Exploring the future use of forests: perceptions from non-industrial private forest owners in Finland

Acknowledgments

Financial support from the Finnish Funding Agency for Innovation Tekes through the FORTUNE project and the Academy of Finland through the FORESCOF project is gratefully acknowledged. The first author was also partly supported by a Young Researcher's Grant funded by the Research Foundation of the University of Helsinki.

Abstract

The transformation of the forest sector towards a bioeconomy calls for finding new sources of competitive advantage for the whole sector to retain its future viability. Non-industrial private forest (NIPF) owners are an important group of actors in the Finnish forest-based sector, as they supply 80% of industrial roundwood and control numerous other tangible and intangible forest-based ecosystem services. Our study analyzes forest owner views on the future use of forests in Finland, their perceptions on the evolving sectorial interlinkages and the position of the forest sector now and in the future bioeconomy. The data were collected in two phases: through telephone interviews of forest owners (n=278) and four focus group discussions (n=17), and were analyzed both qualitatively and quantitatively. The interviews showed that forest owners consider the highest potential for strengthening the sector towards bioeconomy to come from collaboration with energy and construction businesses. During the focus group phase we identified new possibilities founded on forest-based recreational services, cooperation with nature-based tourism, and in increasing value-added wood products. In total, forest owners as a high-involvement group emphasized future value creation to be based upon forest ecosystem services and in diversifying the utilization of forests beyond the dominant raw material -driven mindset.

Key words: future use of forests, non-industrial private forest owners, customer involvement, forest bioeconomy

1. Introduction

Globally, a paradigm shift is occurring as forests are seen as an important factor in climate change mitigation (Streck et al. 2008; Bonan 2008), and as a source of renewable materials in the green economy or bioeconomy as a part of the global sustainable development paradigm (European Commission 2012, FAO 2014). The European Commission has high expectations for the evolving bioeconomy based upon reducing the dependence on fossil fuels and improving the economic and environmental sustainability of primary production and processing industries (European Commission 2012). The forest-based sector has faced increasing demands from different stakeholder groups concerned about issues such as forest loss, accelerated carbon dioxide emissions or the decreased profitability of forest products (Lindahl and Westholm 2012, Hetemäki et al. 2013). Increasing consumer demand for more sustainable products emphasizes the role of the forest-based sector in creating sustainable solutions from renewable resources in the future bioeconomy (Pätäri et al. 2016). However, the research field of forest-based bioeconomy is yet highly fragmented especially from sustainability and social science perspective (see e.g. Pfau et al. 2014).

In parallel, the global forest sector has faced multifaceted challenges during the last decade, such as changing production and consumption patterns of especially paper and paperboard and the rise of competition from emerging producer countries that have led to structural changes in the industry in the Nordic countries. To retain its future viability, the competitive advantage of the entire sector needs to be sought, in addition to traditional forest products, also increasingly from the intangible values of forests and by enhancing the role of services (e.g. Hetemäki et al. 2011). Forest industry, especially in the Nordic countries, has become active at re-inventing its strategies, products, services, and business models (Näyhä et al. 2014, Forest Sector Technology Platform 2015). According to Lindahl and Westholm (2012), changing activities and outputs also bring new actors into the markets despite other actors possibly exiting from the forest sector. Even though forestry service organizations have likely seen forest owners more as raw material producers than customers buying services (Mattila and Roos 2014), following service dominant logic is becoming increasingly important approach also in forest sector (Näyhä et al. 2015).Key actor perceptions on the future and challenges and opportunities of forest use will affect their strategies and actions, and their relative capacities for realizing their visions, while on the other hand influencing future forest use (Lindahl and Westholm 2012). One of the key actors in the field consists of non-industrial private forest (NIPF) owners, especially in countries where they own a major part of the forestland. The majority of forests

in Nordic countries and the United States are owned by hundreds of thousands of small-scale NIPFs, who supply the main body of industrial roundwood and have control on numerous other tangible and intangible forest-based ecosystem services. Comprehending the perceptions and preferences of private owners has been the aim of several studies as NIPFs provide useful knowledge for the forest sector (e.g. Kuuluvainen et al. 1996, Kline et al. 2000, Butler et al. 2007). While previous studies have shown that NIPF owners have multidimensional values and ownership objectives, increasing emphasis has more recently been placed on the intangible forest values of owners (Hull and Nelson 2011, Häyrinen et al. 2014). According to Häyrinen et al. (2016, p. 12) "as the NIPF owners have more personal connections with the forest than average consumers, they are a potential source of information for exploring the untapped future potential that help in transition of the Finnish forest sector to a forest bioeconomy." Along with changes in the structure of Finnish NIPF owners and consequently changes in forest owner objectives (Karppinen et al. 2002, Karppinen and Hänninen 2006, Hänninen et al. 2011), e.g. young and new forest owners may have an entirely different stance for their forest management objectives and the overall utilization of forests than elderly forest owners.

Therefore our study approaches future forest use from the NIPF owner perspective. Due to their high psychological involvement and rich experience in forest use and management, we argue that this stakeholder group could play an important role when identifying new innovative ideas for forest utilization in the future. The explicit aim of our study is to explore how forest owners in Finland, supplying 80% of the industrial timber supply, recognize the future utilization prospects of forests. Our research questions are:

1) Which linkages between forests and other industrial branches are recognized as most important in the development towards a forest bioeconomy?

2) How do sustainability oriented forest owners perceive the current state and future of the forest-based sector in Finland?

2. Conceptual background

Transition of the forest-based sector towards a bioeconomy

Although the concept of bioeconomy differs depending on those using it (Kleinschmit et al. 2014), the term generally refers to an economic transition from relying on fossil-based fuels to the sustainable use of natural resources by taking advantage of renewable resources and new innovations (Staffas et al. 2013). Terminology such as 'bioeconomy' and 'bio-based economy' is also often used interchangeably despite these terms having slightly different meanings (see e.g. Staffas et al. 2013, see also Schmid et al. 2012 for definitions). Growing societal emphasis on sustainable development has raised the importance of a bioeconomy, enhancing green consumerism that emphasizes sustainable choices in everyday consumption patterns (see e.g. Roberts 1996, Young 2010). When reaching towards the future bioeconomy, forests as a leading renewable resource base in the Nordic countries offer huge potential for developing more sustainable products and services also in terms of intangible values, including food, health, leisure time, and nature-based tourism possibilities (Hetemäki et al. 2006). While international agreements on sustainable development (see e.g. United Nations 2012) call for a more efficient use of the Earth's resources, they turn the emphasis towards renewable resources, which opens up many interesting possibilities for the more diversified forest-based sector.

