Chapter 15
Forest Owners' and Forestry Stakeholders' Perceptions

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Abstract

- In Finland, the new Forest Act in 2014 made continuous cover forestry (CCF) a possible forest management option. This triggered research on how forest owners and forestry professionals perceive CCF. In Sweden and Norway, the CCF method has been legal but not encouraged. Research on stakeholder views on CCF has only recently emerged, so only a few studies have been published on the topic.
- In Finland, according to surveys, less than 10% of forest owners have converted to CCF in all their forests and around 20–25% in part of their forests. About a fifth of forest owners expressed an interest in testing it.
- In the Finnish studies, CCF has been of particular interest to forest owners whose holdings are smaller than average and where they have recreational objectives.

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- The interest of forest owners clearly increased if they were compensated for converting to CCF.
- Forestry companies, as well as their associations in Sweden and Finland, promote CCF as an alternative forest management method, according to statements on their official websites. How well this supportive attitude will materialise in their actions remains an open question.
- The current forestry culture, the power of industrial networks, uncertainties concerning economic profitability and ecological outcomes, as well as current forestry education and technical knowledge, are the main barriers for CCF.

Keywords Forest owners · Forestry professionals · Forest industry · Perceptions · Barriers

15.1 Introduction

To understand the potential for implementation of continuous cover forestry (CCF) at a larger scale in the Nordic countries it is important to understand the actors influencing forest management decisions. While the forest owner has the legal right to make these decisions, other forestry actors and the institutional, operational, and social context in which these decisions are made are also highly influential (Andersson and Keskitalo 2018, Matilainen et al. 2023). Rather than considering CCF implementation to be the outcome of an individual owner decision (i.e. only determined by the owner's perceptions), other actors in the forest sector, including owner associations, the forest industry, and government actors are likely to play an important role, through formal and informal interactions with the owners.

The ownership structure differs somewhat between Norway, Sweden, and Finland, but non-industrial private forest (NIPF) owners (sometimes referred to as family forest owners or individual private forest owners) is an important ownership category in all countries. In this chapter we use the terms NIPF or forest owners when referring to this group. Finland has the highest number of individual NIPF forest owners (Fig. 15.1), and 11% of the population are forest owners. The corresponding figures in Sweden and Norway are 3% and 2%, respectively.

There are some other differences between the countries in terms of ownership structure (see Fig. 15.1). In Finland, the average size of holdings is 48 ha including shrub and idle land (Karppinen et al. 2020). In Sweden the corresponding figure is 45 ha (Skogsstyrelsen 2021a, 2021b) and in Norway 45 ha (Statistics Norway 2022). Forest owners are heterogeneous in their socioeconomic backgrounds, attitudes, values, and objectives for their forest ownership (Ficko et al. 2019). Ficko et al. also report that forest owner groups appearing in earlier forest owner surveys include multi-objective forest owners, recreationists, investors, and indifferent owners. Together with site-specific characteristics of forests, the varying objectives have led to various forest management choices. For example, forest owners in the

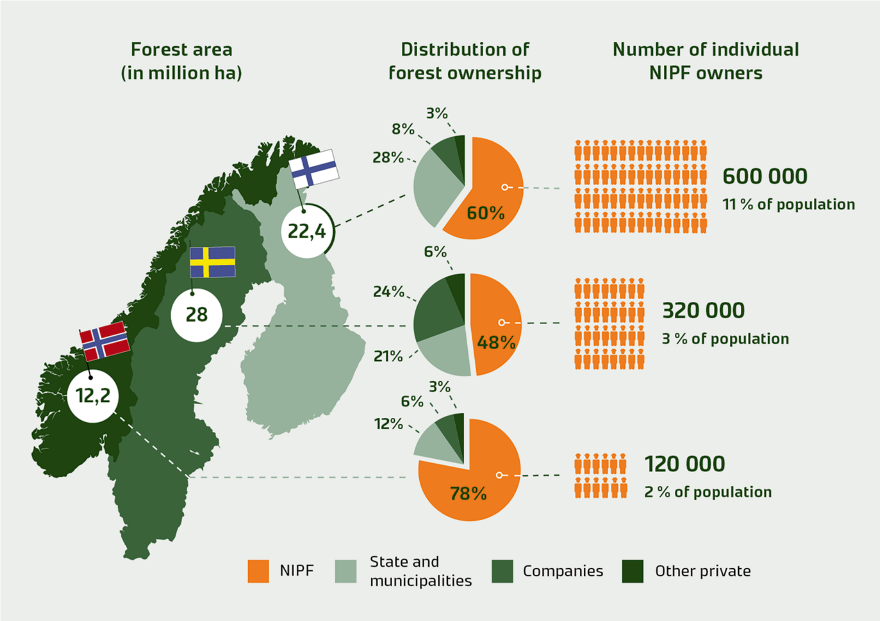

Fig. 15.1 Forest ownership in Fennoscandia

different countries use varying management strategies, and there also seem to be different drivers for their management choices (Westin et al. 2023).

