Forest Management and Governance in Sweden

A Phronetic Analysis of Social Practices

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Abstract

The transition to a sustainable society requires improved knowledge about what determines forest management and the relationship to governance and policies. This thesis constitutes a phronetic analysis of social practices in forest management at the local level and of how social practices materialise and influence forest governance and ultimately, forest management more broadly. Social practices are used as the object of study in the synthesising analysis of empirical findings in Papers I-IV. In doing so, tension-points have been identified and problematized. The research has applied a case study approach from local to national and European levels.

Identified social practices, relevant for determining actual forest management are mainly: personal relationships and trust towards professional forest advisors and purchasers; upholding and respecting local social values through discussing forest management with neighbours; intergenerational socialisation in relation to one's own forest creating emotional bonds with the forest and across generations; and a rural life-style including hard work and diverse businesses.

The identified tension-points include: i) two partially competing logics of practice: the traditional versus the professional logic where the latter is perceived by the former as a threat to local social values and, ii) a tendency of local social practices to streamline rather than to diversify forest management. From a policy-making perspective, trying to balance the different services from the forest, ways to address both logics of practice and the diversification of social practices should be explored. Especially, trusted advisors are a major factor determining forest management and policy outcomes. Current evolving practices of outreach strategies towards forest owners that decrease personal contact run the risk of eroding valuable social capital.

Participatory and collaborative forest governance efforts could build on the strong social capital and willingness to cooperate found at the local level. Power structures embedded between governance levels and among local stakeholders should, however, not be underestimated and more research into the pre-conditions for collaboration is needed. Social practices as the object of study provides a promising path for future studies in order to find effective policy solutions.

Keywords: multi-level governance, forest policy, forest ownership, forest planning, phronesis, participatory action research, boundary object, social capital.

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Dedication

Till morfar och mormor

Wisest is he who knows he does not know
Visast är den som vet vad hen inte vet
Proverb based on Socrates

Contents

List of Publications

This thesis is based on the work contained in the following papers, referred to by Roman numerals in the text:

I Wallin, I. Rural realities between policy goals, market forces and natural disasters – a narrative of local forest management in Southern Sweden. (manuscript)

II Guillén, L.A., Wallin, I., & Brukas, V., 2015. Social capital in small-scale forestry: A local case study in Southern Sweden. Forest Policy and Economics, 53, pp. 21–28.

III Hoogstra-Klein, M., Brukas, V., & Wallin, I., Multiple-use forestry as a boundary object: from a shared ideal to multiple-realities. (submitted)

IV Wallin, I., Carlsson, J., & Hansen, H.P., 2016. Envisioning future forested landscapes in Sweden – Revealing local-national discrepancies through participatory action research. Forest Policy and Economics, 73, pp. 25–40.

The contribution of Wallin to the papers included in this thesis was as follows:

I Wallin conducted the interviews, wrote the narrative, discussed the findings and drew the conclusions.

II Wallin conducted the interviews and identified the relationship between the three featured actors as a key issue for understanding local forest management. The analysis of the interviews and application of social capital theory was done by Guillen, who also wrote the majority of the paper. Wallin wrote the description of the interview study and the description of actors and contributed to a lesser degree to the rest of the paper.

III Hoogstra-Klein developed the idea for the paper, conducted the main analysis and wrote the main text. Wallin did the analysis of the Swedish case study and wrote the description of the same and has contributed to the main text to a lesser extent.

IV Wallin developed the research and participatory workshop methodology in close cooperation with Carlsson and Hansen. Wallin and Carlsson jointly conducted all workshops with assistance from colleagues. Wallin was mainly responsible for the Helgeå case study and Carlsson for Vilhelmina. The analysis and evaluation were done by Wallin in consultation with Carlsson. The writing of the paper and subsequent review process was led by Wallin with contributions mainly from Carlsson

Abbreviations

CUAR	Critical Utopian Action Research
EU	European Union
FMP	Forest Management Plan
FOA	Forest Owner Association
LBA	Legally Binding Agreement
MCPFE	Ministerial Conference on the Protection of Forests in Europe
NFP	National Forest Program
NIPF	Non-Industrial Private Forest
SFA	Swedish Forest Agency
SFM	Sustainable Forest Management
SPO	Species Protection Ordinance
WFD	Water Framework Directive

Preface

Why do we manage forests the way we do? This broad question has fascinated me since before I started studying forestry in 2006. During my bachelor studies in Umeå I understood that the answer had less to do with what we were learning in biology, ecology and soil science classes and more to do with economics, history and policy. In my masters I had the opportunity to dig deeper into the topic of national and international forest policy, both through classroom teachings in Alnarp and Göttingen, and through discussing with colleagues from widely different forest and policy contexts. My basic questions then changed to: Who is to decide how the forest should be managed? And for whom do we manage it? What principles should guide the decision process? Through my doctoral studies I have been given the opportunity to study forestry from a social science perspective and learn more about the democratic and non-democratic governing of the forest resource. Thus, I have finally been able to fulfil my long-lived dream to pursue questions about democracy and justice in relation to forests. The interactions between society and forests have only become more fascinating for me during these years and there are now so many more questions in need of an answer: How do we accomplish change and transition towards a more sustainable society in a democratic way? What are the best ways to accomplish participation and collaboration? What are the obstacles and who are the enablers?

What triggered this flow of questions are, to a high degree, my personal experiences of forest planning and management in Småland and the deep forest of Ödmården on the border between Hälsningland and Gästrikland. During summer holidays I worked at the forest owner association Södra as an inspector and as a planner doing inventories for Stora Enso. Many of the experiences from these three summers in the forest stuck with me and continue to provoke questions, especially my encounters with experienced planners and forest workers whose practical knowledge about the forest was very impressive. But I also remember the high pressure of productivity versus the need to identify

valuable environmental and cultural structures. On a weekly average I had to inventory and plan a certain number of hectares. It was important how I planned the work depending on weather and stand qualities. In good weather and in an even-aged pine forest on flat terrain I could inventory many hectares a day without problems. When it was raining I needed to avoid the stands with big stones as the risk of slipping slowed me down. In hindsight I should have stayed home the day when it was raining so much that the height meter stopped working. It turned out that heavy rain is no good when the measurement relies on ultrasound. I also became pretty good at finding the remnants of charcoal mines. I could almost feel when entering a stand that they must be somewhere around and then I looked for the typical signs; small spruces standing closely together, close to a mire or small lake where water to put out any fires could be easily fetched. It was hard work, but I enjoyed it immensely on good days - seeing forest that few had ever seen, smelling sun-warmed pine forest and finding a rare species like a secret treasure in the forest. On bad days I wished I had someone to share my lunch with and that I could talk to so that I did not have to sing aloud all the time to scare away lurking brown bears. I heard about another student in another district who quit the job, refusing to work alone in one of the most bear dense areas in Sweden. I never quit, but I understood that student's sentiments intuitively. One summer a scandal frightened me more than the bears. Allegedly, a student had planned a pine stand for harvesting and only after the harvest they found old fire scars on the tree stumps. The student had caused irreversible damaged to valuable structures in the forest. I could not let go of the thought of how that could be allowed to happen, but I also understood how easily it could have happened to myself. After 2-3 years of theory and some practical work I had not nearly acquired enough experience to completely avoid such blunders. I realised after finishing my studies that I wanted to find answers to some of the questions I had and I started working on what has become this PhD thesis. I hope you will enjoy the read!

1 Introduction

1.1 Forest management in forest governance – a need for improved understandings

Forests are essential for all life through sustaining vital ecosystem functions such as oxygen production, carbon sequestration, water quality, soil fertility and biological diversity. They are furthermore a primary source of welfare for societies, supplying materials, food and recreation. The extraction and management of resources from forests is dependent on our knowledge, labour and technological innovations.

Forest management is however far from being a mere technocratic endeavour concerned with how to reach set goals, maximising output and optimising operations through professional knowledge. Forest management involves many types of knowledge, skills, values and norms held by various actors (IUFRO, 2016). These actors execute actual forest operations such as harvesting, regeneration and conservation measures through communication and social relationships. It is thus through these localised applications and inherently social processes that goals of sustainability and other policy initiatives can be achieved (Rametsteiner and Mayer, 2004; Giessen, 2013). Local processes can also, in turn, play a decisive role in forming higher-level forest governance through feed-back loops such as multi-level organisations (Secco *et al.*, 2013). Forestry is in a fundamental sense "*inseparably intertwined*" with society (Schanz, 1999, p. 79).

Despite the importance of the forest resource, the top-down and bottom-up social processes that determine how forests are managed are still poorly understood. Research tends to have either a governance or a management perspective leading to a lack of understanding about the connections between the two. In the face of increased pressure on forest resources due to climate change and higher societal demand for renewable forest goods and services

(Malmberg, 2015), there is now more than ever a need to find valid policy solutions that take into account institutional, political and societal restraints (Nilsson, 2015). Improved understandings about how the forest is managed, for what purpose, and the connections between governance and forest management would facilitate finding solutions to such issues and aid in sustainable use of forest resources. *This thesis investigates social practices in forest management at the local level and how they materialise and influence forest governance and ultimately, forest management more broadly.*

The following section reviews forest governance and management literature bringing up the pressing challenges. It identifies the gap in understanding of what determines how the forest is managed and how governance is grounded in local processes.

1.2 From government to governance

In order to understand current practices one needs to understand general trends and historical developments in the governing of forests (Howlett and Rayner, 2006; Howlett and Cashore, 2009). The most drastic change over the last decades in terms of forest governing has been the shift in the early 1980's from state regulation and hard law to deregulation and soft law. This has been termed the shift from government to governance, which has had a large scale impact on both international and national governing of forests (Arts *et al.*, 2010). Forest governance in the meaning of "*new modes of governance"* has been thoroughly reviewed when it comes to discourses and institutions as well as actors' roles and power (c.f. Arts *et al.,* 2006; Glück *et al.,* 2006; Arts 2014; Giessen & Buttoud, 2014). The realisation of policies on the ground however remains unclear and research has been criticized for being too optimistic and naive regarding the accomplishments of forest governance (Arts *et al.*, 2012).

Prior to the shift to governance, governing of forest resources by modern nation states, was primarily accomplished through top-down, hierarchical approaches and by applying "*command-and-control*" instruments, where ownership and regulations by a centralised state were emphasised (Glück *et al.*, 2006). "*Command-and-control*" management systems of natural resources have led to unsustainable practices as they "*are usually directed at complex, poorly understood, and nonlinear natural systems, rather than at the fundamental source of the problem - human population growth and consumption*" and have consequently resulted in short-term economic returns with increased vulnerability of ecosystems (Holling and Meffet, 1996, p. 335). The idea that dynamic and complex systems such as forests should be governed by a similarly

variable governance systems puts the "*command-and-control*" approach to shame (Ostrom and Schlager, 1996).

Centralised "*command-and-control*" approaches have thus been abandoned by many governments over the last three decades and instead market-based, self-regulatory and voluntary measures have been introduced (Glück *et al.*, 2006). This development lies within the overall shift from the old mode of "*governance by government*" to "*new modes of governance*" where governing takes place with or without government, emphasising networks, partnerships and markets (c.f. Peters & Pierre, 1998; Kooiman, 1999; Bäckstrand *et al.*, 2010). At its core the shift is the "*erosion of traditional bases of political power*" (Pierre 2000, p. 1) where certain responsibilities for policy implementation, traditionally carried out in a hierarchical fashion by the government, have been handed over to private actors (Sundström and Jacobsson, 2007). The shift occurred partly based on failures of the system driven by the state authority, but also due to the neo-liberal discourse of the 1980's where market solutions were seen as more effective (Arts *et al.*, 2010). The globalisation of both capital and environmental problems has played a central role in moving environmental policy- and decisions-making processes from national to the international level (Bäckstrand *et al.*, 2010). Environmental politics and sustainable development has become something of an experimental arena for "*new modes of governance*" (Bäckstrand *et al.*, 2010).

The promise that "*new modes of governance*" hold is to counteract the previous deficits and achieve legitimate democratic processes and effective environmental policies (Bäckstrand *et al.*, 2010). Legitimacy and effectiveness are the key terms here as issues of representativeness, accountability and transparency in the decision-making process become more complex under "*new modes of governance*", not following the normal procedures of representative democracy (Hogl *et al.*, 2012b). Effectiveness can refer to either effective governance arrangements to achieve policy goals or to solving the addressed problems, or just to a change in political programs. Democratic legitimacy refers to the perceived legitimacy of the decision-making process and final decision (Newig and Kvarda, 2012): who has been involved in taking the decision? Can participants influence the final decision? Are the procedures fair in that sense that no groups are disproportionally disadvantaged or favoured?

In environmental policies "*new modes of governance*" often take the form of deliberative and collaborative governance, including for example stakeholder dialogues, public-private partnerships, network governance and participatory strategies (Bäckstrand *et al.*, 2010). This is not least true for decision- and policy-making concerning forests and forestry (Buchy and Hoverman, 2000; Appelstrand, 2002; Reed, 2008; Secco, Pettenella and Gatto, 2011; Secco *et al.*, 2013). Demands for participation are today expressed in international legally-

binding agreements such as the Aarhus Convention and the European Landscape Convention (Jones, 2007; Jones and Stenseke, 2011; Butler, 2014). The question if new modes of governance and participatory strategies live up to their promise of increased legitimacy and effectiveness in environmental and forest policies is highly debated and questioned (Hogl *et al.*, 2012a). Inherent difficulties, power imbalances and administration of such governance arrangements is nevertheless said to challenge current forest sector structures in that they question property rights (Appelstrand, 2002) and change the working tasks to be performed by professional foresters, and require new educational measures (Weber and Schnappup, 1998; Buchy and Hoverman, 2000).

Today's multi-level, multi-centred and multi-actor character of global forest governance is becoming increasingly complex, making it difficult to monitor and give a full account of developments unfolding (Ellison, Pettersson and Keskitalo, 2009; Eckerberg and Joas, 2011; Bernstein and Cashore, 2012; Arts, Giessen and Visseren-Hamakers, 2013). Change and stability are mostly likely to occur simultaneously at different levels and to varying degrees, where sub-regime levels may require different models of explanation (Howlett and Rayner, 2006). Rather than through hierarchical steering, impact on the local level is transmitted from global ideas, norms and rules through "*networks of forest departments, scientists, policy makers, donors, companies, NGOs, social movements, etc*." (Arts and Babili, 2013, p. 132). In order to understand how governance actually occurs and its possible trajectories, one has to study the complexity of governance arrangements (Agrawal, Chhatre and Hardin, 2008; Howlett, Rayner and Tollefson, 2009). The outcome of forest policies will, in the end, depend on "*the context, country, nature of the goods, societal values, land tenure, market effectiveness, and the government funding and authority*" (Cubbage, Harou and Sills, 2007, p. 849).

The role of forest management in the future use of forest resources is a strategic issue for actors with different interests (Beland Lindahl, Westholm and Kraxner, 2015). Old conflicts over forest usage have taken new forms, for example, in a divide between actors advocating carbon storing in either *standing* or *growing* forests, in combination with harvested wood substituted for non-renewable materials. The science is still perceived as uncertain as to which of these uses are most efficient in combating climate change and thus cannot provide a firm advice (Schlyter and Stjernquist, 2010). There is a need for policy solutions that can tackle the challenges of climate change and other land-uses in an integrated way and ideally result in efficient measures directed at important trade-offs (Nilsson, 2015). Nilsson asks for more integrated research regarding forest management and governance as a basis for these policy solutions and in order for the forest sector to manage the transition process.

In general, forest management has the capacity to find practical solutions in specific cases through spatial or temporal allocation and where policy can provide a context facilitating such solutions (Krott 2005, pp. 15-16). One example is the assigning of private property rights which is widely acknowledged to be a strategy for rendering the owner a strong interest in the preservation of the holding and capital (Barnes, 2013). However, when the capital is bound to only a single service produced, such as is often the case for forests and timber, then assigning private property rights does not protect from detrimental effects on other services produced, so called externalities, e.g. carbon sequestration, recreation and biodiversity (Robert and Stenger, 2013; Rosser, 2013). Market distortions result in the need for policy solutions as the so called non-market benefits from the forest run a high risk of being neglected by management (Daily *et al.*, 2009; Duncker *et al.*, 2012; Gustafsson *et al.*, 2012). Due to the historical assignment of private property rights to forests, governments are now forced to intervene in order to preserve such values through, for example, monetary compensation to the owners (Glück *et al.*, 2006). Such efforts can be costly and thus depend on the general financial situation.

Since both "*command-and-control*" and deregulation policy strategies have failed to solve environmental problems, the concept of "*smart regulation*" has gained more attention over the last two decades as an attempt to come to terms with strengths and weaknesses of different policy mechanisms (Arts *et al.*, 2010). "*Smart regulation*" builds on certain design principles to combine regulations and mechanisms, activating multiple actors in order to manage the complexity of environmental problems (Gunningham and Sinclair, 1999; Van Gossum, Arts and Verheyen, 2012). Nevertheless, "*smart regulation*" strategies also depend on, for example, institutional constraints as policy-makers do not have access to all possible policy instruments (Böcher and Töller, 2003). Problem structure, discourses, actors and the decision situation influence the choice of policy instruments (Böcher, 2012).

In the end, forest owners' and forest professionals' acceptance of policy instruments is key in policy implementation as acceptance precedes behavioural change, or at least decides the efficiency and legitimacy of the policy in question (Pregernig, 2001; Serbruyns and Luyssaert, 2006). Acceptance of policy instruments, for example, increases with educational level and knowledge held by the forest owner (Serbruyns and Luyssaert, 2006). Values and norms are more persistent over time and thus precede acceptance. According to this view, policy instruments need to address the variety of values and norms held by actors and their effect will differ depending on the addressee and context (Pregernig, 2001). The question is however to what degree owners and managers' attitudes, values and objectives translate into actual forest management behaviour (Ní Dhubháin

et al., 2007) and how much depends instead on the local context and social practices for the final outcome (Hokajärvi *et al.*, 2009). With local context is here meant the local community and forest characteristics as well as the professional planners, entrepreneurs, advisors, and other actors with whom forest owners are in direct contact regarding forest-related services and issues.

