Research paper

Reflections of active forest owners to the public-private forestry support system in Estonia

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Abstract. Private forest owners are increasingly responsible for providing an extensive range of goods and services from their forests, as there are around 100,000 forest owners in Estonia. In order to support forest owners in providing these services, the state has continuously backed the forestry sector and established a public-private partnership with forest owners’ associations as well as their umbrella organisations and cooperatives. The aim of this paper is to identify the service and information needs of private forest owners in the context of this established support system. Using a survey sample of 757 respondents, we found that in regard to informational needs more focus should be put on forest management activities, i.e. on available information about service providers’ contacts, prices, options and principles for selling harvesting rights and timber. Furthermore, joint timber sales as a service should be further developed and focused on. While forest owners ranked highly both the information about financial support and the specific measures, they found the system sometimes too complicated. Both in terms of information and service importance-performance, forest owners indicated certification as a low-priority topic. Whilst interest representation in policy processes was indicated as a very important service, its performance was rated quite modestly indicating slight dissatisfaction with the current arrangements. There are also several socio-demographic attributes of forest owners that influence their needs for information and services about forest management. However, a better understanding of these attributes might help develop the system further.

Key words: service needs, information needs, importance-performance analysis, forest policy, forest governance.

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Introduction

Private forest has become a more profound research topic during the past decade in Estonia (Põllumäe & Korjus, 2017) as the sector itself has developed and expanded since the regaining of independence in 1991. Private landowners (more than 100,000) are increasingly more responsible for providing an extensive range of goods, products and services. For example, private forest owners (PFO) harvest 50–60% of the total timber harvesting volume (1/3 comes from small-scale forest owners) and biodiversity protection is provided on 14% of private forest area under

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different conservation regimes in Estonia. Privately owned protected forests account for 30% of the total area of forests under protection. Within these increased responsibilities of private forest owners, the public authorities and national forest policy have significantly influenced and guided the developments in the sector (Keskkonnaagentuur, 2017). Since the early 1990s, it was recognized that forest policy has to tackle with a variety of problems that new private forest ownership raises, e.g. lack of forest owners’ knowledge and fragmentation (Forest policy, 1997). To ensure guided management of private forests from the forest policy perspective, a support system has been established (Figure 1). This system includes firstly the state authorities responsible for managing financial support schemes and measures (i.e. mainly the foundation Private Forest Centre, PFC, established in 1999). Secondly, regional forest owners’ associations (FOA, today approximately 35 FOAs exist in Estonia) whose second wave of establishment was in the early 2000s (Põllumäe & Korjus, 2017). Thirdly, national forest owners’ interest-representing umbrella organisation Estonian Private Forest Union, EPFU, with 22 regional FOAs as members (EPFU, 2019). Fourthly, two secondary cooperatives (established in 2009 and 2013 by regional FOAs) responsible for timber sales/forest management activities. This support system aims to help the forest owners in their forestry activities and forms a complex public-private partnership. However, when looking at small-scale forest owners – the target group – the support system as a whole needs continuous information about the ever-changing ownership characteristics. Such information is important from the forest policy planning, designing and implementing perspectives. Previous research has shown that the forest management objectives and related characteristics (e.g. motivations) influence, for example, how landowners react to policy tools (Janota & Broussard, 2008) or communication (Hujula & Tikkanen, 2008). In the context of Estonia, the latest mapping of forest owners’ informational and service-related needs goes back some 16 years (Toivonen et al., 2005). Therefore, the general objective of this study is to identify the service and information needs of PFOs in Estonia in the context of the established support system. In addition, to explore how these needs are influenced by various ownership characteristics and how current policy and service developments meet the requirements of forest owners.

![Figure 1. The structure and numbers of the private forestry support system in Estonia (based on Private Forest Centre, 2018).](image-url)
Recent research has illustrated how diverse and fragmented forest ownership and owners can be (Weiss et al., 2019b). One of the main ways to systemize and illustrate this diversity has been developing forest owners’ typologies (c.f. Ficko et al., 2019). In many cases, such typologies are based on selected socio-demographic characteristics and/or the diverse values and/or objectives of the forest owners. However, the nature of the objectives can vary across the geographical (e.g. Tikkanen et al., 2006), historical or socio-economic (Weiss et al., 2019a) continuum, making the typologies from different regions very difficult to compare (Ficko et al., 2019). While limited from several perspectives, such typologies can be useful. For example, the most common application has been their use in teaching academic courses, while their application in policy-making has been more limited. One of the reasons could be that such typologies are very limited when predicting forest owners’ actual behaviour (Ficko et al., 2019). Forest owner typologies are more likely simplified illustrations of how diverse forest ownership and management can be. Despite the limitations it is highlighted that such diversity of forest owners is often not reflected in forest-related concepts and policies (Weiss et al., 2019b). Moreover, policy-makers’ impression about private forest owners is often limited to the understanding that the owners are not very interested in management activities and are rather passive (Feliciano et al., 2017). Such owner type – passive or indifferent – is frequently also identified in numerous studies (c.f. Ficko et al., 2019) when classifying owners. From a policy-making viewpoint, however, the diversity of forest owners and thus their different psychological (c.f. Matilainen et al., 2019) or socio-demographic (e.g. Schaaf & Broussard, 2006) aspects are important. This is because, besides policy formulation, participation, regular evaluations and monitoring, forest policy-making means also its implementation (Krott, 2005). The implementation includes a selection of policy tools or instruments with the aim of changing or sustaining a particular behaviour of forest owners. These instruments vary significantly as to how they are employed and how they influence attitudes or behaviour. One classical division of the tools is into sticks, carrots and sermons (c.f. Serbruyns & Luyssaert, 2006). The first of these (sticks) refers to binding regulatory instruments, such as laws and regulations. The second category (carrots) describes financial means for regulating behaviour e.g. support measures, cost-share programs, etc. The third group (sermons) characterizes instruments that are not binding but aimed more at informing and educating the target group. The connection between instrument choice, policy changes and forest owner diversity is therefore something rather obvious, hence the criticism that policy-makers should consider such diversity even more (Weiss et al., 2019b). However, at the same time it has been reported that forest owners can be quite reluctant in accepting instruments that start to intervene with their existing practices (Serbruyns & Luyssaert, 2006). Different forest owners prefer different instruments, but they also might react to policy changes in a way that does not coincide with the expectations of policy-makers (Sotirov et al., 2019). For example, Sarvašová et al. (2019) showed how the Natura 2000 compensation measure as a financial policy instrument has failed to accost many private forest owners in Europe due to both administrative burdens and potential conflicts with property rights. Furthermore, Quiroga et al. (2019) have indicated that forest owners with economically oriented goals are more in favour of financial policy instruments, such as subsidies. They also conclude that there are differences between Eastern and Western European forest owners in this respect; namely the Eastern European forest owners being more interested in such subsidy-based instruments.