Current perceptions regarding CCF among forest owners and professionals should be viewed in the light of how CCF has been used historically in the Nordic countries. In the nineteenth century and earlier, forest harvesting in Norway, Sweden and Finland was based on selective cutting of trees that exceeded a certain diameter, and this form of management had some CCF characteristics (detailed description in Chap. 2). It was, however, practised in such a way that the most valuable trees were harvested, and regeneration of the forest was not necessarily managed, resulting in a depletion of forest resources.

Awareness of this depletion brought about change in forest management practices, which were switched to rotation forestry (RF). After the 1950s and until recently, CCF management was rarely applied in the Nordic countries. In Finland, CCF was not even permitted under the provisions of the Forest Act until 2014, with the exception of some special cases. The Forest Act reform diversified forest management, removing previous constraints and allowing CCF to be adopted as a method of growing the forest. In Sweden, while there have been no formal barriers, and in recent years CCF has been increasingly supported by institutional factors (e.g., certification schemes), CCF is limited in certain forest contexts and few policy measures have promoted the method (Sténs et al. 2019). However, Espmark's (2017) report on the debate in Sweden shows that public interest in CCF has grown considerably since the 1990s, reflected in the number of news articles including keywords relating to CCF. The debate is characterised by conflicting arguments and opinions, representing different interests, and little is known about what forest owners and forestry professionals have specifically contributed to the debate and how they are influenced by it.

This chapter focuses on perceptions of CCF among stakeholders who have a direct or indirect influence over decisions regarding forest management. Emphasis is placed on examining how NIPF owners perceive and evaluate CCF, as well as their interest in adopting CCF practices. Given the importance of decision-support services in forest owners' decision making (Takala et al. 2023), the perceptions of forestry professionals—advisors at forest owner associations, timber buyers, etc.—are also reviewed. The limited number of empirical studies on NIPF owners and forestry stakeholders makes a comprehensive comparison of the Nordic countries difficult and prevents general conclusions regarding the perceptions of stakeholder groups. Nevertheless, the following review reveals some of the drivers and barriers relating to CCF adoption at larger scales in the Nordic countries.

15.2 Forest Owners and Forestry Professionals

15.2.1 Forest Owners in Finland

An evaluation of the revised Forest Law shows that CCF is slowly gaining popularity (Kniivilä et al. 2020). In the Finnish Forest Owner Survey conducted in 2019 (Hänninen et al. 2020), 8% of NIPF owners reported that they have converted to CCF in all their forests, and 18% in part of their forests. Approximately 20% of NIPF owners had not applied CCF forestry but were interested in doing so in the future (Horne et al. 2020). If compensation were paid for a transition to CCF on the grounds of climate benefits, 62% of NIPF owners expressed interest in implementing it in part of their forests (Koskela et al. 2021).

In another survey that asked NIPF owners to estimate the proportion of different management types in their forest holdings (Juutinen et al. 2020), RF averaged around 60% and CCF 19% of the reported areas, weighted by forest area. More than 60% of respondents intended to use two or more methods of managing their forest in the future (RF, short RF, long RF, CCF, or other management methods incorporating conservation). If an area had been naturally regenerated previously, there was a greater interest in CCF, but the use of seedlings, young stand management and clearcut in the 5-year period prior to the survey was associated with less interest in CCF.

According to the Finnish Forest Owner Survey, NIPF owners regarded CCF as being beneficial to certain species, so it was a more common forest management method among owners who prioritised recreational and natural values (Horne et al. 2020). Similar results have been reported in other studies. Nature and recreation goals, and smaller-than-average forest estates also correlated with the willingness of forest owners to adopt CCF in the future (Husa and Kosenius 2021). In a qualitative study that interviewed ten owners of different-sized forest estates in the Kuonanjoki river catchment area in southern Finland, the owners were particularly critical about the profitability of CCF, changes in timber value, and the risks associated with forest regeneration/ingrowth (Kietäväinen 2022). In contrast, landscape values, biodiversity, and the suitability of CCF for some forest stands and locations were assessed as positive features. The level of knowledge varied, and not all owners meant the same things even when using the same terms. Perceptions of CCF compared to RF varied: some forest owners thought that CCF was more profitable than RF, whereas others took the opposite view. Some forest owners thought that CCF required more management, improved the wood quality, or was better for soil, animals, and plants, while other forest owners felt the opposite.