1.3 Forest governance & management research

Mirroring the developments in forest governance, research has similarly developed and undergone drastic changes over the last decades in a response to contemporary needs for understanding the on-going processes. Forest policy first emerged as a sub-discipline to forestry science in the 1970's having a normative focus on providing information to policy- and decision-makers, guiding them in how to solve problems due to higher societal demand for forest products (Wiersum, Arts and van Laar, 2013). The research changed in the 1980's as a consequence of increased influence from other policy fields and the disintegration of the ideal-type forest sector into a variety of institutional arrangements and multiple actors. Forest policy scientists had then to apply a more analytical approach focused on explaining policy processes and the resulting conflicting positions.

In the analytical tradition, Krott (2005) defines the contribution of policy analysis as providing "*a framework that comprises and classifies greatly differing explanatory theories of policy by indicating interrelationships between policy, politics and polity"* (p. 283). In the late 20th century increasing numbers of social and political scientists started to study forest policies and consequently forest policy research moved closer to political science, emphasising analysis instead of praxis (Arts, 2012; Wiersum, Arts and van Laar, 2013). Today, forest policy analysis is described as a specialised sub-discipline to policy and political sciences applying common theories and following the same general trends in theory application (Arts, 2012; de Jong, Arts and Krott, 2012). During the past decade, forest policy research has taken a new turn, towards critical policy analysis stressing the role of power and deconstruction of meanings (Wiersum, Arts and van Laar, 2013). Focus can then be on the critical analysis of ambiguous but powerful concepts such as bioeconomy and participation, how they are created, by whom and how they are (re-) interpreted in forest governance (Kleinschmit *et al.*, 2014; Pülzl, Kleinschmit and Arts, 2014). Such studies inform society, decision-makers and the scientific community about "*ideological and normative biases, power inequalities, discursive struggles and multiple-realities of various social groups implied in forest policy*" *(*Wiersum *et al.,* 2013, p. 42). There is no single approach to forest policy analysis today, but

multiple-methods of inquiry and explanation are used, from sociology and communication studies (Kleinschmit, Alarcón-Ferrari and Hansen, 2012). Policy advice is still relevant, but the normative choice of policies is normally left to the stakeholders (Wiersum *et al.*, 2013, p. 42).

Swedish forest policy research has been meagre if one compares it to the political and economic importance of the forest sector for the economy. The number of publications in peer-reviewed journals was found to be 34 between 1990 and 2009, with a rapid increase since 2000 (Kleinschmit, Ingemarson and Holmgren, 2012). The same study found that studies of forest governance has grown the most over the past decade, reflecting the increased impact that forest certification has had on domestic forest policy. Studies of gender, conflicts and climate change were present in the survey but to a lesser degree. Additional contributions since then show for example gender differences in harvesting and silvicultural activities by female forest owners (Lidestav and Berg Lejon, 2013) and in inheritance of forest property (Lidestav, 2010). Forest conflicts represent a growing research field (Eckerberg and Sandström, 2013) and in Sweden, recent studies reveal conflicts over property rights (Sténs and Sandström, 2013) and bioenergy from the forest (Söderberg and Eckerberg, 2013). Hellström (2001) found two major conflict themes in Sweden during the period 1984–1995 namely the protection of mountainous forests and the preservation of biodiversity on all forestland. Typical for forest-related environmental conflicts in Sweden is a polarisation between forestry and environmental organisations, often involving strong campaigning (Hellström, 2001). Studies clarifying the relationship between Swedish forest policy and international policy regimes have emerged during the last years pointing towards the increased influence of EU policies on Swedish policies related to forestry, including the EU Water Framework Directive (Futter *et al.*, 2011). Actors in the Swedish forest sector now carefully position themselves within the discussions about a more formalized forest policy in the EU (Bjärstig, 2013).

Small-scale forestry, forest owners' behaviour and values dominated the Swedish forest policy research in the 90's and continues to be a strong topic (Kleinschmit, Ingemarson and Holmgren, 2012). Studies of forest ownership and forest management behaviour have been conducted predominantly by economists who have applied neo-liberal perspectives focusing on effective production (Fischer *et al.*, 2010). Forest owners' attitudes, objectives and their underlying values and beliefs are primarily used in studies as an approximation for forest management behaviour (c.f. Nordlund & Westin 2010). Forest owner typologies often make a tacit assumption that forestry behaviour is influenced by objectives and goals of the forest owners, but few studies assess if that is the case (Ní Dhubháin *et al.*, 2007). In fact, Eggers et al. (2014) did not find any

strong association between ownership objectives and management strategy and explain the result with outsourcing of forest operations and influence from professional advisors. Thus, objectives, values and attitudes of individual forest owners cannot be the sole explanatory factors of how forests are managed.

Studies highlighting the importance of local social context or the relationships between owners and professional advisors do exist, but to a smaller degree. Törnqvist's (1995) sociological study of forest ownership at household level in Sweden points to the importance of social context mainly in the form of family relationships. Hokajärvi *et al.* (2009) applied social cultural-historical activity theory to study practices in forest planning and associated advisory services in Finland, revealing frustration among planners to balance the policy goal of timber supply and the multiple wishes of the forest owners. Knoot and Rickenbach (2011) in their social network analysis of landowners in Wisconsin, USA, found greater application of best management practices among forest owners with strong ties to other forest owners and forest professionals. Both studies emphasise the need for studying the social context of forestry practice for the sake of reaching policy goals and finding solutions to practical problems. Similar to the conclusions drawn by Eggers *et al.* (2014), Novais and Canadas (2010) in their study of forest-related work models of NIPF owners in Portugal concluded that the analysis of owners' behaviour can be improved by linking management practices to the social context. Knowing the logic behind actors' actions is crucial to understanding forestry practices and finding policy solutions to secure sustainable forest management (Novais and Canadas, 2010). From professionals' perspective and that of policy implementation, Primmer (2010) analysed how nature conservation was introduced in non-industrial private forest management by public and private actor organisations in Finland. The findings reveal that nature conservation strategies are rather subsumed than integrated at the hands of forest professionals, who are mainly concerned with the expectations of their peers rather than of society in general (Primmer, 2010).

1.4 Scope, aim & research questions

Copious scientific literature has been written about forest governance and management separately, and where forest management is often reduced to attitudes and motivations of individual actors, mainly forest owners. Only a few studies have addressed the connections between forest governance and management or the influence of governance and local social context on individuals' forest management behaviour. This indicates insufficient understanding of what determines how forests are actually managed. The few studies integrating such perspectives show a significant influence from advisory

services and other social relationships on the forest management. Improved understandings through a multi-level analysis, integrating multiple actors and their social relations in the analysis could potentially contribute to finding new pathways and policy solutions to pressing challenges in forest management and governance.

While a single dissertation cannot fully close such a knowledge gap, there is clearly a space for contextualised studies, linking forest governance and management. *The scope of this thesis is to analyse how social practices in forest management at the local level materialise and influence forest governance and ultimately, forest management more broadly. In line with the applied phronetic approach the aim is to identify and problematise tension-points found in local forest management and in the relation to forest governance*. The synthesising phronetic analysis of social practices and found tension-points are then used to discuss how these new understandings of forest management and governance can inform policy solutions.

By conducting research based on a phronetic epistemology and framework, this thesis focuses on the particular and contextual. Thus, it applies a highly local case study approach, but then lifts the perspective, connecting the local situation to multiple-levels of forest governance. The thesis has a multi-actor perspective, but there is a focus on forest owners as being the main decision-makers in forest management. Notably, the object of study in the synthesising analysis is not forest owners per see, but theirs and other stakeholders' social practices that impact forest management.

The included papers provide the basis for the synthesising analysis of social practices and have been conducted according to a multi-level case study approach where the following issues in forest management and governance have been investigated:

On a local level:

- Narrative analysis of local forest management investigating how local context and larger-scale social change influence forest management over time. *(Paper I)*
- How are trust and social capital represented in a local setting of small-scale private forestry in Southern Sweden? Whom do forest owners trust and why? *(Paper II)*

On local to national and European levels:

- How is the concept of multiple-use forestry abstracted, modulated, accommodated and standardised in Sweden? What are the differences and similarities in comparison with Lithuania and the Netherlands? What consequences for forest policy and management arise from the boundary object qualities of the multiple-use concept? *(Paper III)*

On local to national level:

- How to link local visions of the future forest landscape with national policy-making? Can methods of participatory action research be a way to bring together different decision-making levels? *(Paper IV)*

1.5 Outline of the thesis

The introduction above provides a general overview of the problem and the knowledge gap addressed. Section 2 describes the ontological and epistemological underpinnings, presenting phronetic research as the framework applied in this thesis. As a point of departure, the section provides an overview of forest policy and governance research and commonly applied theories. Section 3, background, digs deeper into what is and isn't known and about forest governance and management in Sweden. In this section I describe multi-level governance of forest resources and the particularities of the Swedish forest sector, policy and governance, followed by a review of the typical forest management and planning in Sweden. The materials and method section (4) explains the project context, the origin of empirical materials, describes the case study areas and the synthesising analysis of social practices. Section 5 overviews Papers I-IV and summarises the key results adding to the overall thesis. Section 6 performs the synthesising phronetic analysis of social practices evident in Papers I-IV and discusses research findings bringing up implications for policy, practice and future research. Finally, a few general conclusions are drawn in section 7.

2 Ontological & epistemological underpinnings

2.1 Theory in forest policy analysis and in this thesis

The scientific study of the social is subject to different schools of thought within philosophy of the social sciences. Fundamental assumptions: ideas about the quality of reality (ontology) and the knowledge we can have of the same (epistemology), underlying this thesis will be accounted for together with a short overview of the main trends in the theory use within forest policy analysis.

Theory, in a basic sense, consists of conceptual relationships, explaining why phenomena occur through providing causal links (Wacker, 2008). Further, it provides a framework for analysis, focusing the research questions and facilitating relevant outcomes and modest conclusions (de Jong, Arts and Krott, 2012). Depending on ontological and epistemological presumptions, theories can be grouped into families. Fischer, Miller and Sidney (2007) make a division of theories in the following categories: i) policy processes, ii) politics, advocacy, and expertise, iii) rationality, networks and learning iv) deliberative policy analysis and, v) comparative, cultural and ethical perspectives.

Arts (2012) further delineates theories typically used in forest policy analysis along the ideational-material and structure-agency divides. These latter divisions are related to what one considers being the main drivers of change and explanations of social order and phenomena. Is it ideational factors (e.g. ideas, narratives, discourses) or material factors (e.g. resources, rules, technology)? Is it agency (intentions, motivations and behaviour of individuals) or structure (social and political institutions, power hierarchies and conventions)? The preconceived answers to these questions will influence the choice of theoretical approach, which according to de Jong *et al.* (2012) is guided by personal preferences and presumably related to one's "*deep core beliefs*" (Sotirov and Memmler, 2012). Kasza (2006) suggests three ways to motivate the choice of

theoretical perspective based on knowledge about ontological and epistemological assumptions; (i) examine your own experiences in life, (ii) look to historic accounts, and (iii) read philosophy. The theory you choose is, however, most often related to the tradition within your discipline, making any larger deviations from the same in need of an explanation.

Positivism is traditionally strong in forest policy research (Arts, 2012). It claims that reality exists independently of our knowledge and can be observed directly. Theory use is limited to hypothesis testing with the aim to produce generalisations and general laws for prediction and should be falsifiable (Alvesson and Sköldberg, 2009). Scientists are then objective observers of reality where norms and values should be separated from the scientific analysis. The naturalist position is an integral part of the positivist tradition and claims that social and natural phenomena are not significantly different and can be scientifically studied based on the same principles. Post-positivism however recognises that there is an independent world but hold the position that observations are inherently fallible and that we can never directly observe the truth and have to make approximations (Alvesson and Sköldberg, 2009). Common theories and frameworks in forest policy analysis belonging to the positivist or post-positivist traditions include rationalism, institutionalism and network policy analysis (Arts, 2012). Institutional and neo-institutional approaches are especially strong in studies about the global South and examine how structures, rules, norms and beliefs shape the social. The use of rational policy analysis and rational choice theory with a focus on agency has grown lately.

The "*argumentative turn*" in social and political sciences focuses on ideational factors and has led to critical policy analysis becoming more common in forest policy analysis during the last two decades (Arts, 2012). The use of discourse theory in particular has increased since the early 2000s. The trend is however not as strong as in political science and comes with a time lag. Critical policy analysis is a diverse family of theories but they all share the same rejection of the positivist view on reality as existing independently of our knowledge. Instead, the ontological foundation is anti-positivist stating that reality does not exist independently of our knowledge. There is however an important distinction to be made here between anti-positivism and post-positivism, whereas the former rejects the positivist realism completely, the latter criticises the positivist ontology and makes amendments for the human factor. Both exist within critical policy analysis.

The school of critical thought, including critical policy analysis focuses on how meaning is given and created regarding events and happenings (Arts 2012, p. 10). Reality cannot be directly observed but has to be interpreted by the

researcher, who is him/herself steered by subjective meanings. The double hermeneutics of reality as described by Giddens (1984) relates to the necessity that meaning created in social sciences goes through a double process of interpretation; reality is firstly interpreted by actors whose meanings are then interpreted by the social scientist. Which makes reflections about one's own meanings and interpretations central to good scientific practice.

Belonging to the school of critical thought, Critical Theory is not a theory in the sense described above but regards theory as an intellectual practice of self-reflection where researchers express critiques of society, based on an ideal understanding of what "*should be*" and thus liberating human beings from enslaving circumstances (Nielsen and Nielsen, 2006). Critical Theory is often made synonymous with the Frankfurt School of Philosophy, whose most known present-day representative is Jürgen Habermas (Jeßing, 2001). Critical Theory and Habermas' Theory of Communicative Action (Habermas, 1984) has inspired the evaluation of visioning workshops in Paper IV.

While theory-usage in classical positivist forest policy analysis is most often confined to theory testing and combinations there is also the option of theory building (Weber, 2012). Building or development of new theory is favoured by interpretative and Grounded Theory approaches, the latter being applied in Paper II. Instead of starting with the formation of a hypothesis for deductive testing, an inductive inquiry is carried out where openness to the data is the key and hypothesis formulation only takes place (if ever) after a structure has been identified by the researcher, so called *ex post* hypothesis formulation (Oktay, 2012).

The Papers I-IV in this thesis has foundations in Grounded Theory and Critical Theory for example, but the over-all research approach has not been guided by any specific theory outlined above. Instead, this thesis is based on the phronetic approach to social sciences as explained in the next section.

2.2 Phronetic social science

Application of phronetic research

This thesis has been guided by, and largely conducted, according to, the so-called phronetic approach to social science. The phronetic approach has linked this thesis to a more general research program that promises to stay in close contact with the experiences of practitioners and tries to do social science that matters for (forestry) practice. The origins, development and principles of phronetic research and what this has meant for the analysis of social practices in local forest management and the connections to wider forest governance is described here.

Origins and the development of phronetic social science

Phronetic social science originates from the notion that social sciences suffer from an inferiority complex in relation to natural sciences, which are often regarded as the only true sciences. Social scientists are consequently divided between those who advocate the naturalist point of view, pointing towards the need for more uniformity and the creation of a distinct scientific discipline through adherence to common principles shared with natural sciences (scientism) and those in favour of more pluralism in applied methodologies (Schram, 2006). In the book *Making social science matter – Why social inquiry fails and how it can succeed again* (2001) Bent Flyvbjerg presents a way for social sciences to let go of the idea of mimicking methodologies of the natural science and instead embracing the fact that social phenomena are fundamentally different.

Due to the inherit nature of human activity and knowledge as contextual it is not possible to reach the ideal of complete and predictive theory that is the requirement in the classical definition of ideal science (Flyvbjerg 2001, pp. 38-49). Only by recognising and embracing the contextual nature of the social and letting go of predictive theory building as its main purpose, social science can become relevant again and contribute to better practices in the social and political spheres (Flyvbjerg 2001, pp. 166-168). Social and political sciences should solve problems experienced in practice and provide society with concrete empirical analyses and ethical guidance, increasing its capacity for "*value-rational deliberation and action*" (Flyvbjerg 2001, p. 167). In the words of Schram (2012); "*phronetic social science is ultimately about producing knowledge that can challenge power not in theory but in ways that inform real efforts to produce change*" and that "*improves the ability of those people to make informed decisions about critical issues confronting them*" (p. 20). The problem-driven nature of phronetic research means one must leave behind the divide between interpretivism and positivism that has shaped social sciences for so long and make use of mixed methods to best fit the needs, which is increasingly done within social sciences today (Schram, 2012). Kvale and Brinkmann (2015) place Flyvbjerg's phronetic social science within the research tradition of pragmatic validity where the value of the scientific project is based on its capacity to accomplish desirable change of practices.

The ideas of pluralism and reformation of social sciences are shared by other scholars within political sciences, but what sets Flyvbjerg and the phronetic approach apart is the "*solid intellectual justification*" of the effort and the thorough review of social science research already applying these ideas (Schram 2006, p. 27). There is already much phronetic research, that prioritises practical before epistemic knowledge, but what Flyvbjerg (2001, pp. 129-130) does is to

supply explicit guidelines for the development of what he has chosen to call phronetic social science. The books *Making Social Science Matter* (Flyvbjerg, 2001), *Making Political Science Matter* (Schram and Caterino, 2006) and *Real Social Science – Applied Phronesis* (Flyvbjerg, Landman and Schram, 2012) represent the development of phronetic social sciences towards a more practical methodology, making the phronetic approach readily available for researchers and scholars. The phronetic approach to social sciences is thus not exclusive in its claim; research conducted according to its principles has already been done. What the works by Flyvbjerg and colleagues offer the researcher are certain frames and much needed ontological and epistemological foundations that will be accounted for here, in relation to the research conducted in this thesis.