As mentioned previously, there has been a similar study (i.e. Toivonen et al., 2005) looking at forest owners’ information.
and service needs by comparing Estonian and Finnish situations. However, there have been quite significant changes – i.e. a comprehensive support system has been established – in the sector and the ownership itself has developed further. Pivoriūnas & Lazdinis (2004) have similarly analysed the situation in Lithuania. Both Toivonen et al. (2005) and Pivoriūnas & Lazdinis (2004) conclude that private landowners are multi-objective in their management. Lately, the idea that forest owners’ conceptualization about forest management is linked to the multi-functionality of forests has found further evidence (Feliciano et al., 2017). Interestingly, in both the Estonian and Lithuanian cases, it was reported that one of the main issues of concern to owners are pests and diseases that influence their forests. Ficko & Boncina (2015) were looking at the owners’ representation of forest management and similarly found that the maintenance of the forest is one of the main ways owners conceptualize forest management. This included the idea of taking care of the forest so that it would not be neglected. In addition, Pivoriūnas & Lazdinis (2004) highlight the existence of knowledge gaps about forestry and forest management, but also bureaucracy as an obstacle. Their analysis did not exemplify the nature of bureaucracy; however, the regulation of forestry-related activities was mentioned.

Materials and Methods

An online questionnaire survey was conducted from October to November 2017 for the study. The respondents were reached by using two main channels. A total of 6,687 forest owners were reached directly by e-mail with the help of the PFC who managed the database of forest owners who had previously applied for forest-related support measures. In addition, 35 FOA representatives were contacted with the request to forward the online questionnaire to the members of the FOAs. In the case of both channels, also one reminder was sent almost two weeks after the initial request. These channels were used as there are no freely accessible and unified databases of all PFOs in Estonia which would allow a more representative survey approach. Similar structural obstacles have been present in some previous studies from Estonia (e.g. Pöllumäe et al., 2014). The questionnaire included close-ended questions on generic ownership characteristics (size, tenure, ownership duration); used informational sources; knowledge and personal experience with the stakeholders within the support system; importance of selected forest management services; information needs and their importance. Both open-ended and close-ended questions were used in combination in the questionnaire. The open-ended questions focused on the nature of the support system (Q1) and the service needs (Q2).

In total, we collected 780 responses to the survey. Due to re-occurrences and missing answers, the responses of 23 PFOs were excluded from the dataset resulting in an adjusted number of 757 observations. The general characteristics of the respondents show that we were moderately successful in capturing the diversity of PFOs. The majority of respondents indicated themselves as private individuals (83.4%). However, among some of these respondents were also individuals who owned companies that were forest owners as 11.6% of respondents were also legal persons (companies) and 13.6% self-employed persons. 63.3% of the respondents are male and 36.7% female, whereas on the national level the gender proportions of physical forest owners are 54.6% and 45.4%, respectively (Keskkonnaagentuur, 2017). The shape of the age distribution of the respondents is similar to the one of Estonian private forest

1 Q1: Please describe the shortcomings of today’s private forestry support system and how these could be remedied?
2 Q2: What do you think are the most important services or products the private forest owner needs today?
owners in general. However, age groups 41–50, 51–60 and 61–70 have higher shares in our dataset and the rest of the age classes have somewhat lower proportions than on the national level. In comparison to the official statistics, the shares of ownership size classes in our dataset are more equally distributed. This also means that owners with small properties (0.1–5 ha) are under-represented (65% on the national level vs 17.4% in our dataset). The mean ownership duration is 18 years and there are 74 respondents that have owned their forest since 1991 when Estonia regained independence. 21% of the respondents stated that they live on the same property where their forest is located and 24.5% live within 1 to 10 km of their forest holding.

The content of open-ended questions (Q1, Q2) was analysed in the ATLAS.ti software by openly coding the answers (c.f. Krippendorff, 2004). For Q1, we received 356 and for Q2 409 answers (i.e. 47% and 55%, respectively, from the total number of observations). The first coding procedure resulted in 37 different codes with the occurrence of 436 (including possible overlaps) times in total for Q1 and for Q2, the respective numbers were 16 and 606. These were further merged and categorized based on the similarities of the content of each code (see Tables 5 and 6). Based on their content, each code family was then described.