Juutinen et al. (2020) examined which forest management types Finnish forest owners planned to implement in the future, and how their assessment of generally implemented forest management types impacted these plans. The area that owners planned to allocate to CCF was smaller if they were positive about current forest management in Finland in terms of timber production, biodiversity, and carbon sequestration. NIPF owners who described themselves as agricultural or forestry entrepreneurs allocated a smaller area of forest to CCF than forest owners of any other occupation. The other socioeconomic background factors—age, gender, education, living in a city or large town—had no effect on future plans for forest management.

The choice by Finnish NIPF owners between conventional forest management that prioritises wood production and alternative forest management that emphasises natural values has also been studied using the choice experiment method (Juutinen et al. 2021). In that study, forest management with an emphasis on natural values was described as being similar to CCF. The majority of owners were interested in making an agreement on management that prioritised natural values and was similar to CCF in return for financial compensation. Forest owners were also interested in choosing nature-oriented forestry without financial compensation if it was more profitable in economic terms than conventional RF.

The potential of CCF for reducing carbon dioxide emissions (Chap. 13) and nutrient leakage to water bodies (Chap. 14) from peatlands has entered the debate in recent years. According to the Finnish Forest Owner Survey, almost 40% of owners were willing to convert to CCF on peatlands without ditch maintenance if they received compensation (Koskela et al. 2021). About 30% of owners did not know where they stood on the issue. NIPF owners who were more often interested in CCF on peatlands lived in urban environments, were aged between 45 and 54, owned the forest through a joint ownership or estate of a deceased person, had multiple objectives for forestry, or emphasised recreational use. Other respondents reported economic objectives or had no specific goals for their forest ownership.

A recent survey (Viitala et al. 2023) examined the willingness of peatland forest owners to convert to CCF. Fifty-seven percent believed that clearcutting and ditch maintenance on peatlands should be avoided because of water quality issues, and

43% because of climate change mitigation. About half (52%) of respondents thought that the conversion to CCF on peatlands should be subsidised by the government. The same proportion felt they needed more information about CCF on peatlands. The owners were asked about what compensation they would need to convert to CCF in rich, spruce-dominated peatland forests. About 45% were willing to enter into an agreement on conversion to CCF, even if the compensation was lower than their self-estimated loss of income relating to the conversion. Thirty percent wanted their loss of income to be covered, and 11% required compensation that would exceed the estimated costs. Only 6% were not willing to enter into the proposed agreement for any financial compensation.

15.2.2 Forestry Professionals in Finland

Soon after the revision of the Finnish Forest Act allowing CCF, an educational seminar tour for forestry professionals was organised (Valkonen and Cheng 2014). Participants were asked to complete a questionnaire about their views on CCF; the 771 respondents corresponded to a response rate of 78%. Most had a neutral attitude towards CCF. As CCF had previously only been allowed in special cases, only a few respondents had any experience of it. Less than 20% of the respondents agreed with the statement that they found CCF appealing, and about 50% disagreed. However, a majority of respondents were willing to learn more about CCF, were interested in applying it, and were positive to the method being allowed in the new Forest Act. Forestry professionals were not eager to recommend CCF, but the majority were willing to apply it if forest owners requested it and if implementation would lead to successful timber production in relation to the characteristics of the forest. CCF was believed to be more suitable than RF for some specific sites and some forest owners. However, respondents felt that adoption of CCF would remain limited in the future, and that RF would retain its dominance because it was considered more profitable.

While not the main focus, some studies have touched upon forestry professionals' perceptions regarding CCF. Hujala et al. (2016) studied the development of decision-support services to protect biodiversity and diversify forest management. A survey was conducted of forestry professionals working in forest management associations and in a national company that offers forestry services (Otso Metsäpalvelut Ltd). Results showed that 30–50% of respondents had drawn up forest management plans that included CCF for their customers in the first year after the new Forest Act. The respondents submitted written comments about CCF, and their perceptions ranged from positive to very negative. Positive comments included that the change in the law made it possible to use CCF in a rational way rather than under other, misleading terms due to earlier legislative restrictions. The neutral respondents referred to the lack of knowledge about CCF and a current lack of interest among forest owners. In the negative comments, the forestry professionals were critical of CCF as a forest management method and perceived that both forestry professionals and forest owners were both sceptical. They also believed that forest industry companies would not be interested in buying wood from CCF sites.

