

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

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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

29 **1. Introduction**

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

44 In parallel, the global forest sector has faced multifaceted challenges during the last decade, such as
45 changing production and consumption patterns of especially paper and paperboard and the rise of
46 competition from emerging producer countries that have led to structural changes in the industry in the
47 Nordic countries. To retain its future viability, the competitive advantage of the entire sector needs to
48 be sought, in addition to traditional forest products, also increasingly from the intangible values of
49 forests and by enhancing the role of services (e.g. Hetemäki et al. 2011). Forest industry, especially in
50 the Nordic countries, has become active at re-inventing its strategies, products, services, and business
51 models (Näyhä et al. 2014, Forest Sector Technology Platform 2015). According to Lindahl and
52 Westholm (2012), changing activities and outputs also bring new actors into the markets despite other
53 actors possibly exiting from the forest sector. Even though forestry service organizations have likely
54 seen forest owners more as raw material producers than customers buying services (Mattila and Roos
55 2014), following service dominant logic is becoming increasingly important approach also in forest
56 sector (Näyhä et al. 2015). Key actor perceptions on the future and challenges and opportunities
57 of forest use will affect their strategies and actions, and their relative capacities for realizing
58 their visions, while on the other hand influencing future forest use (Lindahl and Westholm
59 2012). One of the key actors in the field consists of non-industrial private forest (NIPF) owners,
60 especially in countries where they own a major part of the forestland. The majority of forests

61 in Nordic countries and the United States are owned by hundreds of thousands of small-scale
62 NIPFs, who supply the main body of industrial roundwood and have control on numerous other
63 tangible and intangible forest-based ecosystem services. Comprehending the perceptions and
64 preferences of private owners has been the aim of several studies as NIPFs provide useful
65 knowledge for the forest sector (e.g. Kuuluvainen et al. 1996, Kline et al. 2000, Butler et al.
66 2007). While previous studies have shown that NIPF owners have multidimensional values and
67 ownership objectives, increasing emphasis has more recently been placed on the intangible
68 forest values of owners (Hull and Nelson 2011, Häyrynen et al. 2014). According to Häyrynen
69 et al. (2016, p. 12) “as the NIPF owners have more personal connections with the forest than
70 average consumers, they are a potential source of information for exploring the untapped future
71 potential that help in transition of the Finnish forest sector to a forest bioeconomy.” Along with
72 changes in the structure of Finnish NIPF owners and consequently changes in forest owner
73 objectives (Karppinen et al. 2002, Karppinen and Hänninen 2006, Hänninen et al. 2011), e.g.
74 young and new forest owners may have an entirely different stance for their forest management
75 objectives and the overall utilization of forests than elderly forest owners.

76

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

83

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

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

88

89 **2. Conceptual background**

90 **Transition of the forest-based sector towards a bioeconomy**

91 Although the concept of bioeconomy differs depending on those using it (Kleinschmit et al.
92 2014), the term generally refers to an economic transition from relying on fossil-based fuels to
93 the sustainable use of natural resources by taking advantage of renewable resources and new
94 innovations (Staffas et al. 2013). Terminology such as ‘bioeconomy’ and ‘bio-based economy’
95 is also often used interchangeably despite these terms having slightly different meanings (see
96 e.g. Staffas et al. 2013, see also Schmid et al. 2012 for definitions). Growing societal emphasis
97 on sustainable development has raised the importance of a bioeconomy, enhancing green
98 consumerism that emphasizes sustainable choices in everyday consumption patterns (see e.g.
99 Roberts 1996, Young 2010). When reaching towards the future bioeconomy, forests as a leading
100 renewable resource base in the Nordic countries offer huge potential for developing more
101 sustainable products and services also in terms of intangible values, including food, health,
102 leisure time, and nature-based tourism possibilities (Hetemäki et al. 2006). While international
103 agreements on sustainable development (see e.g. United Nations 2012) call for a more efficient
104 use of the Earth’s resources, they turn the emphasis towards renewable resources, which opens
105 up many interesting possibilities for the more diversified forest-based sector.

