costly task. For example it is difficult to imagine a costlier and more complex situation than for a large group of individuals agreeing on a common interest or objective. In addition to this, competition, i.e. the perfect market is also required. This requirement limits the explanatory potential of these theories significantly considering the complexity of forest governance and

policy. Amacher *et al.* (2003a) underlines that the benefits from cooperation among landowners could be very important to the application of forest policy. However, the challenge for forest policy is to find instruments that promote several neighbouring forest owners to act as sole owners (Amacher *et al.*, 2003b). While there are still command-and-control policy instruments in some countries, other instrumental forms are emerging as well, influencing this “perfect market” to a degree that makes one question the usefulness of these neoclassical approaches. Also as Rickenbach *et al.* (2011) put it, “*cooperation is fundamentally a social enterprise*”, which means trust-based communication and relationship with other individuals.

2.3. Institutional Analysis and Development (IAD) framework

2.3.1. Different levels of analysis

Max Krott (2000) describes how forest scientists are often looking for appropriate theories from political science and economics, but also from social science disciplines (De Jong *et al.*, 2012). The challenge is to find appropriate ones that could provide new knowledge to forestry. Yet, theories are just one of the three foundations that are used to study institutions (figure 2; Ostrom, 2011).

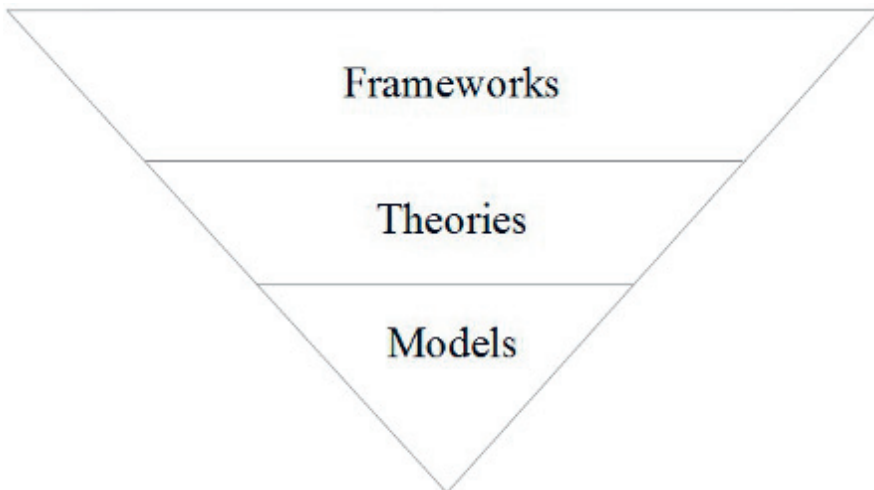


Figure 2. The level of explanatory potential and generalization level of frameworks, theories and models.

Models are quite specific and they include a certain number of parameters to test hypotheses or predict outcomes (Weber, 2012) by combining these parameters using a specific theory (Ostrom, 2011). Theories help to interpret or explain events and create new knowledge, i.e. it is done either by creating abstract understandings or by exploring the empirical results or “reality” as De Jong *et al.* (2012) puts it. What frameworks provide is an opportunity to integrate or compare different theories in one domain, so that they would provide more coherent explanations (Koontz, 2003; Ostrom, 2011). It is the most general form of theoretical analysis.

2.3.2. IAD framework components

The IAD framework is a result of a lifelong work of Elinor Ostrom and the Workshop in Political Theory and Policy Analysis (McGinnis, 2011; Ostrom, 2007; Ostrom, 2005). Its roots go back to the “Tragedy of Commons” (Hardin, 1968) and Ostroms critique that not all common-pool resource systems are deemed to failure. The literature about institutions of collective action and natural resource governance is one of the most important legacies of her work (Araral, 2014). It is not really a single general approach, but rather an instrument for getting to know the key parts of the framework and analysing how the different parts of the framework influence each other (figure 3).

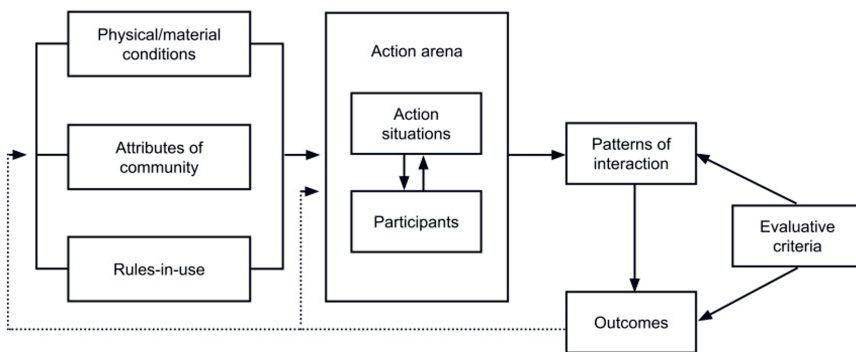


Figure 3. Components of the framework for institutional analysis (Ostrom, 2005: 15).

Ostrom (2007: 46) outlines: “*The IAD framework is thus a general language about how rules, physical and material conditions, and attributes*

of community affect the structure of action arenas, the incentives that individuals face, and the resulting outcomes". The key parts of the framework include an action arena, where action situations with actors occur, and the resulting patterns of interactions, outcomes and the evaluation of these outcomes.

Action arenas consist of two important parts – action situations and actors. "*Action situations are the social spaces where individuals interact, exchange goods and services, solve problems, dominate one another, or fight (among the many things that individuals do in action situations)*" (Ostrom, 2011). It is the "black box" where choices are made (McGinnis, 2011). The action situation consists of: (1) the set of actors; (2) the specific positions of participants or actors; (3) the set of allowable actions and their linkage to outcomes; (4) the potential outcomes that are linked to individual sequences of actions; (5) the level of control each participant has over choice; (6) the information available to participants about the structure of the action situation; and (7) the costs and benefits (Ostrom, 2007; Ostrom, 2011).

The biophysical conditions are very important in the analysis. Goods, which are involved in an action situation, are defined. They provide the context in which the action situation is situated (McGinnis, 2011). Forests are often seen as common-pool resources. In this case – private forests – they could be characterised as private goods, i.e. consumption of one unit now lowers the potential consumption of another unit afterwards. And in addition, it is not expensive to exclude others from accessing the resource. This is due to a higher degree of governance arrangements. However, this applies largely only to timber. A lot of other benefits that forests provide can be considered as common-pool resources (e.g. biodiversity, fresh air). For example, individual A can freely pick mushrooms from a private forest, which leaves fewer mushrooms for individual B. At the same time it is costly to exclude others from these mushrooms. The attributes of the community reflect all the general social and cultural backgrounds within the action situation (McGinnis, 2011). It can be seen as the historic, cultural and religious backgrounds of the individuals in the action situation

(Andersson, 2006). It encompasses values, beliefs, skills, knowledge, i.e. a range of socioeconomic characteristics.

The rules-in-use indicate all the important parts of the overall context in which an action situation is located. It consists of formal (e.g. laws) and informal rules (some might not be even acknowledged by the actors). In general, rules are shared understandings about what the actors are allowed and not allowed to do and what actions are needed, prohibited or permitted (Ostrom, 2007). These can include laws, regulations and even property rights (McGinnis, 2011), and, e.g. agreed membership statutes in an association or firm (Ostrom, 2007). All these parts together affect the types of actions that individuals can take, thus also resulting in some costs, benefits and outcomes (Ostrom, 2007).

The patterns of interaction in general refer to the likely patterns of behaviour – more specifically, the characteristics of the action situation with the behaviour of participants in the specific structure (Polski and Ostrom, 1999). It is a structure or an arena in which the participants can sort out possible solutions to the action problem. These patterns of interactions result in outcomes.

Outcomes are outputs of an action situation, the results of interactions. It is important to understand that outcomes are difficult to predict while there are other exogenous influences from other action situations (McGinnis, 2011). The IAD is therefore also useful to predict alternative outcomes under different set-ups (Ostrom, 2011). Both interaction patterns and outcomes are assessed and evaluated and they provide the basis for change. Feedback and adaptive learning can have an impact on future inputs and therefore on processes in the action situation (McGinnis, 2011).

While there are many ways to evaluate the outcomes or alternative outcomes, the following criteria are most commonly used (Ostrom, 2011): (1) economic efficiency; (2) equity through fiscal equivalence; (3) redistributive equity; (4) accountability; (5) conformance to values of local actors; and (6) sustainability.

2.3.3. Institutions

Institutions are often seen only as organisations (e.g. a research institution). However, the definition is a more complex set of constraints that both includes informal (e.g. traditions, customs, values) and formal (e.g. property rights, laws) elements (North, 1991; Williamson, 2000). Institutions form our very behaviour in relationships, decision-making and transactions. Institutions are “*the prescriptions that humans use to organise all forms of repetitive and structured interactions /...../*” (Ostrom, 2005: 3). The most commonly used definition (Kingston and Caballero, 2009) is that institutions “*are the rules of the game in a society, or, more formally, are the humanly devised constraints that shape human interaction*” (North, 1990: 3). Pejovich (1998) defines it as: “*the legal, administrative, and customary arrangements for repeated human interactions*”. Institutions determine the success of policies and development.

The IAD framework has been most commonly used to study watershed and fisheries (e.g. Benson *et al.*, 2013; Rahman *et al.*, 2012; Rudd, 2004) being one of the most classical examples of common-pool resources. However, there are also studies from developing countries that look at specific forestry issues. For example Clement and Amezaga (2009) analyse the compatibility of a national afforestation campaign in Vietnam with the attributes of households in the forestry sector. Mehring *et al.* (2011) focuses on the application of SFM in Indonesia. Both studies conclude that the formal rules have not been well implemented and the policies have not been success stories. From the perspective of this thesis the IAD framework has also had applications that study e.g. farmers organisations (Mbeche and Dorward, 2014), incentive programs provided to NIPF owners in Indiana, USA (York *et al.*, 2006), forest property rights (Irimie and Essmann, 2009) and decentralized forest governance (Andersson, 2006). Although the theory of collective action has found its way to studying FOO, the author of this thesis is unaware about the use of the IAD framework in the same field.

2.4. Research on the institutions of forest owners cooperation

As presented, cooperation between scattered ownerships can be fruitful both in theory and in practice. It might support forest owners' entrepreneurship outlooks, especially in wood production (Niskanen *et al.*, 2007a), since they are most often seen as marketing organisations both by the members and the management (Schraml, 2005). However, Kittredge (2005) underlines that cooperation is not appealing to all owners and it is not a “*silver bullet*” for all problems. Nevertheless, the successes or failures of cooperation have been quite important research topics in small-scale forest research for several decades.

Cooperation between forest owners comes in all shapes and sizes. There are several ways the different organisational forms are referred to. In some cases forest owners' organisations (FOO) are referred to in general as interest groups (FAO, 2012a; Glück *et al.*, 2010). Often in Eastern European cases (e.g. Milijic *et al.*, 2010) the formal owners' groups are called forest owners' associations (FOA) while in the US they are more often referred to as cooperatives or cooperative groups (Kittredge, 2003; Rickenbach *et al.*, 2006); however, contrasting examples also exist (Kilgore *et al.*, 2007). For example, in Switzerland the term “regional organisations” (RO) is used by Seeland *et al.* (2011) and in some cases the term “forest groups” is used (Van Gossum *et al.*, 2005).

Of course there are differences behind the name itself, i.e. FOCs (i.e. forest owners' cooperatives) are usually economic organisations with a primary aim of providing technical support to forest owners, while FOAs focus on representative tasks like influencing policy developments and advocating private forestry in general (FAO, 2012a). However, in many cases it comes down to history and national legislation, e.g. in Estonia FOOs are also the ones that provide technical advice and management services, while forest owners' cooperatives are almost non-existent. The description provided by FAO (2012a) is therefore a little too general and the different cooperation types or forms should be reviewed more thoroughly. It is like the term “*small-scale forestry*”, which often means different things in different

countries (Harrison *et al.*, 2002). Further in the thesis the abbreviation FOO is used in the case of Estonia.

A whole different approach to distinguishing types of cooperation is suggested by Kittredge (2005). He divides cooperation types according to the management needs identifying Information Cooperation, Equipment Cooperation, Financial Cooperation and Management Cooperation, suggesting that latter is a by-product of the first three types. All such descriptive categorisations can be quite useful since they simplify more complex organisational forms (Weber, 2012).

In the US, private forest ownership-related research is progressive both in terms of quality and quantity. One reason for that is the simple fact that about 42% of the total forestland in the US belongs to approximately 10 million NIPF owners (Butler and Leatherberry, 2004). The number of NIPF owners has also been increasing due to parcelisation (Bengston *et al.*, 2011; Rickenbach *et al.*, 2005), making the average parcel size smaller (Kendra and Hull, 2005). While forests are still important for providing different benefits on an ecosystem level, private forest owners have to involve themselves in cross-boundary cooperation (Finley *et al.*, 2006).

However, the creation and sustainment of cooperative groups has not been successful even with a long history of competitive markets (Rickenbach *et al.*, 2005). Finley *et al.* (2006) distinguished four groups of forest owners regarding their interest in cooperation – General Cooperators (27%), Conservation Cooperators (21%), Neutralists (27%) and Non-Cooperators (24%). The latter two were the ones representing apathy and disinterest, respectively. While Finley *et al.* (2006) indicated that the size of forest owners' properties was not significantly different between the groups, Rickenbach *et al.* (2005) found the size of the ownership to be relevant, i.e. larger forest owners are likelier to be members of a cooperative group. Rickenbach *et al.* (2006) also found significant differences in how non-members responded to the willingness to work with their neighbours compared to forest owners with membership in an association or cooperative. But even more interesting, they also found differences in how forest owners

in different FOOs would find cooperation attractive. This already indicates the importance of the values, ownership motivations and objectives of the forest owners, which has also been a wide topic of research in the US (Bengston *et al.*, 2011; Finley and Kittredge, 2006; Kendra and Hull, 2005; Majumdar *et al.*, 2008; Rickenbach *et al.*, 2005). While owners still harvest timber from their forests, management for economic benefits is often not the main objective of most landowners (Blinn *et al.*, 2007), which is made evident by Lönnstedt and Sedjo (2012) describing the situation in the north-western US: “*The saw log market [...] is dominated by few and large timberland owners with Nonindustrial Private Forest Owners holding only about 20% of the timberland.*” Hence, it is difficult to have a single organisation on any scale that would cover the diverse objectives of forest owners (Rickenbach *et al.*, 2006).

Since Central European countries have a longer history of private ownership, the amount of scientific literature about private forest owners and cooperation is quite noteworthy. However, important differences exist in the organisation of forest owners due to cultural traditions (Wiersum *et al.*, 2005). There are studies concentrating on only cooperation, but a significant amount of literature is about forest owners’ classifications or typologies (Hogl *et al.*, 2005; Ingemarson *et al.*, 2006; Selter *et al.*, 2009; Urquhart and Courtney, 2011; Wiersum *et al.*, 2005), values, objectives and attitudes (Boon and Meilby, 2007; Dominguez and Shannon, 2011; Hugosson and Ingemarson, 2004; Karppinen, 1998; Kuuluvainen *et al.*, 1996; Ní Dhubháin *et al.*, 2007) and decision-making (Lönnstedt, 1997; Rodríguez-Vicente and Marey-Pérez, 2009).

Within this literature some aspects about cooperation are also touched upon. For example, Selter *et al.* (2009) shows that membership in an FOO has historically been one of the indicators in Germany used in ownership typologies, namely in studies conducted in 1975-1990. In studies about policy tools and typologies it is often outlined that forest owners’ associations or cooperatives provide an important source of information (Hogl *et al.*, 2005; Urquhart and Courtney, 2011) and that different types of forest owners consider this source with different

significances. Dedeurwaerdere (2009) looks at cooperative forest management, but does so in a social learning perspective, underlining that it does have a lot of positive effects compared to stricter implementation tools. A key similarity in this literature is present: it is clear that monetary benefits and timber utilisation are not the main objectives of a lot of forest owners.

Studies focused on forest owners' cooperation specifically are found in countries like Germany, France, Portugal, Norway, Sweden, Austria, etc. For example, Darses *et al.* (2011) looked at cooperation for production and public goods provision in the case of French forests. They found that the delegation of management is likely to promote cooperation, but they also underline that there is a huge difference between the willingness to cooperate and the actual act of cooperating. In France, forest cooperatives manage about 13% of French private forests (Darses *et al.*, 2011). In Sweden, the first associations emerged in the 1910-1920s, but due to consolidation and efficiency problems only a handful are left (Lönstedt, 2014). For Sweden both Kittredge (2003) and Berlin *et al.* (2006) indicate that the main function of forest owners' associations is to provide competitive means to market timber and the possibility to get full service in forest management and political representation. Kittredge (2003) also concludes that it is not based on other broader objectives like recreation or habitat maintenance. Berlin *et al.* (2006) also found that members and non-members of FOOs differ in their values, i.e. members value property benefits more similarly and consider income to be slightly more important compared to non-members. In Norway, FOOs also play a key role in timber marketing, with a total share of 75% of the sales in the country (Størdal, 2004). In Portugal, FOOs started to develop in the 1990s (Mendes, 2006), but they are still struggling to survive (Feliciano and Mendes, 2011). Seeland *et al.* (2011) looked at the situation in Canton of Luzern, Switzerland, where between 2006 and 2008 11 regional forest owners' organisations were established. 30% of the region's private forest owners became members of these organisations while covering 60% of the private forestland, indicating that relatively larger forest owners were more interested in joining. They found that these processes were seen as a case of success in the region (Seeland *et al.*,

2011). Rauch (2007) used SWOT analysis to map timber mobilisation strategies for Austrian FOCs and concludes that new business models are promising since the number of not very knowledgeable forest owners is growing. For Finland an overview is provided by Jylhä (2007). In some European countries (e.g. Sweden, Austria, Finland) one of the key drivers for cooperation is the need to protect the ownership rights on the policy arena (Kittredge, 2005).

Compared to the previous two examples of the US and Central Europe the post-socialist countries are of particular interest in this kind of research because of the rapid developments during the past decades. Most of the CEE countries share the same patterns of transition history (Nijnik *et al.*, 2009). Still the research in these countries is developing slowly and it is geographically divided into two distinctive parts – South-Eastern Europe and the Baltic States.

Developments in Bosnia and Herzegovina, Croatia, Macedonia and Serbia have been discussed by Glück *et al.* (2010). They deal with the subject in the frame of the logic of collective action and conclude that the preconditions for the emergence of FOOs is favourable and forest owners have clear needs for the services that FOOs should supply. However, they also underline that proper incentives have not yet been provided and that a lot still depends on policy-makers' decisions. Weiland (2010) describes the latter as a challenge to seeking a better balance between the state and private sector since with the emergence of FOOs, power relations change. Milijic *et al.* (2010) found that in Serbia the economic interests of forest owners were an important factor (Nonic *et al.*, 2011) along with state support for the development of FOOs. However, similarly to a study in the US (Finley *et al.*, 2006) 39% of forest owners in Serbia are not willing to be a part of the establishment of FOOs (Nonic *et al.*, 2011).

In the Baltic countries efforts have also been made to decentralise the management of forests (Carlsson and Lazdinis, 2004) and compared to Poland, for example, the Baltic States have progressed quite similarly (Lazdinis *et al.*, 2009). However, cooperation in private forestry is still developing slowly in the Baltics (Lazdinis *et al.*, 2005b; Mizaraite *et al.*,

2010; Põllumäe and Korjus, 2014; Põllumäe and Korjus, 2012). Quite similarly to some conclusions from the US, the shifting goals and objectives of private forest owners have been identified in the Baltics as well (Lazdinis *et al.*, 2005b; Mizaraite *et al.*, 2010; Pivoriūnas and Lazdinis, 2004; Põllumäe and Korjus, 2012). While often FOOs concentrate more on traditional wood production, forest ownership might be for other reasons than a source of income (Niskanen *et al.*, 2007b). Comparative studies about FOOs in the whole CEE region have also been carried out (FAO, 2012a). Mostly they conclude with a position that FOOs are still struggling in their development in CEE countries, compared to more developed countries.

3. AIMS OF THE STUDY

Forest owners' cooperation is a broad and complex topic to study. While there are some relevant theories about the formation of interest associations and good studies testing the theories (e.g. Glück *et al.*, 2010) they lack in providing comprehensiveness. Therefore, in this thesis the Institutional Analysis and Development (IAD) framework approach is used. This enables the institutional arrangements related to forest owners' cooperation to be described, which consists of different aspects that have been identified in relevant research articles (I, II, III, IV). The result is therefore a broad and comprehensive perspective on the development of forest owners' cooperation in Estonia.

The aims of this thesis are:

1. To identify the main drivers and characteristics of forest owners to cooperate in a forest owners' association (I);
2. To explore and identify forest owners' values and objectives towards decision-making on forest management and cooperation (II);
3. To compare the developments of forest owners' cooperation in Estonia with other Central and Eastern European countries (III);
4. To identify key aspects of policy instruments and characteristics that influence forest owners' cooperation in Estonia (IV).

The main hypotheses of the study are:

1. Forest owners' association members and non-members differ significantly in their property characteristics, motives and decision-making;
2. Forest owners in Estonia are very heterogeneous concerning their forest-related values and objectives, which influences their decision-making on forest management and cooperation. Therefore the use of forest owners typologies is inefficient in policy formulation and implementation;
3. The policy and related instruments regarding private forest owners has been one-sided, concentrating more on instruments with a higher degree of state intervention;

4. The insufficient level of forest owners' cooperation is partly due to the still ongoing transition process and the shifting objectives of forest owners.

4. MATERIALS AND METHODS

4.1. Data collection and use

The data collection involved several different techniques. Questionnaire surveys were conducted (I; II) to reach forest owners. Document review, literature review and semi-structured interviews (III; IV) were used to describe the situation of existing FOOs in CEE countries and to describe the formal institutional arrangements. Questionnaire surveys were conducted in 2007 (EMÜ, 2007; I) and in 2011 (II).

In the first case the sample consisted of 4177 (2064 owners had forests more than 10 ha and 2113 owners had less than 10 ha) randomly selected (from the Forest Register) forest owners and 584 forest owners who had previously applied for various support measures. A cross-examination was carried out to indicate possible recurrences. From the overall sample, 1000 forest owners were randomly selected and the questionnaires were sent to them. The response rate was 47% with 472 filled questionnaires from which 22 were excluded due to insufficient or missing answers.

In the second data collection case in 2011 two distinctive ways of sampling were used. Supposedly more active forest owners were reached with the help of FOOs that were contacted and asked to distribute the questionnaire among their members. 163 respondents were reached through regional FOOs (with 8 excluded questionnaires). A random sample of forest owners was also taken from the forest owners' database. A permit from the Ministry of the Interior was obtained to do this. 1000 forest owners were randomly selected and 606 of them received the questionnaire. 110 filled questionnaires were sent back (response rate 18% with 11 excluded questionnaires). A general overview about the survey methods is provided in table 1.

Table 1. Data collection methods for questionnaire surveys.