Takala et al. (2023) investigated discourses on decision-support services that go beyond the traditional production-oriented focus and promote the concept of more sustainable forest use, including CCF. In the study, 12 forest owners and 12 forestry professionals were interviewed about their views on the need for development of decision-support services provided to forest owners. Four discourses related to the issue were identified.

1) The juggling discourse, which was produced exclusively by the forestry professionals (not NIPF owners), means that the purpose of decision-support services was to balance the different forest uses starting with the forest owners' objectives. In principle, the professionals were interested in providing new services and multi-objective forest management, but they also often saw restrictions regarding changing current systems and practices. The juggling discourse expressed a somewhat reserved attitude towards CCF since, among other reasons, forest owners may not necessarily understand all the difficulties, uncertainties, and risks associated with CCF.
2) The productivist discourse, produced by both forest owners and professionals, emphasised a pragmatic forestry based on forestry guidelines, which they judged to be a non-ideological approach. This discourse also expressed scepticism towards environmental perspectives. CCF was considered a challenge to the well-established practice of high-quality RF.
3) The loyal discourse, produced exclusively by forest owners, was satisfied with the mainstream decision-support services.
4) The critical discourse, produced primarily but not exclusively by forest owners, highlighted contentious issues pertaining to forests. Unlike the other three narratives, it showcased dissatisfaction with the mainstream, production-oriented decision-support services.

The findings demonstrated that the prevailing conditions for discourse may prevent notions that diverge from the dominant production-focused mindset in the mainstream decision-support services offered to forest owners in Finland.

15.2.3 Forest Owners and Forestry Professionals in Sweden and Norway

Studies from Sweden and Norway have compared perceptions and attitudes of different forestry stakeholder groups. In a study examining stakeholder preferences and willingness to pay[1] for forest management alternatives at landscape level, Nordén et al. (2017) showed that NIPF owners in Sweden had a slightly negative

[1] Willingness to pay reflects the value of product or service in monetary terms.

mean marginal willingness to pay for uneven-aged forests through CCF, which may be compared to the owners' positive mean marginal WTP for a mixed-tree composition. The owners' WTP for uneven-aged forests through CCF was comparable to public forest officials employed at the Swedish Forest Agency, whereas private forest officials displayed a lower WTP for CCF. The sample of owners in this study was considerable (also including a random sample of owners in Sweden), indicating that the study may provide an adequate overview of the large group of NIPF owners in Sweden.

In a small-scale study of Swedish NIPF owners recruited via forest owner associations, Eriksson and Klapwijk (2019) found that the owners displayed an overall neutral attitude towards CCF. The study also showed that the attitude towards CCF was less positive compared to evaluations of biodiversity considerations made as part of RF (e.g., leaving dead wood) but more positive compared to forest preservation. In both studies, the perceptions of CCF among NIPF owners were heterogeneous, suggesting that owners lacked a coherent view of CCF.

Axelsson and Angelstam (2011) examined how local forestry stakeholders, including NIPF owners and private and public forest professionals, perceived CCF in two case study areas in northern and central Sweden. They found a range of perceptions associated with CCF, including the historically based view of selective cutting and thinning as forms of forest exploitation, but also the more current perceptions regarding management for aims other than production. Results revealed concerns regarding the economic viability of CCF, but also perceived benefits regarding the social and ecological aspects of CCF. Another study showed that forestry stakeholders emphasising the importance of ecological and social ecosystem services, and problems associated with biodiversity loss, were more positive towards managing the forest for biodiversity benefits, including CCF (Eriksson and Klapwijk 2019).

Hertog et al. (2022) examined perceived barriers to endorsing CCF in a survey of Swedish stakeholders, i.e., selected institutional forest owners (e.g., municipal forest managers), one private forest owner, professionals working with CCF, and actors in mainstream forestry (e.g. forest owner associations and companies). Results showed that these actors had different perceptions of barriers to a large-scale uptake of CCF. The current forestry culture and the power of industrial networks were perceived to be more important barriers among the actors endorsing CCF than actors in mainstream forestry. Instead, the latter emphasised low economic profitability and ecological risks. Both groups considered current forestry education and technical knowledge about CCF as barriers to an increased uptake of CCF.