106

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

120

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

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

132

133 An interesting question is how the related and supporting industries – and the innovations on
134 the sectorial interfaces – could enhance development towards a forest bioeconomy. Porter
135 (1990) summarizes the competitive advantage of a firm in his famous diamond model to consist
136 of four main elements: factor conditions, demand conditions, related and supporting industries
137 as well as a firm strategy, structure, and rivalry (see more e.g. Porter 1990, 1998), which form
138 a strong field of business, a cluster, that successful industries tend to create. More specifically,
139 Porter’s (1990) recognition of related and supporting industries stems from the view that the
140 presence of local competitive industries also improves the success likelihood of other related
141 industries.² Following the thoughts of Michael Porter, bioeconomy is a platform for a broad
142 range of industries that can cooperate and mutually benefit from collaboration across disciplines
143 and sectors, which has been indicated as one of the important factors in the transition towards
144 a bioeconomy (European Commission 2011, McCormick and Kautto 2013). According to the
145 European Commission (2012), the growth is expected to originate from sustainable primary
146 production, food processing, and industrial biotechnology and biorefineries, but to maintain its
147 competitiveness the European bioeconomy sectors need to innovate and diversify their current
148 businesses.

149

150 **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 intertwined 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.

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

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

172 Customer involvement has not been widely studied in the forestry context, while Nybakk et al.
173 (2009) have studied Norwegian forest owner innovativeness. They found that an owner's higher
174 level of learning orientation and local social network are critical antecedents for their
175 innovativeness. Furthermore, innovativeness is an important factor in obtaining high
176 performance levels, and forest owners with larger property sizes are more effectively able to
177 turn innovativeness into higher performance. In another Norwegian study, Lunnan et al. (2006)
178 studied factors affecting NIPF owner rates for initiating new activities on their lands. They
179 found that forest owners with higher entrepreneurial orientation have a higher probability of
180 initiating new activities, which suggests that more emphasis should be addressed towards
181 developing entrepreneurial attitudes among forest owners, as well as improving the institutional
182 setting stimulating business activities.

183 3. Research data and analysis methods

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

193 Figure 1 about here

194

195 *Data sets 0 and 1*

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

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

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

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

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

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

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

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

301 **4. Results**

302 **4.1 Interview results**

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

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

313 *“Wood refining into liquid fuels is an important issue.”*

314 *“Energy wood has a lot of development needs. (...) Wood should be much drier when it’s taken to*
315 *the power plant.”*

316 The second most commonly mentioned sector in the interviews was the building industry, as
317 23% of respondents suggested it as a potential sector for future business collaboration. The
318 construction sector in general was discussed by 14% of forest owners, while 10% of the
319 interviewees elaborated the issue in more detail. Further, respondents mentioned issues related
320 to wood products and the furniture sector in 19% of cases. The following are comments from
321 these areas:

322 *“Wood is a living construction material, which breaths along with the climate. Mold would not be*
323 *such a problem either.”*

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

327 *“Wood should be processed more for different kinds of design [products].”*

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

332
333 *“Commercialized hunting”*

334 *“There should be more entrepreneurs and associations that offer recreational forest uses and*
335 *experienced services, so that everyone could enjoy forest more.”*

336 *“I have thought about riding safaris.”*

337 Themes coded under agriculture and forestry were discussed by 17% of respondents. Even more
338 detailed comments were presented in 12% of cases while 5% of forest owners made more
339 general comments. Other business areas were mentioned in less than 10% of cases, including
340 human health and social work (6%), paper and paper products (5%), pharmaceutical products
341 (4%), chemical industry and textiles (4%) and technology and information technology (3%).
342 However, some interesting ideas from these sectors were received as well:

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

346 *“Health products are booming. Could forest owners be taught how the health features provided by*
347 *forests could be utilized economically?”*

348 *“Antibiotics these days are not that efficient against new diseases and I believe the solution can be*
349 *found from forests.”*

350 *“For example the wood and plastic composite that could be utilized in car industry. New raw*
351 *materials should be invented.”*

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

355 *“Forest industry is in need of a new technology and utilization of intelligent options.”*

356 *“Applied sciences and product development should be invested in.”*

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

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

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

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

370 *“Using common sense. Exporting timber to Denmark and manufacturing furniture there and then*
371 *selling them back to Finland. Doesn’t make any sense.”*

372

373 Figure 2 about here

374 4.2 Results from focus group discussions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

460 *“(...) We need to find a niche. No matter how good the idea, we have limited demand, and when we*
461 *think about e.g. some narrow sector or hobby, the demand is very limited. It’s a question of how*
462 *good you are at marketing and where is it located.” (FG3)*
463

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

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

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

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

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

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

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

496 *“It [forest industry] will consist of several small pieces...there won’t only be one large industry, but*
497 *the industry is formed from all the little things in the future.” (FG1)*

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

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

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

511

512 Table 1 about here

513 **5. Discussion**

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

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

532 Findings from our study also indicated that Finnish NIPF owners appear to have a social calling
533 for placing more emphasis on recreational service development, which was evident especially
534 in the FG discussions. Sievänen (2005) already showed that nature-based tourism prospects in
535 Finland were seen as favorable due to socio-economic changes in population and increased
536 awareness of health and environmental issues. However, the main challenges in the generation
537 of nature-based tourism and cultural forest ecosystem services continue to be related to the
538 development of new service business models, and more precisely to how the most appealing
539 factors of nature are formulated into functional service packages for different customer
540 segments (Peltola 2007). However, Finnish everyman's rights challenge the implementation of
541 commercial innovations in recreational services, as citizens are unaccustomed to paying for
542 them (Weiss et al. 2007). Also, as foresters as a professional community are mainly aimed at
543 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 on 1.1.2014.