While various national- and international-level strategies and policies for the transition towards a bioeconomy have been formulated (e.g. McCormick and Kautto 2013), the main issues in national bioeconomy strategies and policies according to Staffas et al. (2013) include (i) establishing a balance between sustainability and economic aspirations; (ii) the limited attention given to measuring its progress; and (iii) the challenge of resource scarcity. According to Pülzl et al. (2014), economic aspects still dominate in bioeconomy discourse, despite sustainable development supposedly being the main aim. According to Näyhä et al. (2014), a lot of interest has been generated towards e.g. forest biorefineries, which could more efficiently utilize the entire potential of raw materials and by-streams for producing a broad range of products, but according to Pfau et al. (2014) with a limited attention to sustainability imperative. In a recent study by Pätäri et al. (2016) concerning the future of European pulp and paper, it was also found that the designed energy and environmental policies have the potential to advance a paradigm shift towards a bioeconomy rather than curbing the viable future of the industry.

Traditionally the forest sector can be described as an industry following goods-dominant logic (see Vargo and Lusch 2004, Mattila et al. 2013, Mattila 2015). Timber production dominance as a forest management goal is clear for Finland, but other forest uses are increasingly

emphasized (Häyrinen et al. 2015a, Mattila et al. 2015). Ungerböck et al. (2015) researched the economic significance of forests beyond timber production in Austria, and found that the share of other activities contribute only 2.5% of the profitability in forestry enterprises. They state this to be caused by the fact that only a small share of forest-related goods and services are directly marketable, and emphasize the better utilization of forest multi-functionality. Although the forest industry especially in Nordic countries is diversifying its course of actions towards a variety of new directions, and many interesting products have already been developed, plenty of unutilized potential remains for new forest-based products and services (Näyhä et al. 2014).[1]

An interesting question is how the related and supporting industries – and the innovations on the sectorial interfaces – could enhance development towards a forest bioeconomy. Porter (1990) summarizes the competitive advantage of a firm in his famous diamond model to consist of four main elements: factor conditions, demand conditions, related and supporting industries as well as a firm strategy, structure, and rivalry (see more e.g. Porter 1990, 1998), which form a strong field of business, a cluster, that successful industries tend to create. More specifically, Porter's (1990) recognition of related and supporting industries stems from the view that the presence of local competitive industries also improves the success likelihood of other related industries.[2] Following the thoughts of Michael Porter, bioeconomy is a platform for a broad range of industries that can cooperate and mutually benefit from collaboration across disciplines and sectors, which has been indicated as one of the important factors in the transition towards a bioeconomy (European Commission 2011, McCormick and Kautto 2013). According to the European Commission (2012), the growth is expected to originate from sustainable primary production, food processing, and industrial biotechnology and biorefineries, but to maintain its competitiveness the European bioeconomy sectors need to innovate and diversify their current businesses.

Customer involvement in new product and service development

[1] Näyhä et al. (2015) state that one of the most potential forest uses lies particularly in services. An estimated 70% of the service sector GDP is formed in the OECD countries (OECD 2005), although it is often difficult to distinguish the services and products as they are strongly interwined because service functions are often embedded in manufacturing processes (Näyhä et al. 2015).

[2] Porter (1990) defines supporting industries as those that enable machinery and inputs as well as their effective use and ongoing coordination, but especially as the process of innovation and upgrading. Related industries are those that can coordinate or share activities in the value chain together or that are concerned with complementary products.

Although the benefits of customer involvement in new product and service development have been discussed in a number of studies (e.g. Alam and Perry 2002; Lundkvist and Yakhlef 2004), no literature has been published on forest owner involvement of new product and service development in the context of the forest sector. A Service-Dominant Logic (SDL) mindset, which has been introduced within the marketing field by Vargo and Lusch (e.g. Vargo and Lusch, 2004; 2015), highlights mutual and reciprocal value co-creation between various actors in the business ecosystem. The contribution of SDL for service innovation literature is that customers should be involved in several stages of the service development process (Edvardsson et al. 2012). Hence, apart from being a necessity, customers are seen as a core resource in new service development (Matthing et al. 2004).

Oftentimes it is essential that consumers pilot new products aimed at themselves in the form of lead users because producers are currently unaware of the substantially profitable business potential of it (von Hippel et al. 2011). While these so-called user innovators may expect to benefit from using an innovative product, producer innovators vice versa expect to benefit from selling an innovative product (Kuusisto et al. 2013). We consequently argue that due to their high involvement in natural resource utilization, forest owners could as lead users act as co-creators in new business development regarding the future use of forests. The industrial organizations' closer collaboration with NIPF owners can also lead to better comprehension of customer value creation in general, due to the dual role of NIPFs as suppliers and consumers, especially in countries such as Finland where forest owners comprise a significant proportion of the entire population (Häyrinen et al. 2015a).

Customer involvement has not been widely studied in the forestry context, while Nybakk et al. (2009) have studied Norwegian forest owner innovativeness. They found that an owner's higher level of learning orientation and local social network are critical antecedents for their innovativeness. Furthermore, innovativeness is an important factor in obtaining high performance levels, and forest owners with larger property sizes are more effectively able to turn innovativeness into higher performance. In another Norwegian study, Lunnan et al. (2006) studied factors affecting NIPF owner rates for initiating new activities on their lands. They found that forest owners with higher entrepreneurial orientation have a higher probability of initiating new activities, which suggests that more emphasis should be addressed towards developing entrepreneurial attitudes among forest owners, as well as improving the institutional setting stimulating business activities.