Flyvbjerg calls for a strengthening of social sciences where it complements natural sciences and where it should be strongest; in the analysis of interests, values and goals of society, including context, experience, and practical knowledge (Flyvbjerg 2001, pp. 1-3, 23-24, 53). He builds his argumentation on the promise of *phronesis*, the intellectual virtue as applied by Aristotle for describing practical, intuitive and context-dependent knowledge (Flyvbjerg 2001, pp. 55-60). *Phronesis* has no contemporary connotation and is often translated to "*prudence*" and "*practical common sense*" making it an issue of ethics. For Aristotle there was also a connection to truth and thus to the scientific endeavour. *Phronesis* is the study of value judgement and is especially concerned with particularities and particular circumstances of experience. The other intellectual virtues of Aristotle have modern connotations and are prominent in contemporary society; *episteme* and *techne*. *Episteme* is synonymous with the naturalist perception of science as generalizable and context-independent knowledge and is the linguistic origin of "*epistemology*". *Techne* can be translated as know-how and concerns how to produce things, making it the intellectual virtue of arts and crafts. Modern connotations are "*technology*" and "*technical*" for example. In his argument Flyvbjerg frequently refers to other phronetic works and contributions to philosophy of social science foremost by Nietzsche, Rorty (the (im)possibility of social science to become a normal science and philosophical pragmatism), Bourdieu (the concept of habitus and practical knowledge), Foucault (perspective on power and genealogy), Bernstein and Toulmin (both for their "*practical philosophy*"), and Giddens and Garfinkel (both for their contribution to interpretivist approaches and the need to study human self-interpretation) (Flyvbjerg 2001, pp. 47, 60). It is important to here recognise that for a scientist engaging in phronetic research there is no contradiction in also engaging in research aiming for episteme and techne. What Flyvbjerg and other phronetic scholars advocate is that social sciences has lost one of its main qualities by overlooking phronesis and the value of researching

practical knowledge, in a false quest to be recognised as a science on the same premises as natural science (scientism). The aim is to reverse that trend and make social science matter again through more phronetic research.

Value judgements and power

Phronetic research focuses on values and power with one of the primary tasks of the researcher to answer the following value-rational questions (Landman 2012, p. 36):

1. Where are we going?
2. Who gains and who loses, and by which mechanism of power?
3. Is this development desirable?
4. What, if anything, should be done?

Answering these questions means making a value judgement, making phronetic research susceptible to relativism and foundationalism. In phronetic research the validity of a claim to truth comes from adhering to procedures and basic ground rules, meaning that "*better*" interpretations will replace the former as the valid one (Flyvbjerg 2001, pp. 130-131). By applying situational ethics, the validity of the value of the interpretation is instead based on the common view of the reference group to which the researcher refers and that group's socially and historically conditioned context. "*Better*" is thus defined according to sets of validity claims decided by the reference group. The process of final authority over the interpretation is dialogical and includes a "*polyphony of voices*" including the researcher's (Flyvbjerg 2001, pp. 139-140).

Social acceptance of the interpretation thus proves its validity claim, making it socially conditioned; "*phronetic social scientists rely on public deliberation and the public sphere not because it is perfect but because it is the best we have for collective decision-making*" (Flyvbjerg, Landman and Schram 2012, p. 286). The normative basis of applied phronesis is not based on idiosyncratic moral or personal preferences among those who problematise and act. Instead, the socially and historically conditioned context is seen as the most effective protection against relativism and nihilism according to (Flyvbjerg *et al.,* 2012). Defining the reference group is up to the scientist and is, according to Flyvbjerg; "*the people who champion the values and rules that citizens and parliamentarians of democratic societies have decided should apply to governance, truth, ethics, economics and the environment, safety, social affairs and so on*" (Flyvbjerg *et al.,* 2012, p. 293). The question to which degree such a reference group has been established and how socially conditioned are the validity claims being made in this thesis will be discussed in section 6.3.

Regarding the perspective on power held by phronetic research, the relationship between phronetic social science and democratic theory and praxis is strong and is informed by Foucault, sharing his focus on conflict, power and partisanship (Flyvbjerg 2001, p. 109). Public consensus is not impossible but conflict is seen as an inevitable part of contemporary pluralistic democracies and as more of a positive force in society; not necessarily destructive and in need of being contained as in Habermas' perspective on conflicts (Flyvbjerg, 1998). The existence of universal values, as advocated by Habermas, is further out of line with the Foucauldian perspective on power in phronetic research. The implications for the thesis of this perspective are discussed in section 6.3.

Conducting phronetic research

Phronetic research is not a theory in itself, it is an approach with great attention to procedures and can best be described as an analytical project (Flyvbjerg 2001, p. 140). There is no *one* method for a phronetic study and the adherence to practice often results in the need to apply mixed methods. The phronetic approach to social science is bottom-up, contextual and action-oriented as it dictates openness to the empirical material and does not aim for theory building but to having impact in practice (Flyvbjerg *et al.,* 2012). This approach stands in contrast to the conventional social science where the researcher applies theory *a priori*, with a point of departure in top-down, decontextualized theory and rules. The action is then to first choose the right theory and then apply it correctly. Instead, the researcher engaging in phronetic research will him/herself apply phronesis when identifying dubious practices and teasing out tension-points for problematisation from the situation and action under study (Flyvbjerg *et al.,* 2012). Tension-points are fault lines, fraught with dubious practices and contestable power relations, that when problematized, break apart and create space for better practices. They refer to "*the tension between what is <u>said</u> and what is <u>done</u> in specific policy areas*" (emphasis in the original)(Flyvbjerg *et al.,* 2012, p. 295), for example between authoritative and democratic governance or between globalisation and localised social realities. Referencing to practices as dubious thus means that they are questionable based on the type of value judgements described above. Researchers adhering to the ideas of phronetic social research will, in their field of study, strive to (Flyvbjerg *et al.,* 2012, p. 290);

1. Actively identify dubious practices within policy and social action,
2. Undermine these practices through problematisation; and
3. Constructively help to develop new and better practices

In line with the phronetic approach, the theoretical perspectives in this thesis are applied *ex post*. The research has primarily been conducted inductively, where the point of departure was the general issue of how do forest management, social change and policy interact, and how does this interaction shape the practical forest management. In Paper II the empirical material was analysed by means of grounded theory where the data was repeatedly revisited in the search for themes and meanings that could then later be referred to social capital theory and practices (Oktay, 2012). Explanations of social phenomena were employed by the researcher upon confrontation with the empirical data. In addition, the participatory action research model developed in Paper IV had an explicit aim to change reality and develop better practices. The application of boundary object theory in Paper III was also applied in a later stage of the analysis.

The research presented in this thesis applied a case study methodology which is a prime investigative method of phronetic research; phronesis being concerned with the particular and context (Flyvbjerg 2001, pp. 66-87). True expertise and practical knowledge is situational and derived from multitude of experiences, thus it cannot be summarised in a few universal rules or predictive theory. Five common misunderstandings exist that downgrade case studies as scientific method and are harmful for the social sciences on whole (Flyvbjerg, 2006). Case studies are usually seen as less valuable due to; (i) generalizable, theoretical (context-independent) knowledge is seen as more valuable, (ii) individual cases cannot be generalised, (iii) case studies are mainly useful to generate hypotheses for later testing in larger samples, (iv) case studies contain bias towards verification, and (v) it is difficult to summarize and generalise findings from individual case studies. Flyvbjerg (2006) argues that these are indeed misunderstandings of the nature of case studies and the aim of social science and inquiry in general. Generalisations and predictive theory cannot capture the understanding of social acting and practices and thus cannot be the sole task of social science. In the study of human affairs it is important to provide concrete and context-dependent knowledge as it better represents the detailed reality of the human experience. Bias towards verification is present in all research methods and case studies nonetheless, but in-depth analysis has the capacity for falsification and discovery of "*black swans*".

Narratives are a further method advocated within phronetic research and Paper I in this thesis presents a narrative. Contextualised examples are a great source of learning and can bring students and researchers from the first level of rule-based, context-independent knowledge to true expertise (Flyvbjerg 2001, pp. 84-86). A good case study narrative provides the reader with a learning opportunity by displaying great details, conflicting statements and diversity of human affairs. The reader then has the opportunity to make their own

interpretations and draw diverse conclusions. A good narrative will convey meaningfulness of the event or process under scrutiny and the reader will afterwards not be able to question its relevance ("*so what?*"). Narrative analyses has much to offer phronetic research as it "*illuminate[s] the ways in which individuals experience, confront and exercise power*" (Landman 2012, p. 28) and thus challenges power. A phronetic approach adds an extra dimension to narrative analysis as it "*looks for ways to redress power imbalances that are revealed through the research process"* (Landman 2012 p. 35).

There are also limitations to the narrative analysis such as problems with authenticity, faithfulness, representativeness and generalizability (Landman 2012 p. 36). The first two problems can be addressed through phronesis itself and the practical wisdom exercised by the researcher in the analysis. The two last problems can be solved through research design. Though no comprehensive framework can be given for performing narrative analysis as a phronetic research method, Landman (2012) puts forth a set of questions to facilitate reflection about one's own research ventures and methods, and the added value of the phronetic research approach. A few examples are: Is your research question one that focuses on problematic issues that are of real concern for the public? In what ways will your own expert status have bearing on what you do for the definition of the research question, and the analysis and interpretation of the results? Does your analysis of the narratives uncover and/or challenge the dominant modes of power?

Social practices as the object of study

Within phronetic research, practices go before discourse as the object of study (Flyvbjerg 2001, pp. 134-135). Practices are closer than discourse to everyday life experiences of people; Flyvbjerg argues practices discipline discourse. The focus should always be on daily practices and routines within a field of interest and the researcher is tasked with understanding "*the roles played by practices studied in the total system of relations*" (Flyvbjerg 2001, p. 135). Practices as the object of study in phronetic research builds on Bourdieu's concept of habitus (Bourdieu, 1977) and entails a joining of structure and agency in the analysis (Flyvbjerg 2001, pp. 137-138). They are seen as integral parts of each other and cannot be studied in isolation. The phronetic researcher should thus investigate how structure influences agency and how actions of agency influence structures in return.

Social practices as the focal point for the synthesising analysis in this thesis need a definition; a social practice is an open-ended, spatially-temporally dispersed "*nexus of doings and sayings*" (Schatzki, 2012, p. 14) and "*routinized type of behaviour*" that integrates "*forms of bodily activities, forms of mental*

activities, 'things' and their use" (Reckwitz, 2002, p. 249) in a specific field or domain (Spaargaren, 2011), here forest management. Practices are not based on only one person but on different people's activities (Schatzki, 2012) and where individuals are carriers of practices showing "*routinized ways of understanding, knowing how and desiring*" in relation to other subjects and material things such as the environment and forests (Reckwitz, 2002, p. 250). Practice theory emphasises human action and the embodiment of mental activity (Schatzki, 2001). Bourdieu (1977) similarly describe habitus as a system of individual dispositions (thoughts, skills, actions etc.) in which actors embody and reproduce social structures in their daily activities. Applying social practices to natural resource management including forestry, Arts *et al.* (2013, pp. 18–22) suggests the sensitising concepts of "*logic of practice*" and " *situated agency*" for facilitating the research analysis. "*Logic of practice*" then refers to the internal logic of every human practice; one that is not that of a logician, but one that organises human behaviour by a few generative principles (e.g. reciprocity) without being subject to authority (pp. 18-20). "*Situated agency*" highlights that an actor's identity and behaviour are shaped by social and material context (e.g. tradition, discourse and rules), resulting in agency not being autonomous but neither ruled solely by structure.

In studies of Swedish forest management, social practices as an object of study has been applied in a small number of studies. Lidestav and Nordfjell (2005) suggests a conceptual model where social practices constitute the connections between seven concepts and institutions: self-employment, land, property rights, marriage, inheritance, taxes and gender. Their quantitative survey of family forest owners reveals how different individuals' or sub-groups of forest owners' identities and social practices are related to each other and to concepts and institutions. The added value of social practices in the analysis is somewhat doubtful because social practices are not analysed per see, but form the interlinkages between concepts and institutions in the conceptual model. While it is true that social practices and identity are connected and shape each other (Arts *et al.*, 2014), the analysis could have been made using identities, the concepts and institutions only. Lodin *et al.,* (in press) applies social practice in their analysis of contextual and attitudinal drivers of tree species choice in the regeneration after storm events. The concept of situated agency and reliance on experiential knowledge are used to explain the persistence of practices of planting Norway spruce (*Picea abies*), despite it being infamous for its poor storm resistance.

Forest ownership by NIPF owners in Sweden is described by Törnqvist (1995) as a kingdom of inheritors where social motivations are often more important than economic, but where the economic importance of forestry for

one's own businesses and household cannot be neglected. His socio-economic analysis of decision-making in forest management at household level implies that emerging patterns of behaviour can neither be referred to as "*homo sociologicus*" nor "*homo economicus*" (p. 46). The former is a model of human behaviour following a "*logic of appropriateness*", where rules are internalised unknowingly and behaviour can be changed through implementing new or altered rules (Arts *et al.,* 2013, pp. 15-16). "*Homo economicus*" represents the rational-strategic human that acts according to maximum utility and predicted consequences. Partially dismissing these logics of behaviour, Törnqvist (1995) emphasises that human behaviour is multi-dimensional and a consequence of rational and irrational considerations, resembling the "*homo interpreter*" or "*homo practicus*" (Arts *et al.,* 2013, pp. 15-16). Here, there are no over-arching behaviour rules, but neither is the individual autonomous in his or her agency. This last pattern of human behaviour is in line with the perceptions about human behaviour within the practice based approach (Arts *et al.*, 2013).

Embracing social practices as the object of study brings attention to not only sayings by actors, but also things and actions. The aim of studying practices is not to make generalisations about knowledge, but to give in-depth insights into complex social practices, highlighting cases where conventional theory does not apply (Flyvbjerg, 2004). In fact, the result of phronetic research can be briefly summarised as "*a pragmatically governed interpretation of studied practices*" (Flyvbjerg 2001, p. 140).

3 Background

3.1 International and European governance of forests

It is outside the scope of this thesis to give a full account of the particularities of international and European forest governance but a short review of the influence of higher level governance on forest policy and management in Sweden is necessary. This section brings up general pathways of influence from international and regional levels to the national level, giving three prominent examples: Sustainable Forest Management (SFM); biodiversity; and climate change policies. Then it touches briefly on the lack of a Legally Binding Agreement (LBA) on forests across multiple European levels, and influences from other EU policy areas on Swedish forest governance.

According to Bernstein and Cashore (2012) there are four pathways through which global policies can influence domestic and private sector policies: international rules; international norms and discourses; creation of or interventions in markets; and direct access to domestic policy processes. Governance mechanisms are not confined to any single pathway, but interact across processes and can create collective influences through multiple-pathways.

The top level of the multi-level structure governing world forests consists of the so-called international forest regime complex as "*sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relation*" (Giessen, 2013). This complex has been deemed fragmented and hollow in the sense that it is made up of several different treaties with various scopes and subject areas, which are, at times, contradictory. Domestic factors in the form of national bureaucracies, private sector economic interests and multi-level politics play a role in this fragmentation. Increased fragmentation is feared to result in ineffectiveness of global governance regimes but instead of aiming for simplification, learning to deal with the complexity could turn out to be just as

rewarding (Arts *et al.*, 2010; Bernstein and Cashore, 2012). Fragmented or not, there are a number of international treaties and conventions that do have an impact in terms of influencing regional and domestic forest policies and processes in Europe and Sweden (Ellison and Keskitalo, 2009; Arts, Giessen and Visseren-Hamakers, 2013). The Convention on Biological Diversity (CBD) from 1992 and The United Nations Framework Convention on Climate Change (UNFCCC) have both had significant impact on European and Swedish forest policy for example through the Forest Europe process (Arts, Giessen and Visseren-Hamakers, 2013). Forest Europe (former Ministerial Conference on the Protection of Forests in Europe (MCPFE)) is the institution that formulated the Pan-European definition and criteria and indicators for SFM (see Text box 1). SFM is regarded as the main program of the forest sector today and is the most prominent example of an international norm and discourse gaining influence over domestic policies globally through its multiple pathways of

Text box 1 Sustainable forest management

Today, Sustainable Forest Management (SFM) is the globally prevailing paradigm, or programme of the forest sector, and constitutes normative goals for forestry activities expressed in national legislation and international conventions. SFM, in its modern understanding, has its foundation in the Brundtland Commission from 1987 where the global programme for sustainable development was delineated, implementing a vision for integration of both ecology and economy as a win-win solution for policy and management (Arts and Buizer, 2009). In 1992, the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro formulated guidelines and means for protecting the world's forests, followed by the Montreal Process (Siry, Cubbage and Ahmed, 2005). On the European level, the development was taken up in the Helsinki process by the 2nd Ministerial Conference on the Protection of Forests in Europe (MCPFE) in 1993 where a definition of SFM was agreed upon by the participating countries (Rametsteiner and Mayer, 2004): "*Sustainable management means the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological and economic and, social functions, at local, national, and global levels, and that does not cause damage to other ecosystems*" (MCPFE, 1993). The idea and programme of SFM is today classical, being firmly institutionalised in processes, science, policies and minds, for example, through wide-spread forest certification schemes (Arts and Buizer, 2009). However, new developments indicate that SFM is being reshaped by the bioeconomy discourse that emphasises economic aspects with significant disregard for social considerations (Pülzl, Kleinschmit and Arts, 2014). Future developments will test the sustainability of the SFM concept.

diffusion, formal processes and international rules (Bernstein and Cashore, 2012).

Similarly to SFM, the influence of climate change policies and the UNFCCC on regional and domestic levels in Europe has been through multiple pathways, e.g. EU Emission Trading System (Winkel *et al.*, 2013). At the national level in Sweden, domestic politics have shifted the Climate Change narrative in relation to forestry from being about "*a threat*" to being "*an opportunity*", making it an issue about forest production rather than environmental (Holmgren, 2015; Holmgren and Arora-jonsson, 2015). Integration of Climate Change in Swedish forest policy has thus followed conventional, production-oriented ways of thinking (Ulmanen, Swartling and Wallgren, 2012) with a clear disadvantage for non-market interests (Ellison and Keskitalo, 2009). Implementation of adaptation strategies in the forestry sector are limited by the dominance of actors advocating increased production and the low number and poor organisation of actors advocating adaptation (Ulmanen, Swartling and Wallgren, 2015). The main implementation of adaptation strategies in forestry practice so far is through advice to land-owners by the Swedish Forest Agency (SFA) and other actors (Ulmanen, Swartling and Wallgren, 2012). The industry, however, reports primarily working with improvement of harvesting technology and forest roads to meet the more demanding conditions for forest operations under a changed climate as well as adjusting forest management to a shorter harvesting cycle and storm risks (Ellison and Keskitalo, 2009).