For the set of close-ended questions where the PFOs had to assess the availability and importance of information, the importance-performance analysis (IPA) was applied. The same procedure was also used for the questions about the availability of information. The IPA framework, introduced by Martilla & James (1977), is a commonly used tool for determining the attributes of a service or a product that need improvement to enhance competitiveness. The survey included 14 pairs of questions where the respondents had to first rate the importance of a service followed by the performance and 9 pairs of questions about the availability and importance of information (see Tables 1 and 3). The ratings were given on a 5-point Likert type scale with an additional option of “no opinion” for importance items and “have not used this service” for the performance items. During the IPA, responses with either of the additional options were excluded item-wise from the analysis, therefore the ratings were given by actual users of the services, which also means that the number of responses varied across the items. Several studies about the IPA methodology and its issues have been published and we refer the interested reader to Azzopardi & Nash (2013), Lai & Hitchcock (2015), and Sever (2015) for an extensive overview. We used the modified data-centred method proposed by Deng et al. (2017) to position the crosshair that divides the grid into quadrants. The main advantage of this method over the commonly used scale-centred or data-centred methods is that the mean of the differences is zero, thus the crosshair is positioned at (0, 0) and lies on the iso-rating line. In addition to plotting the IPA grids, paired sample $t$-tests for mean differences between raw performance and importance scores were performed in order to identify the existence of performance gaps and the shares of satisfied respondents were calculated. In order to see if the importance-performance ratings were affected from the generic ownership characteristics of the respondents, correlation analyses between both the evaluations of informational needs and forest management services and some general characteristics of the respondents were performed. All the aforementioned analyses on the close-ended questions were carried out in the R software environment (R Core Team, 2018).

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3 Please assess the importance of the following services for private forest owners. / Have you used any of the following services, if yes – how satisfied were you with the quality of the service?

4 Please assess the availability of information on the following topics. / Please assess the importance of information on the following topics.
Results

Value of informational items
Table 1 shows the mean performance and importance ratings for the informational items related to the support system. According to the results of the paired $t$-tests, significant performance gaps were detected for all items in the analysis. This is also indicated by the difference in the overall means for performance (3.46) and importance (3.90). Based on the mean values, information about the support measures (item 27) was perceived very important, whereas information about forest certification (item 25) got the lowest importance ratings. Information access and availability about the profiles and contacts of private forestry consultants (item 26) received the highest mean performance score, while the mean rating for forest certification information (item 25) is the lowest of all. As somewhat expected, the items with the highest shares of satisfied respondents (e.g. items 23 and 26) also had the smallest performance gaps whilst the largest gaps (items 29 and 27) were reflected in also low satisfaction. At the same time, some of the most important informational items (e.g. 27 and 29) also had the biggest performance gaps.

The results of the IPA are plotted on a 2-dimensional grid where importance is shown on the y-axis and performance on the x-axis (Figure 2). The grid is divided into four quadrants indicating resource allocation priorities: “concentrate here”, “keep up the good work”, “low priority”, and “possible overkill”. The diagonal iso-rating line is another way of identifying areas of concern; items in the lower triangle have higher performance than importance ratings, whereas items in the upper triangle require improvement.

![Importance-Performance grid of informational items](image_url)

Figure 2. Importance-Performance grid of informational items (see Table 1).
Table 1. Importance-Performance analysis results of forest management informational items for private forest owners.

| No | Informational item                                           | Importance | Performance | Performance gap | t-value | p-value | Number of respondents | % of satisfied respondents* |
|----|-------------------------------------------------------------|------------|-------------|-----------------|---------|---------|-----------------------|----------------------------|
| 23 | Local forest owner associations                            | 3.89       | 3.74        | -0.15           | -3.12   | 0.002   | 483                   | 72.9                       |
| 24 | Services provided by FOAs                                 | 3.94       | 3.57        | -0.37           | -7.11   | <0.001  | 468                   | 61.8                       |
| 25 | Forest certification                                       | 3.26       | 2.92        | -0.34           | -5.16   | <0.001  | 413                   | 60.5                       |
| 26 | Profile and contacts of consultants                        | 4.16       | 3.86        | -0.30           | -5.86   | <0.001  | 492                   | 60.5                       |
| 27 | Private forestry support measures                          | 4.51       | 3.78        | -0.73           | -14.99  | <0.001  | 514                   | 48.2                       |
| 28 | Forest management service companies information, contacts and prices | 3.95       | 3.25        | -0.70           | -10.54  | <0.001  | 464                   | 50.2                       |
| 29 | Principles and means of timber sales and harvesting rights | 4.10       | 3.34        | -0.76           | -12.20  | <0.001  | 472                   | 48.1                       |
| 30 | Activities of the PFC                                     | 3.87       | 3.60        | -0.27           | -5.54   | <0.001  | 469                   | 66.7                       |
| 31 | Activities of the EPFU                                    | 3.43       | 3.07        | -0.36           | -6.25   | <0.001  | 428                   | 66.4                       |
|    | Mean                                                       | 3.90       | 3.46        | -0.44           |         |         |                      | 60.3                       |

* Respondents were considered as satisfied when their performance score was equal to or greater than their importance score (c.f. Sever, 2015).
Table 2. Significant correlations between informational (importance/performance) items and general characteristics of respondents.