3. Research data and analysis methods

Our research is an explorative study by nature and is based on a mixed methods study conducted in Finland during 2013–2014. The data needed to accomplish the study's objectives were collected in two phases (hereafter referred to as data sets 1 and 2). The first data set was collected as part of a quantitative study (Häyrinen et al. 2015b) conducted in August 2013. The second data set was collected in January and February 2014 using the focus group (FG) method to complement and elaborate the findings from the first data set. We begin by describing the quantitative study including a pre-survey and a qualitative part (data set 1). We then extend our study to the FG discussions (data set 2). Figure 1 and the following sections describe the data collection process and analyses methods in more detail.

Figure 1 about here

Data sets 0 and 1

Quantitative and qualitative survey data were collected via telephone interviews (n=278) from a nation-wide registry of Finnish forest owners during the first phase of data collection. The sampling and contact information were based on the customer database of the Finnish Forest Centre, which includes approximately 300 000 private forest owners in Finland. The objective of the pilot-survey (called as data set 0) was by asking question outside traditional forestry to widen the scope of the respondents to think about the meanings and future on a larger scale. The pilot-survey was implemented by using a random sample among 100 Finnish forest owners. The average age of the interviewees of the pilot-survey was over 60 and the answers to the open questions saturated to saturate especially in the scenario-questions with a clear difficulty to find new approaches. Further, we needed to slightly modify the questionnaire at this point because the interviews exceeded the time frame that was budgeted.

The forest sector is often argued to be self-contained and concentrating on incremental innovations (Hovgaard and Hansen 2004). Based on the results of pilot-survey and the objective of identifying new innovative ideas for forest utilization in the future, we decided to diversify the sample of the survey by using stratified sample concentrating on owners that are younger than the average Our aim was not to achieve an representative sample of landowners, but more

to gain insight into the future of forests and their use. Therefore, the sample was collected by selecting circa 20% of forest owners from five age classes (under 30, 31–39, 40–49, 50–59 and over 60 year-olds). While this data mainly included quantitative information (findings reported in Häyrinen et al. 2015b), the final part of the questionnaire included open-ended questions. Initially 402 respondents were interviewed, but as eight of them stated they no longer own forest and 116 interviewees did not provide answers to the open-ended questions, these were omitted from the data, with a final sample of 278.

Transcribed data from the telephone interviews were content analyzed using the ATLAS.ti 7 program. The data were analyzed mainly qualitatively by thematically categorizing speech, but the analysis also included a numeric part as we calculated the frequencies of the most commonly mentioned issues. The aim in using content analysis was to produce a condensed and broad description of the researched phenomenon (Elo and Kyngäs 2008) by categorizing words in the text into fewer content classes (Weber 1990). According to Weber (1990), the best content analysis research applies both qualitative and quantitative operations. While content analysis typically shows three approaches: conventional, directed and summative, we chose to only use the conventional approach, which is appropriate when theory or research literature on a phenomenon is limited, and hence no preconceived categories or theoretical perspectives are needed (see Hsieh and Shannon 2005).

During the phone interviews, forest owners were asked to consider which other related or supporting sectors could be utilized when considering the forest sector's transition to a bioeconomy and in what ways. These data were analyzed at two levels. We first coded the business fields each respondent mentioned by following the standard industrial classification of Statistics Finland (2015) including 21 main areas. This was performed to follow the officially defined business categories. These 21 areas still included several subcategories. These subcategories are not discussed here in detail but can be found in Statistics Finland (2015). Industrial classification is partly overlapping and in certain sections it is not absolutely clear which category a specific action should be classified in. It was thus necessary to create new categories for bioenergy, technology, and information technology (IT), and nature-based tourism that were not found in the standard industrial classification, but were frequently mentioned. Second, more specific product- or service-related activities connected to these sectors were coded if a respondent had discussed the sector at a more detailed level. Further,

243 certain closely related sectors were combined during the analysis phase, as some categories
244 only received a few mentions.

245 In addition to several identified business areas that were recognized, we alternatively created
246 three other codes for issues that did not fit into any sector. Propositions for increasing the level
247 of product value-addition and issues related to research and development were discussed
248 widely, and were thus given their own codes. We also additionally created codes for the critical
249 remarks given by many respondents concerning the forest sector and its course of actions. The
250 analyses of our paper were conducted in cooperation with two researchers (the first and second
251 authors of our paper) to improve inter-coder reliability.

252 *Data set 2*

253 We used FG discussions during the next phase to enrich the data collected during the first phase.
254 FG participants were therefore purposefully selected from the sample of telephone
255 interviewees. Forest owners were again contacted by phone and invited to join a FG meeting.
256 We particularly aimed to identify and select a subsample of forest owners, who, based on the
257 structural equation modeling of the first-stage interview data (reported in Häyrinen et al.
258 2015b), showed high involvement in environmental and social sustainability and forest
259 ownership issues. This setting for the FG discussions was developed from the quantitative part
260 of the first data, where Häyrinen et al. (2015b) found that more pro-environmentally oriented
261 forest owners value multiple forest aspects higher than other owners. With this background, we
262 hypothesized that also the pro-environmental lifestyle of owners (see Häyrinen et al. 2015b)
263 affects how they utilize or value forests, and consequently this could lead to more in-depth
264 views on the sustainable use of the natural resource base, contributing to future service and
265 product provisioning. However, we also accepted forest owners from less environmentally
266 oriented groups to join the FG groups, as we believed the discussions would be more fruitful if
267 involving participants with different viewpoints in the groups. The final sample of owners
268 therefore consisted of 11 participants placed in two pro-environmentally oriented groups as
269 well as 5 participants forming two less environmentally oriented groups. We additionally did
270 not identify the orientation of one attending forest owner, as she accompanied another forest
271 owner. The qualitative research data (data set 2) were thus collected in four FG meetings in
272 January and February 2014, consisting in total of 17 NIPF owners. Participant age varied from
273 26 to 68 years, with a total of eight females and nine males. While the ideal group size for FGs

is four to eight participants as suggested by Kitzinger (1995), our groups varied in size from three to six participants. The FG meetings ranged between 0:40 h and 1:29 h in length, with a mean of 01:09 h. The FG interviews were audio-recorded and transcribed, and the discussions were led by a moderator.