Paper	Data collection method	Initial sample size	Questionnaires sent	Number of respondents (usable sample)
I	Random sample	4177	1000	450
	Support database	584		
II	Through FOO	-	-	155
	Random sample	1000	606	99

For a comparative analysis of FOOs in the CEE region (III), countries were chosen based on the geographical scope, common recent history in the post-communist period, and having a significant share of private forest ownership. In combination, two methods were used to prepare the common country case study and a specific FOO case report – in-depth interviews and expert knowledge. The country case study reports described the general country situation regarding FOOs and the characteristics of FOOs on the national level, characterisation of umbrella organisations, types of associations, descriptions of chronology, key factors influencing their development, main tasks and their challenges for the future. The FOO case report was done based on available documents and qualitative, face-to-face semi-structured in-depth interviews. For looking at the formal institutions (IV) a case study approach was used (Yin, 2003). Extensive review on literature and various policy documents was carried out along with the review of 24 different FOO statutes.

4.2. Data analysis

In study I, survey respondents were grouped by their status as members and non-members of forest associations. From the 450 forest owners, 191 (42%) were members of an FOO and 259 (58%) were non-members. Responses to various closed-ended questions (e.g. number of holdings, the total size of the holdings, past and future silvicultural activities, preferences, expectations, etc.) were statistically compared

based on this grouping using Chi-square tests and t-tests. Relationships between variables were classed as statistically significant where the p-value was less than 0.05. Secondly, the reasons for not joining an FOO were explored based on answers to the question, “Why don’t you belong to an FOO?” As it was an open-ended question, coding was used to map all the possible reasons mentioned.

Second questionnaire (II) respondents were asked to indicate how well each forest-related statement reflected their aims and values for forest management. A five-point Likert scale was used – “Strongly Agree” (5); “Agree” (4); “Neutral” (3); “Disagree” (2); and “Strongly Disagree” (1). There were 16 different forest-related value statements and long-term objectives that had to be indicated. To decrease the overall number of original variables and to combine both values and objectives, principal component analysis (PCA) was used. Based on the components’ scores for each original variable and combinations between the scores for values and objectives, the components were named accordingly. Variables with PCA ratings above 0.4 were considered equally important and were used in the calculation of numeric values of motives. For determining the importance of motives a comparison of the motive value with a threshold value was carried out. Threshold value was determined as the upper third on the Likert scale (>3.67 for a single variable).

4.3. The application of IAD framework

4.3.1 The conventional use of IAD

The key aspects are defining the components of the action arena. The specific parts of the action arena are traditionally seen as dependent variables. External variables are considered independent. Therefore, the IAD framework has been mostly used to predict and explain the behaviour on the action arena (the situation itself) based on assumptions about the external environment. But as Ostrom (2007) indicates some researchers might be more interested in one particular external variable than others, depending on their interests. And that IAD has been used on resource governance issues as well (Ostrom, 2011) i.e. conversely to the usual way.

4.3.2. The action arena – dependent variables

In our case example we consider the action situation as the “*box*” where forest owners make their decisions on cooperation. Although joining an FOO does not necessarily mean that the forest owner is very interested in cooperating with other owners, but for analysis purposes this assumption is made. Since defining the boundaries of the analysis is firstly vital (Andersson, 2006) we define our arena as the “*private forest sector*”. Another part of the arena is the actors. In our case example we consider actors as private forest owners. We describe the actors based on their attributes (resources, preferences they assign to actions and outcomes, knowledge and information attributes, motives) as the IAD approach distinguishes (Ostrom *et al.*, 1994). While there are other stakeholders in the currently defined action arena (e.g. consultants, state officials) there is a need for limitations. Even though IAD is a multiple-layer framework and it would allow such an analysis, it would be out of the reach of this thesis.

5. RESULTS

5.1. Values, objectives and motives

The use of PCA (II) enabled us to simplify the set of 16 different variables (answers on a 5-point Likert scale) by each of the forest owners to various forest-related values and objectives. The simplification resulted in 5 principal components that between each other were weakly linked (i.e. they were different) and that described forest owners' values and objectives, i.e. their motives (tables 3 and 4 in II). "Conservation motive", "Non-wood motive", "Income motive", "Personal consumption motive" and "Home motive" were identified. The identified motives can be viewed independently and together. For example, for 9% of the respondents all motives were identified but with various levels of importance. 16% of the owners had only one clear motive while in the case of 5% of the forest owners, no motives were identified.

Forest owners with values towards monetary benefits are likelier to have income-motivated decisions. Even more, these forest owners have more properties and in total more forestland. It was also found that FOO membership was much likelier in such cases (I, II). Although similar monetary values and objectives might also be present in such forest owners who have much less forest, it is usually not the prevailing motive of the owners. In fact, the personal consumption motive had the highest share of respondents. While looking only at the most important one, "income motive" (36%) was determined. The least important motive that was found was "non-wood motive". Regards general characteristics and FOO membership the most important differences appear when looking at the prevailing motivation (comparison of tables 7 and 8 in II). In addition to "income motive", however, there are also other motives that influence the behaviour of forest owners, but "conservation motive" and "personal consumption motive" were the only other two prevailing motives with a high share of respondents.

5.2. Drivers of cooperation

In two cases (I; II) it was identified that FOO members have on average more forest properties and land, thus the share of income to the household from forest management is higher. They are also on average likelier to increase their holdings and they are more active in applying for different support measures. They are more active in various management activities (especially harvesting) since they more frequently take into account the situation on the wood market and also the possible rotation ages (forest maturity).

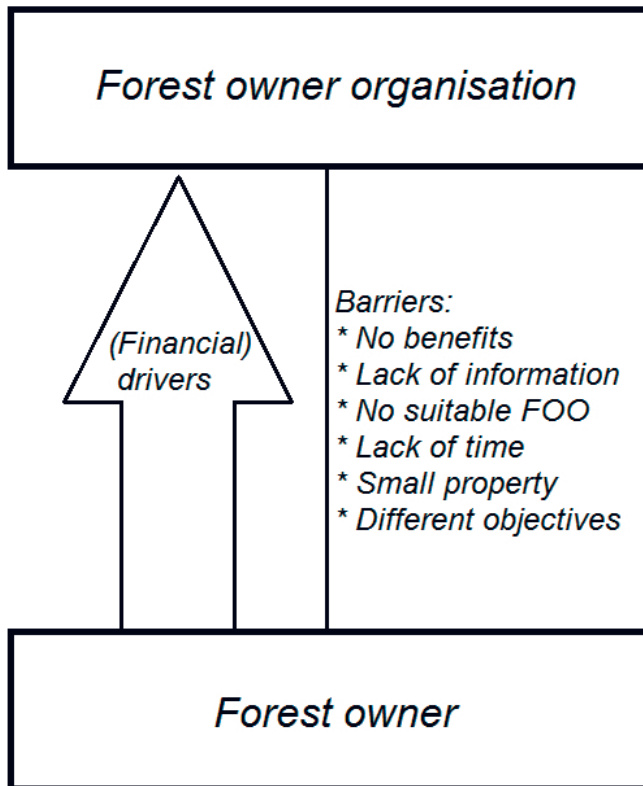


Figure 4. Drivers and barriers to join FOOs.

Additionally to some drivers there are also barriers to cooperation. There are several reasons why forest owners have not engaged

themselves in FOOs (table 5.1 in I). These reasons are divided roughly into two: there are FOO-based reasons and owners' individual reasons. In the first case for example forest owners do not recognise the benefits (being the most important aspect). Also, there is a lack of information about the FOO or there are no suitable FOOs to be found. Individual reasons for not joining an FOO include lack of enthusiasm, time and small property size.

5.3. International examples and perspective

The two main reasons for FOO establishment in most CEE countries include forest owners' interest representation and support for restitution and privatisation processes (III). Since the establishment of the first FOOs, interest in them has grown, yet as the interviews suggest, there is still scepticism among forest owners about these organisations.

Table 2. General information about the selected CEE countries (III; FAO, 2012a; FAO, 2012b; Forinfo, 2011).

Country	Average size of individual private forest property (ha)	Start year of FOO creation	Number of individual forest owners	Total area of individually owned private forests (ha)	Number of forest owners in FOO-s
Czech Republic	3,0	1991	140 000	504 000	1 000 in SVOL ¹
Estonia	8,0	1992	93 000	746 000	7 000
Hungary	1,5	1991	-	383 000	1 400 in MEGOSZ ²
Latvia	7,5	1991	145 000	1 420 000	-
Lithuania	3,3	1993	245 000	837 000	5 000 private individuals in LMSA ³
Romania	0,9	1998	820 000	727 000	-
Slovakia	2,9	1991	57 000	165 000	No precise information. RVNL ⁴

¹ Association of Municipal and Private Forest Owners (SVOL). Their members include communities, towns, private owners, forest cooperatives and unions of small-scale owners who manage approximately 360 000 ha of forests, which represent 14 percent of the country's total forest area.

² Association of Hungarian Private Forest Owners (MEGOSZ). It represents a total of more than 115 000 ha of forest.

³ The Forest Owners Association of Lithuania (LMSA). The organisation represents besides private individual forest owners also FOC-s and companies who provide services for private forest owners.

⁴ Council of Non-State Forest Owners' Associations (RVNL) represents 854 000 ha of non-state forest owners (88%). These owners include private individuals, FOC-s, municipalities, church and other various private organisations.

In all the reporting countries interest organisations that relate to private forestry were present and counted for. Still it is different how countries view such organisations as in some cases even state agencies have been considered as interest groups. The set-up of FOOs is therefore significantly different. Most FOOs act as non-governmental organisations or voluntary organisations. In some cases they are founded as non-profit organisations mainly to make them eligible for tax exemptions (III) or subsidies (IV). In the Czech Republic or Slovakia FOOs are civil organisations (III). In general, umbrella organisations (like national organisations of local FOOs) are likelier to be focussed on interest representation, as stakeholders and political actors, while regional and local groups are usually focussed on business cooperation, and also provide technical support and knowledge. The CEE experience indicates that the existence of FOOs depends largely on sustained government support. In some cases (Czech Republic) supportive regulations are used (III), but there are also financial incentives (IV). Nevertheless, the amount of public support and extent of regulative norms is very different in the selected CEE countries.

5.4 The policy factor: influence, outcomes and implications

Forest owners' cooperation and FOOs are seen as possibilities to encourage the provision of forest-related benefits. Even more, it ought to be done in an efficient and profitable manner. Forestry delivers a range of goods that are of public interest. Therefore, private forestry and cooperation are targeted widely in forest policy (IV). In addition, policy-makers view FOOs as a means to having the interests of landowners represented in the policy processes (III). In a transition situation it helps the state to legitimise policies.

Forest owners' cooperation is significantly influenced by the state. While cooperation is based on volunteer participation, a range of regulatory and economic incentives are being used (IV). These include

for example defining FOOs by law, providing financial support to FOOs with performance indicators and membership quotas for eligibility. Clear targets are set by the policy (NFP 2011–2020, 2010): increased FOO membership by a covered area of ~70% from a baseline of 150,000 ha to 500,000 ha and joint wood mobilisation should sum up during a 10-year period to 5,000,000 m³. The policy seems to assume that forest owners are interested in forest management, so the main focus is put on wood mobilisation. Nevertheless, in recent years membership in FOOs has increased significantly compared to the 1990s and 2000s. The average forest holding of an FOO member has also decreased, indicating that smaller forest are owners have joined FOOs (IV).

The outcomes of different policy processes could be a subject for additional analysis. In Estonia, the evaluation of the NFP measures until 2020 (2010) could provide a first insight into the results that different tools have had. Nevertheless, the implications of these developments remain unclear.

5.5. Application of the IAD framework

We have looked at some aspects of the external variables of the IAD framework and identified significant influences on the action arena. For example the significance of “rules-in-use” is observed (IV), especially since 2009. The importance of state influence is also indicated in other post-socialist countries (III).

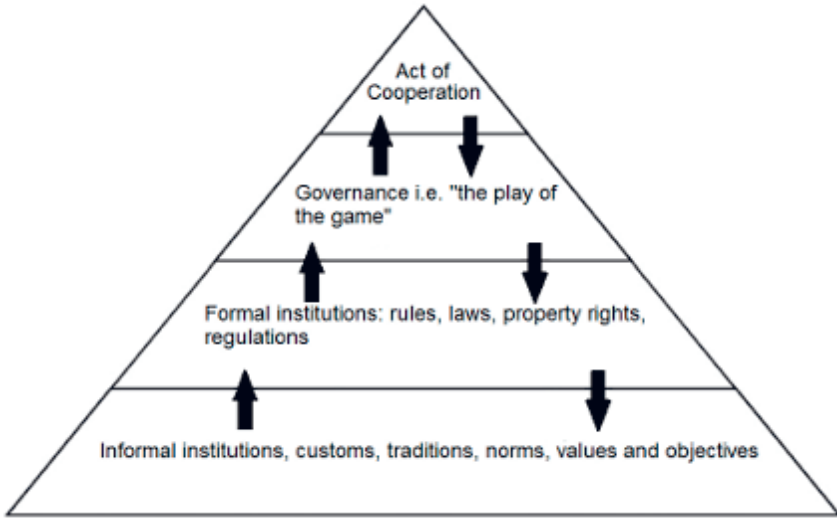


Figure 5. Forest owner cooperation in an institutional context.

The attributes of this community are very diverse as identified in **I** and **II**. Although in many cases forest owners have some monetary linkages to the forest it is not often the main influence. While FOOs tend to focus on forest management in particular, there is a mismatch between the objectives and services of the FOO and forest owners. This might be even more so in cases of small-scale ownership (**I**). Such a mismatch also seems to be rooted to formal institutions, which in turn influences the development of FOOs.

How some of the outcomes have produced feedback to the external variables has yet to be investigated. One possible example of such feedback could be the introduction of increased support in 2009 after almost two decades of very slow FOO development.

6. DISCUSSION

Common interests unite people. This is a presumable case in any interest organisation regardless of the topic. However, what is seen in private forestry is that forest owners are not quite keen on joining FOOs although ideally it could be assumed that they would be. When looking at forest owners' cooperation, especially focusing on such cooperative organisations, it is therefore expected that the ones who belong to these organisations differ in some way or another from non-members. Indeed, FOO members are likelier to be interested in the economic aspects of forest management. FOO members have on average more forest properties and forestland. Similar findings can be found both in Europe (Malovrh *et al.*, 2010; Schraml, 2005; Seeland *et al.*, 2011) and the US (Rickenbach *et al.*, 2005). FOO members with these characteristics look more at possible stand rotation ages, consider forest maturity and timber prices as also proposed by Favada *et al.* (2009). Forest owners with larger properties and more forestland sell timber more frequently than owners who have smaller holdings (Toivonen *et al.*, 2005). It seems that Estonian FOOs serve a type of owner who is interested in gaining more income. Berlin *et al.* (2006); Milijic *et al.* (2010) and Nonic *et al.* (2011) came to same conclusions. Likewise to Sweden (Berlin *et al.*, 2006; Kittredge, 2003) it seems that FOOs' main function is to provide a competitive means to market timber. Although we could presume that the common interest topic for FOOs is private forestry, it does not bring all private forest owners under "one umbrella". The economic aspects prevail.

While the most prevailing interest within FOOs is linked to monetary benefits and interest in FOOs is reported to be low, could it be that there are other aspects of forestry or forest management that interest owners? Berlin *et al.* (2006) found that FOO members value property benefits more similarly and consider income to be more important compared to non-members. Jennings and van Putten (2006) found that their "income and investment owners" usually had larger forest areas. As in the Estonian, case similar patterns emerged (I, II). Even more, the analysis showed that 34% of forest owners did not have any motives towards income and only 36% of forest owners had income as

their prevailing motive with personal consumption and conservation motives as runners-up. A significant amount of literature supports the finding of the large heterogeneity of forest owners' values and objectives (Bengston *et al.*, 2011; Boon and Meilby, 2007; Dominguez and Shannon, 2011; Finley and Kittredge, 2006; Hugosson and Ingemarson, 2004; Jennings and van Putten, 2006; Karppinen, 1998; Kendra and Hull, 2005; Kuuluvainen *et al.*, 1996; Lazdinis *et al.*, 2005b; Majumdar *et al.*, 2008; Mizaraite *et al.*, 2010; Ní Dhubháin *et al.*, 2007; Pivoriūnas and Lazdinis, 2004; Rickenbach *et al.*, 2005). Management for economic benefits is not often the main objective of landowners (Blinn *et al.*, 2007).

Thus, cooperation is not appealing to all owners (Kittredge, 2005), as also shown by Finley *et al.* (2006) and Nonic *et al.* (2011). But is it because there are no suitable FOOs with these other needed services and values (as some forest owners indicated in table 5 in I)? Because membership in an FOO can also serve other means, in addition to efficient timber marketing. FOOs can also serve owners by protecting their property rights (Kittredge, 2005, III) or being the voice of the owners in the policy arena (Rickenbach *et al.*, 2006; III). Even more in numerous cases from the US (Finley *et al.*, 2006; Kittredge, 2005; Kline *et al.*, 2000), cooperation might also focus on ecological functions of the forest as only 9% of forest owners in the US consider timber production to be important (Butler and Leatherberry, 2004).

But compared to more developed countries and regions the CEE countries are in a different position with their history and transition processes (Nijnik *et al.*, 2009; III). Therefore, it could be assumed that regarding the developments of forest owners' cooperation there are similar patterns in the region. Indeed, in most of the CEE countries FOOs started to develop at the beginning of the 1990s (FAO, 2012a; III) with the help of public support. Their position has changed over the decades and activities have diversified. In general they still lack representativeness and they do not have a direct impact on the management of their members' forests (III). The FOOs in some of the reported (III) CEE countries are very different in their set-up. Some of these organisations are based on non-profit organisation principles as

they focus on representative tasks (FAO, 2012a) and they do not own any properties themselves (III). In some cases these organisations can act as cooperatives where a share of ownership is divided between the members, and dividends are paid (e.g. the Swedish case described by Kittredge, 2003). Their membership could also differ, e.g. in some countries FOOs are also formed by other non-state owners (including municipalities, churches, etc.) while in some cases only private individuals are members of these organisations (FAO, 2012b). The range of cooperative models in general, as well as in CEE, is enormous and there is potential to learn and adopt better practices from other regions. However, some of these characteristics that describe the situation in CEE are quite common to other countries as well. For example, Schraml (2005) concludes that fewer than 1/3 of forest owners in Germany are members of FOOs. For Sweden, Kittredge (2003) reports this number to be 44%, through LRF Skogsägarna. In Lucerne, Switzerland a third of forest owners are also members of FOOs (Seeland *et al.*, 2011).

Forest owners' cooperation has been on the agenda since the re-establishment of private forest ownership. Although forest owners' cooperation is based on private initiative and volunteer decisions, the problems of small-scale forest ownership and possible solutions have been reflected in the Estonian National Forest Policy (1997) formulation. Only in the recent NFP 2011–2020 (2010) has it gained additional attention. It can be seen that there is a need to increase the effectiveness and efficiency of private forest management. The policy provides the tools (Krott, 2005) to make cooperation more appealing (Pöllumäe and Korjus, 2012). However, it is identified (IV) that the tools are more of a regulatory and financial nature. Or as Serbruyns and Luyssaert (2006) would describe it – *sticks* and *carrots* are used. There are still informational tolls (cf. Böcher, 2012) used, but in any case the main implementation body is a state foundation Private Forest Centre. FOOs are directly used for policy implementation. Both Brabänder (1981) and Schraml (2005) suggest similar characteristics. While examples of bottom-up cooperation in sharing information on different support measures can be identified in CEE countries (III), it is also evident that the degree of state involvement in the development

of forest owners' cooperation is significant (III; IV). In order to be influential, instrument design and choice has to be in line with the groups that are being targeted (Pregernig, 2001). Regulatory tools might not be accepted by private forest owners compared to informative tools (Serbruyns and Luysaert, 2006). Even more, policies should consider and provide appealing tools that are in line with landowners' ownership motivations (Janota and Broussard, 2008) and fair to them (Cubbage *et al.*, 2007). For example in the US, Kilgore and Blinn (2004) found that applying harvesting practices involves mostly technical assistance and educational programs. Along with cost-share programs they accounted for 88% of the policy tools that were examined in 50 reporting states and provinces in North America. Dedeurwaerdere (2009) discussed social learning as a policy tool for sustainable forest management. Some regulatory tools might influence behaviour even negatively as was found by Zhang and Flick (2001) in the case of reforestation investments. While very clear and measurable targets (hectares of forest in FOO membership and cubic meters of joint wood sales) are set (NFP 2011–2020, 2010) for forest owners' cooperation in Estonia, these objectives cannot eventually describe the effectiveness of forest owners' cooperation (Kittredge, 2005).

Looking at these developments in a wider context using the IAD framework proved to be useful. It provided a needed level of comprehensiveness as it considered various aspects of the situation. It also raised several explanatory points that are linked to institutions and resource management. Firstly, let us discuss institutional or social learning, which prevails over individual decision-making and presumes collective-level actions (Siebenhüner and Suplie, 2005). Can institutional learning answer the question of why forest owners are reluctant to join FOOs? There are some theoretical possibilities and explanations. As presented (I, II) in the Estonian, and even in other cases (e.g. Kittredge, 2003; Schraml, 2005), forest owners of larger properties are likelier to be members of FOOs. We could assume that they have indeed noticed the benefits that these organisations bring about. However, in small-scale forestry the activities happen with very low frequency, which means that institutional learning is slower in such cases. More frequent choices help us to learn about the pros and cons

linked to different alternatives more quickly (Schlüter, 2007). As indicated the importance of institutional learning remains unclear, as it is more of a theoretical discussion here. However, it could be a future direction for scientific analysis.

Institutional or social learning has another aspect – capital. One needs people for such collective learning. And as a result, between people, social capital appears. It is measured and defined as a level of mutual trust among people (Chloupkova *et al.*, 2003). Considering the mutual history of CEE countries it is found that totalitarian regimes destroy such capital (Paldam and Svendsen, 2000). While trust and social capital play a huge role in social networks (Borg *et al.*, 2015) and cooperative structures (Pretty and Ward, 2001) it could be that due to the past of many CEE countries, including Estonia, cooperative initiatives are not in the forefront. Comparing Poland and Denmark, Chloupkova *et al.*, (2003) found that an average Dane is twelve times likelier to be a member of a voluntary organisation compared to the average Pole. Such kind of trust is something that can be destroyed quickly, but takes decades to build. Considering how slow institutional learning and trust-building are, there is not much room for error when one aims to encourage large-scale cooperation.

Thirdly, and somewhat linked to the previous notes, the relevance of path dependency can be identified. North (1990) characterises institutions with path dependency, i.e. decisions made in the past have an influence on decisions in the future. Peters (1999) describes it as “*the legacy of the past*”. Could this explain some of the choices that are made when policy-makers decide which policy tools to use during policy implementation? Individual forest owners might also be influenced. With a history of nationalisation, and collective and state farms, people could be more than sceptical towards such FOOs. Even more with the experience of losing the land and getting it back a feeling of kinship or attachment to the place might be reinforced (Grubbström, 2011).