| No | Informational item | Age      | Sex       | Private persons | Legal persons | Self-employed persons | Years | Area   | Distance | FOA member |
|----|--------------------|----------|-----------|----------------|---------------|----------------------|-------|--------|----------|-----------|
| 23 | Local forest owner associations | /0.16** | /-0.11*  | /0.13*         | 0.14**         | /0.25**              | 0.45**/0.52** |        |         |          |           |
| 24 | Services provided by FOAs | /0.10*  | /-0.13** | /-0.12**       | /0.10*        | /-0.10*              |       |        |          |           |
| 25 | Forest certification | 0.12*/0.17** | /0.13*/0.10* | /-0.17**/0.10* | 0.10*         | /-0.10*              |       |        |          |           |
| 26 | Profile and contacts of consultants | /0.12*/0.17** | /0.13*/0.10* | /-0.17**/0.10* | 0.10*         | /-0.10*              |       |        |          |           |
| 27 | Private forestry support measures | 0.12*/0.17** | /0.13*/0.10* | /-0.17**/0.10* | 0.10*         | /-0.10*              |       |        |          |           |
| 28 | Forest management service companies information, contacts and prices | /-0.11* | 0.10*    | /-0.11*        | /0.10*        | /-0.11*              |       |        |          |           |
| 29 | Principles and means of timber sales and harvesting rights | 0.12*/0.17** | /0.13*/0.10* | /-0.17**/0.10* | 0.10*         | /-0.10*              |       |        |          |           |
| 30 | Activities of the PFC | 0.14*/0.12** | 0.10*    | /-0.16**       | /0.10*        | /-0.16**              |       |        |          |           |

* Symbols indicate significance (p-values: *** p<0.001, ** p<0.01, * p<0.05). Correlations with p≥0.05 are not shown.

Description of the general characteristics in the table: Age – age of respondent in years, Sex – sex of respondent (positive indicates female, negative indicates male), Private persons – respondent owns forest as a private person, Legal persons – respondent owns forest as a legal person, Self-employed persons – respondent owns forest as a self-employed person, Years – respondent’s forest ownership duration in years, Area – size of respondent’s forest holding in hectares, Distance – distance to respondent’s forest holding from home (0 means that the respondent lives on the same property), FOA member – respondent is an FOA member.
As can be seen on the IPA grid, two items (28; 29) are placed in the “concentrate here” quadrant, three items (24; 26; 27) are in the “keep up the good work” quadrant, two items (23; 30) are in the “possible overkill” quadrant and two items (25; 31) lie in the “low priority” quadrant. The iso-rating line approach shows that three items (27; 28; 29) are above the diagonal line, thus indicating a need for performance improvement.

The correlation analyses (Table 2) between the evaluations of importance-performance of information and some general characteristics of the respondents showed a strong link between valuing services and belonging to the FOA (positive correlation indicates members). FOA members value greatly most of the information related to forest management and consider it very important. Interestingly, the private individual forest ownership type correlates negatively with the principles and means of timber sales and harvesting rights, as with information about the FOA and their services. Companies' ownership type and the size of the ownership are contrarily positively correlated with information importance and performance of an FOA and their services, support measures, timber sales information, etc.

Importance and performance of existing services
Table 3 shows the mean performance and importance ratings of the forest management services. Similarly to the set of questions about informational items, significant performance gaps were also detected for all of the services in the analysis. This is also reflected in the difference between the overall means for performance (3.77) and importance (4.33). The mean values show that supporting forest owners (item 35) was perceived as the most important service, whereas organizing property auctions (item 40) got the lowest importance ratings. Performing forest inventories and compiling management plans (item 43) received the highest mean performance score while the mean rating for interest representation in policy processes (item 45) was the lowest of all. It is interesting to note that the services that received the highest and lowest means for performance also have the smallest and greatest performance gaps. The calculated mean performance gaps are highly correlated (0.97) with the percentages of satisfied respondents. This is as expected, since in essence they are just different ways of presenting inferred dissatisfaction/satisfaction. Although the item with the largest performance gap (45) also had the lowest share of satisfied respondents, the items with the highest proportion of satisfaction (41) and smallest performance gap (43) did not match.

The IPA results of the forest management services are shown in Figure 3. Three services (36; 37; 45) are placed in the concentrate here quadrant, six services (33; 34; 35; 41; 42; 43) are in the “keep up the good work” quadrant, one service (44) is in the “possible overkill” quadrant and four services (38; 39; 40; 46) lie in the “low priority” quadrant. Judging by the iso-rating line six services (33; 35; 36; 37; 39; 45) are above the diagonal line, hence indicating a need for performance improvement.

The correlation analyses (Table 4) between the evaluations of importance-performance of services and some general characteristics of the respondents showed that advisory services are quite significant – positive correlations were detected with the owners’ gender (positive correlation indicates female respondents), FOA membership and the private individual forest ownership type. Negative correlations were identified with ownership types, such as legal and self-employed persons and with ownership duration and ownership size. The importance of auctioning harvesting rights as a service correlates positively with the private individual ownership type, while negatively with company ownership type and ownerships size.
Table 3. Importance-Performance analysis results of forest management services for private forest owners.