According to Morgan (1997), FG discussions can be used as a self-contained method, supplementary source, or as a part of multimethod studies. Kitzinger (1995) states that FG discussions may encourage participants to explore and elaborate their perceptions in ways that would be less easy in a one-to-one interview situation. Further, FG participants are also able to generate their own questions and discuss issues important to them. As group interaction is an important aspect of the method (Kitzinger 1995), it is also possible that participants may change their minds during the FG discussions, or express different views than earlier in the discussion (Parker and Tritter 2006).

The objective of the FG discussions was to give forest owners a topic that they could discuss and form their own opinions freely about, and not influence the course of the discussion too much. The pre-selected topics covered themes of 1) the significance of being a forest owner (why to own forests, what does the own forest mean, what to think about different ways to use forests, the objectives as a forests owner), 2) the current state of the forest sector in Finland, 3) the future of the Finnish forest sector (overview, potential, new ways of using forests, forest-based products substituting non-renewables), and 3) future plans as a forest owner (willingness to keep the forest estate, how to develop the sector from the viewpoint of an owner, networking, communicating and information sources). Transcribed data from the FG discussions were also analyzed using the ATLAS.ti 7 program by identifying various perceptions and visions and giving them a descriptive code. The FG discussions outcome was categorized into two main themes according to the research questions: (1) group visions on emerging utilization potential for forest use and challenges related to these new possibilities, also from the perspective of intersectoral collaboration, and (2) perceptions on the current and future state of the Finnish forest sector.

4. Results

4.1 Interview results

We received 278 responses for the first research question concerning forest owner perceptions on the role of related and supporting industries (Porter 1990) that might collaborate in creating novel value from forests. Figure 2 shows the frequencies of how often each sector was mentioned in the interviews.

Based on Figure 2, bioenergy was by far the most commonly mentioned business area in the discussion topics. Altogether 46% of forest owners mentioned bioenergy or gave a more detailed description related to bioenergy as a potential future utilization form of Finnish forests. Of the total sample 18% of respondents only mentioned bioenergy or the energy sector generally: *"Bioenergy comes first to mind…"*, while 28% of forest owners also discussed specific products related to bioenergy:

> *"Wood refining into liquid fuels is an important issue."*

> *"Energy wood has a lot of development needs. (…) Wood should be much drier when it's taken to the power plant."*

The second most commonly mentioned sector in the interviews was the building industry, as 23% of respondents suggested it as a potential sector for future business collaboration. The construction sector in general was discussed by 14% of forest owners, while 10% of the interviewees elaborated the issue in more detail. Further, respondents mentioned issues related to wood products and the furniture sector in 19% of cases. The following are comments from these areas:

> *"Wood is a living construction material, which breaths along with the climate. Mold would not be such a problem either."*

> *"A totally different mindset should be created into society. Environmental benefits should be utilized as a whole and e.g. lumber could be used to build large public buildings. Carbon could be stored in this way for a long time."*

> *"Wood should be processed more for different kinds of design [products]."*

Sectorial cooperation towards arts, entertainment and recreation, and education was mentioned by 17% of respondents. Nature-based tourism was named by 13% of NIPF owners as a potential sector for cooperation. The following representative comments are shown from the respondents who expressed more specific opinions of these sectors:

> *"Commercialized hunting"*

> *"There should be more entrepreneurs and associations that offer recreational forest uses and experienced services, so that everyone could enjoy forest more."*

"I have thought about riding safaris."

Themes coded under agriculture and forestry were discussed by 17% of respondents. Even more detailed comments were presented in 12% of cases while 5% of forest owners made more general comments. Other business areas were mentioned in less than 10% of cases, including human health and social work (6%), paper and paper products (5%), pharmaceutical products (4%), chemical industry and textiles (4%) and technology and information technology (3%). However, some interesting ideas from these sectors were received as well:

"We should begin with basic customer service. A timber buyer must be able to offer something else than price per cubic unit. It is impossible to compete with the price of timber any longer. The seller and buyer must stand behind the same thing. "

"Health products are booming. Could forest owners be taught how the health features provided by forests could be utilized economically?"

"Antibiotics these days are not that efficient against new diseases and I believe the solution can be found from forests."

"For example the wood and plastic composite that could be utilized in car industry. New raw materials should be invented."

Research and development activity (mentioned in 10% of cases) included very general ideas and comments concerning forest use, such as emphasizing the meaning of innovations and research and development, as demonstrated in the following comments:

"Forest industry is in need of a new technology and utilization of intelligent options."

"Applied sciences and product development should be invested in."

"Different applications of wood should be researched and we should consider whether wood [material] could replace more products than currently. Wood is a renewable natural resource and forests have plenty of capacity."

Many respondents emphasized the great significance of value-added products (12%) and stated that the Finnish forest industry should stop exporting commodity sawnwood, but instead focus on adding more value to the products. A fairly high share (21%) of respondents also criticized the current practices in the forest sector as well as forest industry-related issues, which dealt with e.g. regulation and policies, the role of nature conservation, timber importing, and low prices.

"I would also emphasize the significance of [product] upgrading: raw wood shouldn't be exported at all, a means of upgrading it should first be developed and then export could be considered."

"By increasing the degree of processing, more expensive end[-use] products could be sold abroad and consequently [industry] competitiveness would improve."

"Using common sense. Exporting timber to Denmark and manufacturing furniture there and then selling them back to Finland. Doesn't make any sense."

Figure 2 about here

4.2 Results from focus group discussions

The main findings from the FG discussions are summarized in Table 1. When forest owners were asked to consider the prospects of using forests, participants across all four FGs presented great insight for both tangible and intangible value creation. According to forest owners (especially in group 4), more emphasis was placed on developing forest-based recreational services. Health and sport -related activities also intrigued discussion among owners in group 4. The owners discussed themes e.g. creating health yoga services and path running events for enhancing health and well-being. One owner had experience in organizing eco-psychology courses and also others in the FG became excited about the forests' role in nursing.