Sweden has been a member in the EU since 1994 and while there is no directive on forests within the EU there is an impact at the national level from other policy areas. Policies for agriculture, rural development, biodiversity, climate change, energy, industry and trade jointly result in a fragmented, inconsistent, un-coordinated and under-financed EU forest "policy" (Winkel *et al.*, 2013). The implementation of the Water -, Birds - and Habitat Directives in particular have impacted the Swedish forest sector. The implementation of the EU Water Framework Directive (WFD) in Sweden has not led to any substantial changes of legislation and practices but follows a path dependency of existing systems (Keskitalo and Pettersson, 2012). The WFD has raised the forest sector's awareness of water issues but lacks implementation in forest management (Berglund, 2014). In comparison, the Birds- and Habitat Directives, the EU's main mechanisms for biodiversity protection, have had a much larger impact and have been incorporated into Swedish legislation through the Environmental Code (Forsberg, 2012). They form the basis for the Swedish Species Protection Ordinance (SPO) (SFS 2007:845) that takes precedence over the Forestry Act (SFS 1979:429, sec. 4) and stipulates far-reaching prohibitions on the deterioration or destruction of breeding sites and resting places of certain

listed species and all wild birds. Since there are no derogations for forestry operations, these prohibitions can be said to be absolute with regard to forestry (SFS 2007:845, sec. 14; c.f. Habitats Directive, art. 16.1). The impact on practical forestry since implementation in 2007 has, however, until recently been limited due to existing policy strategies However, during the past year several prohibitions of planned harvesting operations based on the SPO have been issued. This has led to great controversy in relation to private property rights (Nilsson, 2016).

In the process of developing an LBA concerning forests in Europe, three main conflicting interests are blocking an agreement: i) subsidiarity and sovereignty versus policy beyond the nation state, ii) nature conservation versus forest production in forest management and, iii) UN rules versus independent negotiating process (Edwards and Kleinschmit, 2013). Procedural and principle issues regarding the democratic process at a European level are the main hurdles. In the case of the nature conservation versus forest production controversy, the driving forces at the European level are national arrangements and interests, but the controversy will not likely stop any agreement, only 'water it down'. From being very adverse to a formal forest policy in EU, the actors in the Swedish forestry sector are now actively trying to influence the process reasoning that it is better to be pro-active in order to have more opportunities and to win (Bjärstig, 2013). The Swedish government continues to show little interest and remains committed to a national strategy.

In short: Multi-level governance of forests

- Today, global forests are governed by a multi-level, multi-centred and multi-actor governance regime and the interactions between levels are increasingly complex.
- The international forest regime has been deemed fragmented and hollow. Ways to influence domestic policy and practice exist through actor networks, discourses and norm diffusion.
- Domestic policies and arrangements have a significant impact on the implementation of international and regional policies. Strong production interests in Sweden have altered the direction of policies including climate change and water policies in relation to forests. Biodiversity policies have had a more direct and controversial impact.
- In order to understand forest management and governance one has to adopt a multi-level perspective on the issues at hand.

3.2 Forest policy & governance in Sweden

The co-evolution of Swedish forestry and policy

Forests cover 69% of Swedish land and forestry is an important economic sector, especially in the rural areas and accounted for 11% of Sweden's total export value in 2013 (SFA, 2014). Swedish forest policy is to a high degree the result of the present and historical importance of forest resources and forest related industries for the economy.

Forestry in Sweden today is characterised by a high-degree of mechanisation, large export-oriented forest industries, high percentage of private ownership, a dominant clear-cutting system, and wide-spread private certification schemes. The combination of integrative and segregative strategies for environmental and social considerations combine set-aside areas for nature conservation with retention forestry on all productive forestland. This stands in sharp contrast to the first half of the 19th century when forestry involved heavy manual labour and forest owners were prevailingly small-scale farmers (owning or leasing the land) working in forest during the winter (Lundell, 2011). The ideas, structures and developments that lay the foundation for present day forestry include foremost the private land-ownership structure originating in the privatisation of crown land over two hundred years ago (Nylund and Ingemarson, 2007), the industrialisation of forestry that took force in the mid-19th century (Enander, 2007a), the influential forest production research from the early 20th century and onwards, and the rapid increase in efficiency through mechanisation during the second half of the 20th century. The first legislation demanding reforestation after fellings was introduced in 1903 and in 1948 goals for sustainable forests were introduced (Nylund, 2009). It was already an explicit strategy of the government in 1903 to implement the new legislation through informational and educational measures rather than through strict regulation and aiming to create new norms of good forestry practice (Appelstrand, 2007). The current prevalent silvicultural practices became established in the mid-20th century, with a focus on continuous wood supply for the pulp-and paper industry and for export markets through rational clear-cutting methods (Lisberg Jensen, 2011).

In 1963 the book *Silent spring* by Rachel Carson was published in Swedish revealing facts about the threat to humans and nature from invisible chemicals being released (Enander 2007a, pp. 177-197). In Sweden, as elsewhere, the book triggered a new environmental consciousness among the public and a social movement took form. The 1960's and 70's became a period of heated environmental debate, where broad public opinion criticised forestry's use of pesticides and herbicides, the increasingly large clear-cuts, the use of soil-scarification methods and the loss of jobs in rural areas due to mechanisation. It

was a critique that hit the heart of modern forestry. Nevertheless, regulations promoting production forestry reached a peak as late as in 1979 and 1983 (Enander 2007b, pp. 287-281). Non-industrial forest owners were steered to perform active forestry and supply the industry with timber for example through obligations to harvest a certain amount of older forest and low stocked forest stands and to have a forest management plan (FMP) (Lundell, 2011). The background was a fear of a future wood deficit among both politicians and forest industries. The forest owners' organisations heavily opposed the policy and throughout the 1980's advocated for deregulation and free entrepreneurship. In parallel, the booming ecological sciences presented the environmental movement with rational scientific arguments and terminology that won them increased political influence during the same decade (Lisberg Jensen, 2011).

In 1993 a major revision occurred when the goal for sustainable forest production was given equal weight as the goal of biodiversity preservation, expressed as a change of the first paragraph of the Forestry Act (Bush, 2005; Nylund, 2010). The new legislation that came into force in 1994 marked the start of the contemporary era of forest policy in Sweden. With minor additions since then, the first paragraph of the Forestry Act now reads (latest revision 2008:662):

> "The forest is a national asset and a renewable resource that shall be managed in such a way as to provide sustainable good yield while maintaining biological diversity. Forest management should also take into account other public interests." (SFS 1979:429)

The shift was made possible through a combination of favourable conditions: relief from a believed wood deficit, new ecological research and an environmentally friendly public opinion plus the argument that biological diversity ensures high forestry production, all framed within an optimistic ecological-modernisation discourse (Bush, 2005; Hysing and Olsson, 2008; Nylund, 2010). Most notably however, the 1993 Forestry Act came together with far-reaching deregulation of the forestry sector, where many forest owner obligations were removed (Enander 2007b, p. 293). It thus invoked a strong turn towards governance instead of government (Nylund, 2010). Activities associated with governance such as participation in decision-making, cooperation and partnerships between state and private actors have, however, existed in the Swedish forest sector since the early 20th century (Appelstrand, 2007). Traditionally a strong mutual understanding exists between public authorities - mainly the Forest Agency - and the different stakeholders in the forest sector, including scientific institutions (Boström, 2003). Representatives of the forest sector describe the importance of dialogue and consensus, but also of tradition, culture and sharing educational background (Sundström, 2005).

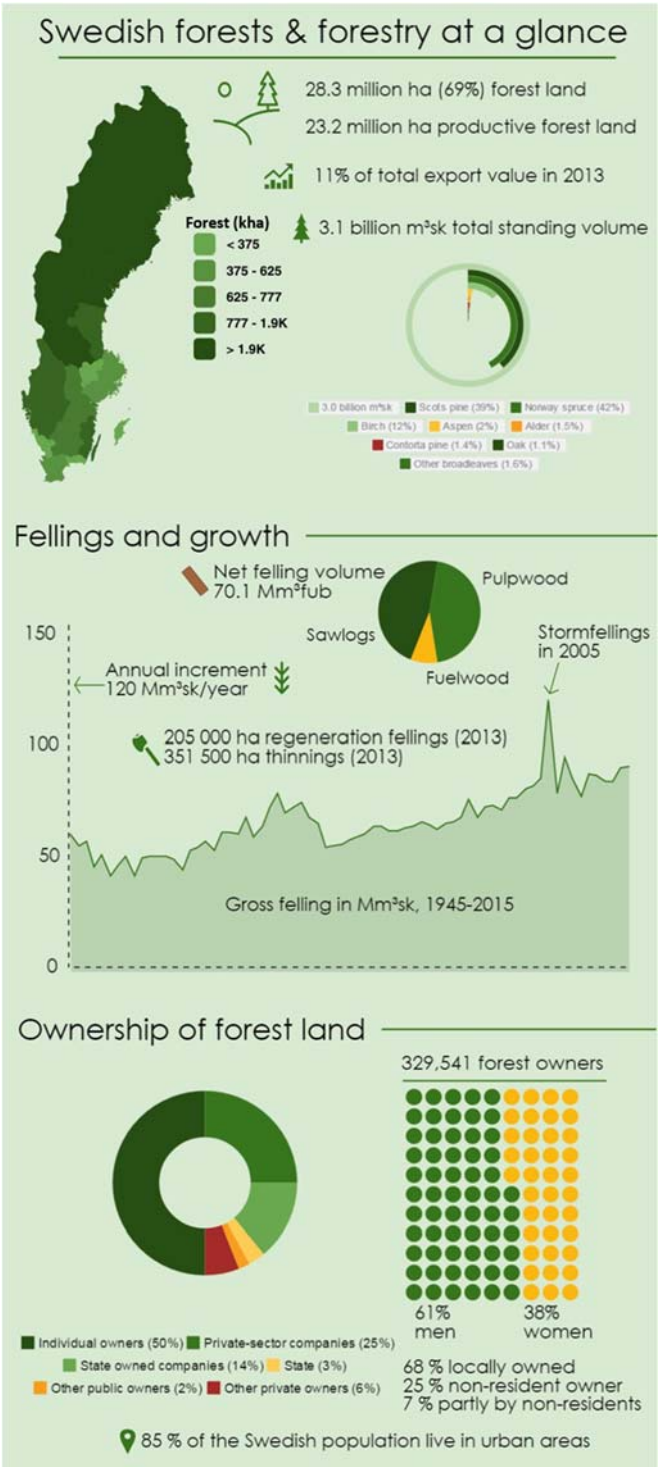

Figure 1. Key characteristics of Swedish forests and forestry. Sources: (SFA 2014; SLU 2016; SCB 2015).

Throughout much of the 20th century the forest policy built on these premises, on information and education of forest owners and managers who were then given much freedom in their forest management (c.f. Appelstrand 2007).

The Swedish Forestry Model and its critique

The sector with a long tradition of *laissez-faire* policy hence took a step further along the same line in 1993 and introduced a model where "*freedom under responsibility*" and "*sectorial responsibility*" continue to be guiding slogans until present day (Sundström, 2005; KSLA, 2012). The "*Swedish Forestry Model*" has become a commonly-used term for Sweden's liberal forest policy where prevailingly 'soft' policy instruments, collaborative approaches and voluntary measures are applied (Sundström, 2005; Brukas and Sallnäs, 2012). 'Soft' policy instruments customarily applied are information and communication towards the sector, forest owners and managers, regarding the set-up objectives for environmental consideration and cultural heritage for example (Appelstrand, 2012). The legislation is explicitly referred to as a minimum and seldom expresses defined quantitative thresholds for silvicultural or environmental targets (Brukas *et al.,* 2013). Exceptions are 5 § of the Forestry Act (SFS 1979:429)[1] that dictate the duty to regenerate the forest three years after final felling, 10 § stipulating the lowest allowable final felling age, and the prescription limiting the size of clear-cuts in sub-montane forest areas. In general, forest management should consider surrounding stands, environmental and cultural values when planning clear-cuts and one should strive to minimize the size. With the law as a minimum, the model of sectorial responsibility is built on the forest owners doing more than the legislation requires or that they can be persuaded to do so by forest consultants (Lidskog and Löfmarck, 2016). The importance of personal initiatives and resources are crucial for the implementation of policy strategies, since they often rely upon voluntary measures, participation and dialog (Appelstrand, 2007, 2012).

The Swedish Forestry Model has also been described by Beland Lindahl *et al.* (in press) as a model for "*more of everything*", referring to the ambition to have more biodiversity and more forest production on all forestland. Analysing the Swedish Forestry Model, Beland Lindahl *et al.* however concluded that the governance model still prioritises the economic and productive aspects of

[1] References to Swedish legislation firstly refers to the chapter (kap.), if such exists, and then to the paragraph (§) of the concerned legal text and lastly to the specific section (st.), ending with the name of the legal text in question. For example "6 kap. 5 § 2 st. Miljöbalken", refers to the 2nd section of the 5th paragraph in the 6th chapter of the Environmental Code. All legal texts are part of the Swedish Statue Book (In Swedish: *Svensk Författningssamling*, and in short SFS) and are referenced with year and number.

forestry due to path-dependency and lack of or inadequate, non-inclusive participatory political processes. Brukas *et al.* (2013) concluded that southern Sweden, in a comparison to the ecologically similar Lithuania, holds less favourable conditions for forest biodiversity due to more intensive forest management and that the gap is likely to increase if current forest management practices are upheld.

Text box 2 Actors in the Swedish forest sector

Sweden has a strong tradition of combining consensus-seeking democracy and corporatism (Vergunst, 2003; Appelstrand, 2012) and the public administration is distinguished by a culture of pragmatism, consensus-thinking and openness combined with willingness to compromise (Boström, 2003). This has favoured the participation of large and well organised interest groups.

Ministries, governmental agencies and a state owned company

Under the Ministry of Rural Affairs, the Swedish Forest Agency (SFA) is responsible for the mediation and implementation of the Forestry Act and formulate some regulations and directives. They operate at a national level but also have a very strong local tradition and a decentralized organisational structure with regional and district offices. The County Boards (CB) are the regional bodies responsible for the implementation of the Environmental Act, administratively located under the Swedish Environmental Protection Agency and the Ministry of Environment. While the over-all distinction between the SFA and CBs is the former's responsibility for forests and the latter's for the environment, the SFA and CBs have some overlapping duties. Swedish authorities nowadays apply a policy of 'one door in', meaning that forest owners only need to hand in applications and notifications to one authority independently which authority is the end-receiver. Sveaskog is the state-owned company that manages some of the state's forestland (4 million hectares).

Industrial actors

50 pulp- and paper mills, 120 saw mills and 40 other forest related industries are organised at a national level through the Federation of Swedish Forest Industries. The Swedish Association of Forestry Contractors represents 70 % of the professional forestry contractors in Sweden, including logging, silvicultural and planning contractors.

Forest- and land-owner organisations

The six forest owner associations in Sweden are regionally organised and have more than 111 000 members (34%) controlling a total 6 million hectares of forestland (SFA, 2014). At the national and EU levels they are represented through the Federation of Forest Owners. All the forest owner associations own saw-, pulp- and paper mills.

(Cont. Text box 2)

Non-Governmental Organisations (NGOs) representing specific user groups

The Swedish Village Action Movement organises around 5 000 local groups and associations working for rural development. Svenskt Friluftsliv organises 25 outdoor-life related associations with 1.8 million members. Friluftsfrämjandet is an outdoor association with local clubs throughout the whole country. Svenska Jägarförbundet is the Swedish association for hunters and has local representations in all counties.

Indigenous group representatives

The indigenous Sámi population in Sweden is foremost organised and represented by the Sámi parliament (also a state agency) and the National Union of the Swedish Sámi People (SSR). Locally, the Sámi population is organised in so-called Sámi villages. According to the Swedish legislation as well as the Swedish FSC standard, it is the affected Sámi village(s) that is the partner to contact for the formal counselling procedures concerning land-uses affecting reindeer herding.

Environmental Non-Governmental Organisations (ENGOs)

Swedish Society for Nature Conservation (SSNC) is the largest ENGO with 224 000 members. Swedish WWF (195 000 Swedish supporters) together with SOF-BirdLife (25 regional member organisations) and the Swedish Entomological Society (13 member organisations) are the only members of the environmental chamber of FSC Sweden. Other ENGOs in Sweden are Friends of the Earth Sweden (10 local groups), Protect the Forest and Nature & Youth Sweden (23 local clubs).

Labour unions

The Swedish union of forestry, wood and graphical workers (GS- union) organizes workers in the forestry, woodworking and graphic industries.

Research and educational institutions

Skogforsk is a research institute for the forest sector jointly financed by the sector and the state. The only Faculty of Forest Sciences in Sweden is part of the Swedish University of Agricultural Sciences. It is the only institution educating foresters at both bachelor and master level. Research is conducted here in most fields related to forests and forestry. The Linneausuniversity educates forest bachelor students and engineers and conducts research mainly on forest products. Forest related research is also conducted at Umeå University (mainly political science & geography), Luleå Technical University, Stockholm Resilience Centre, and Stockholm Environmental Institute.

Others

Föreningen Skogen is a non-profit, unattached association promoting forests and forestry through membership activities and a magazine.

Source: The selection of actors in the Swedish forest sector is based on the represented organisations in the NFP process and on membership in any of the FSC chambers. Information about the organisations has been gathered from each organisation's webpage during Oct-Nov 2016.

Participation in forest policy-making and public opinion

Participation of private actors in policy-making concerning forests has a long tradition in Sweden and has varied over time in the degree and quality of deliberation and the range of interests included. There has been a recent return of deliberative practices in Swedish forest governance but not due to any democratic demands, but rather as a necessity due to an increasingly more complex reality and competing claims by stakeholder interests (Schlyter and Stjernquist, 2010). The state has thus not stepped back but seems to accommodate deliberation and softer policies due to uncertainties about the biophysical, social and political risks involved.