Changes in silviculture and harvesting strategies could be one way to adapt to a changing climate. Heltorp et al. (2018) used focus group interviews to investigate the views of Norwegian forest owners and forest professionals on forest management and adaptation to climate change. In general, climate change was viewed as an opportunity rather than a threat, with limited need to adapt. In a larger survey of members of owner associations, Norwegian NIPF owners were asked if they would consider CCF as a strategy to adapt to climate change (Heltorp 2019). Approximately half of the respondents were indifferent. These findings are supported in a study of forestry professionals by Roitsch et al. (2023). More research is needed to determine and understand the underlying factors behind these results. However, it is evident that CCF is currently attracting growing interest in the Norwegian forest sector, and courses are offered to NIPF owners and forest professionals such as harvester operators.

15.3 Forest Industry Companies

Positions taken by large forest companies on CCF are relevant to NIPF owners' management decisions, because the companies play a key role in the timber market, their employees are instructing the forest owners, and they are making decisions in the forest during harvesting. However, forest companies' perceptions of CCF have been examined in only a couple of Swedish studies so far. Companies regard CCF as inferior to conventional clearcut-based forestry (Heder Brandt et al. 2023; Hertog et al. 2022; Espmark 2017). CCF is only considered suitable for enhancing social values close to urban areas, for promoting reindeer husbandry, and for preserving certain species and ecological structures, as expressed for example by the Swedish Forest Industries Federation on their website:

> *CCF (Hyggesfritt skogsbruk) has its place in achieving certain objectives and where special consideration needs to be given that cannot be met by clear-cutting. This may, for example, involve maintaining or enhancing recreational values in areas close to urban areas, preserving and promoting deciduous forests that are important for reindeer husbandry or for promoting fungi/mycorrhiza.* (Skogsindustrierna 2023)

Similar statements can be found in information provided by the major forest companies Sveaskog, Holmen and Sydved. The practice of CCF is confined to areas managed for objectives other than production, such as Sveaskog's Ekoparks and SCA's areas of high conservation status. The Finnish forest industry companies, UPM and the Metsä Group, and Finnish-Swedish StoraEnso make similar statements on their websites, as does the Finnish Forest Industries Federation (Finnish Forest Industries Federation 2021). In Finland, CCF has been suggested for peatland forests to reduce carbon emissions. UPM has stated that they will convert to CCF in all their own nutrient-rich peatland forests dominated by Norway spruce (UPM 2021). UPM owns a total of 515,000 ha of forest in Finland (UPM 2023).

As arguments against an expansion of CCF, forest companies refer to a lack of technical knowledge, ecological uncertainties, and lower economic profitability (Hertog et al. 2022). Any larger shift towards alternative forest management methods must be preceded by a shift in company attitudes. According to the study by Heder Brandt et al. (2023), CCF was mentioned only three times in the magazines of three major forest companies in Sweden between 2019 and 2021. The EU Forest Strategy 2030 seems to have prompted a shift towards a stronger focus on environmental issues and led to more articles mentioning CCF during 2021–2022. The magazine Skogsnära, issued by Stora Enso Ltd., has opened the possibility of incorporating alternative forest management methods instead of clearcutting, but RF and clearcutting practices dominate the magazine content. The current RF model is described as positive for the environmental, economic, and social aspects of forest management, making it the superior option for sustainable forestry, at least according to Swedish forest companies. This shows that external pressures have not yet brought about changes in the attitudes of major forest companies (Heder Brandt et al. 2023).

15.4 Conclusions and Discussion

CCF is growing slowly in Norway, Sweden and Finland, but there are considerable differences between the countries regarding the extent of the CCF debate and interest in understanding how NIPF owners and forestry stakeholders perceive CCF. In Norway, CCF has not been used widely and only a few studies were found that touched on Norwegian forest owners' views on CCF, and no studies on forest industries and their policies were found. In Sweden, a comprehensive understanding of forest owners' and forestry professionals' views on CCF is still lacking. However, studies have addressed the policies of forest industry companies regarding CCF and how the companies promote their views to forest owners in their own publications. Barriers to CCF have been studied from the perspective of the Swedish forestry sector. In Finland, the revision of the Forest Act in 2014 allowing for CCF triggered many studies that examined the NIPF owners' willingness to adopt CCF. Forestry professionals' perceptions have also been studied in Finland, but research into how policies of forest industry companies and other institutional surroundings impact the adoption of CCF is still limited.