> *"I've participated in a path running school…there is more interest in it… There is huge potential in Finland for organizing such events, which can be very interesting to foreigners as well." (FG4)*

> *"I'm a member of an association that is organizing a course on "the basics of eco-psychology" in March… It will deal with nature-based methods and their utilization e.g. in nursing and education. (…) A patient group will be taken out into nature and plants are also taken indoors." (FG4)*

> *"One of these [recreational services] is yoga, which has been a huge hit and people greatly appreciate all forms of "mindfulness". Forest as an environment naturally provides you with peace of mind." (FG4)*

Many participants emphasized the role that Finland's unique nature has on attracting tourists. Some ideas were also based on the owners' own experiences, such as off-road safaris as a form of adventure tourism, but the organization of these as a business activity was seen as problematic.

> *"We have a huge reserve in nature and forests (…) it is worth investing in intangibles…If you are able to sell the atmosphere and experience…of course you need an extra trick there…" (FG3)*

> *"As I have to travel due to my work, I have to say that we have spectacular sceneries and there is broad potential for traveling in forests, and also promoting it. This is special. When I come back to Finland from China I can breathe freely again…" (FG1)*

> *"Those [activities] will require a huge amount of capital into the equipment. (…) I'm a bit suspicious of safari recreation actions and similar activities because of all the different laws involved… environmental permissions are required and what if something like oil damage occurs, what then…" (FG3)*

The importance of environmental aspects in the Finnish society was discussed in general. Participants felt that Finns in principle are willing to support more ecological or socially responsible consumer products, but are not willing to pay extra for these features. This has led

to a situation, where sufficient demand does not exist, although e.g. the demand for organic food is on the rise. Further, converting forests into conservation areas was brought up as one of the potential uses due to existing carbon markets. It was also stated that forests have special value as they are, and hence forests could be left in a natural state. Again, as the discussion continued, it was noted that nature values alone will not be economically sufficient for forest owners. On the other hand, the participants acknowledged that the majority of owners are not likely to be willing to convert forests into conservation areas without some financial incentive, because of the importance of financial security and income embedded in forestry. However, it was frequently brought up that due to their abundance forests are taken for granted in Finland, and the wide range of benefits provided by nature are not appreciated enough, let alone commercialized to a sufficient level due to extensive everyman's rights:

> *"Usually nature alone is not enough… An economic viewpoint is needed as well…" (FG1)*

> *"Then there are these carbon dioxide directives and others… as forests are renewable raw material… It has potential…" (FG3)*

> *"For Finns these things are so self-evident that it is difficult to consider them in a commercial manner." (FG4)*

Group 4 participants in particular felt that alienation from nature does not only affect adults but their children as well. Introducing forests into urban areas in one way or another, even virtually, was one proposed solution. However, some participants suggested that a general alienation from nature could create novel forest-related commercial opportunities:

> *"Foreigners are able to understand the value of forests in a spiritual and mental sense. I've read that the Japanese have made a health forest certificate. (…) Spending time in forests lowers blood pressure and stress hormone levels and enhances resistance etc. We as Finns should understand how incredible a value we have, from which something like this could be created… then there are also recreational walking parks, (…) those should be easily achievable." (FG4)*

> *"Many people in Finland have become estranged from nature and forest, especially in larger cities. There are several recreational opportunities… As long as the potential were applied." (FG3)*

> *"Forests offer many sorts of things, but everything has costs in the beginning, so we should start by selling intangible experiences. We wouldn't be so tied to entrepreneurship. And even though the return is lower, it would be easier on a smaller scale." (FG3)*

The potential of increasing value-added wood products was brought up in a few FG discussions. The commercial potential of value-adding was seen as good a concept, because consumers are more and more willing to pay for high quality locally produced wood products, which would also bring competitive advantages compared to imported ones. One forest owner e.g. had his own business idea relating to wooden posts, but he did not want to reveal very much about it.

> *"There has been a lot of talk about increasing the degree of upgrading, it isn't just bulk that should be produced but the added-value has to be found from further processed products. Consumers are willing to pay more for wood products, especially domestic ones." (FG4)*

> *"It is always the costs that are counted. It [value-adding] should be made very trendy… e.g. these wood constructions and wood buildings… so even though prices were higher, it would pay off and find a market…" (FG3)*

> *"Our domestic log houses could interest the world if marketing was better. They are good because they can withstand a lot of shaking before collapsing… for earthquake zones…" (FG3)*

Yet, further development and commercialization of nascent NIPF-based business ideas and innovations was seen to be very challenging. The capital intensiveness of the forest industry was considered the most challenging business-related barrier for individual owners. A forest owner should have plenty of finances and an established network of contacts to develop their ideas any further. Development needs were also found in the state of marketing skills, as demonstrated by the following comments:

> *"We [Finns] are poor marketers though. We have so many things here, we just don't see the potential and sell them. We take all things for granted. If we looked at the American way, things would be completely different in this country. We have lived so modestly… Enthusiasm for marketing is lacking in general." (FG3)*

> *"(…) We need to find a niche. No matter how good the idea, we have limited demand, and when we think about e.g. some narrow sector or hobby, the demand is very limited. It's a question of how good you are at marketing and where is it located." (FG3)*

Many participants also emphasized their willingness to learn more about forest-related issues. The wish of group 1 was to network with other forest owners to discuss forests and forest ownership issues e.g. during existing forest fairs. NIPF owners who had just recently inherited forests wished to learn more and hear about the different and more diverse possibilities of forest management and in this way contribute to the sector, as voiced by one FG participant:

> *"…My objective is to understand something about these things so that I could sell some timber and manage it properly, but I want to avoid situations where I have to regret something. So the idea is to understand these things better and familiarize myself with these issues." (FG4)*