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; Häyrynen 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 stemming from the “stocks
640 of natural resources” to include also dimensions of intangible value (Matthies et. al., 2016).

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

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

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848 **Tables**

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

Group 1	<ul style="list-style-type: none"> · 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	<ul style="list-style-type: none"> · 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	<ul style="list-style-type: none"> · 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	<ul style="list-style-type: none"> · 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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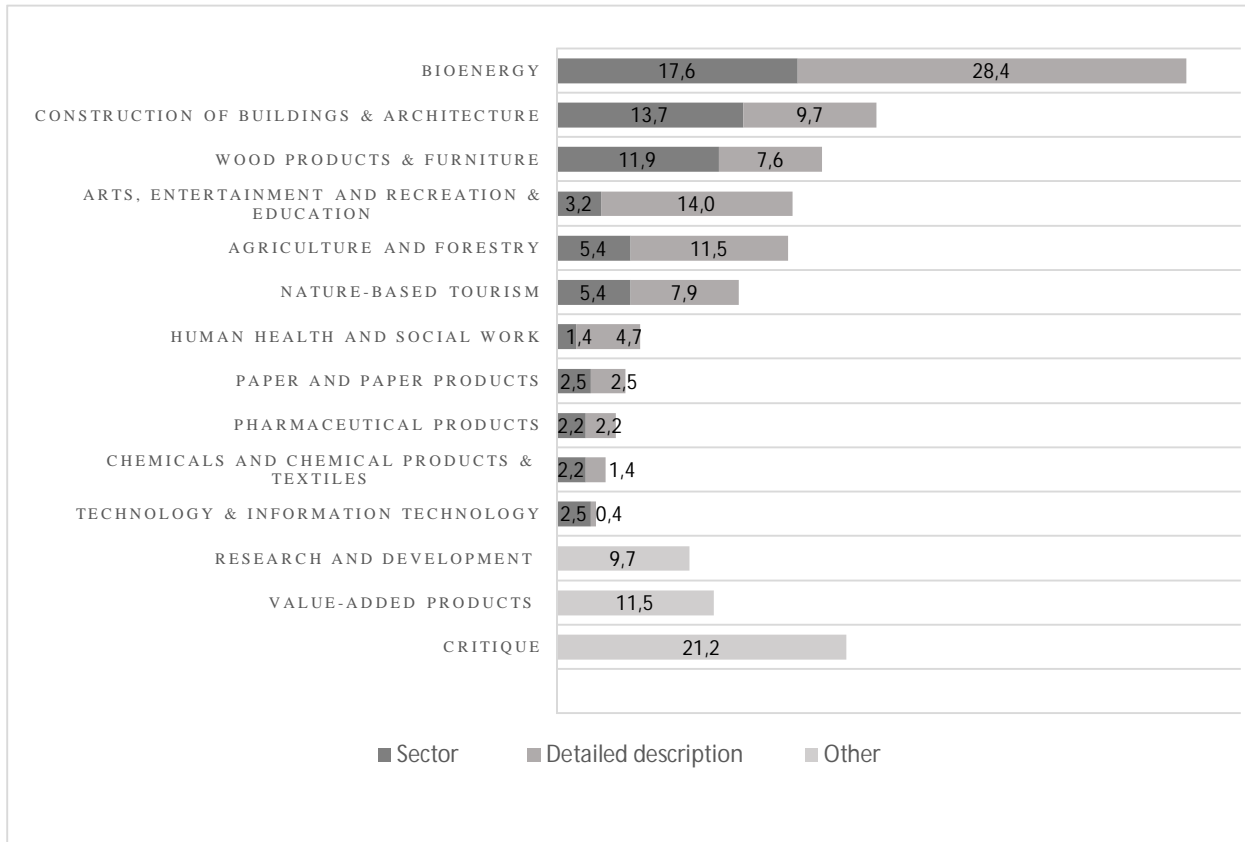
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856 Figure 1. Research design and connections between data sets

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

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