Much along these lines, the Swedish National Forest Program (NFP) was initiated in 2013 and has the primary purpose to reach a broad consensus regarding the use of Swedish forests and their contribution to a future Swedish bioeconomy (Johansson, 2016). Johansson's analysis of the initial phase of the NFP (2013-2015) reveals that, while the participating actors agree on the goal, the forest industry and the environmental NGOs hold differing opinions about the optimal way to reach the goal. The industry wants the process to enable the transition into a new-bioeconomy through technological advances while the environmental advocates want to see new robust policies to stop biodiversity losses and improve environmental conservation. There are further question-marks with regard to the proceedings of the NFP, the capacity for deliberation and equal inclusion of actor groups. The latter has been particularly criticised due to the limited inclusion of actors, contradicting the explicit ambition of the government to increase participation from non-traditional forestry actors and sectors.

Public participation in forest policy-making will take place to a certain degree in the NFP, but in general, a public debate about the understanding and operationalisation of sustainable development in Sweden is lacking according to Beland Lindahl *et al.* (in press). Overall, the forest policy is to be regarded as legitimate as the different interests of the public are integrated but in following public opinion, environmental and social values should be prioritised above production values (Eriksson, Nordlund and Westin, 2013). There are clear discrepancies between the valuation of production and environmental values for different forest user groups. Citizens assess environmental values higher than forest owners, while public forest officers as well as employees at forestry industries and forest owner associations all value production higher, but each group to different degrees (Nordén *et al.*, 2015). The public is, in general, more interested in recreational activities than other stakeholders, but it is crucial to recognise the great variability that exists within groups of stakeholders and not be steered by stereotypical images when creating policies (Eriksson, 2012).

Attitudes to intensive forestry have been stable in Sweden over the years and the main objection from the public lies in a general resentment towards large-scale landscape changes, while attitudes towards fertilization and novel tree species are ambiguous (Lindkvist *et al.*, 2012). Technical solutions are possible in some cases when intensive forestry can be moved to locations with less conflict.

In addition to the NFP, participatory processes that are related to forests exist on all levels in Sweden. For the vast majority of these processes they are generally organised by the SFA or other governmental bodies. The main exception is Forest Stewardship Council (FSC) certification where the SFA officially has no role to play, but as discussed below, the government had some influence in setting up the certification process in Sweden (Boström, 2003; Hysing, 2009). On a national level, the FSC process gathers all the main private actors in the forest sector in their three chambers for economic, social and ecological values (FSC Sweden, 2010). Within the PEFC certification scheme there is not the same system of chambers based on different interests and forest owners dominate the democratic process (PEFC, 2010), making FSC more interesting from a perspective of participation. In addition at the local level, the FSC standard in Sweden demands that consultations with local stakeholders in relation to reindeer herding areas and valuable recreational areas are conducted (FSC Sweden, 2010). PEFC and the Forestry Act 20 § (SFS 1979:429) only obligates consultations in the case of forestry activities in the more limited so called reindeer-herding areas (PEFC, 2010). According to the regulations and prescriptions by SFA regarding 12 kap. 6 § in the Environmental Code, activities and measures that "*may substantially change the environment*" have to be reported for consultation to the SFA at least six weeks before initiation (SKSFS 2013:3). This obligation concerns a number of forestry measures including, for example, cutting in key habitats, fertilization of forestland, harvest of stumps, and construction of forest roads.

The role of forest certification schemes

In the context of the deregulated Swedish forestry, the strong position of certification schemes is interesting and has an impact on forest management and forest policy alike, through green forest management plans and participatory processes of private stakeholders at a national level (Sandström *et al.*, 2011; Kleinschmit, Ingemarson and Holmgren, 2012; Brukas *et al.*, 2013). The Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification schemes (PEFC - initially named the Pan-European Forest Certification Scheme) presently encompass more than 12 million ha and 11.5 million ha of forestland respectively (PEFC, 2015; FSC Sweden, 2016). Forest certification was initiated in Sweden by WWF and a national FSC standard was

implemented in 1998 (Schlyter, Stjernquist and Bäckstrand, 2009). The initiative was driven through disappointment with the inability of regulatory frameworks to deal with environmental problems in the forest (Boström, 2003). Forest certification is promoted as a market-based tool where the private sector improves environmental standards instead of the government, but in the case of forest certification in Sweden, the state and SFA were governing at arm's length by shaping the ground rules of governance and facilitating the introduction of forest certification (Boström, 2003; Hysing, 2009). The FSC standards rapidly expanded in Sweden as larger industrial forest owners joined the process, but the FSC national standard was rejected by family forestry. Instead family forestry joined the PEFC scheme that approved the Swedish national standard in 2000. Today it is increasingly common with both FSC and PEFC, so called double certifications as the certification schemes now accommodate different types of forest owners' ownership in term of size. Close to 8 million ha forestland (FAO definition[2]) was certified by both FSC and PEFC in 2015[3]. In interviews forest owners express that they have been given proof of their good forest management when becoming certified (Edwards *et al.*, 2013).

The two certification schemes display a similar degree of environmental effectiveness and only minor differences exist between the standards (Schlyter, Stjernquist and Bäckstrand, 2009). It is noteworthy that the certification standards are more specific and require more in terms of environmental and social consideration than the legislation (Brukas *et al.*, 2013). For example, the legislation stipulates that the proportion of broadleaves should not be decreased while the FSC standard states that forest holdings should be managed so that, over time, not less than 5% of mesic and moist forestland carries broadleaf-dominated stands. Similarly, the certification standard specifies the number of retention trees that should be left on clear-cut areas, a minimum of ten wind resistant live trees of different species. Other areas where the certification standard goes one step further than the legislation are to require a so called green FMP and both the FSC and PEFC certification schemes require the forest owner allocates 5 % of the forest area to be managed for nature values (FSC Sweden, 2010; PEFC, 2010). The problem of specifying the policy goal for environmental values has thus been achieved to some degree by the certification schemes (Nylund, 2010). Regarding social issues, FSC certification is stricter than the

[2] Land within a contiguous area where trees have a height of more than five meters and with a canopy cover of more than ten per cent, or has the potential to reach this height and canopy cover without measures to increase production (FAO, 2000).

[3] A conservative estimate based on information about double certification through personal communication (Autumn 2015) with the forest owner association (FOA) Södra and forest companies SCA, Holmen and Bergvik Skog, the Swedish church and Swedish FSC.

legislation, for example, when it comes to consideration for the rights of the indigenous Sámi people. The law dictates consultation if a forestry measure is planned in the area used for reindeer herding all-year-around (*året runt marker*) (SFS 1979:429). The FSC standard dictates consultation for measures planned on all land affected by reindeer herding, regardless if the reindeers are there all year around or only part-time (FSC Sweden, 2010).

Nevertheless, while certification has been seen as a support to the implementation of Swedish forest policy, the certification system is in reality a complex operation of multi-level communication in the forest management chain (Keskitalo and Liljenfeldt, 2014). The assessment of sustainability differs significantly from the monitoring and evaluation system conducted by the state and the Swedish Forest Agency, resulting in deviating standards. More importantly however, the desired, and often reviewed, positive effects of certification on environmental protection have been limited if one compares National Forest Inventory data for forest conditions with data on small-scale forestry practices and certification (Johansson and Lidestav, 2011). There is a need to improve the methods for measuring the cause and effect of forest certification on environmental protection. In addition, the participatory aspect of certification that is often brought forward as a general gain by its introduction has been shown to have limited legitimacy at the local level where representatives from ENGOs and reindeer husbandry (indigenous Sámi) experience limited opportunities to influence long-term forest management through the FSC scheme and where certification has the potential to stir conflict locally (Johansson 2013). Certification simply does not have the capacity to influence existing power asymmetries and national regulatory frameworks. Locally grounded social sustainability is not necessarily guaranteed through globally agreed certification standards due to for example inherently different worldviews (Ehrnström-Fuentes and Kröger, 2017).

Policy formulation and implementation in the Swedish forest sector

In an international comparison, the public administration in Sweden is characterised by a far-reaching division between ministries and authorities, where authorities holding special expertise and governing sectors seen as periphery tend to take more initiative on their own (Sundström, 2005). Governmental agencies in Sweden are furthermore formally independent from the political sphere as ministries and ministers cannot "*intervene in an agency's decisions in specific matters relating to the application of the law or the due exercise of its authority*" (Government Offices of Sweden, 2016). The only recourse for the government is to change the regulations. The legislation is decided by the parliament, while the government and agencies can formulate

Text box 3 Protected forestland in Sweden

The percentage of protected forestland in Sweden is highly debated and official numbers vary between less than 10% to up to 25% depending on definitions of forestland and protection status (see Table 1) (SFA, 2014). The key issue is that almost 4 million ha of forestland are excluded from forestry according to the Forestry Act as the land is classified as unproductive (forest production < 1 m^3/ha/year). This area is included in the FAO definition of forestland but is not formally considered protected area.

Table 1. Protected forest areas in Sweden in year the 2011 depending on the forestland definition.

Protection status		Percentage of protected forestland area according to different definitions	
		FAO forestland definition [a] *Total area 28.3 million ha*	Forestland that can produce timber on average at least 1 m^3/ha/year *Total area: 23.2 million ha*
Formally protected	Nature reserves & national parks	6.8%	3.4 %
	Habitat protection areas & nature conservation agreements	0.2%	0.2 %
	Voluntarily set asides for conservation purposes (sub-montane)	3.9%	4.8 %
Non-formally protected	Unproductive forestland not included in any of the above categories	14.1%	(not forestland according to the definition)
TOTAL		**25%**	**8.4 %**

[a] Land within a contiguous area where trees have a height of more than five meters and with a canopy cover of more than ten per cent, or has the potential to reach this height and canopy cover without measures to increase production (FAO, 2000).

(Source: SFA, 2014)

legally binding regulations and non-legally binding prescriptions (SFS 1974:152). The responsibility for forests rests currently with the Ministry of

Enterprise and Innovation and the Minister of Rural Affairs. The government agency responsible for the implementation of the forest policy is in general the SFA (SFS 2009:1393). Its local roots are seen as important, and this is emphasised in government ordinances.

The SFA has the authority to formulate regulations, prescriptions and other recommendations for the implementation of the legislation (SFS 2009:1393). However, under the present forest policy the SFA functions not so much as 'regulatory' authority but as 'facilitator', or 'motor' that as a partner promotes collaborative structures and cooperation (Appelstrand 2007, p. 304). Policy instruments are predominantly 'soft', encompassing primarily information, advisory services and educational measures. The intended audience of forest policies are forest owners and users. The importance of financial instruments decreased substantially with the deregulations in 1993 (Nylund, 2009), but for certain forestry measures it is possible to apply for funding, e.g. nature conservation and protection of cultural heritage. Collaborative strategies of governmental agencies have proved to be successful when establishing public–private partnerships (PPPs) for voluntary nature conservation agreements (Widman, 2015). The "*discretionary power of authorities*" increased the landowners' willingness to participate and showed a strong capability of the agencies to develop sustainable relationships. However, internal investigations by the Swedish Forest Agency have found that inspections and directives have a better effect than advice and counselling with respect to environmental consideration in private forests (Christiansen *et al.*, 2015).

In short: Forest policy & governance in Sweden

- The Swedish forest policy is a result of the current and historical importance of the forest resource and forestry related industries for the national economy in combination with certain patterns of cooperation between authorities and actors in the sector where consensus-seeking democracy, pragmatism and corporatism continue to be guiding principles.
- Forestry and forest policies have increasingly accommodated the multi-functionality of forests and the goals of forest production and biodiversity maintenance became equalized in the Forestry Act in 1993.
- Far-reaching deregulation was however implemented through amendments to the Forestry Act in 1993 and the authorities have now few means to control the practical equalization of forest production and biodiversity maintenance.
- The Swedish Forestry Model continues to favour production forestry and timber supply for industries due to traditionally powerful, influential

actors and interests and limited influence of non-traditional interests in policy processes. Central elements of Swedish forest policy implementation are certification, collaboration, public-private partnerships, management by objectives, education and informational measures.

3.3 Forest management & planning in Sweden

Scope and tasks of forest management and planning

Forest management and planning is concerned with the temporal and spatial dimensions of managing the often conflicting goals for the forest resource. Managing trade-offs between the different functions and uses of the forest can be solved through spatial allocation following an integrative or segregative strategy, or indeed certain forms in-between the two (Andersson, 2002). Simply put, in an integrated strategy all forest functions should be managed on all forest areas while in segregated management one designate separate areas for each use in an optimal way. There is an important issue of scale here where integration can take place on either stand or landscape level. While Swedish forest policy dictates an integrative strategy at stand level (promoting all forest functions on all forest land) (Hytönen, 1995), for example, Lithuanian forest policy upholds an integrative strategy at the landscape level that allows coordination and designation of forest functions over larger forest areas (Brukas *et al.*, 2013). A segregative strategy has the potential to produce more of a few functions but upon changes in climatic factors or social preferences a segregative system limits the planning space and is sensitive to changes in operational environment, e.g. in policy directions (Andersson, 2002). Policy documents underlying the present Forestry Act state a general approach to integrated forest management in Sweden (Hytönen, 1995). However, in reality there exists small-scale zoning with dominant uses defined per stand with a perspective of a forest holding as the zoning is done by the forest owners (Andersson, 2002).

Temporal aspects of forestry are primarily related to the inertia of the system as trees take time to grow and adaptations to new policies take time to manifest themselves. For example, the current Norway spruce dominated tree-species composition in southern Sweden is poorly adapted to the predicted change in climate in the years to come. Without drastic management measures such as large-scale harvesting and replanting with broadleaves it will take several decades before any substantial change can be noted (Felton, Ellingson, *et al.*, 2010; Felton, Lindbladh, *et al.*, 2010). Planning procedures are normally divided into strategic, tactical and operational levels, where the strategic plan takes into consideration policy and long-term goals (up to 100 years or more) while the

tactical and operational planning are concerned with how to carry out the strategic plan on time scales of 5-10 and 0-5 years respectively (Andersson, 2005). While forestry companies work on all planning levels, smaller scale forest owners do not have the same needs and typically plan for the coming 10 years.

The complexity in forest management planning, encompassing natural processes as well as subjective goals of forest owners, has fostered a strong modelling tradition in forestry sciences in order to assist decision-making (Jonsson, Jacobsson and Kallur, 1993). Decision support tools and systems support both forest managers and policy-makers in their decisions regarding the future of the forest. Optimisation of timber flows, growth modelling, logistics and spatial analysis through mathematical programming are classical tasks, but new challenges of multifunctional forestry such as stakeholder diversity, increased uncertainty under climate change and other biological functions have put new demands on operational research (Martell, Gunn and Weintraub, 1998). Modern decision support systems such as the Heureka system offer computer modelling of all forest functions and evaluation of alternative management scenarios for multi-criteria decision-making (Wikström *et al.*, 2011). These systems can be used for analysing inventory data and developing forest management plans.

Forest management plans

Forest management plans (FMPs) are typically made for each forest holding, be it a private company with large areas or a small-scale family forest owner with only a few hectares. The owner's goals and objectives for the entire forest holding are the basis for the plan (Jonsson, Jacobsson and Kallur, 1993). In a FMP the forest holding is divided into relatively homogenous compartments regarding stand structure and tree age (Wilhelmsson, 2007). Typically in Sweden, each compartment in the FMP is given a long-term production or environmental goal depending on the level of consideration taken in the forest production towards nature conservation values and other uses[4]. The plans for non-industrial private forest owners are primarily made by planners, employed or sub-contracted by timber purchasing companies, forest owner associations or the SFA. The planner's tasks include forest inventory, designations of areas and formulation of management alternatives to fit the normative goals of the owner and thus provide decision-support and advice to the forest owner. However the forest management planning process in Sweden is rather targeted to the needs of

[4] PG - production goal with general nature conservation consideration, PF (or K) - production goals with reinforced conservation consideration, NS - nature conservation goals where management is needed to sustain the conservation value, and finally NO - nature conservation goals where the forest should be left untouched (Wilhelmsson, 2007).

the planner's organisations and the advisory function is less emphasised, the time spend with the forest owner being left to the planner's discretion (Brukas and Sallnäs, 2012). This for example results in the goal formulation that is written into the plan normally being very general and representing the planners' interpretation of the owner's goal that is often too vague to be useful in the planning process, or a standard formulation is used (Wilhelmsson, 2011). Reasons for this can be that a thorough investigation into the forest owner's goals is perceived as too time consuming and thus costly, that the evaluation of the goal fulfilment are limited or that every 10 years is too short of a time frame for regular updates of the long-term goals.

Being the main tool for realising the goals of the forest owner, the FMP is also a primary instrument for realising sustainable forest management or other policies. The SFA (Mårtensson *et al.,* 2003 in Brukas & Sallnäs 2012, p. 605) states: "*A forest management plan is one of several instruments for implementing forest policy and an important aid in forestry advisory services*". Surprisingly, Brukas & Sallnäs (2012) is the first study to explicitly examine the FMP as a policy instrument. Swedish forest planning research has generally been limited to technical evaluations of methods and not covering socio-ecological processes on any larger scale (Andersson, 2002). Considering that forest owners with a FMP are more active and deliver more timber the plans are of great interest to the industry and the government (Lönnstedt, 1989). While FMPs used to be obligatory (Enander 2007b, pp. 287-281), this requirement was removed in the deregulation of the forest sector in 1993. Today it is only a requirement for those who wish to be certified in their forest management to have a so-called green FMP.

Landscape planning, participation in forest decision-making and conflicts

Planning activities spanning several forest holdings and whole landscapes are seldom applied due to ownership structures and administrative boundaries. Only companies and state managers with large, concentrated ownership have this opportunity. Large-scale, landscape planning is however increasingly asked for due to loss of biodiversity as a consequence of increased fragmentation of ecosystems (Angelstam *et al.*, 2011; Andersson *et al.*, 2012; Forsberg, 2012). Green infrastructure planning was part of the government bill "*A Swedish strategy for biological diversity and ecosystem services*" (Government bill 2013/14:141) and will be implemented at a regional level during 2016-2017 (SEPA, 2015). Participation is going to be an integral part of the implementation of green infrastructure plans.