| No | Forest management service                                                                 | Importance | Performance | Performance gap | t-value | p-value | Number of respondents | % of satisfied respondents* |
|----|-------------------------------------------------------------------------------------------|------------|-------------|-----------------|---------|---------|-----------------------|----------------------------|
| 33 | Organizing forest regeneration activities                                                  | 4.52       | 3.78        | -0.74           | -9.96   | <0.001  | 181                   | 42.5                       |
| 34 | Advisory services for forest owners                                                        | 4.46       | 4.08        | -0.38           | -8.27   | <0.001  | 450                   | 60.2                       |
| 35 | Financial support measures (support measures for forest management, counselling, etc.)     | 4.68       | 4.06        | -0.62           | -13.09  | <0.001  | 463                   | 50.5                       |
| 36 | Overall developing of private forestry                                                     | 4.43       | 3.54        | -0.89           | -11.95  | <0.001  | 172                   | 37.8                       |
| 37 | Organizing joint timber sales                                                               | 4.43       | 3.56        | -0.87           | -7.74   | <0.001  | 127                   | 45.7                       |
| 38 | Organizing harvesting activities                                                            | 4.21       | 3.72        | -0.49           | -5.65   | <0.001  | 191                   | 53.4                       |
| 39 | Organizing auctions on harvesting rights                                                     | 4.08       | 3.46        | -0.62           | -5.35   | <0.001  | 110                   | 52.7                       |
| 40 | Organizing property auctions                                                                | 3.70       | 3.33        | -0.37           | -2.13   | 0.037   | 61                    | 62.3                       |
| 41 | Information and training days                                                               | 4.34       | 4.07        | -0.27           | -5.35   | <0.001  | 271                   | 69.0                       |
| 42 | Assistance in applying for support measures                                                 | 4.55       | 4.24        | -0.31           | -6.79   | <0.001  | 410                   | 65.6                       |
| 43 | Performing forest inventories and compiling management plans                                | 4.53       | 4.28        | -0.25           | -5.40   | <0.001  | 400                   | 67.2                       |
| 44 | Publishing information booklets                                                             | 4.24       | 3.84        | -0.40           | -6.30   | <0.001  | 254                   | 55.9                       |
| 45 | Interest representation in policy-making                                                   | 4.61       | 3.31        | -1.30           | -14.61  | <0.001  | 186                   | 29.0                       |
| 46 | Forest certification                                                                      | 3.86       | 3.45        | -0.41           | -4.65   | <0.001  | 96                    | 61.1                       |

Mean: 4.33, 3.77, -0.56, 53.8

*Respondents were considered as satisfied when their performance score was equal to or greater than their importance score (c.f. Sever, 2015).
Views on shortcomings and most important services

From the 356 respondents who answered the open-ended question about the possible shortcomings of the support system, we identified 436 individual code occurrences during the first reading of the answers. After the revision of the contents of the initial 37 codes and the content-based segmentation process, we ended up with 10 broader code families. One of these codes specifically included the indication that the respondents did not have any ideas or comments to the question (109 occurrences). A second code indicated that the support system is fine as it is and there are no shortcomings that the owners have experienced (32 occurrences). This left us with eight meaningful themes about the possible shortcomings of the private forestry support system (Table 5).

Table 5. Categorized shortcomings of the private forestry support system.

| Problems                                | Occurrences | Share of occurrences (%) |
|-----------------------------------------|-------------|--------------------------|
| Specific services                       | 47          | 17.0                     |
| Financial support                       | 40          | 14.5                     |
| Complicated system, bureaucracy         | 39          | 14.1                     |
| Capacity and strength of FOA            | 33          | 12.0                     |
| National policies                       | 33          | 12.0                     |
| Difficult to access or obtain information | 32          | 11.6                     |
| Lack of trust, cheating                 | 29          | 10.5                     |
| Other/passive                           | 23          | 8.3                      |
| Sum                                     | 276         | 100.0                    |

Figure 3. Importance-Performance grid of selected forest management services (see Table 3).
Table 4. Significant correlations between the services (importance/performance) and general characteristics of respondents.

| No | Forest management service                                                                 | Age | Sex | Private persons | Legal persons | Self-employed persons | Years | Area | Distance | FOA member |
|----|------------------------------------------------------------------------------------------|-----|-----|-----------------|---------------|------------------------|-------|------|----------|------------|
| 33 | Organizing forest regeneration activities                                                 | 0.21** | / 0.20** |
| 34 | Advisory services for forest owners                                                      | / 0.12* | 0.23*** / 0.12* | -0.14** / -0.10** / -0.09** | -0.13** / -0.11** | 0.13** / 0.14** |
| 35 | Financial support measures (support measures for forest management, counselling, etc.)   | -0.09* / | 0.20*** / |
| 36 | Overall developing of private forestry                                                   | 0.16** / |
| 37 | Organizing joint timber sales                                                            | / 0.24** |
| 38 | Organizing harvesting activities                                                         |       |
| 39 | Organizing auctions on harvesting rights                                                 | 0.20* / | -0.34*** / | -0.23* / |
| 40 | Organizing property auctions                                                             | -0.27* / |
| 41 | Information and training days                                                            | 0.23*** / 0.28*** |
| 42 | Assistance in applying for support measures                                             | / 0.12* | / 0.10* | -0.11* / |
| 43 | Performing forest inventories and compiling management plans                              | 0.12* / 0.11* |
| 44 | Publishing information booklets                                                          | / 0.15* |
| 45 | Interest representation in policy-making                                                | -0.19** / | / -0.17* |
| 46 | Forest certification                                                                     | -0.25* / |

* Symbols indicate significance (p-values: ***, p < 0.001, ** p < 0.01, * p < 0.05). Correlations with p ≥ 0.05 are not shown.

See table 2 for detailed descriptions of the general characteristics in this table.
Many owners indicated issues with specific services that they either have not received, found or the quality has been poor, e.g. forest inventory, planting material, melioration services, etc. One of the main issues that was raised was linked to the financial support that is available to forest owners. Either namely, the support is considered too small or the system unfair as many of the schemes are operated through FOAs, i.e. only FOA members can apply and receive that support. An additional problem that was raised regarding national policies was the issue of nature conservation legislation, i.e. forest owners’ management options are limited.