There are a number of limitations and deficiencies in this analysis of forest owners’ cooperation. The first one is linked to basically every

such type of survey-based empirical study about the types of forest owners or about their values and objectives. Most often a simple 5-point Likert scale is used to compare and categorise owners according to their responses to different statements. The core of the problem rests in the fact that by, e.g. asking, “*Is biodiversity important?*” we assume a common understanding about what “biodiversity” is. During the analysis it is never discussed how forest owners understand terms like “*biomass*”, “*biodiversity*”, “*beauty of landscape*”, etc. Also, what might be an important “*additional income*” for some might just be marginal to other forest owners. The categories analysts get are not conclusive or mutually exclusive and they describe the phenomena and do not explain them (Smith, 2002). While such studies have their downsides the most important function of the results is that it gives us a simplified overview of complex situations. Identifying forest owner typologies is also the most used application in forest policy studies (Weber, 2012).

The second limitation is linked to the IAD framework. As described above the framework itself proved to be a useful tool in describing such institutional arrangements and developments. The limitations of this approach are in its multi-layer nature. The challenge is in the complexity of institutionally-oriented policy analysis (Polski and Ostrom, 1999). We have simplified our analysis by defining the actors as private forest owners. However, they are influenced by a number of other people (e.g. colleagues, forestry professionals, consultants in FOO) as well. In a nutshell, there are several “action arenas” with their own context. People interact within multiple action situations (Polski and Ostrom, 1999). For example when looking at formal institutions and policy-makers we need to realise that they also are actors in another action arena. The multi-dimensional characteristic of the IAD framework makes it somewhat complex and hard to grasp, as one needs to be aware of the limitations.

Throughout the study, an important assumption is also made, i.e. cooperation between forest owners occurs in FOOs. This might not be the case while forest owners could have some type of cooperation between each other as well. And without membership in an FOO. However, due to the large scale and a need for simplification, this

assumption has to be made. Still, potentially, this could be a field for future research since there is no information about the actual acts of cooperating. Darses *et al.* (2011) found for example that there was a difference between the willingness to cooperate and the actual act of cooperating. Also, membership in an FOO might not necessarily mean that the forest owner is highly motivated in cooperating.

7. CONCLUSIONS

A combination of empirical and theoretical analysis on forest owners (I; II), cooperation (I; II; III) and policy developments (III, IV) helps to fill the knowledge gap that has been present for several decades. Forest owners' cooperation is in fact a very broad question to study and there are several ways to address this issue. The discussion has also proven that there are still aspects left to investigate. And while forest owners, ownership, economic conditions and natural conditions are constantly in change the topic of sustainable management of private forest resources is a moving target.

Based on the results of this thesis the following conclusions and comments are drawn:

1. In general forest owners' cooperation and FOO membership in Estonia is more common among larger forest owners who own more properties and more forestland. They are likelier to be interested in generating income from forest management and thus FOOs are the means to do so.
2. Forest owners in Estonia are diverse in their attitudes towards forest-related values and objectives as in some cases for example there are no motives for income generation and in some cases there is no clear motivation at all. Conservation and personal consumption are also important aspects for forest owners. Such complex diversity makes the use of classical forest owner typologies ineffective for policy formulation and implementation.
3. While the history of CEE countries is similar there are also similarities in the development of private forestry and forest owners' cooperation. In the observed countries FOO establishment started in the early 1990s and it was mostly driven by the need for forest owners' interest representation and land reform processes. However, the differences are rather significant how the organisations are set-up and how membership is characterised. FOOs in CEE countries depend on sustained government support.
4. Policy targets for cooperation are one-sided and, while measurable, covered area and sold timber volumes alone do not describe the effectiveness of cooperation.

5. Considering the heterogeneity of forest owners the policy tools that are used to encourage forest owners' cooperation in Estonia might not be effective. While the focus of the policy and its tools are on the economic aspects of forest management, landowners' preferences seem to be different.

6. In addition to the focus of the policy instruments, their design is also important. The tools that are being used are mostly regulatory or financially oriented and when informative they still largely have a top-down approach.

7. Promoting and sustaining forest owners' cooperation further is a significant challenge both to policy-makers and FOOs, and it requires a more in-depth evaluation of policies and instruments.

8. Forest owners' organisations are important channels for forest policy implementation. While cooperation is not common among the smallest of small-scale forest owners, the state has legitimacy to influence the development of FOOs.

9. While the IAD framework proved to be useful in looking at these developments in a wider context there are several other aspects that would require further investigation, e.g. how much does institutional learning and trust influence the success of cooperation.

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SUMMARY IN ESTONIAN

EESTI ERAMETSAOMANIKE KOOSTÖÖ ANALÜÜS

Sissejuhatus

Metsaressursside säästev kasutamine on oluline kogu maailmas, sest nendega on seotud paljud inimestele vajalikud tooted ja teenused. Metsanduses mõistetakse säästva ehk jätkusuutliku tegevusena metsade sihipärasest majandamisest, mis täidab praeguse põlvkonna vajadusi ja tagab seejuures metsade kasutamise võimalikkuse ka tulevikus. Säästva metsakasutuse põhimõtted on aja jooksul aina keerukamaks muutunud.

Metsast saadavate hüvede puhul tuleb arvestada omandiõigusega ja sellega seotud metsaomandiga. Alates 1991. aastast on Eestis toimunud laialdased maakasutuse ja -omandi muudatused. Kui nõukogude perioodil majandasid metsi 60% ulatuses riik ja 40% osas ühismajandid (kolhoosid ja sovhoosid), siis praeguseks ajaks on märkimisväärseks ressursihoidjaks kujunenud erametsaomanikud. Rohkem kui miljonit hektarit erametsa majandab ligikaudu 97 000 (sh 93 000 füüsilisest isikust) erametsaomanikku. Paljude metsanduslike hüvede tootmist ja kasutamist raskendab eraomandi killustatus: keskmisele füüsilisest isikust metsaomanikule kuulub ~8 hektarit metsa. Ligikaudu pooltel erametsaomanikel on metsakinnistud väiksemad kui 5 hektarit. Sellise killustatuse juures tekib küsimus, kuidas säästlikult on nendel olev metsaressurss majandatud.

Üks võimalus killustatusest tingitud negatiivseid mõjusid vähendada on arendada metsaomanike omavahelist koostööd. Hea metsapoliitiline vahend selleks on metsaühistu. Esimesed metsaühistud tekkisid juba 1990. aastate alguses, ent veel 2010. aastal oli ühistutega liitunud metsaomanikke vaid 6% nende koguarvust. Nii madalat liitumisprotsenti on käsitletud ka Eesti metsapoliitika põhidokumentides. Sellest tulenevalt sätestab Eesti metsanduse arengukava 2020. aastani ambitsioonikaid eesmärke, kuidas suurendada ühistute metsamaa

pindala metsaomanike liitumise kaudu ja ühistu teel müüdava puidu mahtu.

Selles doktoritöös käsitletakse metsaomanike omavahelist koostööd ning erametsaomandiga seotud probleeme ja arengut Eestis. Teemast lähtuvalt uuritakse nii erametsanduse hetkeseisu (I) kui ka metsaomanike eesmäärke, väärtushinnanguid ja tegutsemise motiive seoses koostöö ning metsa majandamisega (II). Võrreldakse Kesk- ja Ida-Euroopa riikide metsaomanike organisatsioone (III) ja Eesti metsapoliitikat analüüsitakse laiemas kontekstis (IV).

Kirjanduse ülevaade

Metsanduse sotsiaalsed aspektid ja jätkusuutlikkus on teadusuuringutes üha aktuaalsemaks muutunud. Sellega seoses peetakse oluliseks ka metsaomandi probleeme. Seda eriti just Ida-Euroopa üleminekuriikides, kus metsaomandi struktuur on muutunud, mistõttu on metsade säästliku majandamise küsimused eriti olulised. Erametsandusega seotud teadus- ja uurimistöö on Eestis senini olnud kesine, kusjuures metsaomanike koostööd pole üldse analüüsitud.

Väikeste metsaomandite puhul soodustab metsaomanike koostöö metsade majandamist ja annab positiivseid tulemusi metsamaastike kujundamisel. Samas ei ole selline koostöö kõigile metsaomanikele piisavalt atraktiivne. Uurides metsaomanike koostöö probleeme, on võimalikud erinevad teooriad ja lähenemisviisid. Näiteks rõhutatakse, et organisatsioonis toimuv koostöö peab teenima ühist huvi. Samas tuleb arvestada ratsionaalse individualisti teooriat, mille puhul eeldatakse, et ideaalses turusituatsioonis teeb metsaomanik oma heaolu silmas pidades parima majandusliku otsuse. Viimase käsitluse juures on aga rõhutatud, et individuaalsel tasandil võib selle mudeli rakendamine anda rahuldavaid tulemusi, samas kui kollektiivis ei pruugi see olla rakendatav. Suures rühmas võib indiviidi panus hajuda ja huvi ühistegevuse vastu väheneda: tekib võimalus teiste kulul elada ja hüvesid tasuta kasutada. Seega on ka kollektiivi suurus oluline tegur. Samuti on koostöö aspektist oluline metsaomandi suurus: suurema metsaga omanik võib mõnest kasulikust protsessist (nt parem

hinnapakumine) rohkem võita kui väiksema metsa omanik. Erinevaid teoreetilisi käsitlusi on väga palju ja neil on ka märkimisväärseid puudusi. Mitmed ökonoomikal põhinevad teooriad eeldavad näiteks ideaalselt toimivaid turge, põhjalikke teadmisi protsessidest ja ratsionaalselt käituvaid subjekte. Muutuvas ja killustatud erametsanduses suure tõenäosusega eelnimetatud mõjureid korraga ei esine ja see muudab kaheldavaks selliste teooriate rakendamise.

Institutsioonid on õiguslikud, administratiivsed või traditsioonilised kokkulepped inimeste omavahelises suhtluses ja need on institutsionaalse analüüsi (ingl *Institutional Analysis and Development Framework*, edaspidi IAD-analüüs) aluseks. Metsaomanike koostööd on selle meetodiga uuritud üsna palju Ameerika Ühendriikides ja Kesk-Euroopas. Järjest enam tähtsustub see uurimismeetod ka Ida-Euroopa riikides.

Materjal ja metoodika

Käesolev doktoritöö on empiirilise ja teoreetilise IAD-analüüsi kombinatsioon. Empiiriline materjal on valdavalt kogutud küsimustike abil (I, II). Lisaks on analüüsitud kirjandust, dokumente ja poolstruktureeritud intervjuusid (III, IV). Ankeetküsitlused korraldati 2007. (I) ja 2011. aastal (II). Esimesel korral võeti metsaregistri andmetest juhuvalikuga 4177 metsaomaniku andmed. Neile lisati 584 metsaomaniku andmed erametsanduse toetuste andmebaasist. Kogu valimist võeti juhuvalikuga omakorda 1000 omaniku andmed ja neile saadeti küsimustikud. Tagasi saadi 450 analüüsiks sobilikku vastusankeeti. 2011. aastal korraldati ankeetuuring kahel viisil. Metsaühistute kaudu saadi 155 analüüsiks sobilikku vastusankeeti. Lisaks võeti metsaomanike registrist juhuvalikuga 1000 inimese andmed, kellest 606-le saadeti postiga ankeetküsimustikud. Metsaomanikud tagastasid 99 analüüsiks sobilikku ankeeti.

Kesk- ja Ida-Euroopat käsitleva metsaomanike organisatsioonide võrdlusanalüüsi (III) jaoks valiti välja riigid, mis oleksid geograafiliselt, ajalooliselt ja erametsaomandilt sarnased. Kasutati ühtset juhtumianalüüsi meetodit, sh tehti intervjuusid ja küsiti

ekspertarvamusi. Sarnasel viisil uuriti ka formaliseeritud institutsionaalseid arengusuundi (IV).

Saadud vastuste analüüsimiseks eraldati metsaühistu liikmete ja mitteliikmete vastused (I) ning neid võrreldi, kasutades χ^2 -testi ja t-testi. Muutujatevahelised seosed loeti usaldusväärset oluliseks, kui p-väärtus oli väiksem kui 0,05. Küsimustiku lahtisi vastuseid analüüsiti vastuste kodeerimise meetodiga. Nii analüüsiti vastuseid nt küsimusele “Miks te ei kuulu metsaühistusse?”. Teises uuringus (II) hindasid vastajad Likerti 5-pallisel skaalal 16 metsanduslikku väärtust ja eesmärki. Saadud andmestiku lihtsustamiseks rakendati peakomponentanalüüsi. Leitud komponendid olid metsaomanike tegutsemismotiivide välja selgitamise ning nende edasise võrdlemise aluseks.

Doktoritöö eri osade tulemusi (I, II, III, IV) vaadeldakse tervikuna IAD-analüüsi raamistikus. See koosneb välistest sõltumatutest muutujatest ja sõltuvatest muutujatest. See teoreetiline raamistik võimaldab koos üheaegselt vaadelda erinevaid muutujaid ja nende omavahelisi mõjusid. Erametsasektoris on sõltuvad muutujad metsaomanike otsused metsaühistutega liitumise suhtes.

Tulemused

Peakomponentanalüüs (II) selgitas välja 5 peamist komponenti: “looduskaitse“, “tulu“, “omatarbimine“, “kodu“, “mittepuiduline“. Komponente tuli hinnata ka nende tähtsuse alusel. Kõiki komponente esines 9% vastanutest, vaid üks komponent esines 16% vastanutest ja 5% metsaomanikest puudusid analüüsitud komponendid üldse.

“Tulu“ välja toonud metsaomanike seas esineb enim keskmisest suurema metsaomandiga ja rohkemate metsakinnistutega metsaomanikke. Mõlemas küsitluses (I, II) leiti, et sellised metsaomanikud on tõenäolisemalt metsaühistute liikmed. Kuigi metsa puhul peavad paljud metsaomanikud tähtsaks sissetulekuga seotud väärtusi, on selle tähtsus erinev. Nii näiteks leiti, et kõige universaalsemaks komponendiks osutus “omatarbimine“, mida esines

metsaomanike seas kõige enam, kõige vähemtähtsaks aga “mittepuiduline“ (tabelid 7 ja 8 artiklis II). Analüüsist (I) selgus, et kõige rohkem takistab metsaomanikke metsaühistutega liitumast tõsiasi, et ei tajuta ühistute kasulikkust. Lisaks tõid metsaomanikud välja, et tihti puudub vajalik informatsioon või sobilik metsaühistu oma piirkonnas. Samas mainiti ka omandi väiksust ja enda ajapuudust.

Eesti metsaomanike koostöö arengusuunad ei erine suuresti teiste Kesk- ja Ida-Euroopa riikide arengusuundadest (III). Kõikides vaadeldud riikides on metsaomanike organisatsioonid tekkinud 1990. aastate esimeses pooles, ent metsaomanike huvi selliste organisatsioonide vastu on endiselt väike. Kui vaadata organisatsioonide ülesehitust, siis need on eri riikides väga erinevad. Ühtedel juhtudel võib see hõlmata üksnes füüsilisi isikuid, ent mõnes riigis kogu erasektorit tervikuna. Organisatsioone ja nende koostööd on mõjutanud maareformidega seotud protsessid, sh nende kulgemise kiirus.

Metsapoliitika juurutamisel on metsaomanike organisatsioonidel täita väga oluline osa (III). Üleminekuühiskonnas on huvirühma olemasolu ja toe korral lihtsam otsuste legitiimsust suurendada: metsaomanike ühistegevus kajastub metsapoliitikas tõhusamalt. Metsanduse arengukavas on sätestatud mitu eesmärki seoses ühistu kaudu müüdava puidu mahu ja metsaühistutesse kuuluvate metsaomanike metsamaa kogupindala suurenemisega. Seetõttu on kasutusel mitmeid seadusandlikke vahendeid, et soodustada metsaomanike liitumist metsaühistutega (VI).

Arutelu ja järeldused

Metsaomanike huvi ühistegevuse ja koostöö vastu on paljudes riikides ja piirkondades jäänud tagasihoidlikuks. Kuulumine metsaomanike organisatsiooni ei ole sugugi mitte kõigile metsaomanikele abiks või vajalikki. Metsaomanike koostööl on peamiselt majanduslik funktsioon. Muutuva omandi kontekstis on aga ilmne, et mitte kõik metsaomanikud ei ole rahalistele väärtustele orienteeritud. Siiski huvitub metsapoliitika sellest, et võimalikult paljud metsaomanikud teeksid omavahel koostööd ja osaleksid ühistegevuses. Metsaomanikke

ühistutega liituma innustamiseks kasutatakse erinevaid vahendeid. Need vahendid on valdavalt seadusandlikud või rahalised, mõjutades nii metsaühistuid kui ka metsaomanikke. Võrreldes enam arenenud riikidega on mõjutusvahendite valik erinev ning mõjutamissuund on pigem ülevalt alla. Mõjutusvahendite valik ja nende kasutusviis on aga olulised selleks, et nad oleksid tõhusad. Vahendid, mis ei ole metsaomanikele piisavalt atraktiivsetena esitatud, ei pruugi viia soovitud tulemusteni. Veelgi enam, seatud eesmärgid (müüdnud puidu maht või ühistute liikmetele kuuluv metsamaa pindala) ei pruugi kirjeldada metsaomanike omavahelise koostöö tegelikku efektiivsust.

Eestis teevad metsade majandamisel koostööd pigem suuremate metsaomanditega omanikud, kelle jaoks on oluline metsandusest tulenev sissetulek. Eesti metsaomanike väärtushinnangud ja eesmärgid on väga erinevad, see on ka üks põhjus, miks omanikevaheline majanduslik koostöö pole väga levinud.

Eesti metsapoliitikas on ühistegevus prioriteet, see peegeldub metsanduse arengukava eesmärkides. Siiski käsitletakse metsapoliitikas koostöö küsimust mõnevõrra ühekülgset, mis tähendab, et selline poliitika ei kajasta omanike koostöö tegelikku efektiivsust ja olemust adekvaatselt. Metsapoliitikas kasutatakse koostöö propageerimiseks vahendeid, mis viitavad pigem ülalt alla poliitika juurutamisele. Arvestades aga muutuvat metsaomandit ja metsaomanike eesmärke, ei pruugi selline lähenemine koostöös soovitud eesmärkideni viia.

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Motives and Incentives for Joining Forest
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Motives and Incentives for Joining Forest Owner Associations in Estonia

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Abstract The development of private ownership is an important outcome of structural changes for the whole economy as well as for the forestry sector in Estonia. Cooperation between forest owners has been seen as one possibility for increasing the provision of various forest-related benefits and goods. Yet the extent of cooperation between forest owners is still not at a sufficient level, but the reasons have not been extensively studied. The authors' aim was to find out the key determinants for forest owners to join a forest owner association and to explore how cooperation between owners could be increased. Survey data were used to divide the respondents into two groups according to whether they were members of forest owners associations or not. It was found that one key aspect is the size of the forest property—association members usually manage larger forest areas than non-members. In addition, the members tend to be more active and consistent in forest management activities than non-members. Also there is potential towards cooperation within non-members as their plans for the future are much more targeted. Although there are limits to voluntary cooperation, a huge potential for Estonian private forest owners could be realised by diversifying forest owner association activities and services to meet the different expectations of forest owners.

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Introduction

As in many Central and Eastern European countries, the forest sector in Estonia has significantly changed during the past two decades due to privatization and restitution. The area of forest land in private ownership and the number of non-industrial private forest (NIPF) owners have been increasing in Estonia and the process is still largely ongoing due to the continuing privatization of forest land. At the same time, economic conditions for wood producers have become more difficult. In Europe, particularly in Germany, the state is very much redefining its role within the forest sector and is attempting to reduce it as underlined by Schlüter (2007) and Schlüter and Koch (2011). These types of processes can be seen also in Estonia in the form of increased expectations of the state towards private initiative and cooperation. The National Forest Programme (NFP) to 2010 (2002) dealt mainly with advisory services and subsidies to forest owners. Cooperation was not separately highlighted in the document. Yet, the NFP 2011–2020 (2010) tackles cooperation as one of the most important issues in the private forestry sector.

Cooperation between, and joint action by, NIPF owners, especially when private forest ownership is fragmented, is the key to increasing production of certain public forest goods and reducing some negative externalities (Mendes et al. 2011). Indeed, fragmentation and lack of planning in forestry have been identified as key problems for the future (Yearbook of Forests 2009, 2010). Therefore, more active forest management is seen to be significant from the national perspective but also voluntary participation in joint actions suggests that it is also locally important (for forest owners and rural areas). Ialnazov and Nenovsky (2011) found that countries vary according to the strength of cooperation among their economic actors and that the degree of their cooperation is partly related to the achievements of the country. These characteristics of economic actors, regardless of whether they are rational and personal interest seeking “economic men” or environmental-economic balance seeking “ecological men” as described by Ingebrigtsen and Jakobsen (2009), are also applicable to forest owners since they possess certain resources irrespective of whether these resources are marketable or not. Cooperation in private forestry could be seen as an important tool to enhance the provision of both marketable and non-marketable goods. As an example, for several years the harvesting rate has been relatively modest especially in private forests. This has led to a shortage in the national wood supply in Estonia and it seems that cooperation is seen as a solution to overcome this. Consequently forest owners associations (FOAs) are seen as a tool for implementing state policies as also outlined by Schraml (2005): “their central role remains in the implementation of forest political concepts”.

In Estonia FOAs started to develop in the beginning of the 1990s yet according to the NFP 2011–2020 (2010:26) only 6 % of forest owners are currently engaged in FOAs. But this small number of FOA members (~4,500) account for roughly ¼ of the total area of private forest, i.e. ~270,000 ha (calculations from Erametsakeskus

2011). The development of FOAs has been influenced by structural changes in the public sector. In the past, a variety of services (e.g. advice) was given to forest owners by state officials and only during the recent decade has the importance of FOAs risen. The Forest Act (Metsaseadus 2006) defines FOAs as non-profit or commercial associations (cooperatives) whose main activity, according to the statutes, is forest management and whose members are natural persons or private legal entities who own forest. Currently there are 47 regional FOAs in Estonia and they are providing the following services to private owners (Eramets 2011):

- Organizing forest owners with mutual interests within an area;
- Providing advisory services;
- Collective action, organization of events (meetings, field trips, contests);
- Communicating information to forest owners, organizing information sessions;
- Providing assistance to forest owners when applying for support and grants (both state and rural development funds);
- Protection of interests at local level (hunting laws, environmental restrictions, etc.);
- Joint economic activity (e.g. organizing joint sales and other cooperation in forest management activities).

One of the aims of the NFP 2011–2020 is that 500,000 ha of private forests would be in the ownership of FOA members (NFP 2010) by 2020, yet there seems to be a gap between what policy makers and forest owners want. It is not clear why some forest owners have joined FOAs and others have not. Therefore the authors aim to identify some key differences between these forest owners.