The general consensus in the groups on the current and future state of the Finnish forest sector was that the traditional sector is dominated too strongly by large forest industry companies and the use of forest resources is orchestrated based on the interests of these large companies. In some groups NIPF owners expressed frustration that forest owner associations serve the needs of the timber industry and other service organizations also mainly provide services focused on intensive roundwood production. Forests as a stand were often seen as more valuable when compared to being cut down, and forest management practices based on clear-cuttings were criticized in general. On the other hand, the mutual benefits gained from intensive forest

management for recreational use were also brought up. Even though these groups of forest owners also recognized factors that inhibit the development of the sector, they still saw the overall future of the forest sector as positive. According to owners in general, the forest sector will continue to be profitable also in the future due to long traditions, positive structural change, more diverse utilization of forests, and the emergence of new actors in the field. These issues are exemplified in the following quotes:

> *"Forests are less diverse [today]. If we think about this issue related to wildlife, forests should be more diverse, but it [nature] has lost because of current forestry. There are economic values in the background." (FG3)*

> *"I believe that forest industry isn't the thing that interests inventors and innovators at the moment…everybody is just developing games. But I'm completely sure that at some point it will become interesting and someone will invent something totally different out of wood, and the industry will remain. But it won't be these old things, it will need to be something novel." (FG1)*

> *"It is not a great concern [the forest sector's position], because wood is always needed in great quantities anyway… These other bioprojects, especially the one where they make biodiesel from pine fiber…it is quite an interesting project." (FG2)*

> *"It [forest industry] will consist of several small pieces…there won't only be one large industry, but the industry is formed from all the little things in the future." (FG1)*

Female forest owners strongly underlined the traditional masculine image of the sector and believed that increasing the share of female forest owners was a positive aspect for the entire sector through novel utilization prospects and for developing a more ecological orientation. Especially in female-dominant groups, many participants saw e.g. forest owner associations as being too traditional actors that only facilitate the needs of industrial timber procurement. In addition, new forest owners with their novel perspectives and interests were seen as a potential for the renewal of the traditional sector. The following are representative comments from female-dominant group 4:

> *"It is distressing that there is a huge masculine system behind. Now, once there are a lot of female owners who have inherited forests, then we might even make a difference." (FG4)*

> *"People are more heterogenous. Forest owners are completely different today, and have a variety of interests compared to the old days when all of them came from the countryside… there's a totally different starting point [nowadays]." (FG4)*

Table 1 about here

5. Discussion

The aim of our study was to explore the future opportunities of forest-based services and products as perceived by a sample of Finnish forest owners. Although at this stage the dominantly qualitative research approach was able to provide only general views on the emerging themes, some useful insights could be recognized. Yet, totally new ideas did not emerge during the discussions with individual NIPFs or in their subsequent FGs. However, the FGs clearly expressed a need for changes in forestry practices and services available in the sector, which could be elaborated further.

Regarding our first research question, bioenergy, the construction sector, and secondary manufacturing of wood products were most frequently recognized as intersectoral linkages in the interviews, whereas the general talk within the FGs mostly revolved around enhancing the potential of recreational and tourism activities by emphasizing the unique role of Finnish nature. The strongest emphasis on bioenergy production is interesting in the sense that NIPF owners' land-use choices strongly influence the supply of forest bioenergy widely in several European countries and the United States. Although the potential of bioenergy is widely recognized among NIPF owners, as our study indicates, Rämö et al. (2009) found that Finnish NIPF owners may be confused about practices in the emerging bioenergy markets and they lack availability of market price information. Interestingly, although bioenergy was the most commonly mentioned issue in the interview results, it was not brought up frequently in the FG discussions.

Findings from our study also indicated that Finnish NIPF owners appear to have a social calling for placing more emphasis on recreational service development, which was evident especially in the FG discussions. Sievänen (2005) already showed that nature-based tourism prospects in Finland were seen as favorable due to socio-economic changes in population and increased awareness of health and environmental issues. However, the main challenges in the generation of nature-based tourism and cultural forest ecosystem services continue to be related to the development of new service business models, and more precisely to how the most appealing factors of nature are formulated into functional service packages for different customer segments (Peltola 2007). However, Finnish everyman's rights challenge the implementation of commercial innovations in recreational services, as citizens are unaccustomed to paying for them (Weiss et al. 2007). Also, as foresters as a professional community are mainly aimed at timber production, a reserved attitude towards recreational services and products may exist in

544 the practical forestry extension. From the forest owners‘ viewpoint, economic benefits are also
545 rare because compensating forest use e.g. through nature-tourism purposes is not very common
546 (Matilainen and Lähdesmäki 2014). Weiss et al. (2007) states that enhancing cross-sectoral
547 cooperation between forestry and nature-based tourism is required for the development in
548 service innovations to occur.

549 An important aspect is also, the level at which cooperation between sectors is being
550 implemented. According to Porter (1998), the presence of strong national clusters suggests that
551 much competitive advantage lies outside a company or outside its industry. A study by Delgado
552 et al. (2010), focusing on new business formation, found that the presence of a strong cluster in
553 the same general location enhances entrepreneurial vitality by reducing barriers for entry and
554 growth, as well as enhancing the range and diversity of entrepreneurial start-up opportunities.
555 Furthermore, as Porter (1998) states, cluster boundaries do not often conform to standard
556 industrial classification systems and hence do not succeed in capturing many important actors
557 in the competition and linkages across industries. However, Porter’s approach has also been
558 criticized from multiple perspectives, such as being too geographically limited or not placing
559 sufficient emphasis on international activities (see e.g. Penttinen 1994 for a review).

560 Participants in the FGs also voiced a wish for more opportunities to engage in peer-to-peer
561 discussions concerning the potential of forest use and experiences. Knowledge exchange was
562 studied in a study by Hamunen et al. (2015), which concluded that quite a few options for forest
563 owner gatherings already exist, such as basic courses for new forest owners or forest owner
564 clubs. Perhaps there is still a need to more effectively market such events, especially to new
565 forest owners. Hamunen et al. (2015) also suggested more informal communication “circles”
566 between forest owners that could lead to the testing of more innovative forest management
567 practices. As a few participants in the FGs mentioned, previous studies have also shown that
568 new forest owners can have varying motivations and interests compared to the former owners
569 of these estates (Rickenbach et al. 2005, Hirsch et al. 2007), which can lead to novel
570 perspectives for forestland use. New communication channels should be established with new
571 forest owners, who could then better express their diversified objectives, including ownership,
572 forest use, and conservation issues (Vainio and Paloniemi 2013).