*There is no balance. The size and scope of forestry work in private forests is increasing, but the decreasing national support budgets and support rates are hindering the development significantly* (51-year-old male owner with 8 ha large forest holding).

Further, the system as a whole was criticized mainly because of the bureaucratic set-up of the support measures for both FOAs and private owners. The main issue was the amount of different forms to be filled and the time it takes to get the support. This overall relates also to the shortcoming of low FOA capacity, which is in some cases linked to the bureaucratic state system. In addition, lack of trust was highlighted, mainly reflecting the situation in FOAs as just one part of the system.

*FOAs do not develop because of the need to develop, but because of financial support and politics* (51-year-old male owner with a 5 ha large forest holding).

Some forest owners remain critical about the availability of information. This was sometimes linked to the mistrust towards FOAs as it was felt that certain information was kept from the owners. However, not always was the lack of information mentioned. Related to the complexity of the system as a whole, it was mentioned that the pool of information is so vast that it is difficult for the owners to actually navigate in this and therefore there are cases of misconduct, e.g. representatives of timber trading companies are active in FOAs and make the transparency of the system questionable.

*However, it seems that there are too many institutions with the word “private forest” in their name and the idea of one or another institution remains unclear to ordinary people* (74-year-old female owner with 5 ha large forest holding).

Regarding the second open-ended question (Q2) about the most important services we received 409 answers from the overall 757 respondents (54%). In this case, we found 606 individual code occurrences during the first reading of the answers (i.e. 16 initial broad codes). The second revision and similarity-based segmentation resulted in 8 main response groups (Table 6). On 53 occurrences, the respondents specifically highlighted the lack of knowledge about the issue.

| Services                           | Occurrences | Share of occurrences (%) |
|------------------------------------|-------------|--------------------------|
| Capacity to plan and organize forest management | 123         | 22.2                     |
| Advice and extension               | 116         | 21.0                     |
| Support measures                   | 106         | 19.2                     |
| Information                        | 73          | 13.2                     |
| Other                              | 65          | 11.8                     |
| Joint timber/harvesting rights sales | 41          | 7.4                      |
| Interest representation            | 29          | 5.2                      |
| **Sum**                            | **553**     | **100.0**                |
The main issue was linked to the need for practical help in everyday forest management activities, such as help in organizing work related to drainage maintenance and road construction, planting (including the assistance needed to get seedlings), tending young stands, harvesting (from pre-commercial thinning to final harvesting) and helping to arrange a forest management plan. Also, the respondents highlighted that help is specifically needed in cases of small-scale operations as many larger service providers are not interested in such customers.

Based on the competence of the forest owner, either the provision of individual grants or services /..../ or a complex forest management service where the owner receives only information and all work is planned by the manager (37-year-old male owner with 9 ha large forest holding).

The second important service was extension. Forest owners need and want to have professional guidance in forest management. Many respondents explicitly highlighted that such extension services and advice should be impartial from companies, timber buyers, etc. While consulting mostly relates to practical forest management issues, many respondents reflected the need to get such assistance in order to apply (i.e. fill the forms) for different financial support measures.

Actually, many forest owners don’t even feel the need for forest management and think that the forest is growing by itself, and the only concern is to find a reliable contractor at some point. The fact that forest management techniques can make a significant contribution to their forest remains incomprehensible to many small owners (39-year-old male owner with 6 ha large forest holding).

The existing support measures and the need to have specific financial incentives remain important. The respondents mostly reflected the need to have support for regeneration activities and compensation for restricted management (e.g. Natura 2000 network). But there were also responses expressing the desire for increasing the amount of available support and the need to have long-term stability in terms of measures and their budgets.

It is only because of these grants that the forest owners are today actually joining FOAs. These grants must increase (a track record of 24 years of being a forest owner, 7 ha large forest holding).

Many forest owners need also more information. The responses reflected the need to have contacts with different service providers, timber buyers and information about timber prices. For these forest owners such information brings confidence and makes forest management more transparent. In addition, the need for general information about the activities and trends in the forestry sector was referred to.

I would like to have a proper overview about local logging companies and their reliability; in general, a list of companies that are engaged in forest management and timber buying (47-year-old forest owner).

While the capacity to organize forest management activities and for example, information about companies and contractors seems to be important, fewer respondents highlighted the importance of joint wood sales. Even fewer indicated the importance of interest representation in forest policy as a service.

FOAs should also help the small forest owner to get a good price for his small quantities of timber. They should enter
into contracts with the buyers of the material and then inform forest owners by e-mail about the prices (52-year-old male owner with 5 ha large forest holding).