One local approach to solve the issue of increased fragmentation of ecosystems and other conflicting uses of the forest is the establishment of Model

Forests. The Model Forest is a concept developed in Canada for how to perform sustainable forest management of large-scale landscapes through networks and partnerships with local actors and the public (Elbakidze *et al.*, 2010; Bonnell, 2012; Svensson *et al.*, 2012). Three such Model Forests have been established in Sweden partly through the Baltic Landscapes project led by the SFA. It is however questionable if Model Forests can be considered truly participatory as there are no integrated mechanisms in order for stakeholder groups to influence State policy and practice and this is not part of the purpose of the programme (Buchy and Hoverman, 2000).

Participation in decision-making is often seen as a conflict resolution mechanism, but conflict situations at the local level in Swedish forestry rarely manifest themselves (Ångman and Nordström, 2010). The conflicts that do occur are often described as personal and to be about so called bothersome people. The latent conflict between forest production and biodiversity values only occasionally manifests itself explicitly. Forests close to urban centres are more exposed and here conflicts manifest themselves more often and are often related to negative effects from forest operations such as destruction of paths, left-over branches and wood after cutting. The general policies for participation in forest-related decision-making proclaimed by legislation and certification standards were reviewed in section 3.2.

Individual forest owners and their decision-making

The high percentage of individual forest owners in Sweden (Figure 1) confers high importance to management and decision-making by this group with highly diverse motivations, objectives, values and ideas about forest management (Hugosson and Ingemarson, 2004).

Analyses of NIPF owners attitudes, values and objectives in Sweden have shown that they primarily have interests in preserving and developing their property for future generations and desire an even cash flow (Lönnstedt, 1989, 1997). They are in general risk aversive (Lönnstedt and Svensson, 2000) and take action against forestry hazards (Blennow and Sallnäs, 2002), but the management measures are not necessarily consistent with given recommendations (Eriksson, 2014). The main application of practical and experiential knowledge leads to a disregard of abstract risks and theoretical knowledge regarding future developments (Lidskog and Sjödin, 2014). By categorising forest owners according to their forest management objectives, a forest owner typology was created by (Ingemarson, Lindhagen and Eriksson, 2006) revealing five rather self-explanatory groups of NIPF owners in Sweden; "*the economist*", "*the conservationist*", "*the traditionalist*", "*the multiobjective*

owner" and finally the "*passive owner*". With the exception of the passive owner, all groups had economic forest management goals but to varying degrees.

Factors often investigated for their influence on forest management attitudes and choice of strategies include socio-demographic factors (age, gender, proximity of residency to the own forest, and membership in a forest owner association) and characteristics of forest property and ownership (size of forest holding, degree of self-employment, certification and the possession of a forest management plan) (Lönnstedt, 1997; Lidestav and Berg Lejon, 2013). Urbanisation has led to an increase in the number of non-resident forest owners, but the effect on management attitudes and objectives is weak (Nordlund and Westin, 2010; Eggers *et al.*, 2014). The number of female forest owners has increased over the last two decades and studies have shown that they are less active forest owners in that they do not perform as many silvicultural measures (Lidestav and Berg Lejon, 2013), but in final felling there is no significant difference between male and female forest owners (Lidestav and Ekström, 2000). Female forest owners have, however, more environmental and human-centred forest management attitudes (Nordlund and Westin, 2010), but gender has not been found to have any greater impact on the choice of forest management strategy (Eggers *et al.*, 2014). Owners with larger properties, membership, certification and good knowledge had an increased probability to choose a productive management strategy (Lidestav and Ekström, 2000; Eggers *et al.*, 2014). FMPs have shown to be important policy instruments, aiding the forest owner's decision-making (Brukas and Sallnäs, 2012) and facilitating the identification of cutting possibilities and other management needs (Lönnstedt, 1997).

Management context and roles of actors

Forest management is conducted in a context characterised by locally defined social, ecological, economic and technological aspects. Except for the forest owner and their family, there are also forestry professionals and their respective organisations, local community and organisations, and neighbouring forest owners. Forest professionals encompass forest officers and consultants from governmental agencies as well as so-called inspectors (or purchasers) from the forest owner associations and forest industry companies. Inspectors have the dual task to buy timber from the owners and supply advice and services. Typically offered services include harvesting and thinning, pre-commercial thinnings, planting, soil scarification and certification. Planners can be forestry consultants from the SFA or employed or contracted by a forest owner association (FOA) or a forest company. Influence by actors in the forest sector on forest management of NIPF owners can be in the form of prices for timber

and services as well as through knowledge, thus creating dependencies and power imbalances (Aasetre, 2006).

The influence by professional forest advisors has been much less studied than forest owners' motivations per se, but is estimated to have an impact on forest management strategies and behaviour (Eggers *et al.*, 2014). Professional forest officers regard timber production as more important than the owners, who prioritise recreational and environmental aspects more than the officers, with possible implications for the direction of advice (Kindstrand *et al.*, 2008). Several studies have highlighted the importance of the role of professional advice and consultation by authorities for implementing risk spreading strategies in response to climate change (Felton, Ellingson, *et al.*, 2010) and other forest-related risks (Eriksson, 2014) and as being important for knowledge dissemination about social values (Bjärstig and Kvastegård, 2016).

Obvious contradictions exist in the working tasks by forestry professionals - tension points between aiding forest owners and having to efficiently supply timber to their employer (planners at forest owner associations or timber industries) or implementing public policies (forestry consultants at SFA) (Hokajärvi *et al.*, 2009; Lidskog and Löfmarck, 2016). The industrial agenda of Södra (the only FOA in southern Sweden), however, alienates forest owners and results in the owners seeing the SFA as the only neutral party in their forest management and planning in the sense that they do not have the (industrial interest) to pay a lower price for the timber (Paper II). Hokajärvi *et al.* (2009) found that the ambiguity between economic and other values in forest planning in Finland had been institutionally dismissed by actors through arguing that forest owners primarily have an interest in economic benefits from their forest. Recommendations to forest owners for good silviculture thus follow a logic which plays into the hands of the forest industries who desire to safeguard their timber supply Hokajärvi *et al.* (2009). Other distortions in the relationships between actors in forest management exist for example in between FOAs, forest owners and contractors. Erlandsson (2016) could reveal that forest owners primarily judge the performance by contractors in harvesting operations based on their consistency of performance and the visual appearance, not on the actual outcome of the operation in terms of costs, thinning density or compliance with standards. The lack of knowledge and skills among owners to estimate these parameters could lead to favouring of contractors with better social or communicative skills rather than performance, why tools for facilitating judgement of performance was suggested by Erlandsson (2016).

Forest consultants at the SFA are tasked with the practical implementation of forest policy and traditionally work in face-to-face contact with forest owners through consultations, educational and informational events (SFS 2009:1393).

Their traditional role can be described as that of "*street-level-bureaucrats*" that hold high levels of individual decision-making freedom in the implementation of often ambitious and ambiguous policy goals (Lipsky, 1980). However budget cuts combined with investments in digital services force the consultants out of the forest and into the office (Paper I). Individual forest consultants' coping strategies are in some cases working against official forest policy, challenging the strategy of voluntary measures as an efficient way to induce changes in practices (Lidskog and Löfmarck, 2016). Time pressure on forest planners and forestry consultants are highlighted in studies from both Finland and Sweden, calling for more organisational support in their daily working tasks (Hokajärvi *et al.*, 2009; Brukas and Sallnäs, 2012; Lidskog and Löfmarck, 2016). A powerful culture of action and strict focus on performance is typical for forest workers and professional industrial foresters alike, which is not surprising considering the high demands on productivity (Hugosson 1999, p. 186). Alterations to such cultural expressions are difficult to achieve and if new ideas of how to 'do forestry' become prevalent, difficulties or even conflicts arising from the implementation can be predicted.

In short: Forest management & planning in Sweden

- Forest management and planning involves many types of knowledge, skills, interests, values and norms held by various actors.
- Forest management and planning is mainly conducted for each forest holding and is assisted by professional advisors and organisations offering advice and services to the forest owner.
- Few forest owners are fully self-employed in their forest management and will purchase forest services such as harvesting, thinning and pre-commercial thinning directly from entrepreneurs or indirectly through timber purchasing organisations and forest owner associations.
- Forest owners are, to various degrees, dependent on the knowledge, skills and services offered by industrial Forestry Actors, forest owner associations or by the SFA.
- Prices on timber and forest management plans are salient examples of factors found in the literature influencing the management behaviour of NIPF owners.
- We need to increase our understanding about local processes, including the influence from professional advice and offered services, in order to fully grasp what guides present and future forest management.

4 Materials & methods

4.1 Project context and empirical materials

The empirical materials presented in this thesis were collected as part of the EU FP7 research project INTEGRAL – Future-oriented integrated management of European forested landscapes (2011-2015). The overarching aim of the project was to contribute with empirical knowledge and analyses about sensitive issues of ecology, socio-economics and policy in Europe's forested landscapes in order to improve existing forest policy and management approaches by delivering better balance between the multiple, conflicting demands for forest goods and services[5]. The project employed a case study approach, including diverse forested landscapes in 11 European countries, with two located in Sweden: Helgeå in southern Sweden and Vilhelmina in the north (Figure 2). The case study investigations were conducted in three phases where the first phase aimed to map and analyse the key social, ecological and technical factors at case study and national levels. The data collection included in-depth, qualitative interviews with forest owners and other stakeholders concerning forest management, policies and governance. Desktop research was conducted in order to map and analyse factors at the national level. The two subsequent phases built on the findings in phase one and applied future-oriented participatory methods where local stakeholders where invited first to construct explorative scenarios and then, on the second occasion, formulate their own visions for the future of the local landscape. A variety of different stakeholders were invited to the two future-oriented workshops, with some individuals attending both.

The empirical material presented in this thesis originates from the interviews and desktop research in the first phase of the project and from the visioning workshops in the final phase of the project. No empirical material from the second explorative scenario construction phase is included directly, but provided

[5] INTEGRAL web-page: http://www.integral-project.eu/

parts of the foundation for the final visioning phase. Papers I and II build on the interview material from the Helgeå case study area, focused on the Hallaryd landscape laboratory, while Paper III builds on a complementary literature review and the interviews from Helgeå and Vilhelmina case study areas (see next section about case study areas). Paper IV encompasses the final phase of visioning workshops conducted in both Helgeå and Vilhelmina case study areas and at the national level.

Figure 2. Location of INTEGRAL case study areas; Vilhelmina (in the north) and Helgeå (in the south). GSD-General Map. © Lantmäteriet (2015). SVAR2012 © SMHI (2013)

Adaptation to the local context and own research ideas led to deviations from the common INTEGRAL research methodology and frame in two essential ways. First, the set-up of a landscape laboratory was not included in the project outline but established on the initiative of colleagues within the INTEGRAL project Vilis Brukas and Ola Sallnäs at the Southern Swedish Research Centre, Swedish University of Agricultural Sciences. Their idea was to facilitate an in-depth investigation into the social processes and local context that impact forest management. This zooming in on personal and family relationships and connections has greatly contributed to the direction of Papers I and II in this thesis. Second, from the interviews and participatory workshops in phases one and two, I together with INTEGRAL colleagues learned from our local stakeholders both in Helgeå and in Vilhelmina that an overly technocratic approach in workshops was not appreciated and that connection to higher levels of policy-making was perceived as lacking. Based on these experiences we

decided not to fully implement the visioning method commonly applied in the INTEGRAL project in phase three. Instead we searched for a visioning method that would entail more genuine participation, creating enthusiasm and contributing to positive change in itself. We found the answer to our search in the form of Critical Utopian Action Research (CUAR) introduced to us by Hans Peter Hansen, Department of Environmental Communication at Swedish University of Agricultural Sciences (external to INTEGRAL). Our adaptation of CUAR led to Paper IV in this thesis.

In summary, the INTEGRAL project provided the frame, the infrastructure and the financial opportunity to conduct this doctoral project, but the analysis of empirical material and modifications of workshop methodology are my own research initiatives in cooperation with colleagues included in Papers I-IV.

Table 2. Comparison of the case study areas, Kronoberg County, Hallaryd landscape laboratory and the whole of Sweden regarding characteristics of forests and the ownership structure.

	Sweden [a]	Vilhelmina case study area [b]	Kronoberg county [c]	Helgeå case study area [d]	Hallaryd landscape laboratory [d]
Total area	40.8 million ha	879 750 ha	849 000 ha	163 566 ha	11 495 ha
Forestland, ha (%)	28.2 million ha (69%)	510 378 ha (58%)	-	101 830 ha (62%)	7 361 ha (64%)
Productive forestland [e], ha (%)	23.4 million ha (63%)	318 000 ha (36%)	644 000 ha (76%)	-	-
Average standing stock per ha forestland	138 m^3sk/ha	82 m^3sk/ha [d]	155 m^3sk/ha [d]	138 m^3sk/ha	193 m^3sk/ha
Tree species composition [f]	Spruce 42%, Pine 39%, Birch 12%	Spruce 57%, Pine 23%, Birch 19% [d]	Spruce 53%, Pine 29%, Birch 11%, Others 7%	Spruce 53%, Pine 26%, Birch 12%, Other broadleaves 9%	Spruce 62%, Pine 22%; Birch 8%, Other broadleaves 7 %
Annual increment	120 million m^3sk/year	-	-	-	-
Average site quality	5,5 m^3sk/ha/yr	2,9 m^3sk/ha/yr [g]	9,1 m^3sk/ha/yr	-	-
Removals	92,5 m^3sk	-	-	-	-
Formally protected forestland, ha	2.1 million ha [g]	110 093 ha [d]	9 000 ha (productive forestland)	1 022 ha	0 ha
Inhabitants	9 954 420	6 829	183 386	-	-

Forest ownership (% of productive forestland)	Individual owners 50%, Private owned companies 25%, State owned companies 14 %, Other private owners 6 %, State 3 %, Other public owners 2 %	Other private 55%, Public 21%, Private companies 23%	Other private 81%, Public 17%, Private companies 2%	-	-
Gender	Women 38%, Men 61%	Women 35%, Men 65%	Women 37%, Men 63%	-	-
Residency	68% locally owned, 25% non-residents, 7% partly by non-residents	Locally owned 50%, Non-residents 37%, Partly by non-residents [h] 13%	Locally owned 65%, Non-residents 28%, partly by non-residents 7%	-	-
Number of NIPF owners	329 541	1 234	13 645	-	-
Forest holdings owned by individual private owners	229 802	-	11 189	-	-
Average size of forest holdings	52 ha	-	58 ha	-	-

Note: m3sk stands for cubic meter of wood with the bark

[a] (SFA, 2014, 2016c; SCB, 2016; SLU, 2016)
[b] (SCB, 2016; SFA, 2016d)
[c] (SFA, 2016a)
[d] Derived from kNN-data from 2010 (Granqvist-Pahlén et al., 2004) and the GSD-General Map (Lantmäteriet, 2016).
[e] Forestland that can produce timber on average at least 1 m3sk/ha/year
[f] The percentage of volume standing stock per hectare of each tree species.
[g] Including forestland within national parks, nature reserves and nature protection areas classified according to the Forestry Act.
[h] South Lappland district, including Vilhelmina, Dorotea, Lycksele, Malå, Sorsele, Storuman, and Åsele municipalities.

4.2 Case study approach and areas

General case study approach

Two case study areas in Sweden were established within the INTEGRAL project to cover the variety of issues and forestry practices present within the country, thus constituting representative case studies (Yin, 2003). Southern and Northern Sweden present significant differences in forestry and land-use history, and forest conditions. Northern Sweden is located in the boreal forest zone, while the southern third of Sweden represents the transition from boreal to nemoral (temperate) forests (Nilsson, 1997). Over the last century northern Sweden was characterised by intensive industrial forestry while southern Sweden kept a high degree of linkages to the agrarian system (Eliasson 2002, pp. 360-362). The loss of biodiversity, expressed in the number of extinct or threatened species, is higher in Southern than in Northern Sweden (Nilsson *et al.*, 2006). Most likely the biodiversity loss experienced today is an extinction debt from the last 150 years of changed land-use practices and urgent restoration measures are needed to create suitable substrates and increase connectivity between present biodiversity hot-spot areas (Nilsson *et al.*, 2006). Areas for biodiversity conservation, deciduous forests and single big trees, especially oak (*Quercus robur & Quercus petraea*), have to increase and existing forests should be managed so as to simulate natural disturbances existing in virgin forests (creating light gaps), if further biodiversity loss is going to be prevented (Nilsson, 1997; Lindbladh and Foster, 2010). In northern Sweden land-uses include traditional reindeer herding practices by the indigenous Sámi people, where the existence of lichens during winter is essential for reindeer survival, and which can be negatively influenced by forestry activities (P. Sandström *et al.*, 2016).

Helgeå case study area

The case study area comprises the intersection of the Helgeå River catchment area within Kronoberg County (Figure 3) and covers a total of 164,000 ha (Table 2). The area was selected primarily due to its representativeness for what can be considered normal forest and forstry conditions in Southern Sweden, referring to tree-species composition, ownership structure, and industrial infrastructure. Thus it does not highlight any specific conflicts or unique situations. Forestland dominates the landscape (62%) and the tree composition is mainly Norway spruce (*Picea abies*) (53%), but elements of broadleaves are also common,

especially the noble broadleaves,[6] which are highly important for biodiversity. Kronoberg County was hit by the severe storms Gudrun in 2005 and Per in 2007 affecting in total 75,000 ha forestland and giving rise to large bark-beetle attacks in the succeeding years (SFA, 2016b). Small-scale forest management prevails in the area as 81% of the productive forestland in the county is owned by NIPF owners. The SFA has one district office in the case study area in the town of Älmhult. Challenges for sustainable forest management in the area mainly concern the high proportion of Norway spruce that causes problems from a biodiversity point of view but also for forestry production due to the species high susceptibility for wind-throws and subsequent bark-beetle attacks. Climate change is predicted to regionally increase extreme weather events such as storms and droughts resulting in decreased resilience of forest ecosystems in general and the ecological suitability for Norway spruce especially (Felton, Ellingson, *et al.*, 2010). Strategies for climate change mitigation and adaptation further complicates the management situation as some strategies are conflicting with biodiversity goals such as dead wood retention (Felton *et al.*, 2016). There is a need to prioritise compatible solutions and compensate with conservation measures when necessary, working on a landscape level to combine efforts to manage trade-offs between forestry production and biodiversity conservation (Felton *et al.*, 2016). However, the combination of forestry production and biodiversity conservation will most likely continue to be a major challenge for management in Southern Sweden (Löf *et al.*, 2010). In contrast, forestry production and recreation have fairly good potential to be combined in a satisfactory way, even if considerable uncertainties exists along spatial and temporal scales (Löf *et al.*, 2010). Socio-economic challenges in the area include a strong urbanisation (SCB, 2015).