573 Based on our results, the current state of the entire forest industrial sector in Finland was seen
574 to be in somewhat of a flux. The FG discussions indicated a broad range of opportunities, but
575 their commercialization requires a radically new way of thinking and a change of mindset for

576 the entire forest sector. Interestingly, individual comments in the interview data relating to the
577 state of the Finnish forest sector mostly expressed criticism, whereas most FG comments could
578 be considered constructive and positive. In face of strong societal emphasis on sustainable
579 development, the development of environmentally oriented consumption or lifestyle is
580 becoming increasingly important also among forest owners (Häyrinen et al. 2015b). The
581 findings of our study also supported this, as many ecological viewpoints were strongly
582 elaborated, especially in the FGs. In parallel, many interviewees criticized current forest
583 management practices as too rigid, despite the renewal of the Forest Act on1.1.2014.

584 Particularly some female participants underlined the overly masculine image of the forest
585 sector, which was also brought up in the study by Vainio and Paloniemi (2013). They stated
586 that female forest owners typically adopt a passive bystander position when they own forests
587 together with their husbands. Especially many female forest owners in our FGs desired a
588 broader variety of options for forest management, which is in line with results by Häyrinen et
589 al. (2015a), which found that the roundwood trade -oriented mindset of the established service
590 organizations is no longer considered attractive by all owner groups (see also Hujala et al. 2013,
591 Kuipers et al. 2013). Our findings also suggested that female owners emphasize softer forest
592 values more commonly than men, which could be promoted with gender-specific extensions
593 and activities as suggested by Karppinen and Berghäll (2015). Findings by Umaerus et al.
594 (2013) from Sweden also indicated that female owners are more likely to engage in service-
595 oriented business activities, such as health and nature-based tourism, where they can benefit
596 from their professional knowledge and interests. Furthermore, the recently renewed Forest Act
597 in Finland is aiming for more customer-oriented thinking as it provides more freedom of choice
598 for owners to implement their own management objectives. For example, the new 2014 Forest
599 Act allows continuous-cover silviculture practices in all forests, which has earlier been more
600 restricted, and thus promotes the adoption of multi-functional forest management practices. For
601 example Hull et al. (2004) discussed “boutique“ -style forestry that relates to very small-scale
602 multi-objective forest management. They found that despite the main ownership objective of
603 “boutique forest owners“ in the US being related to forest amenity values, they are not
604 necessarily against timber harvesting for improving aesthetic value or even for receiving
605 income. This is also somewhat in line with our findings from Finland.

606 Yet, working within the confines of the available data sets, our study contains some limitations.
607 While the respondents are the same in both the quantitative telephone interview and FG

608 discussions, the data 1 used in this research are the additional (vented) comments from the
609 structured phase of the earlier research. Therefore when selecting the respondents for the FG
610 discussions the tool of LOHAS-criteria might not be representative of the whole original
611 population. Further, as the directives for the FG discussions were different from the telephone
612 interview phase a certain amount of group dynamics will alter the responses from the first
613 (telephone) interview. Thus, while the findings from the two different data sets could be
614 considered complementary to each other (same people and a more in-depth view on the subject),
615 the findings are not directly comparable with each other due to different premises. , Hence the
616 findings should be considered with some caution. However, due to the diverse characteristics
617 of the FG participants, the discussion themes were perceived slightly differently. Groups 1 and
618 4 especially consisted of mainly female owners, and conversations were related more to the
619 meaning of forests and on new ecological utilization prospects. Instead, groups 2 and 3
620 consisted of only male forest owners, who appeared to be observing and analyzing the forest
621 sector from a more practical perspective and based on their own experiences. Findings from
622 previous studies have also indicated that female owners in Nordic countries appear to
623 emphasize more ecological and preservation forest values than males (Nordlund and Westin
624 2011; Häyrinen et al. 2015a) and e.g. forest management activities are less common on
625 properties owned or managed by females (Lidestav and Lejon 2013).

626 Despite the limitation of a small amount of data and the relatively short interaction in the FGs,
627 a rich data set was created based on the FGs discussions, so the choice of this method in this
628 context can be considered successful. Due to the versatile themes brought up in the interviews
629 and FG discussions, we can conclude that highly committed forest owners (although not
630 necessarily focused on timber production) could more actively be involved in the visioning of
631 a basis for broader forest ecosystem service provision. As customer integration for service
632 development is becoming increasingly important (Edvardsson et al. 2012), introducing SDL
633 perspectives could bring fresher ideas to a very traditional way of thinking that lacks more in-
634 depth sustainability orientation (see also Mattila 2015). Including forest owners in the value
635 creation process in a more versatile way could lead to emerging new ideas and opportunities in
636 the forest sector. As Matthies et. al. (2016) note “the inclusion of SD logic (service dominant
637 logic) into the concept of ecosystem services (ES) broadens the basis of … value creation”.
638 Thus, the transfer from a goods-dominant logic (Vargo & Lusch, 2008) to Service Dominant
639 logic alters the human-nature setting from viewing possible value as steming from the “stocks
640 of natural resources” to include also dimensions of intangible value (Matthies et. al., 2016).

These new demands are reflected in the new customer groups. Therefore the results drawn from our FG attendants seem to support this new basis for value especially in the sphere of social ecosystem services.