Private Forests and Forest Owners in Estonia

Forests cover 2.2 million ha (50.6 % of the total land area) in Estonia and private ownership accounts for 45.3 %, yet forest land undergoing privatization still accounts for 14.8 % of forest area (Keskkonnateabe Keskus 2012). In 2011 there were 93,271 private individuals and 4,001 enterprises and organisations who owned respectively 747,000 ha (74 %) and 263,000 ha (26 %) of private forest land in Estonia (Forinfo 2011). The average size of private forests is 10.4 ha, i.e. in the case of private persons (individuals) the average size is 8.0 ha, for private legal owners (e.g. companies, entrepreneurs) it is 65.7 ha (Forinfo 2011). Approximately 56 % of NIPF owners own properties with a size of 0.1–5.0 ha (76 % with a size of 0.1–10.0 ha) yet such forests account for only 14 % of the area of private forests (excluding legal owners). Forest owners who own 20 ha or more cover 42 % of private forests yet they make up only 9 % of forest owners.

Theoretical Framework

In line with the overview provided in the previous paragraph the authors aim to understand and describe forest owners' behaviour towards FOAs in Estonia. Although policy goals have been set on a national level, there is limited knowledge

about the possible motives of forest owners for joining FOAs. Therefore the aim of this paper is to provide the first insight into the topic in the Estonian case and specifically to determine:

- How do FOA members differ from non-members and whether these differences, if any, explain why the decision to become an FOA member is made?
- Whether these differences correspond to the existing relevant theories and concepts and what might be the key steps that need to be taken to reach the ambitious policy goals that have been set?

The amount of literature about cooperative activities and incentives to join organizations is considerable particularly for former Soviet countries that have been in the transition situation (Glück et al. 2010; Lazdinis et al. 2005; Malovrh et al. 2010; Milijic et al. 2010; Nonic et al. 2011) but also for countries with a long history of private ownership (Berlin et al. 2006; Darses et al. 2011; Finley et al. 2006; Kittredge 2003, 2005; Lutze 2010; Rauch 2007; Rickenbach et al. 2006; Vokun et al. 2010). The available literature reveals that in many former Soviet countries the average private forest area is relatively small and the importance of forest size (fragmentation) is often outlined. This fragmentation leads to inefficient management due to higher transaction costs and it limits access to markets (Schlueter 2008). It could be argued that very small forest owners are not interested in joining FOAs and it is more in the interest of larger forest owners. Within the theory of collective action outlined by Olson (1971), in addition to the importance of group size, the size of individual holding is highlighted—it is argued that the owners of larger forest areas will benefit more from possible lobbying actions than the owners with smaller areas. Yet, the reverse is also possible—an owner of a larger forest area is more independent and might not need any services from an FOA, whereas smaller forest owners are more dependent on these services. This indicates that the possible incentives to join FOAs are very diverse depending on several aspects which reflect the objectives or needs of the forest owner.

Karppinen (1998) argues that forest owners' decisions in general are based on situational (market condition) and institutional aspects (legislation), but among the most important factors are also long term objectives and values, because they form general guidelines for the behaviour of forest owners. Through interest associations, it is possible to influence policy-making and therefore direct the institutional environment towards a more favourable status. The importance of a *voice in policy making* is also outlined by Rickenbach et al. (2006). There is also the well-known *free riding* problem—those who are not members will benefit from the favourable institutional environment without contributing to achieve that situation. Based on the rationale of Olson (1971) it can be argued that if owners of large forest areas join a FOA, they do so as they are more interested in the need to influence the institutional environment and the smaller owners are mostly the *free riders*. In the case of subsidies, for example infrastructure improvement (forest roads and drainage), a larger forest owner will benefit more if the FOA lobbying results in having a support scheme. In the case of situational aspects (e.g. markets), cooperation can minimize transaction costs which, in turn, leads to more market power or improved access to markets. For example, Schlüter (2007) argues that in

the case of competition as a determinant of institutional change, the choice among several alternatives is made considering minimized transaction costs. The outcome of the change (e.g. becoming a FOA member) would be the most efficient management solution from all the possible alternatives. As an illustrative example, Schlüter (2007) points out the possibility to increase timber supply in an efficient manner from fragmented private forests through a forest association. So, in the case of smaller forest owners, the decision to join an FOA might be driven more by the situational aspects (market) than the institutional ones. With this rationale two important problems arise. Firstly, in this case it is assumed that even the small forest owners are interested in having more market power, i.e. financial returns from forestry matter. This, as briefly outlined by Ní Dhubháin et al. (2007), is indeed not always the case—there are different forest owners with a very diverse set of values. Secondly, forest owners have to realize the costs and benefits related to forest management. If the oversimplifying assumption of rational actors is ignored it can be seen that this realization of the costs and benefits can emerge through learning—either from others or through personal experience. Williamson (2000) developed four levels of social analysis where social embeddedness is on the top level and it is characterized by low frequency. If small scale forest owners' management decisions (transactions) are not frequent, institutional learning, and therefore market driven institutional change, will take more time. This is pointed out also by Schlüter (2007) who illustrates it with the example of cash vs. credit cards—every-day choices between alternatives help one to learn about the pros and cons associated with a particular alternative quicker. Forest management activities in general, especially in small-scale forests, are not frequent. Due to the relatively small size of private forests and fragmentation, many forest owners might believe that their property is not worth much (Glück et al. 2011).

The competition theory has weaknesses and a part of institutional changes cannot be explained only with this theory (Schlüter and Koch 2011). Developed mental models and ideologies tend to play a huge role in making institutional choices which again leads us to the decision-making aspects pointed out by Karppinen (1998). These ideologies, beliefs and mental models are also linked to values and as Karppinen (1998) underlines they establish the general guidelines for decision-making which are then supported by the other aspects mentioned above.

Materials and Methods

In 2007 a questionnaire survey (Estonian University of Life Sciences 2007) was carried out among forest owners and companies to obtain information about the extent of forestry activities planned, and investments made, by private forest owners in the period of 2007–2013. Also, information about support received to date and needed in the future during the new Rural Development programming period was obtained. The whole study sample in 2007 (2,064 owners with more than 10 ha and 2,113 with less than 10 ha) was taken randomly from the Forest Register, also a database of NIPF owners who had previously applied for some support measures was used ($n = 584$) (Estonian University of Life Sciences 2007). Both sources were

cross-checked for possible recurrences. Out of these 4,761 unique forest owners (i.e. 4,177 from the Forest Register and 584 from the support database) 1,000 contacts were randomly taken and these forest owners were contacted for the questionnaire survey. Out of these 1,000 forest owners 472 owners sent back their questionnaires. The final dataset for analysis consisted of 450 questionnaires; 22 questionnaires were excluded from the data analysis due to insufficient or missing answers. It is important to highlight that in the frame of this paper the data is of secondary nature but the structure of the questionnaire does not rule out the possibilities to use it for additional purposes.

Firstly forest owners were grouped by their status as members and non-members of forest associations. Responses to questions (e.g. number of holdings, the total size of the holdings, past and future silvicultural activities, preferences, expectations etc.), were statistically compared based on this grouping using Chi square tests (χ^2) and *t* tests. Relationships between variables were classed as statistically significant where the *p* value was less than 0.05. Secondly, the reasons for not joining an FOA were explored based on answers to the question “Why don’t you belong to an FOA?” This was an open-ended question and open coding was used to map all the possible reasons mentioned. In the end of the coding process 6 sub-groups of reasons that emerged during the analysis were created. Results from those two steps were the basis for further discussions using the framework described in the previous sub-chapter.

Results

Of the 450 individual forest owners that formed the sample, 191 (42.4 %) were members of FOAs and 259 (57.6 %) were non-members. Differences in gender, together with some other characteristics of the two groups, are given in Table 1. On average the properties were obtained either through restitution or privatization in 1997 (members) or 1998 (non-members). In total 78 % of forest owners were males. The number of properties per owner was different among the two groups—FOA members had approximately 5 separate properties with the average total size of 63 ha while the non-members had approximately 2 separate properties with the average total size of 32 ha. The number of holdings was significantly different between the two groups of forest owners (*p* value < 0.05).

The answers of the two groups of NIPF owners to some general background questions were compared and the Chi square test results are presented in Table 2. More FOA members (46 %) are planning to increase the size of the forest holding than non-FOA members (32 %). Responsibility for felling operations was also related to group membership with 48 % of the members group conducting harvesting operations themselves while 69 % of non-members conducted this work themselves. Just over three-quarters of FOA members have applied for special forestry support measures while only 56 % of non-member owners have done the same.

Respondents were presented with five possible reasons for harvesting and were asked to rank the importance of each of these reasons. The importance attributed to

Table 1 General characteristics (mean values) of forest owner groups

	Member of FOA	Non-member
Gender (male/female, %)*	82/18	75/25
Age (years)*	49	53
The first forest property was obtained in (year)*	1997	1998
Number of properties owned*	4.6	2.4
Total forest area owned (ha)*	63	32
Relative income to household from forestry (2005–2006, %)	16	8

* Statistically significant difference between groups (*t* test)

two of these reasons was related to group membership (Table 3). The condition of forests (the health of the stand and the possible occurrences of bark beetle, wind throw etc.) was more important to FOA members than non-members. The importance of an efficient rotation period also differed between the two groups with 44 % of group members considering this to be very important while only 30 % of non-members considered this aspect as “very important” when making decision regarding harvesting. Overall, FOA members consider this aspect relatively more important than non-members.

The comparison of past and possible future activities revealed differences between the two groups of forest owners in activities such as forest planting, plantation maintenance, final felling, amelioration and damage prevention measures. A comprehensive overview is provided in Table 4. The data shows that during 2002–2007 FOA members were more active in forest planting (79 % of forest owners) than non-members (56 %). Similar trends were noted for plantation maintenance, final felling; damage prevention measures and amelioration. FOA members are also significantly more likely to be active in future forest management activities than non-members except in the case of undertaking damage prevention measures. FOA members have been more active in management activities and, as indicated in the future plans, will be more active as well. Yet, it is important to notice that within the non-members the relative increase in different activities was greater than within the members’ group.

Open coding was used to map possible reasons for not joining FOAs (Table 5). This process identified six subgroups of reasons for not becoming FOA members. The first subgroup “lack of benefits” included responses such as “no need” to join an FOA and “no benefits” derived from joining. In the case of “lack of suitable FOA” the owners outlined that there was a “lack of FOAs” in the region or that the existing FOAs were “not appropriate” or “not acceptable” to them. In the third case “no idea” or “no information” as to what FOAs are doing or where to find one, was mentioned. Collectively these can be classed as FOA-based reasons. The other three sub-groups can be collectively classed as “forest owner individual reasons” and included reasons such as lack of enthusiasm and time, and small property size. In the case of lack of enthusiasm and time, forest owners typically used phrases such as— “don’t want to”, “too old”, or “it’s not important”. In the case of property size the most common keyword was “small size”. In the time related group owners said that

Table 2 Differences between the two NIPF groups' preferences, expectations and future plans

Question	Groups	Answers		χ^2	<i>p</i> value
		No (%)	Yes, to increase (%)		
Owners' plans to change the size of the holding (5-year perspective), <i>n</i> = 436	Members	51	46	9.072	0.0107
	Non-members	62	32		
The ways owners conduct final felling operations, <i>n</i> = 395	Members	48	32	17.02	0.0002
	Non-members	69	20		
Financial expectations towards forests, <i>n</i> = 425	Members	34	48	2.944	0.2294
	Non-members	26	54		
Financial support measures, <i>n</i> = 436	Members	76	24	19.14	<i>p</i> < 0.005
	Non-members	56	44		

Table 3 Basis for harvesting decisions between the two groups of owners

	Groups	Most important (%)	Very important (%)	Important (%)	Less important (%)	Not important (%)	χ^2	<i>p</i> value
Financial need (n = 367)	Members	3	8	37	33	19	3.181	0.528
	Non-members	2	11	37	27	23		
Condition of forest (n = 425)	Members	58	31	9	2	0	12.040	0.017
	Non-members	45	35	18	1	1		
Efficient rotation period (n = 386)	Members	16	44	30	9	1	9.824	0.043
	Non-members	20	30	35	10	5		
Advice (n = 367)	Members	9	18	33	22	18	5.692	0.223
	Non-members	13	16	39	15	17		
Market situation (n = 343)	Members	1	2	13	32	52	3.385	0.496
	Non-members	1	3	16	23	57		

forestry is a “side work” and that their main occupation is elsewhere; “haven’t had the time to consider” was also mentioned.

Discussion

Some significant differences emerged from the comparison of the two groups. The results showed that FOA members had larger holdings and greater numbers of forest holdings (parcels) than non-FOA members. Malovrh et al. (2010) found similar trends in relation to the characteristics of owners willing to cooperate and those not willing to cooperate. The importance of the size of forest can also be seen from the fact that the 6 % of forest owners (both natural and legal persons) who are FOA members nationally (NFP 2010) own ~25 % of private forests (Erametsakeskus 2011). Furthermore, the analysis revealed that 13 % of non-members stated that they do not belong to FOAs due to the small size of their holding (on average 12 ha). The significance of holding size might be linked to how frequent management activities are conducted because usually the larger forest area means more diverse forest stands in Estonia, which means more opportunities and possibilities to conduct some forest management activities. This does not mean that the small forest owners do not manage their holdings at all—they indeed might but the possible additional benefit of being an FOA member is not significant for some of them. As highlighted, fragmentation (separate holdings) is an important factor as well. Although linked somewhat with the total size, it can be argued that in cases of fragmentation and small properties cooperation might lead to minimized transaction costs, which could be one of the reasons for joining an FOA as also outlined by

Table 4 Forest management activities conducted during the past 5 years (2002–2007) and future plans (2007–2014), $n = 450$

Activity	Group	Done in the past (%)	p value	Will do in the future (%)	p value
Forest planting	Members	79	<0.005	84	<0.005
	Non-members	56		66	
Plantation maintenance	Members	66	0.0073	78	0.0016
	Non-members	53		64	
Precommercial thinning	Members	63	0.1897	77	0.1296
	Non-members	57		71	
Commercial thinning	Members	61	0.3058	69	0.5563
	Non-members	56		66	
Sanitary harvesting	Members	74	0.1716	71	0.2804
	Non-members	68		76	
Final felling	Members	68	0.0078	62	0.0028
	Non-members	55		47	
Damage prevention measures	Members	19	0.011	27	0.0509
	Non-members	10		19	
Restoration of damaged forest	Members	19	0.1902	26	0.7352
	Non-members	14		24	
Amelioration	Members	19	0.0452	41	0.0223
	Non-members	11		31	
Constructing fire bars for protection	Members	0	0.6169	4	0.715
	Non-members	1		3	
Constructing fire hydrants	Members	5	0.7908	15	0.1053
	Non-members	4		9	

Schlüter (2007). In addition, during 2005–2006 the relative income from forestry to the household was twice as high in the members' group compared to non-members. Therefore, for smaller forest owners it might take more time to recognize the benefits of being an FOA member. In terms of harvesting no differences were found in thinning, yet members seem to be more active in final felling and probably due to that also in planting and plantation maintenance. The differences in management e.g. harvesting suggest that ownership objectives could be very different as well between the two groups as concluded by Favada et al. (2009). Our results suggest that forest owners who belong to FOA tend to use more contractors or sell harvesting rights than non-FOA members. Non-members on the other hand tend to use their own labour for final felling. Also, members consider the condition of the forest (damage) and forest maturity slightly more important than non-members. In fact, forest maturity could be seen as the minimum age for a stand for final felling. All these points suggest that FOA members tend to value the economic benefits of forest management more than non-members. The difference in the values owners place on various types of forest benefits is also outlined by Berlin et al. (2006) and Rickenbach et al. (2006). FOAs serve a particular type of owner—one

Table 5 Reasons for not being a FOA member (n = 450)

FOA members (42 %)	Already have a plan to join FOA (1 %)	No plan to join (57 %)
FOA based reasons (30 %)		Lack of benefits (18 %)
		Lack of suitable FOA (6 %)
		Lack of information (6 %)
Forest owner individual reasons (24 %)		Lack of enthusiasm (10 %)
		Small property size (8 %)
		Lack of time (6 %)
Other reasons (3 %)		

who is interested in gaining more income from their holdings (Berlin et al. 2006). The results from the study seem to agree with this. The importance of economic benefits is also outlined in a study by Nonic et al. (2011) where the most important precondition to join an FOA is that it should have some economic advantage for members. It seems that management activities and the size of forests are correlated—non-members, as somewhat smaller forest owners, indicated a larger interest in sanitary harvesting and the importance of own labour. In such cases the reason could be that the main ownership objective is wood for self-consumption and the economic value of forests is not emphasized.

Karppinen (1998) outlined that values together with situational (e.g. market) and institutional (e.g. legislation) aspects form the guidelines for behaviour. Membership of an FOA helps to voice the needs of forest owners in the policy arena (Rickenbach et al. 2006), helps to protect their ownership rights (Kittredge 2005) and might lead to more efficient management (Schlüter 2007), but the core of the decisions tend to lie on the values, or to be more precise, on how forest owners perceive the different values forests provide. For some countries with a longer history of private forest ownership, the values and expectations towards forests are different compared to the ex-Soviet countries. For example, Rickenbach et al. (2006) found that the biggest differences in perceived benefits between FOA members and non-FOA members are ecological (landscape values, habitats, healthy and diverse forests) with non-FOA members valuing the ecological benefits more but there was no statistical difference between groups in perceived economic benefits. At the same time they found that members tend to be more active in management activities (recreation, thinning, restoration, invasive species control) with one important exception—timber harvesting. Cooperation between forest owners, at least in the Estonian case, is seen as a tool for increasing timber harvesting in private forests. This is indicated directly in the NFP 2011–2020 (2010) as a policy goal but the results of this study also indicate the importance of other benefits.

In addition to the discussion above, it is of utmost importance to mention another aspect related to cooperation. As the results of this analysis have shown, cooperation does not universally appeal to all owners (Kittredge 2005). Nonic et al. (2011) showed that in the case of Serbia, 39 % of forest owners in their study were not

prepared to engage themselves in the establishment of a FOA. Similar results can be seen also in the US where approximately 25 % of forest owners were classified as “non-cooperator” (Finley et al. 2006). Since FOAs are not based on compulsory membership they usually reflect certain types of forest owners and should aim at meeting the expectations of more forest owners (Berlin et al. 2006). In this case 1/3 of the non-member owners indicated that the reason for not being a member is that there is no need for or no benefits linked to being a member of an FOA. Yet, the general characteristics of this group were quite similar to those of FOA members. It could be that owners in this group have just not recognized the benefits of being a member, but they could potentially become members at one point. Also, the different reasons for not being a member in an FOA indicate that there might be two broad key aspects—the above-mentioned “institutional learning” which is linked to the frequency of forest management activities and different value perceptions among forest owners. In terms of learning the relative increase in management activities in the future within the non-members’ group might indicate that at least some forest owners might eventually become FOA members if they recognize the benefits. As Rickenbach et al. (2006) highlight, the diverse objectives and interests of forest owners put FOAs in a difficult position—it is complicated to satisfy a huge variety of demands. Therefore, there are limitations to voluntary cooperation and the potential rate of cooperation evolves together with the developments in privatization, with the evolution of existing FOAs and the changing private forest ownership.

As highlighted earlier only 6 % of forest owners are currently engaged in FOAs according to the NFP 2011–2020 (2010:26). The proportion of respondents who were FOA members in the study sample (42 %) is much higher than the national figure. This might be due to the fact that one part of the initial target group included forest owners who had applied for some support measures and FOA members might be more active in applying for such supports. Secondly, FOA members tend to be more active and might therefore be more inclined to respond to such surveys.

Conclusions

The restitution and privatization processes have significantly changed the forestry sector in Estonia. More and more emphasis is being put on forest owners’ cooperation by policy-makers. Organized non-industrial private forest owners are seen by the state as a tool to overcome the problems linked with the fragmentation of forest holdings. Schraml (2005) outlined that FOAs are potentially efficient policy instruments for solving these problems in small-scale forestry. Although FOAs had already emerged in Estonia in the early 1990s, the rate of cooperation has been relatively low. As cooperation is seen as an effective measure to increase wood mobilization (Schlüter 2007) and provide knowledge transfer among forest owners, it is important to understand the differences between FOA members and non-members and to determine whether these differences could be explained by using some general themes about decision-making and cooperation.

The first key aspect was fragmentation (number of holdings) and the size of forest holdings—FOA members have on average more holdings and their average total

forest area is larger in size compared to non-members. FOA members have been more active in management activities and, as indicated in the future plans, will be more active as well. Yet, it is important to notice that within the non-members' group the relative increase in different activities was greater than within the members' group. It shows that FOA members are steadier in their practices. The higher relative increase compared to the past and planned future activities in the non-members' group might also indicate that at least some of them might become members of an FOA. This might be due to the increased frequencies in management activities as indicated by Schlüter (2007) and Williamson (2000). Their institutional learning might lead to the understanding of how membership in an FOA might be beneficial in taking these different activities into consideration. As Karppinen (1998) distinguished, the decisions of forest owners are in general based on situational and institutional aspects which, put in FOA context, means improved market access or conditions and a greater voice in policy making (Rickenbach et al. 2006). Yet the most important factors are the long term objectives and values of owners (Karppinen 1998). Since FOAs serve a particular type of owner—one who is interested in gaining more income from his/her holding (Berlin et al. 2006), there are greater limits to cooperation. A FOA with relatively one-sided activities limits itself in terms of membership and capacity and might not be successful. Although cooperation might not be acceptable for everyone there is still a huge potential in the Estonian case since only 6 % of forest owners have engaged themselves in FOAs (NFP 2010). In addition, the results indicate that there is a remarkable number of forest owners either with a lack of information about FOAs or a lack of knowledge about forest management in general. Forest policy should put more emphasis on capacity (advisory and extension services) and incentive tools (for both tangible and intangible goods) to guide private forestry. Since cooperation is linked to many aspects (rate of privatization, FOA developments, structural changes within private forest ownership) it can be argued that cooperation is in fact a “moving target” and needs to be understood in the frame of forest owners' values, their objectives and economics. For policy-makers, this poses additional difficulties in guiding forest policy implementation.

Although the provided analysis is based on secondary data, it gives a valuable insight into cooperation between forest owners in Estonia. In addition, it helps to guide future research in this area and it could be a basis for analysing the situation nowadays since the data analysed was from 2007. In addition, forest owners with very small properties could be additionally studied taking into account their different position towards forest management compared to larger owners whose management activities are more frequent. The findings could help policy-makers to guide the implementation of the Estonian NFP until 2020. Additionally, it can be concluded:

- FOA members tend to be more interested in forest management—on average they have more forested land, they are more active in the management—which suggests that institutional learning might play a very important role in making decisions to join an FOA.

- It seems that forest owners value FOA membership mainly for economic reasons (market access, minimized transaction costs).
- FOAs should diversify their activities more in order to satisfy a wider range of forest owners with different values, needs and properties. This is important not only because there is a possibility to increase timber utilization, but also to increase the provision of other benefits (e.g. biodiversity, recreation) that are gaining more and more importance.
- There is a need to study the needs and values of non-industrial private forest owners in Estonia to successfully guide forest policy implementation.