Hallaryd landscape laboratory

Inside the Helgeå case study area, a social landscape laboratory was established for an in-depth analysis of the social context and of actors' relations, constituting the Hallaryd parish (Figure 3). The landscape laboratory covers approximately 11,495 ha of rural character, located along the Helgeå River. The area was selected due to the existence of broadleaf elements other than birch (7% of standing stock per hectare) and the presence of Helgeå River, elements that are highly interesting from an environmental perspective. The same features also represent the main challenges for sustainable forest management in the area, when forestry production and biodiversity management are to be combined according to the legislation on all forest land. The high proportion of Norway

[6] Noble broadleaves in Sweden are according to the 22 § in the Forestry Act (SFS 1979:429) the following tree species: oak, ash, hornbeam, maple, elm, lime, beech and cherry.

spruce in the area is also a challenge present in Hallaryd, as described for Helgeå case study area above, with its susceptibility to wind-throw and the likelihood of becoming an unsuitable tree species under climate change. Similarly is urbanisation also an issue in Hallaryd where few can make a living close-by but have to move to urban areas.

Vilhelmina case study area

The case study area of Vilhelmina coincides with the Vilhelmina municipality and has close to 7000 inhabitants (SCB, 2016) (Figure 4). The area represents transitional forest conditions and typical socio-economic settings in Northern Sweden, covering boreal forest and the Fennoscandia Mountains. The case study area has a total area of almost 880,000 ha, of which more than 510,000 ha is forestland and 318,000 ha is productive forestland (Table 2). Formally protected forest land accounts to 110 000 ha, or 22%. Forest ownership in the area is dominated by a mix of state (35%) and private industry (15%) owning half of the productive forested land, while the majority of the remaining land belongs to NIPF owners (37%) (SFA, 2016e). The indigenous Sámi population holds the right to conduct their traditional reindeer herding in the area (P. Sandström *et al.*, 2016). Conflicts over competing land-uses is one of the main challenges to sustainable forest management in the case study area, especially the conflict between reindeer herding and forestry production (Sandström *et al.*, 2011; Svensson *et al.*, 2012). In Vilhelmina, as in the vast majority of rural areas in Sweden there has been a great decrease in population numbers due to continuous urbanisation over the last decades (SCB, 2015).

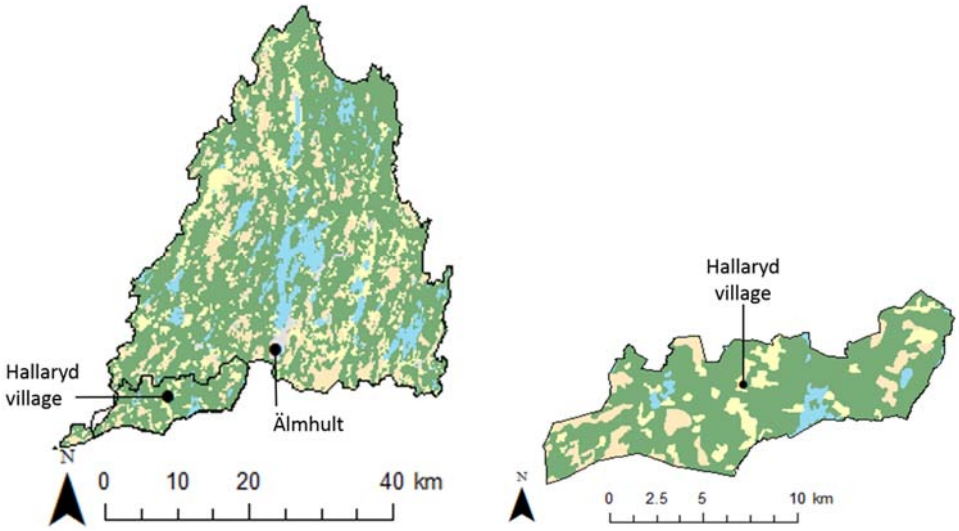

Figure 3. Land-use map of Helgeå case study area and Hallaryd landscape laboratory. SLU Forest Map. © SLU (2015). GSD-General Map. © Lantmäteriet (2015). SVAR2012 © SMHI (2013)

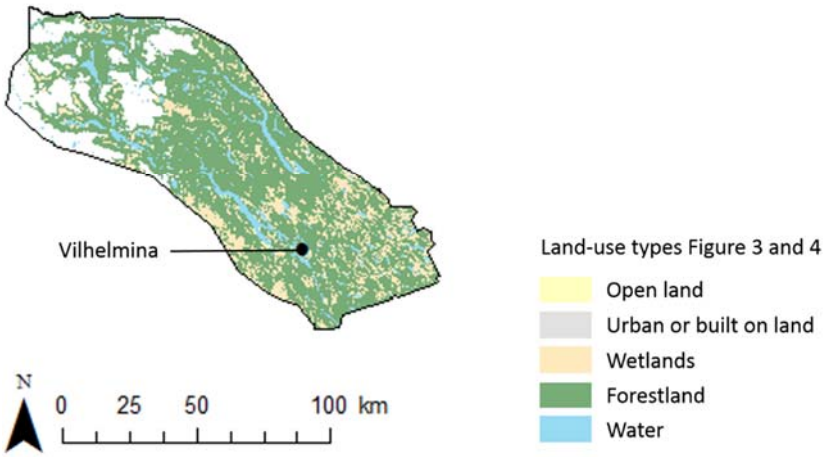

Figure 4. Land-use map of Vilhelmina case study area. SLU Forest Map. © SLU (2015). GSD-General Map. © Lantmäteriet (2015).

4.3 Synthesising analysis of Papers I-IV

In order to synthesise the findings in Papers I-IV I have conducted a phronetic analysis of social practices that could be identified among stakeholders in Helgeå case study area and more specifically in Hallaryd landscape laboratory. The empirical material underlying the analysis then builds on the qualitative interviews and visioning workshop conducted in the area (Papers I-II, IV), but also on the literature review done in Paper III. The interviews and workshop included a wide range of represented interests and stakeholders as visible in Table 3 and 4 respectively.

Table 3. Interviewed NIPF owner, forest managers and other stakeholders according to interest group in Helgeå case study area and Hallaryd landscape laboratory.

Stakeholder interest group	Represented organisations	No of interviews
Forest Owners	-	12
Forest Managers	Swedish Church, SUSAB, municipality	3
Governmental Bodies	SFA, County board, Parliament	8
Land Owners' associations	Södra, Federation of Swedish Farmers	5
Forest Industrial Companies	Sydved, VIDA	2
NGOs	Swedish Outdoor Association, Local Heritage Association, Swedish Association for Hunting and Wildlife Management, Swedish Society for Nature Conservation	5

Table 4. Interests and stakeholder types represented in the workshop held in Helgeå case study area. As several participants represented more than one interest, the sum of participants from different groups exceeds the total number of participants.

Stakeholder types	Helgeå
Governmental organisations	1
Forest authority	2
Forestry organisations and individual private owners	9
Forest industry (companies)	2
Forest entrepreneurs - timber and NTFP based	-
Non-governmental organisations	2
Specific user groups	
- *Outdoor recreation, hunting & fishing, mushroom & berry picking*	13
- *Education & research*	3
Actual number of participants	13

The social practices were identified through interpreting patterns in sayings and doings referred to by the respondents as part of, or related to, their forest management activities. The narrative in Paper I discloses these patterns of behaviour in a detailed way and the empirical foundation for the analysis is therefore not repeated once more in this summary chapter of the thesis.

The phronetic analysis, aiming to problematise tension-points was conducted through analysing the social pratices identified and how certain practices were referred to as questionable, conflicting or problematic by the local stakeholders, leading to an interpretation as dubious practices and tension-points in need of problematisation. In addition, tension-points between forest management and governance were identified according to judgement about how the social practices relate to the forest policy goal of sustainable forest management.

The results of the synthesising analysis: identified social practices, their impact on forest management and the problematisation of tension-points, are presented in section 6.1.

5 Summary of Papers I-IV

Overview

The four papers included in this thesis are summarised below, including the problem addressed, main findings and conclusions drawn from the studies in connection to the overall aim of this thesis. Table 5 summarises the methodological, analytical and theoretical scopes of the papers. Papers I and II make use of the same interview material from Helgeå case study area and Hallaryd landscape laboratory. Paper I however explores a wider perspective of local forest management in a narrative format, while Paper II is focusing the analysis on one specific aspect found in the material, the relationship between forest owners towards FOA Södra and the SFA. Paper III partly build on the same interview material for analysing the standardisation of multiple-use on local level, but also include interview material from the case study area in Vilhelmina and an extensive literature review to cover the Swedish case. Paper IV covers the development of participatory action research methodology and evaluates the method based on the Theory of Communicative Action by Habermas (1984).

Table 5. Thematic and methodological overview of papers I-IV.

Paper	Spatial scale	Analytical level	Research domain	Core theoretical element	Methodological approach	Method of investigation
I	Local	Landscape laboratory (Hallaryd)	Forest management		Narrative	Qualitative interviews
II	Local	Landscape laboratory (Hallaryd)	Forest management	Social capital theory	Grounded theory	Qualitative interviews

III	Local - National - European	Comparative country case studies; Netherlands, Lithuania & Sweden	Multi-level governance and forest policy	Boundary object theory	Comparative analysis	Literature review and qualitative interviews
IV	Local-National	Case study areas (Helgeå & Vilhelmina) and national level	Multi-level governance and forest policy	Theory of Communicative Action	Critical Utopian Action Research	Participatory workshops

Paper I: Rural realities between policy goals, market forces and natural disasters – a narrative of local forest management in southern Sweden

Problem addressed: The forest governance system in Sweden renders high degrees of individual freedom to private forest owners in their forest management at the same time as society's dependence on the forest resource for renewable materials and energy increases and environmental objectives are not reached. This paper provides a narrative about local forest management in connection to societal and sectorial changes, aiming to understand the role of local context in forest management.

Main findings: The resulting narrative brings forth the high level of interconnectedness and interdependences between different agents active in local forest management and emotional ties to the forest among owners and stakeholders. Larger-scale social changes primarily shape local forest management by limiting management alternatives available in their decision-making, while personal relationships with professional advisors and rural lifestyles more directly influence management decisions. Forest owners situated in the local tradition perceive other forest owners with a more production-oriented way of thinking in their forest management as threats to the local community and social values of the forest. Natural disasters in the form of two severe storms have had the most a profound and direct impact on the local forest management, including biophysical and social aspects.

Conclusions: Trusting personal relationships and local tradition are of great importance for how forests are managed and thus relevant to analyse in searching for solutions to trade-offs in forest management. General social change has a large impact on local forest management over time and where the narrative communicates individual meanings and consequences of urbanisation for the

local community. Collaborative approaches to forest governance should take note of the high importance of personal trust towards specific forest advisors and the strong emotional connectedness to their own forest. Both hold great ability to facilitate changes in forest management.

Paper II: Social capital in small-scale forestry: A local case study in Southern Sweden

Problem addressed: Forest management builds on interactions among local stakeholders and includes multiple social situations such as consultations or cooperative engagements between owners and forest professionals. Successful social endeavours rest on positive social capital as operationalised via trust. This study examines the qualities of social capital present in relationships between forest owners and organisations offering consultation and other forestry services.

Main findings: The analysis reveals large differences in owners' trust towards two major actors: the SFA and the FOA Södra. Permanence of personnel, a client-based approach, and personal features of the SFA's local forest officer lead to strong local anchoring and high trust towards SFA. Södra proved to be a trustful partner in the aftermath of calamities; however its industrial priorities seem to erode owners' trust. The key to the success of the SFA is a combination of trusting personalised relationships and strong local anchoring, also expressed as bonding social capital and particularised trust. In other situations the role of bridging social capital and the importance of generalised trust by forest owners towards public authorities or cooperative structures cannot be excluded.

Conclusions: It is crucial to recognise the importance of personal relationships and the catalysing role of bonding social capital in order to understand the local forest management situation. Forestry organisations and policy-makers should pay attention to the local context and explore the possibilities of social capital building. Achieving a good balance between bonding and bridging social capital is necessary from a policy perspective.

Paper III: Multiple-use forestry as a boundary object: from a shared ideal to multiple-realities

Problem addressed: Today, multiple-use forestry is one of the main concepts guiding European forestry, enjoying wide acceptance. However, no uniform definition of the term seems to exist, and actual forestry practices differ significantly among European countries and regions. Such outcomes indicate that multiple-use forestry may contain the essential properties of a boundary

object, i.e. something that is robust enough to conceptually unite different interests, but at the same time is flexible enough to encompass different practices in line with local needs and conditions. Exploring the conceptualization and implementation of multiple-use forestry as a boundary object, this study examines the overall trends at an international level, and scrutinizes the national specifics in three case countries: Lithuania, the Netherlands and Sweden.

Main findings: A widely-accepted interpretation of multiple-use forestry, beyond combining two or more forest functions or uses, was not found in the review of international literature. The case countries show widely different approaches to conceptualizing and implementing multiple-use forestry, not least in terms of spatial scales for integrating or segregating various functions. The standardisation of multiple-use forestry in Swedish forest management is accomplished primarily through well-established certification schemes. Integration, as dictated by forest policy, is taking place at stand level, but small-scale segregation for each forest holding is a well-established practice, while landscape level planning of forest functions is non-existent. Curiously, the Swedish Forestry Model is frequently referred to in debates and literature, while the term multiple-use forestry is seldom mentioned (Hytönen, 1995).

Conclusions: The analysis indicates that the multiple-use forestry concept serves in practice as a functioning boundary object by mediating between interests while still being inclusive of varying forestry practices. There should be no expectations of the concept developing into more uniform guidelines. It is noticeable in the history of the multiple-use concept in Sweden, how different forest uses are implicitly integrated in overarching terminology. First, the cultural aspects became implicitly covered by the environmental goal and second, the multiple-use concept is now integral to the Swedish Forestry Model. The Swedish standardisation of the multiple-use forestry concept as based on voluntary standards is similar to the Netherlands, both countries upholding a liberal view on property rights, while Lithuania has a thorough and compulsory standardisation of forest functions.

Paper IV: Envisioning of future forested landscapes in Sweden – revealing local-national discrepancies through participatory action research

Problem addressed: Governance of forested landscapes must account for multiple interests and perspectives through public and stakeholder participation. In the context of Swedish forestry, participation has mainly been implemented as a top-down venture, without adequate integration of all interests. A

participatory action research model was developed and tested with the objectives: (i) facilitate a discussion among local stakeholders about their common future in relation to their forested landscapes; and (ii) to connect the local level with the national, institutional level.

Main findings: The visioning on the local level was highly appreciated by the participants whom expressed great satisfaction with discussions of common issues in a new setting. However, the objective to connect local visions for the future of the forested landscape to the national level largely failed as the action research method did not generate acceptance of the local visions at the national level. National policy-makers participating in the workshop on local visions expressed partially positive sentiments about the method for discussion and said it promoted new perspectives, but others found it less useful and even illegitimate. Statements neglecting local rights and knowledge were expressed in the evaluation. In the discussion of policy implementation measures, collaboration and dialogue were emphasised on local and national levels.

Conclusions: The results demonstrate the positive opportunity to engage local stakeholders in a constructive discussion about their common future. The great willingness and interest among local and national participants to have a dialogue and collaborate between policy and decision-making levels is a generally positive result of the study. However, often-encountered practical constraints of participatory methods were also experienced. In particular the risk of institutional authorities disregarding local knowledge and claims is an obstacle often observed and also in this study. This finding contradicts the great willingness to collaborate that was expressed and more research into different sentiments about collaboration among stakeholders is needed.

In short: Salient findings of Papers I-IV

- Emotional bonds to the forest, social relationships, contact with neighbours and local community, by owners trusted advisors, local tradition and professional organisations' outreach strategies and working culture are of high importance for forest management. Social change such as urbanisation and rural development have had general impacts on forest management. The most profound impact on forest management was caused by natural disasters in the form of two major storm events.
- Local tradition and more production-oriented forest management are at odds in Hallaryd.
- Historical defiance of forest owners to obey a forest policy decree of harvesting sparsely stocked forests in the 1980's that later turned out to

be highly valuable forests for nature conservation, still provides forest owners with an argument for why they should be listened to and why policy and governmental officers are not always right.

- Social capital in the form of particularised trust between forest owners and specific forestry advisors is central to forest management practices and how policies are interpreted at a local level.
- There should be better balance between bonding and bridging social capital for a more sustainable system of relationships between owners, forestry actors and authorities.
- Multiple-use forestry is a functioning boundary object that continues to result in divergent forest management practices at national and local levels. In Sweden, the accommodation and standardisation of multi-functionality goes through national legislation but is made tangible and standardised primarily by certification standards. Small-scale segregative strategies and designation of forest functions for each stand are performed by the forest owners on their estates.
- The concept of multiple-use forestry is not explicitly discussed to a high degree in Sweden but is considered integral to the Swedish Forestry Model.
- Forest owners and other local and regional stakeholders in the forest sector are in agreement with national stakeholders about the need for more collaboration and dialogue between actors and levels in order to achieve visions for forested landscapes.
- Discrepancies exist between the local and national levels in that local knowledge and claims are not fully recognised by all policy-making actors at the national level. This has consequences for the execution of participatory processes for deliberation.