Discussion

In regards to the informational needs of PFOs, the results from the IPA reveal that improvement efforts should focus on two main areas – forest management activities and support measures. One could argue that PFOs seem to be economically motivated as there is a strong demand for information about forest management service companies, contacts and prices (item 28) as well as for the principles and means of timber and harvesting rights sales (item 29). Both of these informational items fall into the “concentrate here” category of the IPA and have low numbers of satisfied respondents. Although private forestry support measures (item 27) is in the “keep up the good work” category, it should also be prioritised as it has the highest mean importance rating and a notable performance gap. The correlation analysis shows that private persons tend to give lower performance scores for items 23, 24, 28 and 29 than self-employed persons; however, there was no difference in the perceived importance. That may be due to their lower competence, because private persons gave advisory services (item 34) higher importance ratings than self-employed or legal persons and the same trend was evident in the information needs section where the profile and contacts of consultants (item 26) are positively correlated with private persons and negatively with legal persons. This could also reflect the need within the support system to communicate respective issues to smaller-scale forest owners as they are relatively less satisfied with the information performance. We also infer that PFOs regard the processes of timber and harvesting rights sales and applying for support measures to be too complex and involving too much bureaucracy. This is also reflected in the second open-ended question (Q2) where everyday forest management activities were considered to be the most important services. Legal persons seem to rate the importance of information on private forestry support measures (item 27) higher and it is also positively correlated with the length of ownership and property size. This may also indicate that legal persons due to the longer ownership duration and a higher level of knowledge have more awareness about the possibilities of the support measures. In the IPA, forest certification information received the lowest priority ratings however female owners considered the information about certification more important than male owners and self-employed owners did not find such information important.

The services and products the PFOs regard as highly necessary intersect rather well in the IPA and in the response groups of the second open-ended question (Q2). Arranging and organizing forest management activities had the highest number of occurrences for Q2 and in the IPA this is reflected by the more specific items 33 (forest regeneration) and 43 (forest management plans) which are both located in the “keep up the good work” quadrants. However, IPA results show forest harvesting activities (item 38) as a lower-priority service, whereas in Q2 organizing everyday forest management activities was specifically stated as a highly important service for small owners. Also, there is no significant correlation between forest harvesting activities and any of the general characteristics of the respondents. Firstly, one possible explanation is that owners with small properties are underrepresented in our dataset. Secondly, in Q2 forest work which included harvesting activities also incorporated different kind of harvesting, but also planting and other management activities. It could be that in the IPA, harvesting activities were understood by
the respondents as final fellings; whereas in Q2 forest work included many silvicultural activities, e.g. stand tending and thinnings. The latter are known to be important to many owners as there is a support scheme in Estonia to encourage pre-commercial thinnings in stands younger than 35 years. The advice and extension service also has a high share of occurrences in Q2 and judging by the IPA its counterparts 34 (counselling) and 42 (assistance in applying for support measures) are performing well. Support measures are indicated as an important service in both analyses and are placed in the “keep up the good work” quadrant on the IPA grid (item 35). The information needs of the PFOs seem to be mostly satisfied as these have a mediocre share of occurrences and the respective items in the IPA are located in the “keep up the good work” (41, training days) and “possible overkill” quadrants (44, publishing booklets). Timber and harvesting rights sales have a low occurrence in Q2 but the IPA, where these were included as separate items, shows that focus should be put on timber sales (37), whereas harvesting rights (39) are of low overall priority, but are more important for private persons with small forest holdings as is evident from the correlations. Such joint timber sales have only been conducted since 2009 with the establishment of a cooperative which was followed by the establishment of a second one in 2013. Compared to many other services, joint timber sales are, including e.g. certification, quite new to many forest owners. The main contradiction between the results of IPA and Q2 is that interest representation seems to be of least concern in Q2, IPA shows it (item 45) as the highest priority item (farthest from the iso-rating diagonal) and it also has the greatest performance gap. The correlations show that interest representation is more important to younger owners, although ownership duration does not have a significant influence. Within Q2 there were very specific issues that the respondents raised, e.g. taxation, expanding nature protection areas and high levels of bureaucracy. Therefore, the contradiction between the IPA and Q2 could be perhaps interpreted as a general feeling of the respondents about their status or position as forest owners in regards of policy-makers. In the IPA, forest certification service (likewise to information) received an overall low-priority rating with relatively lower importance ratings from self-employed persons compared to private individuals or companies.

With the increase in absentee ownership and the decrease in own work in the forest there is a greater need for labour services (Q2, Karppinen, 2012). Furthermore, the diverse set of small-scale forest ownership objectives, attitudes and needs of the service providers, encourages all parties to change and adapt accordingly in order to be successful. Conventional forest management activities and services need to adapt to the changed objectives and diverse scattered ownerships (Snyder et al., 2019).

To conclude with a broader view on the aspects of small-scale forest landowner research, the authors agree with Toivonen et al. (2005) that a system of regular evaluations and analysis of private forest owners should be implemented on the national level. Why not even on a regional level? Many CEE countries face rather similar patterns of ownership changes (Weiss et al., 2019b), FOA developments (Sarvašová et al., 2015) or patterns in owners’ characteristics (Matilainen et al., 2019). Similarly to what is being done with forests as biological objects – e.g. with the national forest inventory – information is required to adjust, implement and report sustainable forest management. Having abundant data about the forest alone might not provide a sufficient amount of information to guide forest policy developments and implementation. What we would add here in the Estonian context is firstly the need to have a survey approach with a representative sample from the overall population.
of owners. Previously (e.g. Toivonen et al., 2005; Põllumäe et al., 2014), we have reached more active owners, hence a crucial part of owners has not been covered by our investigations. The results of this study reflect the views of more active owners and thus are biased. It is difficult to assess or predict the direction to where the focus point of the results would go if the respondents had been based on a random sample of the overall population of private forest owners. Secondly, future research should also focus on issues that are more specific, e.g. the social networks of Estonian private forest owners and on the influences that these networks induce. It is known, however, that such continuous monitoring systems of forest ownership and its changes are, with a handful of exceptions (e.g. Finland, United States, Sweden), quite rare (Weiss et al., 2019b). Nevertheless, in Estonia we have made many important steps in landowner research during the past decades and the establishment of such a system nowadays is more in the hands of policy-makers.