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Management motives of Estonian private forest owners



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ABSTRACT

Private forestry has been re-established as a rather new phenomenon in many Central-Eastern European countries including Estonia. The sustainable management of these forests has become a question over the years. We aimed to find answers how different values and objectives form management motives and influence decision making in forest management by these new forest owners. Principal-component and correlation analysis were applied to a collected dataset from forest owners in 2011 containing 254 responses. By the collection of datasets these forest owners were divided also by assessment methods. The results showed that randomly selected forest owners may have some different motives in their approaches to forests and forest management than forest owner organisation members, but mainly their motives overlap. The correlation analysis between individual forest owners revealed also that forest owners are very different in how they arrive to a particular decision in management. In addition, perceived values and long-term objectives are one of the fundamental cornerstones for these decisions. Forest policy often neglects the diversity of landowners and therefore policy implementation is often not successful. More flexibility in policies could be an answer.

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1. Introduction

After regaining independence in 1991 private land ownership was re-established in Estonia and now the restitution and privatization process is close to its finish. Forests cover 2.2 million ha (50.6% of the total land area) in Estonia. Private ownership accounts 45.3% and land under privatization 14.8% of total forest area (Keskkonnateabe Keskus, 2012). In 2011 there were 93 271 private individuals and 4001 enterprises and organisations who owned respectively 747 000 ha (74%) and 263 000 ha (26%) of private forest land (Forinfo, 2011). The forest properties are very different in size—e.g. 76% of forest owners have properties between 0.1 and 10 ha while covering a relatively small part of the total private forest area. Private owners who own 20 ha or more forest cover 42% of private forests yet they make up only 9% of the total number of private forest owners (Forinfo, 2011).

During the two decades not only the political concepts have changed but diversification had occurred in parallel and within private forestry during the ongoing changes in political thinking. The institutional environment (defined by North, 1990) has changed over the time gradually and crucial parts of these institutions are not given as much attention as needed. These parts include mainly beliefs and norms. As Schlüter and Koch (2011) point out a significant extent of institutional changes can be explained through mental models and ideologies. All these processes

have enormously influenced the management of private forests in Estonia. In this context the sustainable management of private forests comes into question. Many management-related problems have arisen—low efforts to reforest, lack of interest in stand development and low harvesting rates. According to the National Forest Programme (NFP) until 2020 (Keskkonnaministeerium, 2010) the baseline for reforestation in private forests is 20% of the total final felling area. The aim is to increase this to 40% by 2020. The main ways to improve reforestation and stand development are nowadays subsidies that are given to forest owners through the state foundation Private Forest Centre. In addition the NFP outlines that the annual harvested volume is $\sim 2/3$ of the optimum (Keskkonnaministeerium, 2010). Most of this shortage could be accounted to private forests. In addition to the goals set in the NFP also other policy areas like energy and nature protection play an important role in private forest management and in national strategies. For example the NFP aims to increase the area of strictly protected areas; at the same time the National Renewable Energy Action Plan (Majandus- ja Kommunikatsiooniministeerium, 2010) outlines that "wood has the greatest economic potential as a biofuel for electricity and heat production in Estonia".

Motive is a reason that makes or might make a person choose to act in a certain way and reasons reflect e.g. persons' needs. Irrespective of that need, it is based on broader mental constructs. Ní Dhubháin et al. (2007) argue that forest owners' attitudes and objectives might be the most important variables influencing decision-making and that often it is seen only as an indirect assumption and not a subject for direct analysis. This is also pointed out by Karppinen (1998) who concludes that in terms of decision-making, values and objectives form the general guidelines for a particular decision. Bliss and Martin (1989), using qualitative

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Table 1
Characteristics of questionnaire respondents by forest owner assessment method.

Assessment method	Number of respondents	Mean age (y)	Gender (male/female, %)	Number of properties (mean/median)	Forest area owned* (mean/median, ha)	FOA member (%)	Owners living close to their forest property (%)
Method 1—through FOA	155	50	78/22	3.9/2	54.1/25.5	88	59
Method 2—random	99	56	58/42	1.8/1	13.1/8.0	12	54
All respondents	254	53	70/30	3.1/2	38.0/17.0	59	57

methods, identified a huge spectrum of different motives to conduct forest management. They also underlined that many of those motives might not be quantifiable and that a particular decision can be influenced by different motivations. In relation to harvesting Favada et al. (2009) found that forest owners' objectives have a quantifiable and statistically significant influence. Therefore it is essential to understand these aspects and processes to understand the management behaviour of forest owners, especially because of the short ownership traditions and the rapid dynamic development of private forest ownership as it often occurs in transition countries.

Our aim was to target random forest owners as well as more active forest owners as they influence the forest sector more significantly and they are also influenced more by the policies that are implemented. The aim of this paper is to have an insight how values and objectives of forest owners might influence their management intentions. Also implications of different motives for forest management in Estonian private forests are looked upon. A previous study on Estonian forest owners' objectives concentrated more on forest owners' information needs (Toivonen et al., 2005). We hypothesize that private forest owners are a very diverse in their motives and that forest policy often does not take this into account. Even more, a narrow policy approach, together with strict rules, by concentrating on technical management issues might lead to a non-compliance with national strategies. As Weiland (2010) shows, this is often the case in post-socialist countries where there is an imbalance between the state and private sector which might lead to a low interest in private activities and difficulties in implementing "top-down" policies.

2. Material and methods

The data was obtained through a questionnaire survey conducted in 2011 among private forest owners. Two assessment methods for reaching forest owners were used. More active forest owners were reached with the method 1 and random forest owners were reached with the method 2. Using method 1, 163 questionnaires were collected through regional forest owners associations (FOA) by the help of the Estonian Private Forest Union. Using method 2, another 110 questionnaires were collected using a random sample from the forest owners' database. To access it, a special permit from the Ministry of the Interior was obtained. From the whole database, 1000 forest owners were randomly selected and 606 of them received the questionnaire (response rate 18%). From all the questionnaires received 19 were excluded from

the data analysis due to a large number of missing answers which resulted in 254 usable questionnaires. An overview of respondent characteristics is given in Table 1 and distribution of respondents' forests in Table 2.

In the questionnaire respondents were asked to indicate how well each statement reflected their aims and values for forest management using a Likert scale with five levels—"Strongly Agree" (5), "Agree" (4), "Neutral" (3), "Disagree" (2), and "Strongly Disagree" (1).

A large number of forest values and long-term objectives enabled us to use principal component analysis (PCA) with the 'varimax' rotation. The rationale behind this process was to decrease the overall number of original variables and to combine both values and objectives to see if any combinations arise. Based on the components scores for each original variable and combinations between the scores for values and objectives, the components were named accordingly.

Variables with PCA loadings above 0.4 were considered equally important and were used in calculation the numeric values of motives. The motive scores were calculated taking an average of scores of respective objective and value variables. Determining the importance of a motive was by comparing the motive values with the threshold value. Threshold value was determined as the upper third on Likert scale (> 3.67 for single variable). Fig. 1 shows the share of respondents according to different motive scores depending from the signal strength on Likert scale together with the threshold value. In the end correlation coefficients between individual motive scores and answers to specific forest management questions were found.

3. Results

3.1. Management motives of forest owners

The analysis indicated that five different principal components is a reasonable output. The amount of variance that is accounted for by each of the five components is larger than one. Since the components were based on both ownership objectives and forest values the components are considered as motives for forest owners. None of the components (Table 3) stand out in terms of explained variance which indicates a high diversity between the components. Overall they explain 66% of the total variance. As mentioned the distribution of explained variance between the components suggests that there is a significant diversity between the components i.e. they are not strongly linked. In addition there are strong links within the components which was the basis for

Table 2
Distribution of respondents by number of properties and forest area.

Assessment method	Number of properties					
	1	2	3	4	5	More than 5
Method 1 (%)	32.3	34.2	9.0	6.4	7.1	11.0
Method 2 (%)	55.6	26.3	11.1	3.0	2.0	2.0
All respondents (%)	41.3	31.1	9.8	5.1	5.1	7.6
	Forest area (ha)					
	(0–5)	(5–10)	(10–20)	(20–50)	(50–100)	More than 100
Method 1 (%)	6.6	8.5	26.3	34.9	14.5	9.2
Method 2 (%)	34.3	26.3	21.2	15.2	3.0	0.0
All respondents (%)	17.5	15.5	24.3	27.1	10.0	5.6

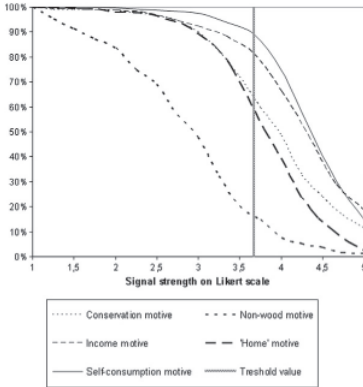


Fig. 1. Share of respondents according to different motive scores depending from the signal strength on Likert scale (5–Strongly Agree, 4–Agree, 3–Neutral, 2–Disagree, 1–Strongly Disagree). The threshold value (3.67) represents the level from which the motive is considered important to the respondent.

naming the new variables. With one exception (PC 4) there were strong links between factor scores for both objectives and values. For example PC 1 presented high factor scores under the objectives 'biodiversity protection' and 'preserving landscape diversity'. For the same component high loadings occurred also under values like 'beauty of the landscape' and 'biodiversity'. Therefore the component was named "Conservation motive". The same principles were used also to name other components—strong links within the components were found also in the case of "Non-wood motive", "Income motive" and "Self-consumption motive". The fourth component was named 'Home' motive as suggested also by Bengston et al. (2011) since all high (above .400) PCA loadings were found just under values.

Motive scores were used instead of PCA loadings for determination of individual motives of forest owners as in such way motives are more understandable. Correlation coefficients between PCA scores and motive values are in the Table 4. The share of respondents according to different motives is presented in Table 5 and according to the number of motives in the Table 6.

We also examined the relationships between forest owners' values and objectives, the number of properties owned and the total size of the forest holding. Some clear patterns emerged from the analysis. For example the more forest (both in terms of size and properties) owners had, the less likely their prevailing management motive was non-wood motive (e.g. mushrooms and berries) or self-consumption motive (Tables 7 and 8). Inversely, an important objective was selling wood for income.

3.2. Management decisions

Firstly general characteristics were identified for forest owners with different motives (Tables 7 and 8). Collected data indicated that self-consumption motive had the highest share of respondents (74%) when all answers (mix of motives) were included, but when only primary answer was included the highest share of respondents (36%) was on income motive. Non-wood motive in the other hand had the lowest rate (15% and 1%) in the same category. Small percent of respondents (5%) didn't have any of proposed motives.

Secondly correlation coefficients between individual motive scores and answers to specific forest management questions were found. (Table 9). The table firstly shows how different motives correlate with some short-term forest management intentions. For example owners with 'home' motive or conservation motive are less likely to sell their forest property (negative correlation) while rather high positive correlations were found for buying forest land for owners with non-wood and income motives. Owners with the latter motives seem to be more active in most of the named activities (non-significant correlations found only for sanitary cuttings).

The results of short-term intentions are reflected also in the ways owners make harvesting decisions. Clearly income motivated owners are most influenced by the market situation and forest maturity but they are in any case the most likely to harvest if conditions are

Table 3
Results of the principal component analysis with the 'varimax' rotation (PCA loadings above .400 marked in bold).

Values and long-term objectives	Principal components				
	PC 1	PC 2	PC 3	PC 4	PC 5
Objectives:	Factor loadings				
Hunting, wildlife	-.060	.840	.130	-.050	.190
Berries and mushrooms	.190	.210	.050	.320	.580
Timber for sale	.050	.270	.790	-.050	-.160
Timber for own consumption	.110	.080	.120	-.010	.730
Tourism and recreation	.280	.660	.060	.210	-.060
Biodiversity protection	.900	.130	-.050	.080	.060
Preserving landscape diversity	.870	.080	-.090	.110	.080
Values:					
Beauty of the landscape	.440	.080	-.050	.580	.030
Recreational	.220	.490	.110	.610	-.140
Privacy	-.010	-.020	-.100	.790	.190
Timber	-.110	.020	.670	-.020	.420
Asset and investment	-.010	.170	.790	.100	.160
Biodiversity	.750	-.020	.090	.280	.170
Heritage	.380	-.140	.190	.520	.290
Wildlife, hunting	-.010	.820	.210	.010	.140
Freedom of management	.370	.250	.230	.470	.250
Eigenvalue	4.324	2.508	1.508	1.116	1.043
SS loadings	2.790	2.320	2.090	1.900	1.400
Proportion of variance (%)	17	14	13	12	9
Cumulative variance (%)	17	32	45	57	66
Named motives	Conservation motive	Non-wood motive	Income motive	'Home' motive	Self-consumption motive

Table 4
Correlation coefficients between PCA scores and motive values.

	PC 1	PC 2	PC 3	PC 4	PC 5
Conservation motive	0.732	0.077	-0.059	0.238	0.036
Non-wood motive	0.054	0.604	0.074	0.157	0.086
Income motive	-0.032	0.131	0.762	-0.004	0.071
'Home' motive	0.309	0.207	0.076	0.666	-0.087
Self-consumption motive	0.145	0.151	0.266	0.136	0.596

favourable in contrast to conservation motivated owners whose decisions to harvest are not so likely triggered.

Forest owners were also asked which forest management activities should be financially supported. Persons with self-consumption motives have usually less need for support measures while commercial users and conservation-driven users consider financial help necessary, especially in case of e.g. forest owner cooperation. In case of income motivated owners significant positive correlations were also found for investment type costs like young stand tending and drainage and road network maintenance.

4. Discussion

4.1. From mental constructs to management

The process of how forest owners transform their values and objectives to actual management decisions may be seen as process of determining management motives (Fig. 2). For instance income motivated forest owners most likely see timber, assets and investments as values or if forest owner objectives are biodiversity protection and preserving landscape diversity then his/her motives are linked to conservation motive (Table 3). Motives i.e. reasons for acting in a certain way are influenced by these broader constructs. Quantitative analysis of mix of different motives gives better description of forest owners than simple classification for implementing policy tools. Emanate from motives forest owners have to deliberate different influences like policy tools, economic conditions, forest condition etc. before they can make the actual management decision and put it into practice. For example an experienced forest owner in need of finances might not be able to make any harvesting decisions due to poor harvesting conditions. Also, many forest owners get stuck into bureaucracy or just don't have enough knowledge about forest management; therefore, their motives may never be accomplished. Forest policy in Estonia doesn't often consider the diversity of forest owners and more financial support is needed to help them to accomplish their different forest management motives. Economic motives depend from many different objectives, among forest policy separate resources, before they come to actualization.

4.2. Social dimension of forest ownership

The results on the size of forest and number of properties show that there are differences between forest owners on how they value different forest-related benefits. The size and characteristics of the forest play an important role on how forest owners manage their forest. As mentioned 76% of forest owners in Estonia own properties between 0.1 and 10 ha while owners who have 20 ha or more make only 9% of the total number of private forest owners while covering 42% of private forests (Forinfo, 2011). The results indicated that there is a positive

Table 5
Share of respondents according to the management motives.

Assessment method	Share of respondents (%)				
	Conservation motive	Non-wood motive	Income motive	'Home' motive	Self-consumption motive
Method 1	62	19	75	55	78
Method 2	56	7	53	43	69
All respondents	59	15	66	51	74

Table 6
Share of respondents according to the number of management motives.

Number of motives	Share of respondents (%)		
	Method 1	Method 2	All respondents
0	4	6	5
1	10	24	16
2	25	28	26
3	25	23	24
4	23	17	20
5	13	2	9

correlation between the size of the forest holding and the motivation of generating income from forest management. It seems that when a system like forestry goes through a significant change (e.g. restitution) the outcome of the change (a person becomes a forest owner) might have substantial influence on how people value forests. Forest owners whose forests have been part of their farm previously (e.g. self-consumption and 'home' motivated owners) tend to have a more emotional link to the property. These forest owners also had less properties with smaller hectares. Bliss and Kelly (2008) emphasize that "family forests in particular reflect the values, objectives and capabilities of their individual owners". Grubbström (2011) also concludes that the emotional bond to the land is often linked to the way the forest has been obtained with restitution being the most influential. Bengtson et al. (2011) conclude that forest ownership can be very closely linked to the identity of the forest owner. A personal connection with the property is outlined in other studies as well (Pivoriūnas and Lazdinis, 2004; Lönnstedt, 1997). Forest ownership has therefore a significant social influence on people and the nature of this influence is dependent often on history and the characteristics of the forest. It is therefore obvious that in many cases forest owners with e.g. 'home' motives might not make any clear cutting decisions even if the market situation is very good.

4.3. Utilization and management

Timber production and harvesting in general are significantly influenced by the values and objectives forest owners have. It is often discussed in Estonia that the annual harvested volume is ~2/3 of the optimum (Keskkonnaministeerium, 2010) and this is due to the lack of interest in harvesting by private owners. Toivonen et al. (2005) underline that forest owners in Estonia with larger properties sell timber more frequently than owners who have smaller holdings. Lidestav and Ekström (2000) showed that older owners were less likely to carry out harvesting activities, while larger ownership and higher site quality increased the frequency of harvesting. According to Dhubbain et al. (2006), this is because owners following different objectives have different management behaviour. Our results show that forest owners with income and non-wood motive are more likely to use their forest for commercial purposes. The mentioned commercial purposes include infrastructure and stand development as well as final felling.

Reforestation is an important part of timber production and utilization. Currently there is a lack of reforestation efforts in private forest (Keskkonnaministeerium, 2010). It is interesting that in a 5-year perspective the income motivated owners indicated that they might not plant as much forest as they harvest indicating that they prefer natural regeneration which is much cheaper than planting. In addition the

Table 7
Characteristics of questionnaire respondents by management motives (all answers included).

Management motive	Share of respondents (%)	Mean age (y)	Gender (male/female, %)	Mean number of properties	Mean forest area owned (ha)	FOA member (%)	Owners living close to their forest property (%)
Conservation motive	59	53	74/26	3.3	40.2	62	58
Non-wood motive	15	50	83/17	4.1	66.7	76	70
Income motive	66	51	79/21	3.6	48.4	70	57
'Home' motive	51	52	78/22	2.9	37.2	66	60
Self-consumption motive	74	52	78/22	2.8	35.7	63	61
Not any of these motives	5	57	62/38	1.2	9.4	38	62

Table 8
Characteristics of questionnaire respondents by the strongest management motive.

Management motive	Share of respondents (%)	Mean age (y)	Gender (male/female, %)	Mean number of properties	Mean forest area owned (ha)	FOA member (%)	Owners living close to their forest property (%)
Conservation motive	23	56	64/36	3.8	41.4	53	45
Non-wood motive	1	48	67/33	2	16.3	67	67
Income motive	36	48	84/16	4.1	61.4	77	59
'Home' motive	7	52	80/20	1.9	24.9	59	65
Self-consumption motive	28	55	62/38	1.8	13.8	37	64
Not any of these motives	5	57	62/38	1.2	9.4	54	38

income motivated owners indicated that support should be given more to activities which are not economically profitable e.g. pre-commercial thinning and young stand tending. At the same time these forest owners are more likely to cooperate whereas the self-consumption motivated owners are less likely to cooperate in forest management. Some of these cooperation characteristics are in line with an earlier study (Pällumäe et al., 2013). Income motivated owners see clear cutting as most profitable and they indicate, in contrast to conservation motivated owners, that regardless of the type of harvesting the activity has to be effective and profitable. This also explains the tendencies towards support needs.

In decision-making, self-consumption motivated owners indicate the need for help from consultants and forest professionals when making harvesting decisions, while income motivated owners concentrate

more on forest maturity and market conditions (price). The importance of timber prices is outlined by Favada et al. (2009) as well and they conclude that forest owners' objectives have a significant impact on harvesting.

Butler and Leatherberry (2004) found that only 9% of forest owners in the US consider timber production important. They also concluded that there is a link between forest land owned and harvesting i.e. forest owners are more likely to harvest if they owned more forest land. Yet, the conclusion is rather obvious and these kinds of relations should be analysed on a landscape level to get a clearer picture about the management differences between owners. Using k-means clustering, Jennings and van Putten (2006) also found that their "income and investment owners" usually had larger forest areas. As our analysis showed five motives stood out in terms of their values and long-term objectives—

Table 9
Correlation between motive values and answers to specific forest management questions (ns = non-significant correlation).

Forest management question	Conservation motive	Non-wood motive	Income motive	'Home' motive	Self-consumption motive
Do you plan within next 5 years:					
forest road construction?	0.13	0.32	0.30	0.22	ns
forest amelioration?	ns	0.28	0.35	0.19	ns
buying forest land?	ns	0.31	0.32	0.20	ns
selling forest land?	-0.15	0.15	0.16	-0.15	ns
planting?	0.17	0.23	0.32	0.28	0.19
final felling?	ns	0.15	0.43	ns	ns
thinning?	ns	0.16	0.22	0.24	0.15
young stand tending?	0.19	0.26	0.17	0.39	0.13
sanitary cutting?	0.15	ns	ns	0.19	0.19
forest protective measures?	0.14	0.30	0.22	0.23	ns
What influences your harvesting decisions:					
personal financial situation	ns	ns	0.23	ns	0.20
sanitary condition of the stand	0.25	ns	0.22	0.20	0.17
forest maturity	ns	0.23	0.46	0.15	0.25
advice from consultants	ns	ns	0.17	ns	0.21
offer from contractors or buyers	ns	0.28	0.26	ns	ns
market situation	ns	0.33	0.47	0.19	ns
forest management plan	0.19	ns	0.25	0.14	0.19
What needs more financial support:					
multiple use of forests	0.29	0.26	ns	0.21	0.15
forest owners cooperation	0.26	0.19	0.23	0.26	ns
(pre)commercial thinnings	0.16	0.18	0.19	0.20	ns
restoration of damaged stands	0.15	ns	ns	0.13	ns
reforestation	0.19	ns	0.15	0.13	ns
young stand tending	ns	ns	0.25	0.14	ns
maintenance of drainage and road network	ns	ns	0.20	ns	ns

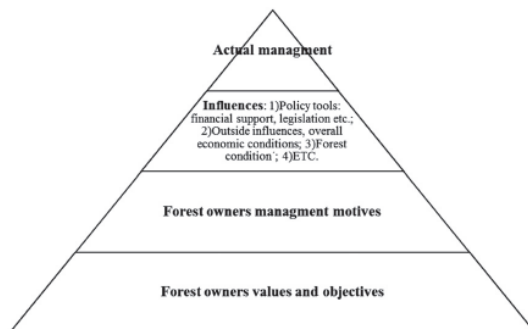


Fig. 2. Stages of forest owners steps from values and objectives to actual forest management.

conservation, non-wood, income, home and self-consumption motive. Our analysis shows that forest owners who own larger areas of land and larger proportion of all FOA land tend to show more interest towards income. But on the other hand analysis suggests that significant proportion of all forest owners are motivated by objectives other than timber production. These results are in line also with the findings of Kline et al. (2000) and Karppinen (1998).

In Estonia harvesting is quite strictly regulated by the Forest Act which includes eligible rotation ages (Metsaseadus, 2006). Several studies both in Estonia (Korjus et al., 2011) and abroad (Nijnik, 2004) have underlined that official rotation ages could be more optimal if one considers economic benefits.