According to the studies carried out in Finland, NIPF owners are interested in testing CCF more in the future, at least in part of their forests. Interest for CCF is particularly common among those Finnish forest owners who emphasise nature and recreation objectives in their forestry. In Sweden, forestry practitioners' views have been similar, and CCF is considered a good management method for promoting forestry goals associated with ecosystem services other than timber production. Forestry practitioners both in Finland and in Sweden have concerns about the economic viability of CCF (Chap. 8), and RF is perceived to be more profitable.

Forest industry companies in Sweden and Finland communicate similar viewpoints, considering CCF as a possible management strategy if the forest owner wants to adopt it, but they also acknowledge the associated risks regarding profitability. The Swedish studies on forest industry companies show more clearly that CCF is considered inferior to RF. It is regarded as suitable for urban forests, for areas of reindeer husbandry, and other areas where certain recreational or ecological objectives are particularly important, but is not to be used if timber production goals are the priority. Since the forest industry companies have an important role in forest management, such as by providing decision support to forest owners, their views on CCF are important in understanding the viewpoints of owners and professionals. As Sténs et al. (2019) point out, public agencies, forestry professionals, and researchers still regard the economic uncertainty of CCF as an obstacle (see also Mason et al. 2021).

The reviewed studies suggest that the spread of CCF has been slowed by institutional factors. While there are currently no institutional barriers to CCF implementation, there is no direct support for CCF either. Cost-sharing or institutional support systems affect the economic profitability of forest management. In Norway and Sweden, forest owners do not generally get financial support for forest management operations. Although certification schemes support CCF in the Swedish context, this is mainly limited to certain forests (Stens et al. 2019). In Finland, the Government provides financial support for several forestry operations, such as tending of seedlings and young stands. The current Finnish system of support for private forestry favours RF, but the removal of the requirement for minimum area in the latest support scheme could enable financial support for group and gap cutting (Laturi et al. 2021; Viitala et al. 2023). Other studies have highlighted logistical barriers associated with mechanised harvesting, market mechanisms whereby forest industries prefer medium-sized rather than large logs, ecological barriers in the form of browsing pressure by ungulates, and ways to introduce CCF into even-aged forests (Mason et al. 2021).

The studies show that forest owners and forestry professionals lack knowledge and experience of CCF, and this is likely preventing greater uptake of CCF in the Nordic countries. The Finnish and Norwegian studies showed that many forest owners were unsure about CCF, and the uncertainties associated with CCF have also been highlighted by forestry professionals in Finland. Lack of knowledge and limited CCF skills among forestry professionals have been highlighted as a key barrier to wider adoption of CCF in Europe, but also a range of uncertainties and lack of scientific knowledge regarding the effect of CCF, for example, regarding climate change and the extent to which CCF can increase forest resilience (Mason et al. 2021).

The need to improve training of forest professionals and industrial workers in individual-based forest management was highlighted by Kruse et al. (2023). Forest owners frequently use advisory services to support their decision making, and advisory services and information to forest owners have an important role in the forest management solutions adopted (Hänninen et al. 2020; Pynnönen et al. 2021). Advisory services therefore play an important role in the spread of new forest management practices. With more experience of CCF, the forestry professionals' knowledge is likely to increase. However, it is still possible that current practices may restrict the adoption of CCF, given that the current RF is considered sustainable and the most efficient way to produce high-quality timber, as shown in the Finnish study of discourses in advisory services (Takala et al. 2023).

Even though forestry actors generally advocate CCF as an alternative management method for environmental, social and cultural ecosystem services, contrasting views are evident (Espmark 2017). Advocates of some CCF methods (Naturkultur with a focus on felling of individual trees providing the most value for the land, and the Lübeck model building on natural processes and endorsing cost minimisation rather than maximisation of production) generally emphasise how CCF is economically superior and the need to maximise revenues for forest owners. Less evident among forestry actors are the views that CCF should be used to combat climate change, which is generally endorsed by climate scientists, and a preference of CCF over RF because the latter is considered an environmental catastrophe, a view generally endorsed by environmental organisations.

If CCF is to be promoted on the basis of benefits such as biodiversity, climate change mitigation or water quality, the barriers or hindrances to its implementation need to be removed. The current RF has been in use for a long time, so a change in management regime requires thorough re-evaluation of the current course of action. It may also be necessary to develop specific forms of support for transitioning to CCF on sites where environmental benefits can be achieved by changing the forest management method. Research needs include the development of effective decision support and different kinds of incentive systems, and the impact these may have on forest owners' decision-making and choices.

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