Conclusions

This paper focused on the assessment of the private forest owners’ support system and information needs in Estonia. More particularly, we concentrated on reflecting the forest owners’ views on the existing private-public support system for forest owners which mainly consists of regional FOAs and the state foundation Private Forest Centre. This symbiosis has been established as a form of collaborative governance of private forests and is used by the state to implement formal forest policies. It therefore forms a triangular relationship between the forest owners, FOAs and the state; each with slightly different views on the private forest. This is why there is a need for increased knowledge about these components of the system; perhaps the forest owners being the segment that we know much less about compared to the rest. However, the results of this study reflect the views of more active owners. Future research should also focus on issues that are more specific, e.g. the social networks of Estonian private forest owners and on the influences that these networks induce. Considering our general objective, the presented results and discussions, we would like to conclude that:

- Estonian forest owners consider information about consultants and financial support measures most important, while forest certification and forest owners’ interest representation in policy-making seem to be topics that owners are less interested about.

- The support system should be more focused on providing easily accessible and adequate information about the possibilities of selling harvesting rights or timber. In addition, price and contact information of different service providers should be made more available.

- Private individuals rely more on regional consultants in getting information (unlike companies) and consider the existing information about FOAs, their services and timber or harvesting sale information relatively poorer than companies or self-employed persons.

- Major performance gaps between the informational aspects might indicate the need for simplifying, e.g. the regulations related to the support measures (excessive bureaucracy) and changing the way e.g. timber sales and harvesting rights issues are being communicated. This is even more evident as assistance in applying for support measures has developed to a separate service itself.

- Advisory and extension services, including assistance in applying for support measures, are seen as highly important. The latter especially among private individuals, thus the advisory and extension services should be fo-
cused on small-scale private individuals rather than companies or self-employed persons. Furthermore, there is a greater need for advisory services among older forest owners, female owners and new owners with short ownership duration.

- Forest inventory and management planning was rated as an important service. But in addition, owners need help with carrying out actual practical forest management, including silvicultural activities and therefore they also highlighted the importance of having the contacts and price information of different service providers.

- Services related to selling forest properties by auction and forest certification are not seen as important by the forest owners.

- Most important performance gaps are seen in interest representation in policy processes (the least satisfied respondents), developing private forestry, organizing joint timber sales and organizing forest regeneration activities. These are the areas of work that should be more concentrated on while further developing the support system.

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Aktiivsete metsaomanike hinnangud erametsanduse tugisüsteemile Eestis

Priit Põllumäe, Ando Lilleleht ja Henn Korjus

Kokkuvõte

Eestis on umbes 100 000 erametsaomandikku ning erametsaomanike on ligikaudu miljon hektarit metsamaad. Erametsaomanikud mängivad üha suuremat roli selles, milliseid hüvesid ja teenuseid ning millises mahus on metsadest võimalik saada. Metsaomanike toetamiseks ja metsapoliitiliste eesmärkide saavutamiseks on riik erametsandust pädevalt toetanud ning loonud omamoodi avaliku ja erasektori partnerluse ehk tugisüsteemi. Erametsanduse tugisüsteem koosneb riigist, metsaühistest ja nende katusorganisatsioonidest ning keskühistest. Selle uuringu eesmärk on välja selgitada erametsaomanteenuse- ja teabevajadused selle tugisüsteemi kontekstis. 2017. aasta oktoobris ja novembris erametsaomanike seas tehtud küsitlus andis võimaluse uurida tugisüsteemi probleeme lähemalt. Meie kasutuses oli 757 vastajat saadud andmetest, mis sisaldas mitmeid vastajaid iseloomustavaid üldisid tunnuseid, nagu vanus, omandi suurus, sugu, omanikuks olemise kestus jm. Lisaks sellele olid praeguse tugisüsteemi valguses antud hinnangud olemasolavatele infokanalitele, organisatsioonidele, teabeväjadustele ning teenuste infole ja kvaliteedile. Leidsime, et teabe arendamisel peaks senisest enam kesken-duma metsamajanduslikele tegevustele. Metsaomanikud soovivad saada paremat informatsiooni teenusepakkujate kontaktide, teenustehandide ning raieõiguse ja puidu müügi võimaluste ja põhimõtete kohta. Lisaks tuleks edasi arendada pü- di- ühismüüki, kuivõrd seda tehnust on hinnatud oluliseks, ent selle sooritust pigem tagasihoidlikiks. Kuigi metsaomanikud hindasid kõrgelt nii teavet toetuste kohta kui ka toetusmeetmete olulisuse üldiselt, leidsid nad, et toetuste süsteem on sageli liiga keeruline või bürokratlik. Nii metsade sertifitseerimise alase teabe huvide esindamise konvendi valguses antud hinnangud metsaomanikud madalalt ning seda peetakse pigem vähetähtaks suunaks. Eraldi äramäärkimist väärib metsaomanike ühiste huvide kaitse teenus. Kui huvi esin-damist poliitilistes protsessides hinnati kui oluliste tehnust, siis seniseid tulemusi hinnati üsna tagasihoidlikult, mis näitab mõõdukat rahulolematust praeguse korraga. Selgitasime ka mitmeid metsaomanike sotsiaaldemograafilisi tunnuseid, mis mõjutavad nende vajadust metsa majandamiseks seotud teabe ja teenuste järele. Nende tunnuste või faktorite mõistmine aitaks paremini suunata tugisüsteemi edasist arendamist.

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