4.4. Conservation

In national forest policy, more emphasis has been put to nature protection activities in Estonian private forests. We can verify that there are owners who are interested in the protective functions of forests in addition to the owners with e.g. income motives. Pivoriūnas and Lazdinis (2004) found that Lithuanian forest owners also consider the environmental values of forest to be important. Similar findings can be seen in several studies conducted both in the US (Berlin et al., 2006; Rickenbach et al., 2006; Kline et al., 2000) and Europe (Kvarda, 2004). In Estonia various restrictions with a wide range of degree have been applied to 31% of forests (Sirmets et al., 2011). Most of these areas are determined by state authorities. One volunteer program of key habitats has been established as well, but its uptake is rather slow by forest owners. In addition, the program can be taken up by the forest owner only if a key habitat, defined by the Forest Act (Metsaseadus, 2006), has been identified by the respective authority. Policies have had a more "top-down" approach which does not provide the necessary incentives for preserving biodiversity (Juutinen et al., 2008; Laarmann et al., 2013). As Jenota and Broussard (2008) conclude, policy tools that are used for conservation should be also based on owners' attitudes and motivations. One option could be voluntary agreements which Mäntymaa et al. (2009) describe as more acceptable both to landowners and the society compared to mandatory approaches. Yet it is essential that these volunteer approaches would be flexible.

5. Conclusions and limitations

The results revealed that forest owners are very different not only in terms of their property but also in how they value and perceive their

forest. There are owners who value monetary benefits and concentrate more on the economic aspects of forest management. These forest owners are more likely to belong to forest owners' organizations, they have different needs and the decisions in forest management are formed differently than in the case of owners who value for example biodiversity and conservation benefits. It is clear that some of the owners who do value conservation more than income still might manage their forest. They might conduct for example clear cuts, but the way these forest owners reach forest management decisions is different and it is influenced by other aspects than market conditions or forest maturity. Policies do not take this kind of diversity into account and forest owners are reflected as a homogeneous group. The same conclusions are drawn also by Brown (2007). This poses difficulties in implementing policies because it often raises reluctance among forest owners. Also, if proper policy tools are not used the implementation of certain goals might fail. More flexibility in both production and protection forestry could help to improve the implementation of national strategies. This flexibility should of course include proper advisory and extension services.

In terms of limitations it is essential to underline that the analysis included somewhat more active forest owners since more than 50% of the questionnaires used were obtained through forest owners' organizations. Most of these forest owners have larger forest areas compared to the overall average in Estonia and therefore the results cannot be transferred to the very small owners (0.1–10 ha) who actually account for most of the forest owners in Estonia. These forest owners should be separately studied in the future. Secondly, even though we draw some conclusions about the potential motives of different forest owners, it is important to highlight that the results fail to reveal the actual views of different owners. People might understand and perceive the same values or objectives differently which in the end influences the decisions.

These results could be an important basis for forest policy implementation. It is essential to know the management rationale of private forest owners to successfully increase the provision of forest related goods and benefits. Policy tools that are used to reach different goals in Estonia could be evaluated and assessed in light of these results.

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Forest Owners Associations in the Central and Eastern European Region

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Abstract The restitution and privatization in Central and Eastern European countries in the early 1990s predisposed a heterogeneous ownership structure, a large number of forest owners and a variety of types of property ownership modes. Furthermore, development of governance in these countries posited a

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new framework for interest representation in the forestry sector, mainly through organised forms of private forest owners, i.e. formation of forest owners' associations (FOAs). In this region, FOAs were one of the opportunities for interest representation in the land restitution processes. Later on these associations gained more competency and importance not only in influencing forest policy-making, but also in offering services to their members. The aim of the paper is to improve the understanding of the origins, evolution and current situation of FOAs in Central and Eastern Europe by describing the factors that influenced the FOAs' creation and development. On the basis of their similar history seven Central Eastern European countries were selected for FOAs analysis: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Romania and Slovakia. The main findings of the study include that FOAs in Eastern and Central Europe, though being the result of the same socio-political changes, differ between countries in terms of their organisational forms. However, they face similar challenges, including the limited motivation of owners to join associations. Also, they undertake similar activities for their successful development, including the provision of information services for their members. Despite not having any legal competence for the direct management of their member's forests, these FOAs do have strong representative and demonstrative effects in their countries.

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Introduction

The Central and Eastern European (CEE) countries¹ have a shared history as socialist countries during the years 1948–1990, when private land (including the forests) was nationalized or used by the state. More than 20 years ago these countries started a transition from communist regimes with centrally planned economies and one-party political systems to democratic regimes and market economies. Nowadays most of them are full members of the European Union meeting all its requirements and conforming to the policy developments. With regards to the forestry sector many EU-wide initiatives apply, e.g. the NATURA 2000² network of protected areas (and its related Directives), and the Common Agricultural Policy with its support measures for rural development (which include some forest management topics as well).

These changes in political regimes also stimulated new phenomena, which brought about change in the forestry sectors of these countries: restitution of forest land, the privatisation of forest industries, the formation of a liberalized timber market; an increased level of timber exports; and new modes of forest management (i.e. private businesses, logging companies). One of the most important factors influencing the current state of the forestry sector and ownership structure in CEE countries was restitution of land rights which were lost during the communist regime. Restitution of forest land is a process of returning property rights to the original (pre-Communist regime) owners. This process started in the 1990s after the fall of the communism and faced many problems. New so-called non-state owners (a term which includes individual owners, commoners, private companies, churches, environmental groups and municipalities) lacked sufficient knowledge about how to manage their forests, and engage in the forestry sector, so as to achieve financial and ecological sustainability. Properties returned to private individuals were often too small for viable independent management and highly fragmented in location. New forest owners also lacked financial capital, technological know-how and the necessary equipment and tools (Weiss et al. 2011).

Forest Owners Associations (FOAs), as an instrument for supporting the sustainable management of private forests, can emerge as an effective option in overcoming new challenges (Ostrom 1990; Glück et al. 2010; Mendes et al. 2011). However in the former communist countries, the main challenge was a lack of experience with interest groups. Notably, before the fall of communist regimes in

¹ Central and Eastern European Countries (CEECs) is an OECD term for the group of countries comprising Albania, Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic, Slovenia, and the three Baltic States: Estonia, Latvia and Lithuania. (<http://stats.oecd.org/glossary/detail.asp?ID=303>).

² NATURA 2000 is an ecological network of protected areas in the territory of European Union designed by each EU Member State according to the Habitats Directive (Council Directive 92/43/EEC) and the Birds Directive (Council Directive 2009/147/EC).

CEE countries the formation of any special interest groups was forbidden. Basically all forest and forestry issues were dealt by the government and the national communist party, with the interest groups that existed in that era being limited to non-executive professional engagement. Since 1990, this situation has been amended in CEE countries, but there were some problems involved in the formation of interest groups. New interest groups were established that operate for the benefit of private forest owners as well as for other stakeholders such as environmental groups. In this way, these associations of private forest owners became the most important and essential part of the forestry sector interest groups. Against this background, the main objective of this paper is to improve the understanding of the origins, evolution and current situation of FOAs in selected CEE countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Romania and Slovakia) by description of the similarities and differences among FOAs and the factors that influenced their creation and development. The following research questions were investigated:

1. What were the main reasons for the establishment of the forest owner associations?
2. How have the FOAs evolved since 1990?
3. What are the common features of FOAs in the selected countries?

Literature Review

In pluralist, corporatist and network approaches to political theory, interest groups play an important role. Despite differences in other regards, various theoretical strands share the basic premise that interest groups are a vital element of functioning democratic market economies. Interest groups as autonomous actors do not only (politically) represent the shared (economic) interest or attitude of a group of actors, but provide the state also with valuable information for policy making. Depending on the theory in mind, interest groups are included in policy formation and implementation via lobbying, corporatist arrangements or participation in networks (Seebaldt 1997; Graf 2006). Interest groups represent their members' interests in the political system, but unlike political parties, interest groups do not strive for governmental responsibility (Salisbury 1969, 1975). Interest associations are irreplaceable in a developed democratic political system (Glück 1976) because they place policy issues, which benefit the interest of their members, onto the political agenda. For this purpose they apply public relations and other means of raising public awareness to ensure the responsiveness of government when formulating appropriate programs (Glück et al. 2010).

The formation of FOAs faces the challenge of organizing collective action, achieving critical mass (Olson 1971), pressure from institutional and external influences (Gibson et al. 2005; Matta and Alavalapati 2006), gaining mutual understanding (Ostrom 1999), setting appropriate rules, gaining finance and

capacity building (McKean 1998), unclear ownership boundaries and level of social capital (Gibson et al. 2005). Mendes et al. (2006) named production of common goods, group heterogeneity and the coercion of members and financial incentives as the triggering factors for the formation of forest owners' associations. Seen from the forest owners' viewpoint, there exist at least two reasons as to why establishing interest or stakeholder organizations makes sense; firstly, interest groups exist in order to protect and represent the common interests of forest owners in the policy-making process, and second, they help in the improvement of forestry knowledge and forest management, for instance, through the provision of services (Rametsteiner et al. 2005; Glück et al. 2010; Weiss et al. 2011).

Issues related to forest ownership structure and forest owners' interest groups are vital for the formulation and implementation of public policy measures. Currently, research on this issue takes on particular relevance in sustainable forest management, increasing competitiveness and the introduction of innovations in forestry, rural development, climate change, biodiversity and water protection. This trend is seen in the number of realized national projects in the CEE region (e.g. in Latvia, Lithuania, Hungary, Poland and Slovenia) and published scientific papers, and in the work of researcher groups active in IUFRO group 03.08.00 (Small Scale Forestry). The issues of ownership structure, ownership rights, attitudes towards sustainable forest management, use of raw wood, owner's management priorities and the enforcement of their objectives have been addressed in the USA by Kittredge (2005), Butler (2005), Butler et al. (2010) and Gootee et al. (2010). In Western Europe, depending on situation, studies have focused on owners' values and objectives or motives derived from typologies of forest owners (Karppinen 2000; Hogl et al. 2005; Schraml and Memmler 2005). The role of private forest owners and their associations in multifunctional forestry practices has been highlighted by several authors, for example by Slee (2005), Kurttila (2005) and Schmithüsen (2007). Specific forest policy impacts of FOAs were investigated by Valkeapää and Karppinen (2010). Rauch (2007) undertook analysis and proposed strategies for FOAs in Austria. The role of FOAs in rural development in Sweden was described by Lidestav et al. (2010), and innovation impact of FOAs in Switzerland was studied by Seeland et al. (2011). Schraml (2005) argued that FOAs are potentially efficient instruments for the implementation of policy for small-scale forest management. Mendes et al. (2006) stressed the economic benefits of joining FOAs.

To date research into forest associations and cooperatives has rarely been carried out in CEE countries (FAO 2012a, b). However the challenges associated with small-scale forest owners and their cooperation were the topic of research in Lithuania. Pivoriūnas and Lazdinis (2004) and Mizaraitė and Mizaras (2005a, b) described the needs of Lithuanian forest owners and conditions for FOA establishment. Pöllumäe et al. (2014) explored the differences between members and non-members of FOAs in Estonia. Golos and Geszprych (2005) claimed that the promotion of owners' cooperatives in Poland can lead to efficiency in forest management. Several research studies dealing with property rights in the Romanian private forest sector were carried out by Bouriaud (2006), Ioras and Abrudan (2006) and Nichiforel and Schanz (2009). FOAs are one of the options for improving the contribution of private forest owners in society and securing their property rights.

Medved (2005), Medved et al. (2010), Glück et al. (2010, 2011) and Nonic et al. (2011) underlined the need for FOAs with clear mandates and sufficient capacity to advise private forest owners in managing their forests and lobbying for their interests in Balkan countries. Similar competencies, required by effective FOAs, are described for several other European countries in the research by Schmithüsen and Hirsch (2010), Mendes et al. (2011) and Weiss et al. (2011).

Research Method

Within the framework of the Central-East European Regional Office of the European Forest Institute's research projects, various types of forest owner organisations in CEE countries were investigated. Table 1 outlines parts of the European Forest Institute projects' findings with a description and analysis of FOAs in the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Romania and Slovakia. The countries were chosen based on the geographical scope, common recent history in the post-communist period, and having a significant share of private forest ownership (private, joint ownership, agricultural co-operatives, and church forests) due to restitution process started in 1990s. Poland was excluded because the country has only a small proportion of non-state forests (17 %) and the process of restitution started after year 2000.

To describe FOAs in selected CEE countries two methods for preparing the case study reports were combined: in-depth interviews and expert knowledge. The case study reports describe the general country situation regarding FOAs and the characteristics of FOAs at the national level, characterization of umbrella organizations (if in existence), types of associations, brief descriptions of chronology, key factors influencing their development, main tasks and their challenges for the future.

In the countries where many organizations of the same type existed, one successful and representative example of a FOA has been selected for deeper analysis (Table 2), i.e. the FOA with the longest existence period, largest number of forest owners or largest land area.

Table 1 Background information about the selected countries (data for 2011)

Country	Start year of political changes	Year of EU accession	Total forest cover (1,000 ha) ^a	Non-state forest (% of forest area)	Start year of FOA creation
Czech Republic	1989	2004	2,657 (34 %)	39.9	1991
Estonia	1991	2004	2,217 (52 %)	48.0	1992
Hungary	1989	2004	2,029 (23 %)	42.7	1991
Latvia	1991	2004	3,354 (54 %)	42.0	1991
Lithuania	1990	2004	2,160 (34 %)	38.6	1993
Romania	1990	2007	6,573 (29 %)	32.0	1998
Slovakia	1989	2004	1,933 (40 %)	40.6	1991

^a FAO (2010)

Source: Adapted from Weiss et al. (2011)

Table 2 Description of the data sources for in-depth interviews and expert knowledge used in the characterisation of FOAs

Country	Name of FOA	Interviewees	Secondary sources
Czech Republic (CZ)	Association of Municipal and Private Forest Owners—Sdružení vlastníků obecních a soukromých lesů v ČR (SVOL)	SVOL Secretary	Internet search and interview with other experts (representative of department of forest policy, Ministry of Agriculture)
Estonia (EE)	Estonian Private Forest Union—Eesti Erametsaliit (EEML)	Former Director and current Managing Director	Internet search, available documents of EEML and forestry yearbooks (including private forestry yearbook)
Hungary (HU)	Association of Hungarian Private Forest Owners—Magán Erdőtulajdonosok és Gazdálkodók Országos Szövetsége (MEGOSZ)	Executive Director	Strategy documents of MEGOSZ Archives of internet publications
Latvia (LV)	Latvian Forest Owners' Association—Latvijas Meža Īpašnieku biedrība (LMIĀ)	Chairman of the Board	Internet search and interview with Director of Forest Advisory Service Centre
Lithuania (LT)	Private Forest Owners of Lithuania—Lietuvos miško savininkų asociacija (LMSA)	Manager of Administration of LMSA	Internet search and interviews with other experts (Chairman) of Marijampole Regional Unit of LMSA, Director of FOA Auštatijos šilas
Romania (RO)	Forest owner association Marsani—Renasterera Padurii Marsani (RPM)	Presidents and Members of the steering committee	Experts of the public forestry authorities, legal reports of the National Forest Administration on the restoration paces
Slovakia (SK)	Association of Municipal Forests—Združenie obecných lesov (ZOL)	First Chairman, Current Chairman, and Current Executive Secretary	Internet search and interviews with other experts (Director of Forests of town Zvolen Ltd., Director of Municipal forests Brezno)

Based on available documents and qualitative, face-to-face semi-structured in-depth interviews, individual descriptions of each FOA were prepared. All interviewees (purposely selected FOA representatives) shared their experiences and provided extensive empirical data. The interviews addressed the following topics:

- Description of the FOA level and type of cooperation.
- State support for the FOA.
- Creation and development of the FOA.
- Operating system and organizational structure of the FOA.
- Functions and services provided to FOA members.
- Effectiveness of the FOA.
- Outcomes of the FOA.

Presented results were obtained by asking key informants the following questions:

1. How, when and why the forest owners' organizations was founded and further developed?
2. Why do you think the cooperation started? What were the critical aspects for the association?
3. What kind of plans do you have for the future: any mission or strategy?

Aspects which were investigated during the interviews included: start-up period, milestones from the FOA point of view, actors involved, members and their roles, various local capacities within the FOA, important developments and tasks for the organizations, financing issues, challenges for the future, and degree of satisfaction with the position of the FOA.

Results

During the last decades, the selected countries underwent similar developments in their forest sector and in the formation of private forest owners' associations. A common feature found is that no forms of private forest ownership existed under the political influence of national communist parties, and traditional ways of managing private property had been forgotten over the years during which forests were nationalised. After the political changes, the forest land restitution (or re-privatisation) process typically resulted in small, fragmented, scattered properties. Table 3 outlines the basic characteristics about the restitution processes in the selected countries.

Forest interest groups and forms of cooperation are being established, but in all the study countries private forest owners are still reluctant to join associations, mainly due to the legacy of bad experiences with imposed cooperatives in the

Table 3 Description of the restitution process (data for 2013)

Country	Total amount of national forest area restituted (ha/%)	Additional forest area for restitution (1,000 ha)	Outcomes and differences	Average size of individual private forest property (ha)
Czech Republic	1.03 M/40	170	1991 (permanent residents, all area owned after 25.2.1948); in 1996 (also for non-permanent residents); in 2000 as a mitigation for some financial damages caused by the holocaust, all together 1.03 M ha; in 2012 was new act on the church property restitutions	3.0
Estonia	946 K/35	no	946,273 ha restituted and privatised by 2010, process is more or less complete	8.0
Hungary	730 K/40	no	730,000 ha privatized, process is more or less complete	1.5
Latvia	1.75 M/50	no	1.75 M ha restituted and privatised, process is more or less complete	7.5
Lithuania	829 K/38	262	829,400 ha restituted	3.3
Romania	715 K/45	460	First phase 1991 (up to 1 ha)—362,000 ha restituted; 2nd phase 2000 (10 ha of forests)—1.87 M ha restituted; 3rd phase 2005 (all areas owned before 1948)—715,000 ha restituted	0.9
Slovakia	995 K/49	200	1991 (permanent residents, all area owned after 25.2.1948; in 1993 also church property)—994,421 ha restituted	2.9

communist period. Despite this reluctance, however, some owners soon recognized the need for the creation of FOAs (Table 1). The new forest owners discovered they had to express their interests vis-à-vis the state. Policy-makers also view FOAs as important means for having the interests of landowners represented in the policy processes and improving forest management practices.

Main Reasons for the Establishment of FOAs

The changes which took place in CEE countries at the beginning of the 1990s included organisational change in the state forestry sector, the start up of private companies, access to a globalised free market. However reduced productivity and high unemployment were also a feature in many countries. At the same time, right after the fall of communism, the first interest groups were quickly, and in different ways depending on the country, created. Nowadays, each country reports having a range of interest groups related to the forestry sector. The numbers of these groups depends on several factors, because some countries include in the total number of interest groups professional chambers, NGOs, trade organisations and even in some cases state agencies and institutions. The aims of formation for interest groups also vary between countries, but in general the following factors are shared by all of the countries in the study:

- To provide advocacy for the interests of forest owners.
- To provide advocacy for the interests of some particular group who utilise forests, for example hunters.
- To protect the forest resource from illegal timber harvesting.
- To deal with the common problems which arise in the restitution process.
- To enhance environmental protection, in the case of non-governmental organizations and state organizations.

From the examples analysed in this study (Table 2), two main reasons for establishing FOAs can be identified:

Supporting the Restitution/Privatization Process

Many new forest owners organized themselves to improve outcomes from the restitution process (which was obstructed by state forest enterprises), to secure access to management expertise for fragmented and small-sized properties, and to provide advocacy for their own interests vis-à-vis the state. Initially aimed at resolving specific problems relating to the restitution process, most of the FOAs started with a focus on one or other of these issues (based on the interviews: SVOL in the Czech Republic; MEGOSZ in Hungary; RPM in Romania; and ZOL in Slovakia).

Representing Owners' Interests with the Government

These FOAs aim to have a voice in the policy-making process. This aim is usually achieved in two ways:

- Through a top-down approach in which the government initiates (informally or formally) the creation of FOAs to provide a few representatives for many forest owners (Examples are the Council of Non-state Forest Owners in Slovakia or the EEML and some others which act as an umbrella FOA at the national level).
- Through a bottom-up approach in which owners unite themselves to become visible (based on interviews: SVOL in the Czech Republic; LMSA in Lithuania)

Current Situation of FOAs

Over time, the FOAs gathered more private forest owners as members in order to advocate their interests and rights, although in the interviews the representatives report that owners are very hesitant to join cooperatives. Many of these FOAs needed time to establish themselves as interest groups and to develop additional services for their members. Since their establishment, they have expanded the range of services they offer. The most important services are:

- Representing the interest in the higher-level institutions (including international level).
- Providing an information channel from the national level to the local level.
- Advice and education opportunity for members.
- Financial and technical support in forest management.
- Increasing market power through joint marketing.

Even though forest owners' associations in CEE countries may have focused on a limited set of activities (representing their members, and providing support during restitutions) in their initial stages, as they grew, they aspired to expand the scope of their activities. It appears that the strategic approach for these new FOAs' is leading to further structural changes, such as providing expanded services to the members, being in touch with international policy processes, and influencing domestic forestry-related policies, especially on rural development. The typical functions of FOAs are political representation on the national and international levels, information sharing, and training. However, some FOAs also offer management support and consultancy. In general, umbrella organizations (like national organisations of local FOAs) are more likely to be focussed on interest representation, as stakeholders and political actors, while regional and local groups are usually focussed on business cooperation, and also provide technical support and knowledge. Information provision can be through: (1) internal information sharing; (2) public information services, such as awareness raising; and (3) education and knowledge transfer for members, facilitated by the FOAs' own staff or in collaboration with government, academia, and other joint ventures.

The survival of the FOAs in the long-run seems to depend largely on having sustained government support, either through monetary incentives and supportive regulations (as in the Czech Republic), or through government's continuing need to have a single representative for policy negotiations (Slovakia). An example for non-

sustained government support was found in Hungary where FOAs encountered serious financial difficulties when governmental financial support ended. Nowadays the main concerns for FOAs' lie in conceiving and implementing state policies dealing with private forestry (EU and national support measures for private forest owners) and development and revision of existing regulations in terms of private forest owners' interests. With EU accession, FOAs gained the opportunity to draw financial resources from European funds. In the Czech Republic during the years 2004–2006 there was for example a special sub-measure for forest associating owners in the Operational Programme for Rural Development and Multifunctional Agriculture. This sub-measure was designed to support the establishment and equipping of business offices for associations. This included information technology hardware and software, and providing for such items of equipment necessary to facilitate the work of the associations in next 5 years. Unfortunately there were no applications for this support, which perhaps demonstrates that the top down approach alone is unlikely to be successful without interests from the forest owners. Countries in this study have reported no more measures focussing directly on creating associations during the EU RDP planning period (2007–2013), but FOAs are favoured subjects in all forestry measures implemented through national Rural Development Programs (e.g. during the evaluation of eligibility of support from RDP in Slovakia and Czech Republic).