As noted in reviewing previous literature, the bioeconomy concept is still a blurred concept to some extent, and its content varies (Schmid et al. 2012, Pülzl et al. 2014). Hence, it was not a priori evident how well forest owners understand the concept. All in all, there is a need for more diverse and in-depth communication and cooperation between political decision-makers, forest owners, the forest industry, and research and extension organizations. In the Finnish case it is evident that forests cannot be utilized for the needs of society without the help and legitimization of NIPF owners. As the results of our study showed, highly diverse aspects were considered in the interviews and FGs, underlining that modern forest owners can also be very future-oriented and operate with multiple thoughts and objectives. Because of the exploratory nature of our study, it raises even more questions. In the future, it may be fruitful e.g. to investigate the means of creating communication networks between various actors in the field. In addition, it would be interesting to study evolving forest ownership issues and the future use of forests in the Nordic region by using foresight methods available in futures studies.

Acknowledgments

Financial support from the Finnish Funding Agency for Innovation Tekes through the FORTUNE project and the Academy of Finland through the FORESCOF project is gratefully acknowledged. The first author was also partly supported by a Young Researcher's Grant funded by the Research Foundation of the University of Helsinki.

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848 **Tables**

849 **Table 1.** Summary of the main findings from the four focus groups.

Group 1	· Potential in recreational and tourism activities: especially the role of Finnish nature; emphasis should be on other possibilities rather than timber trade, though economic aspects have to be taken into account · Information needed on existing and alternative forest management practices or use, not just traditional ones; the wish was to network with other forest owners · Forest sector needs to be renewed, sector is under many changes; general resistance to clear-cuttings
Group 2	· Potential in travelling, construction, composites, technological solutions in forest planning; challenges in commercialization · Overall future of forest sector was seen as positive, new possibilities for using wood will be found in the future
Group 3	· Interest in diversification of forest business through value-adding and marketing: e.g. wood constructions; a lot of potential in forest recreational experiences: e.g. the role of unique Finnish nature in attracting tourists and adventure travelling; confidence in Finnish know-how in the forest sector · Current state of forest sector is seen as challenging, e.g. high productions costs; future of forest sector was seen as somewhat positive if forests are used in a more diverse and rational way
Group 4	· More emphasis should be placed on developing forest-based recreational services: e.g. health- and sport-related activities, potential also in nature tourism and value-added wood products; the wide range of benefits provided by nature are not appreciated enough, let alone commercialized due to extensive everyman's rights · Information needed on forest ownership in general as well as existing and alternative forest management practices · The masculine image of the sector was emphasized but increasing the share of female owners was seen as a positive sign; resistance to clear-cuttings

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853 **Figures**
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856 Figure 1. Research design and connections between data sets
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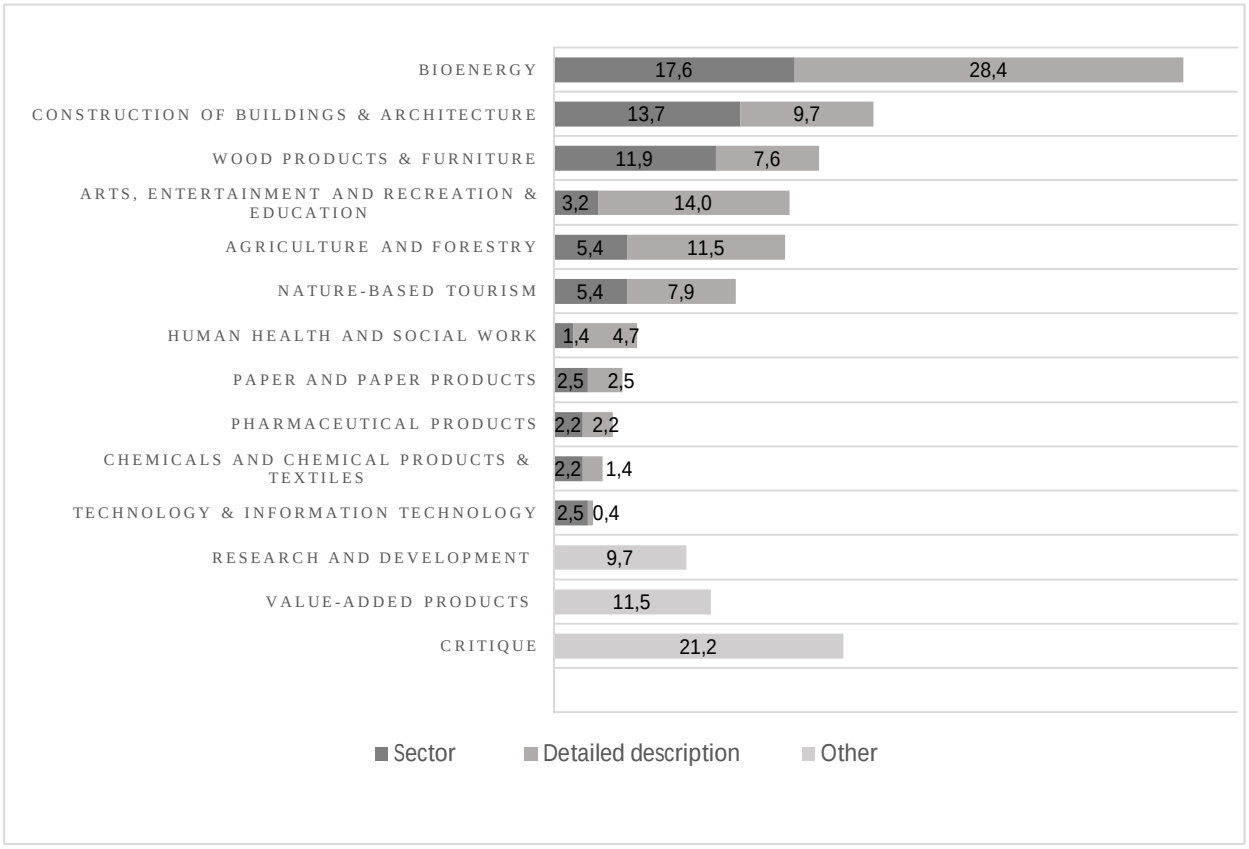

Figure 2. Related and supporting industry sectors in descending order of frequency. The last three categories focus on general issues towards R&D whereas critique includes the share of NIPF owners giving critical remarks towards the nature of the current Finnish forest sector.