Unification or Diversity of FOAs in Selected Countries

In all of the countries studied small forest properties predominate and hence forest ownership is very fragmented (Table 3). In some countries (Hungary, Slovakia, Romania) the situation is even more complex due to a large amount of forest land in joint ownership. The private forest owners are often unable to manage their forests properly because of a backlog of necessary operations, lack of equipment, weak legislative support and inadequate management skills. In many cases they are unable to provide all of the information required to justify their claims (this being a reason why the restitution process is still continuing). The management of a small forest area is usually less cost-effective and most suitable as complementary activity to farming. Another alternative for small forest owners in the CEE countries is to join a free association with an aim of acquiring the principles for management model, focusing on ordinary management of forests, including trade activities and the use of possible support.

Differences among countries in regard to the main characteristics of FOAs can be traced to many different points (Table 4). Most FOAs were created as NGOs or voluntary organisations and do not own any significant amount of property. In some cases they are founded as non-profit organizations mainly to make them eligible for tax exemptions (Lithuania, Romania). In the Czech Republic or Slovakia FOAs are civil organizations. Larger FOAs (operating at the national level) are able to support their members in different ways (lobbying, services). The most frequent types of services provided by FOAs are education, training and advice. The political representation of members' interests is another major function of FOAs. The involvement of FOAs in policy-making processes often results in some or all of

Table 4 Overview of the main characteristics of FOAs

Country	CZ	EE	HU	LV	LT	RO	SK
Top down support for the creation of FOAs	x	x	x			x	
Nationwide umbrella organization		x				x	x
Representing owners' interests within government	x	x	x	x	x	x	x
International cooperation	x	x			x	x	x
Services provided to members:							
Education, training and advice	x	x	x	x	x	x	x
Marketing of wood and non-wood products	x	x		x	x	x	
Forest certification	x		x				x
Insurance of forests						x	
Support for members to obtain national or EU funds for forest management or design of forest management plans		x	x	x		x	x

their proposals and requests being included in policy texts. Member-only services also provide an incentive for joining an organization and paying membership fees, reducing the number of free-loaders who benefit from those activities. Joint economic activities of members and marketing of wood and non-wood products is also a common function but it is not a clear driving force in FOAs. The importance of these services will probably increase in the future.

Regarding the tasks and aims of FOAs, some examples of bottom-up cooperation towards sharing of information on EU or national support for forest management can be identified. However, there is little evidence of real integrated management, and no examples of equipment sharing or financial cooperation. The involvement in cooperation at national or international levels differs from country to country, depending on local interests and possibilities (e.g. EEML is member of the Confederation of European Forest Owners, the International Family Forestry Alliance and The European Landowners Organization).

Conclusion

Structural changes in the political, social and economic environment are often the catalyst for the emergence of a FOA (Mendes et al. 2011), which proves also to be case in the CEE region. After the fall of the communist regimes and with the start of restitution processes, FOAs as a form of organisation in forestry started to become active. However, FOAs in the CEE counties are still not well developed and not very well organized. In selected countries FOAs still do not represent the majority of forest owners or of forest land, and do not have a direct impact on the management of the members' forests.

Since the creation of the first FOAs in the 1990s, their position has been slowly changing. FOAs are now focused more on interest representation, while only a few examples remain focused on forest management support. These two foci are in

many cases overlapping, as is common in many European countries outside the CEE area. The influence of FOAs on timber sales, and participation in commercial activities, is still less developed in the CEE region, compared to northern European countries (e.g. in Scandinavia; Mendes et al. 2011). In general, beside their main focus, all FOAs are developing a range of services for their members, but the survival of FOAs and their success depends on both: (1) political acceptance and support, and (2) services for members and visible success in influencing policy. Already established FOAs in those CEE countries are oriented towards further development of their activities even though they are still facing challenges. It is clear that they have definitely strong representative and demonstration effect in their countries.

Further research which compares the experiences of CEE nations against other, more established FOAs in Europe would be valuable. However this would require more detailed analysis, which was beyond the scope of this study.

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Forest owners' cooperation in Estonia: the role of formal institutions

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Abstract

The process of restitution and privatization has been the cornerstone of the Estonian private forest sector during the last two decades. It has resulted in a high number of forest owners and therefore also fragmented ownership which might make sustainable forest management questionable. Different sustainability issues have been raised both by policy-makers and researchers. Volunteer forest owner associations (FOA) might be possible solutions to join small-scale forest owners together and make forest management more viable and profitable. But only 6% of forest owners are members of these organisations and membership is growing strenuously. In order to advance cooperation the government has taken a number of steps. The paper looks at these steps, formal policy processes and regulations that influence the development of forest owners' cooperation. This is done by exploring the changes from an institutional analysis perspective. It is found that regardless of the voluntary nature of cooperation the state uses several regulatory tools and has economic incentives to encourage cooperation and FOA membership. Such organisations are seen as means for implementing policies in a both short and long term. In a transition country path dependency plays an important role in such developments.

Keywords: *forest owners association, policy tools, forest policy, private forest ownership*

1. Introduction

Forestry involves large land areas and long time periods for the supply of different goods and services. A continuous and sustainable flow of these goods and services is a prerequisite for the industry as well as for the overall welfare. From an economic perspective this flow is dependent on ownership and appropriate institutions.

In Estonia, land restitution and privatization processes began in 1993 aiming to reconstitute and privatize more than half the forests in the country (Meikar and Etverk, 2000). Today 97,000 private forest owners (93,000 individuals and 4,000 legal entities) in Estonia are major resource holders covering 1 million hectares of forest out of the overall 2.2 million hectares (Forinfo, 2011; Yearbook Forest 2013, 2014). While private ownership of forest resources is relatively new in Estonia there are several key issues that have been raised. For example Hain and Ahas (2005) suggest that between 1998 and 2003 a large share (>50%) of harvesting activities in private forests were linked to some type of legal violations. Also, high logging rates (in 1999–2002), insufficient forest regeneration, weak management and fragmentation have been outlined both in research (Urbel-Piirsalu and Bäcklund, 2009) and policy documents (National Forest Programme 2011–2020, 2010). In Estonia, 56% of private owners have forest properties up to 5 ha (Forinfo, 2011). This indicates high ownership fragmentation and such fragmentation may lead to inefficient forest management (Schlueter, 2008), as small holdings have usually no continuous management (FAO, 2012).

Forest owners associations (FOA) are seen in forest policy as a possible solution to boost small-scale forest owners' cooperation. This could enhance the profitability of small-scale forest management, but also continuously provide landowners with relevant information and forestry knowledge. Although the first FOA was established in Estonia already in the early 1990s, FOA membership is not prevalent in Estonia as only 6% of forest owners are FOA members (National Forest Programme 2011–2020, 2010).

To promote such membership policy tools can be used. However, so far, research on this topic has mostly been concentrating on understanding the behaviour or characteristics of forest owners. For example Põllumäe et al. (2014a; 2014b) found that FOA members in Estonia differ quite significantly from non-members i.e. members are usually forest owners with larger holdings (as also found by Rickenbach et al., 2005) and they are more oriented towards generating income. Berlin et al. (2006) found similar differences in the Swedish context, comparing not only members with non-members, but also looking at their residency. In either case they found members being more interested in forestry income. There are also studies which focus on policy preferences (Janota and Broussard, 2008; Schaaf and Broussard, 2006) and different instruments (Lazdinis et al., 2005a; Serbruyns and Luyssaert, 2006). For example Schaaf and Broussard (2006) conclude that in Flanders only a small minority of forest owners are interested in cooperation.

Institutional analysis approach assumes that it would be relevant to view forest owner cooperation from both informal and formal perspectives. As Põllumäe et al. (2014a) have already explored some of the informal institutions in Estonia, this paper focuses on the formal institutions of cooperation. The aim of this paper is to analyse the developments in forest owner cooperation in a formal forest policy context. The formal rules-in-use are described and their influence and importance is discussed.

2. Theoretical background

2.1. What are institutions?

From a neoclassical point-of-view institutional elements are simple – i.e. property rights and markets. The development of economics has significantly broadened these understandings. Institutions are foundations that make up the social life, or as North (1990) puts it, “*the rules of the game in a society*”. Institutions are “*the prescriptions that humans use to organize all forms of repetitive and structured interactions*” (Ostrom, 2005). Pejovich (1998) defines it as “*the legal, administrative, and customary arrangements for repeated human interactions*”. Institutions form and determine the success of policies and development. The key question is about the appropriate institutions for economic development to take place (Steer and Sen, 2010). Institutions that people use are formal and informal, i.e. they are either written-down rules or have a more abstract context, e.g. customs, values, beliefs. Formal institutions have a certain legal status and clear objectives, e.g. the Forest Act. Informal institutions have no legally binding status. Institutions are used in many cases simultaneously, but they can be also contradictory to one another. For example, a forest owner has to keep in mind the formal institutions (the Forest Act and its regulatory acts) before deciding to clear-fell a stand. Regulations must specify which species are allowed to be cut and how large the clear-cut area may be. At the same time the forest owner might have their own informal institutions (e.g. values and objectives) which might not be in line with the formal rules. Inverse situations could also be present. In fact there is a significant amount of literature which suggests that forest owners are very diverse both in their needs, values and management objectives (Bengston et al. 2011; Boon and Meilby, 2007; Dominguez and Shannon, 2011; Finley and Kittredge, 2006; Hugosson and Ingemarson, 2004; Karppinen, 1998; Kendra and Hull, 2005; Kuuluvainen et al., 1996; Lazdinis et al., 2005b; Majumdar et al., 2008; Mizaraite et al., 2010; Ni Dhubháin et al., 2007; Pivoriūnas and Lazdinis, 2004; Põllumäe et al., 2014b; Rickenbach et al., 2005). While owners still harvest timber from their forests, management for economic benefits is not often the main objective for most landowners (Blinn et al., 2007). The role of institutions is therefore to enable activities, but also prevent or forbid certain activities. Institutions should provide the smooth functioning of an economy (North, 1990).

Formal institutions in principle are quite similar to informal ones. The key difference comes out when looking at institutional change. According to North (1990) formal institutions are based on the informal ones and both of them evolve within the social sphere (Casson et al., 2010). In a democratic system therefore, it could be simplistically assumed that formal institutions are the reflections and modifications of informal institutions of the majority. “Path dependency” is therefore one thing that is often used to characterize institutions (North, 1990) meaning that the decisions of today are going to influence the decisions in the future. Peters (1999: 63) puts it as “the legacy of the past”. On an individual level the informal institutions might matter more to a person than the formal ones. Williamson (2000) illustrates this well with four different levels where institutions function. All the informal institutions are on the top level and they are characterized with low frequency, i.e. they change slowly over time and get their input from the lower levels. In this paper we are more concentrated on the levels which include formal institutions e.g. property rights, laws, various regulations, policies etc. These formal institutions are influenced by the informal institutions, but also by the institutions on the lowest level (e.g. markets). Behera and Engel (2006) look at the evolution of joint forest management in India and conclude that an integrated study of all these levels is an important venue for future research. Torniainen and Saastamoinen (2007) look also both at the informal and formal levels of institutions regarding the regulations of forest lease in Russia.

2.2. Policy and its instruments

Policies aim to direct and influence a target (population) towards a desired behaviour. They are bundles of self-interest that people have compromised on. Forest policy includes for example standardized public goals to utilize and protect forest ecosystems and it provides the tools to reach these goals (Krott, 2005). Thus, policies depend on e.g. social values, the types of forest goods and services and the economic value of these benefits (Cubbage et al., 2007). National forest programmes, forest acts and other sub-regulations that come from the latter are therefore rooted in the overall national policy.

Policy instruments are used to implement policies and reach policy objectives. There are different types of instruments that are used in environmental policy. Böcher (2012) explains instruments through state intervention: there are regulatory instruments with a high degree of state intervention and informational instruments where the importance of the state is very low. In between there are also cooperative instruments (e.g. certification) and economic instruments (e.g. taxes and subsidies).

Another way to divide the instruments is using the “sticks, carrots and sermons” approach (Serbruyns and Luyssaert, 2006). In this distinction *sticks* refer to regulatory tools, *carrots* to financial tools, and *sermons* to informational tools. It is also important to notice that the choice of tools depends on also which type of forest land is being influenced. Schaaf and Broussard (2006) suggest that public forest policies are mostly regulatory while private forest policy uses tools that are more informational. Some studies support this suggestion and conclude that owners accept tools that do not involve major changes in management practices (Serbruyns and Luyssaert, 2006). Policy implementation is therefore a difficult task in private forestry considering the wide array of forest owners’ characteristics. Policy instruments have to be therefore also diverse and formulated in a way that different groups are addressed (Pregernig, 2001).

2.3. Property rights

While it might seem that property rights are rather simple phenomena, Acheson and Acheson (2000) draw on the growing literature that it is way complicated than it seems. Property rights are broader agreements of society and therefore they also evolve due to political, economic and social change (Irimie and Essmann, 2009). They enable interactions and transactions in a way that all parties in these situations understand one another. Harold Demsetz (1967) illustrates this as, “*In the world of Robinson Crusoe property rights play no role*”.

A property system has to be established, monitored and enforced (Ostrom and Hess, 2008). In understanding the relations between land use, resources and property rights Rodgers (2009) distinguishes two different models. The first one is focused on the legitimacy of proper entitlements and the second one on resource allocation. The first part forms the fundamentals of “ownership” with its abstract approaches to rights and property and focuses on the legally protected right to exploit and use the land (Rodgers, 2009). The second model focuses on utilization rights and is based on what the law allows. A property right transfer occurs when the law modifies resource allocation utility. This approach is mostly used to internalise negative externalities. Also, much of the literature about natural resources and property rights focus on the “competition” of private and common ownership (see Demsetz, 2002; Ostrom and Hess, 2008).

From a cooperation perspective these questions are important. For example, in some cooperative forms no exchange of property rights occurs while in many cases some rights might be issued to third parties (e.g. joint ownership). An FOA might obtain the right to sell timber of forest owners or manage forest on behalf of a member. Such arrangements within a cooperative unit, e.g. an FOA might significantly influence the success and range of cooperation.

2.4. Technological advancements

Technological advancements (information and communication technology (ICT), public databases and services etc.) may serve as the basis for cooperation as well as enable a more individualistic approach to forest owners. Joint procurement of services and timber sales can be supported by the web environment and appropriate consulting services. Ostrom (2011) also stresses that technological changes influence the events to which agreed rules ought to apply.

3. Objectives and methods

The paper follows a case study approach as firstly we consider the context in which these policy processes occur. Secondly we deal with a variety of sources as we use both qualitative and quantitative data (Yin, 2003). As our aim is not to generalize, we attempt to particularize. The objectives of this paper are to identify:

- how forest owners’ cooperation is reflected in the formal forest policy;
- how the key parts of the arrangement of property rights might influence FOA membership;
- which policy instruments target cooperation between forest owners and;
- how the rules-in-use in the forest owners associations reflect the developments of forest owner cooperation.

Our data collection methods include literature review, document content analysis and official database inquiries. To reach the objectives of the paper the following documents were reviewed and analysed:

- National Forest Policy (1997);
- National Forest Programme until 2010 (2002);
- National Forest Programme 2011–2020 (2010);
- Implementation Plan for the NFP 2012–2020 (2012);
- Forest Act (2006) and its implementing provisions;
- Law of Property Act (1993);
- The foundation statutes of 24 different forest owner organisations (Appendix A).

4. Results

4.1 Forest policy

The start of formulating a national forest policy in Estonia was initiated in 1995 by the State Forestry Department who was under pressure to do so from different stakeholders in the sector (Kallas, 2002). One of the targets was the implementation of sustainable forest management i.e. to meet international agreements, e.g. the requirements made by the Ministerial Conference on the Protection of Forests in Europe (MCPFE). After negotiations between relevant stakeholders the policy document was given to the parliament for approval and by June 1997 Estonia had its first National Forest Policy (1997).

With this policy two primary goals were set:

1. Sustainable forest management i.e. the care and use of forests and forest land in a way and rate that maintains their biological diversity, productivity, regeneration capacity, vitality and potential now and in the future to fulfil ecological, economic and social functions at the local, national, and global levels.
2. Efficient management of forests i.e. the efficient production and use of all forest-related benefits.

The third part of the policy deals with forest ownership and states that forest land owners in Estonia can be both individual persons and legal persons (firms, companies, NGOs, etc.). It also stipulates that due to restitution the emerging forest ownership is of small-scale. Because of that it is important to increase the effectiveness of forest management so the state will help to create larger management entities by supporting forest owners' joint activities, cooperation and land use planning (National Forest Policy, 1997). In special chapter "Private forestry" the policy document underlines also that the state supports private forestry and does it through forest owners organizations. It is also stressed that this support is mainly given by planning activities and advisory services.

For the implementation of this policy the Ministry of Environment initiated the drafting of a long-term development plan in 1999. In 2002 the first National Forest Programme until 2010 (2002) was ready and approved. Among six different problem areas the need for a private forest owner support system was identified. Also fragmentation was already recognized in several ways and this problem was addressed mainly by changing the regulations for restitution and privatization. Regarding the use of private forest and private forest land the following key points are underlined in the National Forest Programme: there is a weak desire for investments (by forest owners) and there is a gap in the inventory data. The programme also marks the use of a special foundation which has been formed by relevant ministries, the forest industry and forest owners organizations. The foundation is called the Private Forest Centre (www.eramets.ee) and it operates under the Ministry of Environment. Its main function is the distribution of both state and EU support to forest owners. However, cooperation had a very low priority in the NFP until 2010.

In 2010 a new National Forest Programme 2011–2020 (2010) was approved. Compared to the previous programme a lot of effort is put on forest owners' cooperation and joint management. Yet some old issues re-emerge, as well: lack of timely inventory data for private forests and lack of interest in regeneration activities. The document also underlines that there is no clear overview on forest ownership and the needs of forest owners. The importance of cooperation is firstly mentioned under the topic of the non-wood use of forests. It underlines that the influence and profitability of that topic is closely linked to cooperation for product development and marketing. Three areas of activities are identified:

- advisory services to and training of forest owners about the potential of non-wood products;
- support for restoring and exposing objects with historic values;
- support for the non-wood use of forests.

Regarding competitiveness of the sector forest owners' cooperation is in the spotlight. The NFP 2011–2020 (2010) establishes straight-forward goals: 500,000 ha of private forests should be covered by owners with FOA memberships (baseline 150,000 ha) and during the 10-year period these forest owners should put 5 million m³ of wood on the market (the baseline is 65,000 m³). It is concluded that it would be reasonable to market the wood in a jointly coordinated way. The measure to achieve this is based on “*the increased efficiency of private forest management and the support for a private initiative based sustainable cooperative support system*”. This refers to the network of FOAs, consultants and other relevant parties. The following activities are being underlined for improving forest owners' cooperation:

- The taxation system is analysed and improved so the fair taxation of private individual forest owners is secured and the interest in forest management improved;
- Support is given to product development, investments in the industry and to the improvement of knowledge;
- Improvements to support measures on obtaining inventory data should be done in order to support more private individuals and provide advisory services through FOAs;
- Develop the Private Forest Centre into a centre of competence;
- An outcome-based system for joint wood sales is developed and implemented;
- An integrated forest management advisory system is implemented;
- Performance targets for the advisory services are set; chargeable advisory services are developed.

Table 1. Overview of forest owners' cooperation throughout policies

National Forest Policy (1997)	National Forest Programme (2002 and 2010)	Forest Act (2006)
Sustainable forest management and efficiency as primary goals	The NFP (2002) indicates the need for a support system. No specific points given regarding cooperation. Even more, supporting cooperation is low in priority.	The definition of a forest owner association was given in 2004
“In order to increase the effectiveness of forest management, the state will help to promote and create larger management entities by facilitating forest owners' cooperation and land use planning”.	The NFP (2010) takes the cooperation problem to another level as clear targets are set. The desire for a self-sufficient system can be identified.	A special article introduced to the Act dealing with the support of private forestry including “forest owners' forestry-related cooperation”.
Financial support needs are highlighted with the main focus on forest inventories, planning and advisory services	[To achieve the utilization targets] “the increased efficiency of private forest management and the support for a private initiative based sustainable cooperative support system” [is needed].	

Some of these principles mentioned above were introduced quite quickly into the legislation (table 1). For example in the Forestry Act (2006) there is a special article (10) which deals with the questions of support for private forestry. According to the act, supporting private forestry is one of the many tasks the state has in forestry (Forestry Act, 2006, section 6). Section 10 of the act is dealing with support activities; sub-section 4 indicates that support is given to “forestry-related joint activities of private forest owners”. The same section indicates that support can be given also to forest associations¹. In this context the association definition is also given in the section (the definition was first introduced in 2004): “For the purposes of this Act, forest association is a non-profit or commercial association whose activities as specified in the articles of association include forest management and whose members are natural persons or legal persons in private law who have forest land.”.

4.2. Property rights

For a long time different property rights aspects concerning forests and forest land were covered by the Law of Property Act (1993). With older versions of the act third parties had access to unlimited or unmarked private property (for extracting non-wood products) if they did not harm excessively the owner's interests. This could be done between sunrise and sunset. The concept of everyman's right was re-arranged in 2014 into the Act of Environmental Code (2014) and some rights were clarified. Similar principles are also applied in Finland (Pouta et al., 2000). The Law of Property Act (1993) also defines *usufructs* and the setting of ones. In the forestry sector usufructs are not very common mainly because

¹ Depending on the support measure also private forest owners and forestry consultants are eligible.

in recent history there have been some cases where the forestry company (the *fructus*) had supposedly abused the lack of knowledge of the forest owner (the *usus*).

There are no obligations or requirements for the forest owner to give away or delegate some rights linked with the forest property in the event of joining a cooperative body. At least in the reviewed FOA cases there were no such requirements. Yet, such arrangements could be possible according to the legislation. Mostly in the light of forest owners' cooperation the question of property rights comes into play when harvesting decisions are being made. Depending on the specific transaction the rights are divided differently. For example if the forest owner sells the right to harvest he/she gives away the right to extract wood to the FOA i.e. access, withdrawal and management rights change possession.

4.3. Policy tools

The National Forest Policy (1997) highlights the need for financial support for forest owners. The NFP until 2010 (2002) indicates that support is mainly given to make forest inventories, form pathological expert opinions, carry out regeneration activities, and provide management advice and extension. It also underlines that the advisory system does not work properly due to the lack of a clear purpose of the activities. This was due to the separateness of FOAs and state-financed consultants who were responsible for the advisory services. In some cases FOA leaders and consultants overlapped but in general the system encouraged the existence of two parallel systems. While efforts have been made to integrate the two so that FOA consultants and professionals could take over the functions of the state the system is still financially supported. Since 2014 the support for advisory services is given not to the consultants but to the FOAs who have agreed on working arrangements with independent consultants.

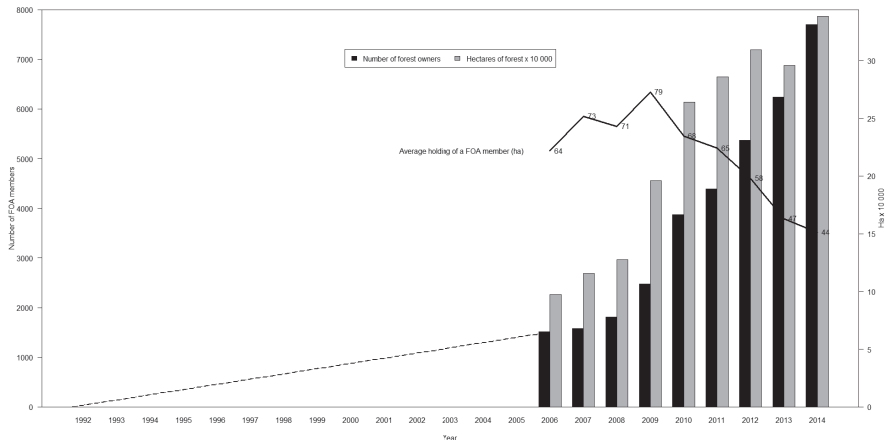


Fig. 1. FOA membership changes between 1992 and 2014 (Data²: Estonian Private Forest Union, 2015; Private Forest Centre, 2015).

² First FOA emerged in 1992 (Sarvašová et al., 2014), but up to the year 2006 there was no information found about the membership of FOA-s. Data between 2006-2008 is based on the archive membership data from the Estonian Private Forest Union. The data from 2009-2014 is based on the FOA reports issued to the Private Forest Centre.

A specific measure for supporting forest owner cooperation is the “FOA support” (regulated with the supplementary regulations of the Forest Act (2006)) which started in 2009. The support includes group consultancies (e.g. seminars, lectures), forestry-related cooperation (i.e. joint wood sales for 1.554 €/m³), general activities of FOAs (a flat rate per member) and the establishment and development of a training site (“school forest”). The NFP 2011–2020 (2010) indicates that 80% of the expenditure of FOAs is covered by financial support from the state. With the new programme directions have been taken to decrease the amount of public support on a year-by-year basis. Also, in order to be eligible FOAs have to meet a number of criteria (e.g. membership quotas) and since the support is decreasing FOAs have started to compete with each other. For example the Private Forest Centre has developed a special performance metric which is then the basis for giving the FOA support. These changes have already encouraged the consolidation of some FOAs. Another measure to increase the interest of forest owners in FOAs is that all the state aid that is meant for private forest owners will be distributed only to FOA members. FOA membership has tripled since the beginning of the FOA support scheme in 2009. The total forest area covered by FOA members has increased by 57% and the average forest holding of a member has decreased from 78 ha to 44 ha (figure 1). The latter phenomenon can be explained by smaller forest owners joining FOAs more in recent years.

Table 2. The main policy tools for promoting cooperation (according to the distinction by Böcher, 2012)

Informational instruments	Cooperative instruments	Economic instruments	Regulatory instruments
Direct mailing to forest owners (leaflets, etc.)	Joint timber sales	Annual public support for FOAs’ costs	FOA definition (2004) Forest owner definition (includes both individuals and companies)
Informational projects in the media financed by the state. Information days.	Joint equipment and machinery	State supported consultants providing advisory services.	Step-wise regulations to decrease public support – performance metrics, membership quotas, etc.
Websites (i.e. www.eramets.ee)	Web portal for timber sales and procurements	State support measures for forest owners only through FOAs (membership needed).	

← Lower degree of state involvement Higher degree of state involvement →

Some informational instruments are also present. Mostly these instruments are managed and arranged by the Private Forest Centre. These include their website (www.eramets.ee) where a map of FOAs can be found. They have implemented direct mailing to forest owners and participated in organising media campaigns. Together with some FOAs various information days are organized, but these tend to take place occasionally. A synthesis table (table 2) about the policy tools is provided.

4.4. Forest owners associations

It was identified that only one FOA (5%) was a cooperative (i.e. a profit-oriented organisation acting under the Commercial Associations Act) and 23 (95%) of FOAs were non-profit organisations. Also membership in all cases did not involve special transfers of property rights regarding forests. In the one cooperative case, there was a possibility to make a non-monetary contribution to the share or capital which gives the forest owner potentially a possibility to use his/her forest to cover the required share. However it could be assumed that this was more of a theoretical possibility. In some cases the review of the statutes of FOAs brought out that a uniform draft has been the basis for several statutes. The definition of an FOA provided by the Forest Act (2006) is the following: “forest association is a non-profit or commercial association whose activities as specified in the articles of association include forest management and whose members are natural persons or legal persons in private law who have forest land.” During the review of the statutes several cases were found where membership requirements were looser than those imposed by the Act. For example in some cases the ownership of a forest is not explicitly mentioned. In at least one case it is indicated that “people who own forest or are interested in forestry can be members of the union”. In another case “every individual or legal entity can be a member of the association who participates actively in the implementation of the objectives of the association and follows the statutes”. How much has this influenced the membership of these FOAs remains unclear.

By looking at the number of FOAs and the developments in recent years it is clear that in many cases either FOAs have terminated their activities or merged to be eligible for state support. For example when in 2009 the Private Forest Centre counted 54 existing FOAs in Estonia then in 2014 they had up-to-date information about the membership and coverage of 27 FOAs (Private Forest Centre, 2015). The number of existing FOAs in Estonia is currently around 35.

5. Discussion

Forest owners’ cooperation has been in the spotlight since the re-establishment of private forest ownership. Yet its degree of importance has varied quite significantly. When already in 1997 the importance of “[...] effectiveness of forest management [...]” and “larger management entities by facilitating forest owners’ cooperation and land use planning” was outlined the first national forest programme did not reflect on the issue that much. Nevertheless during the 2000s several steps were made (e.g. defining an FOA by the Forest Act and allocation of financial support) to encourage the development and cooperation of FOAs. Furthermore the new forest programme until 2020 has set even higher expectations for both forest owners and FOAs. Clear targets are set – an increase of ~70% in FOA membership regarding the area covered from a baseline 150,000 ha to 500,000 ha. And joint wood mobilization during the 10-year period should reach 5,000,000 m³. In addition goals and requirements are set for FOAs: there is a threshold for the number of members, which is increasing year by year, and performance metrics which are used to evaluate FOAs. All this is required if an FOA wants to be eligible and apply for public support. It is not mandatory, yet in many cases it is deeply needed if the FOA strives to function in a long-term perspective. The whole model seems to operate on the assumption that forest owners are interested in forest management so the main focus is put on wood mobilization. Kittredge (2003) described the situation in Sweden quite similarly i.e. cooperation is not based on other objectives such as habitat improvement or recreation.

Considering the set-up of most of the FOAs in Estonia it is evident that forest owners’ cooperation has developed in a careful way. With the decision of becoming an FOA member, the forest owner remains the sole owner of his/her property. Also no other rights transfer in the process (e.g. utilization or extraction rights). The concept of everyman’s right which is protected by law and enables open access

to a private property for recreational purposes still exists and it is not influenced in any way by the FOA membership status. The only case where some rights are exchanged is when an FOA member decides to harvest and do this in a commercial way (not on their own). With a contract with an FOA the right to extract and utilize is delegated and given away.

While general policy directions are clear and evident the state uses several tools to implement these policies. One important implementation body is the Private Forest Centre which is a state foundation acting under the Ministry of Environment. While they are using several different informational tools for promoting FOAs they are also responsible for all national (and partially EU) public support measures. And indeed the significance of various regulatory (addressing both the concept and development of an FOA) and financial tools (subsidies and public support) is quite apparent in the Estonian case. While it is often stressed that such cooperation between forest owners is a private initiative and based on volunteer agreements according to the approach of Böcher (2012) the amount of state intervention and influence is rather large. Policies and policy implementation in Estonia might not be in line with the recommendations and findings of Schaaf and Broussard (2006) and Serbruyns and Luyssaert (2006) that private forest policy tools should be more informative than regulatory. While our national forest policy document recognizes that there is a lack of knowledge about forest ownership and the needs of forest owners (National Forest Programme 2011–2020 (2010)) the choice of instruments is most probably influenced by this knowledge gap. Therefore the most suitable instruments might be rejected or set aside. Also it might not only be the case of incomplete information, but also a case of path dependency of institutional developments. “The legacy of the past” (Peters 1993: 63) in the Estonian case is a centrally controlled Soviet system with a very high degree of state involvement. This would suggest that the arrangements we have today in FOAs and in cooperation are already influenced by the decisions taken in the beginning of the 1990s which were also influenced by earlier times (figure 2). The third aspect might be power relations. While looking at the Western Balkan Region, Glück et al. (2010) suggest that FOA developments depend quite a lot on the decisions of ruling policy-makers. At the same time the formation of strong organizations creates new power and initiates change in power relations. But as Kittredge (2005) underlines without an outside governmental influence or inspiration there might be no developments in cooperative movements.

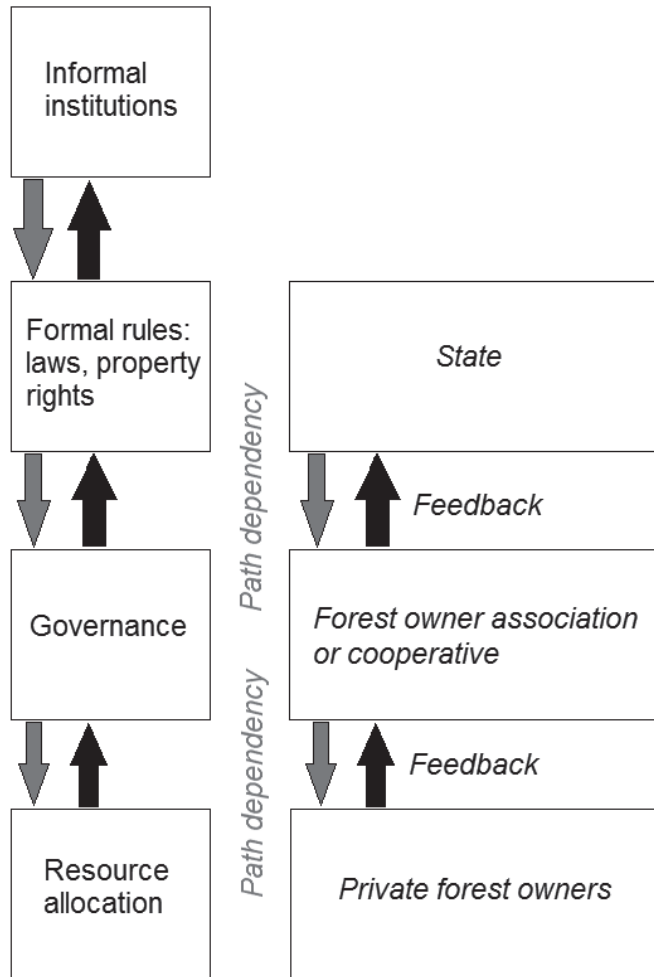


Fig. 2. Levels of institutional analysis in forest owners cooperation context (modified from Williamson, 2000).

As literature suggests forest owners are very diverse in their needs, values and management objectives (Bengston et al., 2011; Blinn et al., 2007; Boon and Meilby, 2007; Dominguez and Shannon, 2011; Finley and Kittredge, 2006; Hugosson and Ingemarson, 2004; Karppinen, 1998; Kendra and Hull, 2005; Kuuluvainen et al., 1996; Lazdinis et al., 2005b; Majumdar et al., 2008; Mizaraite et al., 2010; Ni Dhubbáin et al., 2007; Pivoriūnas and Lazdinis, 2004; Põllumäe et al., 2014b; Rickenbach et al., 2005). Management for economic benefits is not often the main objective anymore. It seems that the current policy developments in Estonia fail to consider these processes in forest ownership. Rather, the focus is mainly on timber utilization, effectiveness and efficiency. Even more the lack of utilization and efficiency in small-scale forestry legitimises the intervention of the state. In the German case this is also pointed out by Schraml (2005). Even more, Schraml (2005) specifies two aspects which describe FOAs in Germany and which also characterise the situation in Estonia: a) associations are criticised for inefficiency and b) their central role is the implementation of forest political concepts. Brabänder (1981) adds to this that “Government forest policy uses co-operatives as a tool to improve the different effects of woodland to the public in general”. In the Estonian case the National Forest Policy 2011–2020 (2010) stipulates that “The support system must be capable of fulfilling short- and long-term tasks given by the state as administrative or partnership agreement” making us question if FOAs themselves are policy tools.

6. Conclusions

This paper focused on the formal institutions that influence and shape the situation of forest owner cooperation in Estonia. Encouraging forest owner cooperation is often seen as a good solution to minimize various negative externalities and encourage the utilization of different forest-related benefits. On a small scale it could be potentially costly to act on one’s own. The following conclusions, notes and remarks are drawn:

- With the development of restitution and privatization the importance of cooperation has increased during the past two decades. This is reflected also in the formal rules that govern private forestry, e.g. the developments between the two national forestry programmes.
- The importance of the state is difficult to underestimate. Although forest owners’ cooperation is based on volunteer participation the state has several regulatory and economic incentives to encourage cooperation and FOA membership. These influence directly both forest owners (with some state aid given only to FOA members) and FOAs (strict membership quotas and performance targets to fulfil in order to get state support).
- FOAs are seen by the state as organisations that can be used to implement policies in a both short and long-term perspective.
- Even though FOAs have emerged in the light of volunteer initiatives the developments suggest a more “top-down” direction of the future development process. In order to survive FOAs have to struggle. The importance of path dependency is quite evident as we consider the Soviet history of very strict state intervention.
- The relationship between forest owners and FOAs are limited with only modest obligations (e.g. membership fee). The level of responsibility is quite low as there is no transfers of property rights (when becoming an FOA member) is involved.
- Cooperation is largely reflected and seen in the form of joint wood sales. This is considered the primary function and goal of forest associations.
- Also advisory services are indicated as an important function of FOAs. At the same time with

the introduction of performance metrics to the system it is somewhat pressured that management actions follow the advice.

These results could provide some useful outputs in other areas, especially in other post-socialist countries where private forestry initiatives are still emerging.

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Appendix A³

The following FOA foundation statutes were reviewed (in alphabetical order):

- Ambla Forest Association (*Ambla Metsäühistu*),
- Society of Estonian Private Forests (*Eesti Erametsade Selts*),
- Estonian Forest Association (*Eesti Metsäühistu*),
- Hiiumaa Forest Association* (*Hiiumaa Metsaselts*),
- Central-Estonian Forest Owners (*Kesk-Eesti Metsaomanikud*),
- Kohila Forest Society (*Kohila Metsaselts*),
- Läänemaa Forest Association (*Läänemaa Metsäühistu*),
- Forestry Development Association (*Metsanduse Arendamise Ühing*),
- NGO Minu Mets (*MTÜ Minu Mets*),
- Palamuse Forest Society (*Palamuse Metsaselts*),
- Põlva Forestowners Association* (*Põlva Metsaomanike Selts*),
- Pärnumaa Forest Owners Society (*Pärnumaa Metsaomanike Selts*),
- Rakvere Forest Association (*Rakvere Metsäühistu*),
- Saaremaa Forestry Society* (*Saaremaa Metsäühing*),
- Tallinn Forestowners Association* (*Tallinna Metsaomanike Selts*),
- Valgamaa Private Forest Association (*Valgamaa Erametsäühing*),
- Vardi Private Forest Society (*Vardi Erametsaselts*),
- Viljandimaa Forest Society (*Viljandimaa Metsaselts*),
- Virumaa Forest Association (*Virumaa Metsäühistu*),
- Visa Forest Association (*Visa Metsäühistu*),
- Vooremaa Forest Association (*Vooremaa Metsäühistu*),
- Võrumaa Forest Owners Union (*Võrumaa Metsaomanike Liit*),
- Vändra Forestry Society (*Vändra Metsäühing*),
- *United Forest Owners (Ühinenud Metsaomanikud)*.

3 The names in brackets are in Estonian. In their statutes only a few organisations mentioned their official English names. These organisations are marked with an asterisk. Others are translations by the authors.

CURRICULUM VITAE

First name: Priit
Surname: Põllumäe
Citizenship: Estonian
Date of Birth: 27.01.1987
Address: Institute of Forestry and Rural Engineering,
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Education:

2010-2015 PhD studies in forestry, Institute of Forestry and Rural Engineering, Estonian University of Life Sciences
2008-2010 Master studies in forest management, Institute of Forestry and Rural Engineering, Estonian University of Life Sciences
2005-2008 Bachelor studies in forestry, Institute of Forestry and Rural Engineering, Estonian University of Life Sciences
2002-2005 Viljandi IV Secondary School
1997-2002 Viljandi Valuoja Elementary School
1993-1997 Viiratsi Elementary School

Professional employment:

Since 2014 Estonian University of Life Sciences,
Institute of Forestry and Rural Engineering,

	Department of Forest Management, Junior research fellow
2011-2012	Estonian University of Life Sciences, Institute of Forestry and Rural Engineering, Department of Forest Management, Senior assistant
2008-2009	Estonian University of Life Sciences, Institute of Forestry and Rural Engineering, Department of Forest Management, Specialist

Research interests:

Forest policy, forest ownership, forest economics, private forestry

Foreign languages:

English, Russian, German

Training and special courses:

2012	PhD course “International forestry and global issues” (France)
2011	PhD course “Making values work - exploring multiple perspectives in understanding the valuation of forest ecosystems” (Germany, Croatia)
2008	MSc course “Innovations in industrial forest management” (Finland)

Projects:

2014 – 2019	Institutional Research Funding nr. IUT21-4: “The carbon dynamics in Estonian forests
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- affected by sustainable management”. Financed by the Ministry of Education and Research. Researcher.
- 2012 – 2016 EU COST action FP1201: Forest Land Ownership Changes in Europe: Significance for Management And Policy (FACESMAP). Working Group member.
- 2010 – 2011 European Forest Institute (EFI) Central-East European Regional Office (EFICEEC) project nr. 8-2/T10069MIMI: “Innovation and Sustainability of forestry in Central-Eastern Europe: Challenges and Perspectives (SUSI-CEE). Financed by the University of Natural Resources and Applied Life Sciences (Vienna, Austria).
Principal investigator.
- 2008 – 2013 Target financed project nr. SF0170014s08: “The effect of changing climate on forest disturbance regimes in temperate and boreal zone”. Financed by the Ministry of Education and Research. Researcher.
- 2008 – 2009 Estonian University of Life Sciences project nr. 8-2/T8097MIMI: “Innovation in the forestry sector”. Financed by the Environmental Investment Centre. Principal investigator.

ELULOOKIRJELDUS

Eesnimi: Priit
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Kodakondsus: Eesti
Sünniaeg: 27.01.1987
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E-post: priit.pollumae@emu.ee

Haridus:

2010-2015 Eesti Maaülikool, metsandus- ja
maaehitusinstituut, metsandus, doktoriõpe
2008-2010 Eesti Maaülikool, metsandus- ja
maaehitusinstituut, metsamajandus,
magistriõpe
2000-2005 Eesti Maaülikool, metsandus- ja
maaehitusinstituut, metsamajandus,
bakalaureuseõpe
2002-2005 Viljandi Maagümnaasium
1997-2002 Viljandi Valuoja Põhikool
1993-1997 Viiratsi Algkool

Teenistuskäik:

Alates 2014 Eesti Maaülikool, metsandus- ja
maaehitusinstituut, metsakorralduse osakond,
nimetatud nooremteadur

- | | |
|-----------|---|
| 2011-2012 | Eesti Maaülikool, metsandus- ja maahitusinstituut, metsakorralduse osakond, vanemlaborant |
| 2008-2009 | Eesti Maaülikool, metsandus- ja maahitusinstituut, metsakorralduse osakond, spetsialist |

Teadustöö suunad:

Metsapoliitika, metsaomand, metsanduse ökonomika, erametsandus

Võõrkeelte oskus:

Inglise, vene, saksa

Täiendkoolitus:

- | | |
|------|--|
| 2012 | Doktorikursus “International forestry and global issues” (Prantsusmaa) |
| 2011 | Doktorikursus “Making values work - exploring multiple perspectives in understanding the valuation of forest ecosystems” (Saksamaa, Horvaatia) |
| 2008 | Magistrikursus “Innovations in industrial forest management” (Soome) |

Projektid:

- | | |
|-------------|---|
| 2014 – 2019 | Institutsionaalne grant nr IUT21-4: “Eesti metsade süsiniku dünaamika ja jätkusuutlik majandamine”. Finantseerija Haridus- ja Teadusministeerium. Täitja. |
| 2012 – 2016 | EU COST projekt FP1201: Forest Land Ownership Changes in Europe: Significance |

for Management And Policy (FACESMAP).
Töögrupi liige.

2010 – 2011

Euroopa Metsaintstituudi (EFI) Kesk- ja Ida-
Euroopa Piirkondliku Büroo (EFICEEC)
projekt nr. 8-2/T10069MIMI: “Innovation and
Sustainability of forestry in Central-Eastern
Europe: Challenges and Perspectives”.
Finantseerija *Viini* Loodusvarade ja
Bioteaduste *Ülikool* (Austria). Põhitäitja.

2008 – 2013

Sihtfinantseeritav teema nr. SF0170014s08:
“Muutuvate kliimatingimuste mõju boreaalse
ja parasvöötme metsade häiringureziimile”.
Finantseerija Haridus- ja Teadusministeerium.
Täitja.

2008 – 2009

Eesti Maaülikooli projekt
nr. 8-2/T8097MIMI:
“Innovatsioon metsasektoris“. Finantseerija SA
Keskkonnainvesteeringute Keskus. Põhitäitja.

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Põllumäe, P.; Korjus, H. 2014. A mismatch between policy and reality: is it a case for private forest owners in Estonia? In: Abstracts: 2-nd Nordic Conference on Forest Policy Science, Ängavallen, Sweden, 12-14 November 2014.

Põllumäe, P.; Korjus, H. 2012. Understanding Forest Owners' Behavior and Values as a First Step to Encourage Cross-boundary Cooperation. In: Book of Abstracts for Oral Presentations: IUFRO 3.08.00 Small-scale Forestry Conference 2012: Science for Solutions, 24-27 September 2012, Amherst, Massachusetts, USA. Amherst: Family Forest Research Center, 40 - 40.

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VIIS VIIMAST KAITSMIST

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COMMUNITY COMPOSITION AND ACTIVITY
ERINEVATE VIJELUSVIISIDE MÕJU MIKROOBIDE
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Dotsent **Enn Lauringson**, vanemteadur **Malle Järvan** (Eesti Taimekasvatuse Instituut)
27. veebruar 2015

JULIA JEREMEJEVA

PROSTAGLANDIN F_{2α} AND PARENTERAL ANTIBIOTICS AS A TREATMENT
OF POSTPARTUM METRITIS AND ENDOMETRITIS, AND POSSIBLE RELATION
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COWS PROSTAGLANDIINI F_{2α} JA ANTIBIOOTIKUMIDE LIHASTESISISENE VÕI
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RAVIS LÜPSILEHMADEL NING TAASTINESUMISE VÕIMALIK HINDAMINE
AKUUTSE FAASI PROTEIINIDE MÄÄRAMISE KAUDU

Dotsent **Kalle Kask**
16. aprill 2015

KADRI KASK

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PUIDU FÜSIKALIS-MEHAANILISTELE OMADUSTELE EESTIS

Dots. Emer. **Jaak Pikk**
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AND SOME METHODOLOGICAL ASPECTS IN THEIR DETERMINATION
AEDMAASIKA VIJADE ANTIOKSÜDATIIVSETE OMADUSTE MÕJUTAMISE
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