6 Discussion

6.1 Phronetic analysis of social practices

Social practices in forest management and how they materialise and influence forest governance

In previous sections it has been argued that there exist incomplete understandings of actual forest management within forest governance and a reduction of forest management to attitudes and beliefs of individual forest owners is often made. This thesis contributes to closing this knowledge gap by conducting a contextualised study, investigating social practices in forest management at the local level and how they materialise and influence forest governance and ultimately, forest management more broadly. Analysing forest management as social practices performed by forest owners and other stakeholders and involving the forest itself connects every-day life experiences to general developments in society and to forest governance. In contrast, analysing agency (intentions, motivations and behaviour of individuals) and structure (social and political institutions, power hierarchies and conventions) separately, disregards their mutual influences and the analysis becomes incomplete as will be argued for below.

Agency-centred models for explaining forest management (e.g. the belief and desire model in Ingemarson *et al.* (2006); or the value-belief-norm theory of environmentalism in Nordlund & Westin (2010)) regard forest owners' individual attitudes, subjective norms and perceived control as resulting in behavioural intention, decision and action (steps 1-4 in Figure 5). The social practice perspective highlights the situated disposition of agency and is more coherent with the findings in Papers I and II. In this perspective one does not assume causality between individual agency and forest management outcomes because that leads to an inadequate understanding of behaviours and results in missed opportunities to find solutions to problems (Brand, 2010). Forest management behaviour is, instead, embedded in social practices - daily

routinized behaviours that develop in concert with structures. The social practice perspective is interested in human actions (Schatzki, 2001) on an aggregated level (Schatzki, 2012). The individual decision (step 2 Figure 5) is thus only seen in relation to social context and structures.

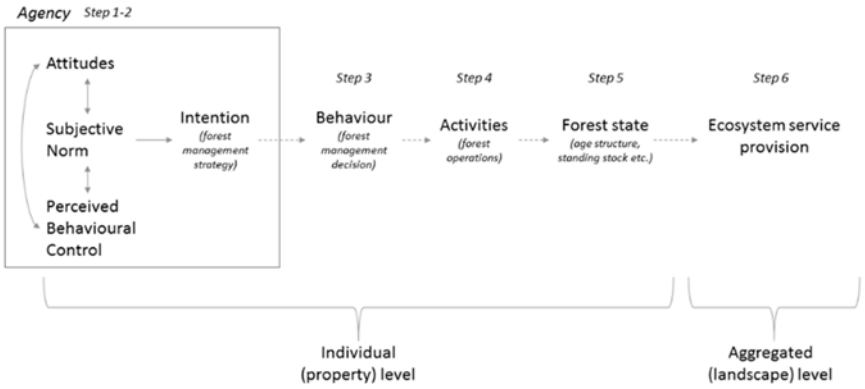

Figure 5. Model of planned behaviour of forest owners' agency. Dotted lines are here introduced as to show where there is empirical uncertainty regarding causality. Source: Own elaboration based on the value-belief-norm theory of environmentalism in Nordlund & Westin (2010).

From the empirical material in Papers I-IV underlying this synthesising analysis it is evident that the forest owners' agency is primarily situated in a context constituted by personal, trusting relationships towards family, neighbours and forest advisors, whose agency in turn are situated in additional organisational and professional contexts. Jointly they perform certain social practices that are decisive for actual decision-making concerning measures and actions in the forest. Social practices relevant for determining actual forest management are mainly: personal relationships and trust towards professional forest advisors and purchasers; upholding and respecting local social values through discussing forest management with neighbours; intergenerational socialisation in relation to one's own forest creating emotional bonds with the forest and across generations; and a rural life-style including hard work and diverse businesses.

Changing demographics, policy goals and market demands influence the social practices performed by forest owners and other stakeholders and in turn influence forest management. How these factors influence social practices comes into the spotlight when investigating how they determine actual forest management and materialise and influence forest governance. The example of multiple-use forestry studied in Paper III shows how an abstract concept on the

international level trickled down to the local level in Sweden, becoming standardised mainly through forest certification. Owners regard certification as a proof of good forest management and a way to receive a price premium, but did not state that it had changed their forest management practices to any large degree. However, one governmental officer stated that certification facilitated discussion about nature conservation. Certification clearly had the capacity to add to existing practices and establish its own practices within these that can later be used as stepping stone for other new practices. The importance of such incremental gains (Ansell and Gash, 2008) should not be underestimated when it comes to changing behaviours, which is a slow and time consuming process at the best of times (Arts *et al.*, 2013).

Another analytical advantage of the social practice perspective is the inclusion of *things* as integral to social practices (Reckwitz, 2002). In forest management, it is not only the interpretation of the forest that has a meaning, but the actual state of the forest. Events such as storms can drastically change possible alternatives for action. As exemplified in Papers I and II, the two major storm events in 2005 and 2007 felled a vast majority of old spruce forest, effectively limiting possible management options due to changes of the biophysical preconditions. The storm fellings also negatively affected the owners' and their families' emotional relationship to the forest and seem to have decreased the possibilities to hand forest ownership to the next generation. Thus affecting social practices having an impact on forest management.

The contextualised decision-making space of forest owners in the Hallaryd landscape laboratory is illustrated in Figure 6. Each position inside the frames represents an available forest management measure such as harvesting at a certain age and the execution of pre-commercial thinning and planting. The different frames represent limits of the decision-space and goes from broader and more general influences to more specific in the centre. First, on a very basic level the decision-making space and available forest management measures are limited by biophysical features of the forest. Second, social factors sets a general frame for available options. In this case, referring to urbanisation and the owner's relationship to the forest. Then the forest policy specifies certain activities that are not allowed and obligatory measures to be performed such as regeneration after harvesting. Next, market forces and timber prices guide the forest owner to take certain forest management decisions including how and when to make a good deal. In addition, certification schemes demand certain management actions be taken. The high price on forest land further means that the purchase of new land requires large amounts of capital and thus limits the possibility to expand one's forest holding. These four frames define the contextualised decision-making space of forest owners in Hallaryd and illustrate

how available forest management alternatives are being restricted by several structural factors, but also the emotional bond to the forest. Within these general frames we do not find owners making use of all available management options. Instead, social practices play a decisive role in forming forest management decisions (indicated by arrows in Figure 6).

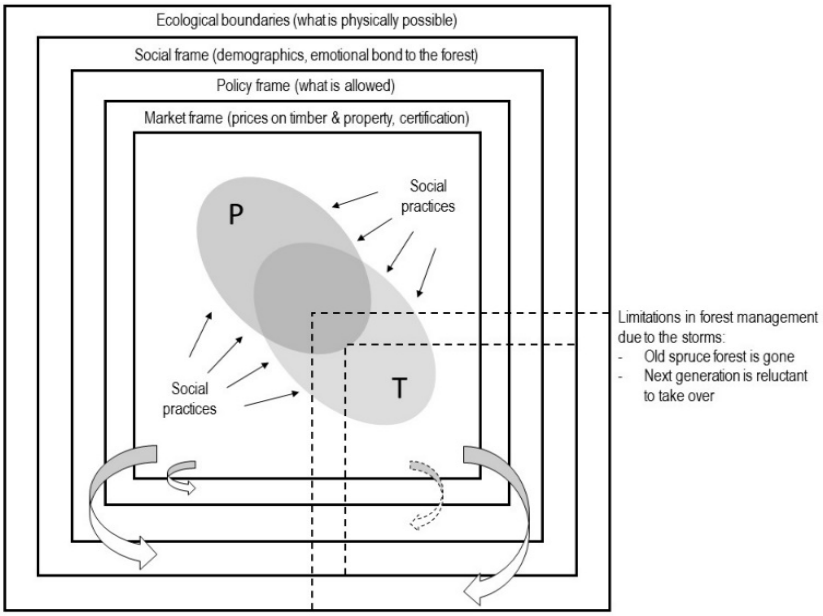

Figure 6. Model of the contextualised decision-making space of forest owners in Hallaryd landscape laboratory. Source: Own elaboration.

Social practices upheld by forest owners and other stakeholders have a converging effect on the forest management decisions taken, indicated by arrows towards the centre. The shaded areas marked with a P (for productivity-oriented) and T (for tradition-oriented) represent examples of forest management programs. The areas over-lap as many management activities are shared by both forest management programs, including the clear-cutting system. The dotted lines represent the limitations of forest management alternatives due to the storms in 2005 and 2007. Through fellings of the old spruce forest the storms had a large impact on the traditional forest management program which typically include a high proportion of Norway spruce at a higher age. In addition, negative effects on the emotional relationships to the forest was observed among the forest owners affected by the storms, including the next generation among

family forest owners. This group also tend to follow the traditional forest management program to a high degree.

By applying the sensitising concepts of "*situated agency*" and "*logic of practices*" (Arts *et al.*, 2013) one can discuss differences in observed social practices and how they form local forest management. When it comes to observed social practices, it is clear that some owners' agencies are situated in a local tradition where the respect for neighbours' recreation and opinions is central to forest management decisions and where knowledge is mainly experiential. While other owners have different situated agency where they identify themselves more as entrepreneurs and professionals than as part of the local community. The latter have a more professional logic of practice that is based on their own or others' professional knowledge about how to optimise forest production, but still, they manage their forest to a high degree for aesthetical and social values. However, their justification for this behaviour is different in comparison to traditionally situated owners. One example of this is the owner coded FO 103 (Paper I) who proudly stated that, despite being accused by the locals of being too production-oriented, they still took more active measurements to promote biodiversity than anyone else in the village since they knew how to from their forestry education. According to FO 103 and several of the professional forest advisors interviewed that all had a more professional logic of practice, the locals just let the trees die.

Applying a social practice perspective to forest owners' behaviour accommodates a change of management without necessitating a change of deep core beliefs and attitudes of individuals, thus opening up new policy solutions (Spaargaren, 2011). This application further allows for individual owners to apply different forest management programs on different parts of the forest property, which has also been observed in the empirical material (Paper I). Depending on which social practices the owners perform, different forest management decisions will be taken. The central point here is that while agency influences the decision, it is the social practices performed by the owner that are more decisive for the final outcome and management behaviour, described by the concept of 'situated agency'. In short, the choice between different forest management alternatives has less to do with individual values and beliefs and more to do with social practices.

Links to the structural elements and general frames from the forest management level are symbolised at the bottom Figure 6 as feedback loops. Few links could be found in the empirical material that connected the local forest management level with the policy making level in a bottom-up fashion (dotted feed-back loop). Paper IV describe an attempt to establish such a link, but the method developed proved faulty. The feed-back loop from forest management

to the ecological boundary frame, however, does not need empirical evidence here as the ultimate purpose of forest management is to alter the state of the forest. The feedback loop from forest management to the market can similarly be assumed due to the nature of supply and demand. Indeed, the forest owners in the visioning workshop in Helgeå case study area expressed a strong desire to conduct profitable forest management, but without increased prices on forest land and associated forest investors buying the land as assets for speculation purposes. Furthermore, as many of the respondents' forest management decisions and activities were aimed at improving forest aesthetics and providing conditions for good quality of life and recreation, the feedback loop from forest management to the social frame, including emotional bonds is proven to exist. Finally, there is the possibility that forest advisors learn from the forest owners and their management, providing feed-back loops to both the market and policy frame. Empirical evidence for the existence of such a link is however weaker. Owners that are capable speakers and doers, who participate in information meetings and are active members in the FOA Södra can hypothetically constitute an especially strong link from the forest management level to the structural level. This is similar to the feed-back loop described by Secco *et al.* (2013) as existing within multi-level organisations.

In conclusion, applying a social practice perspective allows an integrated analysis of forest management and governance and as experienced in everyday life by stakeholders. In doing so, an over reliance on either agency or structure as explanatory factors and basis of change can be avoided. The interactions between the two become more evident and provide a focal point for inducing change to the system.

Tension-points in forest management and governance

In line with the applied phronetic approach, the aim in this thesis is to identify and problematise tension-points found in local forest management and in its relationship with forest governance. The identified tension-points following below provide information about distortions and possibilities for improved practices.

Firstly, on a fundamental level, the policy goal of balancing economic, social and ecological values in forestry is not helped by demonising or glorifying forest owners. They are a very heterogonous group (Hugosson and Ingemarson, 2004) and the local context can exert different influences on forest management as found in this thesis. Notably, the local social practices described here had a tendency to streamline rather than to diversify forest management (Paper I). Forest owners being a heterogeneous group does then not necessarily mean that one will see a diversification in forest management that could potentially allow

Sweden to reach its policy goals. Certain identified social practices can be perceived as positive when considering the preservation of local social values of the forest, but the same could also prove negative for other forest functions.

Secondly, the two groups of social practices identified in local forest management, differentiated as either traditional or professional by similarities in situated agencies and logics of practice, spotlight a great divide concerning the protection of local social values (Paper I). The here so called professional logic of practice in forest management is seen as a threat to the local community and social values of the forest by those adhering to more traditional logics of practice. This situation is problematic from an ethical perspective when the observed trend towards bigger units and more economically-oriented forestry definitely favours the more professional logic of practice. There seem to be little one can do for protecting the local social values that are otherwise regarded as highly valuable from a policy perspective (Bjärstig and Kvastegård, 2016). Bjärstig and Kvastegård suggest that SFA take on a more leading role in the sense of knowledge support and information. In the case of Hallaryd the issue seem to be more about mistrust between owners and neighbours, in the sense that in the interviews great emphasis was given to the lack of communication from those with a professional logic of practice and that were regarded as not part of the community. There are no formal obligations for owners to be in contact with each other regarding management measures but it is considered good informal practice. How does one encourage such practices and build trust in the future? One solution could be to delegate this task to professional advisors who are in any case estimated to increase in importance as the knowledge of forest management among owners decreases (Živojinović *et al.*, 2015). But as shown in Paper II this is either not a straightforward solution due to the ambiguous loyalties of many advisors. Only a few are so called trusted advisors who are not seen as representing an organisation but having the best interest of the owner in mind. Time availability of advisors and planners, and their organisational support are here heavily influencing the situation and any possibilities to find policy solutions in this direction (Brukas and Sallnäs, 2012). This situation of trust and mistrust between specific forest professionals and their organisations in relation to the forest owners also involve the contractors, conducting the actual forest operations, and their role should not be underestimated (Erlandsson, 2016). Due to the frustration experienced among Finnish forest planners over the deficient communication with forest owners, Hokajärvi *et al.* (2009) suggests that there should be two separate systems: a forest information system, where information of the forest is provided to the owner, and secondly a consultative decision-support system where the owner is advised based on his/her aims etc.. This implies a complete change in the Finnish planning system and the need for

new skills and working practices among foresters, leading to a need for supplementary training of professionals (Hokajärvi *et al.*, 2009). Studies of the Finnish forest planning system also suggest that a new model of planning should be operationalised where more owner-driven, problem-oriented and short-term planning services are the aim (Hokajärvi, Hujala and Tikkanen, 2011). It would be a good idea for Swedish policy-makers to examine the outcome of a possible restructuring of the Finnish forest planning system in order to gain valuable insights. If a changed system would mean increased values of forests in Sweden it would also motivate increased funding for planning activities and trust-building activities towards owners.

6.2 Future challenges for Swedish forestry

Future challenges for forestry are primarily related to the increase in demand for forest products and services and the high uncertainty around the future functioning of ecosystems due to climate change, including continued biodiversity loss (Westholm, Beland Lindahl and Kraxner, 2015). In order to overcome the same, Swedish forest policy and forestry has to change so as to better accommodate greater ecological, economic and socio-political uncertainty and variability. There is thus a need for solutions that can better handle trade-offs between different forest functions. How to accomplish this in practice is easier said than done. Lindkvist *et al.* (2009) even state that the conflicting goals between climate change adaptation and mitigation and rich biodiversity require political solutions and cannot be solved through technical solutions alone. They conclude that a dialogue between interests could solve some of the conflicts related to intensified forestry.

Deliberation within new arenas for forest policy-making, integrating other interests than the usual suspects, is indeed suggested by scholars as one partial remedy to the problems of Swedish forest governance (c.f. Beland Lindahl 2008; Zachrisson & Beland Lindahl 2013; Ulmanen *et al.,* 2015). Findings by Schlyter and Stjernquist (2010) however, imply that there is already a (re)turn to deliberative governance of the forest in Sweden. There has, over many decades, been institutionalised multi-stakeholder deliberation when preparing forestry legislation in Sweden and the number and scope of participating parties have increased in recent years. The deregulation of the forest sector in 1993 has empowered forest owners and resulted in participation and deliberation becoming more commonplace (Schlyter and Stjernquist, 2010). They conclude that the present deliberative governance strategy by the state is built on political inability or unwillingness to favour one interest or actor over another while awaiting greater clarity about biophysical, economic and political risks involved.

Most recently, with the initiation of the NFP, the government demonstrates the same practice of opening up for deliberation between stakeholders, this time with the explicit aim of reaching a broad consensus (Johansson, 2016) about how "*to make the forest and its value chain contribute even further to the development towards a sustainable society and a growing bio-based economy*" (Gov. bill 2013/14:141). Since Sweden has no national bioeconomy strategy, the NFP process partly forms the definition and the political stand-point continues to be an open discussion for the moment. Participatory visioning by stakeholder groups at the national level by C. Sandström *et al.* (2016) revealed several possible synergies between interests, but also confirmed the long-standing divide between instrumental and intrinsic values in Swedish forestry. The former values are mainly represented by forest industry and owners but also rural development advocates, while the intrinsic values have their strongest support among groups promoting biodiversity conservation (C. Sandström *et al.*, 2016). The divide is expected to persist due to its already long history in Swedish forestry debate, challenging governance solutions aiming for consensus.

Also on regional and local levels, deliberative forms of governance are emphasised. The typical forest planning and management at household level has the disadvantage that important regional and landscape scale structures such as connectivity between set-aside areas for nature conservation and other land-uses risk being overlooked (Angelstam *et al.*, 2011; Muñoz-Rojas *et al.*, 2015). To reach set biodiversity conservation goals, one needs to take active measures; conduct restoration activities and collaborate across property boundaries and sectors (Felton *et al.*, 2016). The Swedish Government's Green Infrastructure Project is meant as a solution to overcome the problem of property-centred management through, for example, participation of and collaboration with landowners (SEPA, 2015).

Participation and collaboration are however not straightforward answers to forest governance issues on sub-national levels either. Power imbalances that can obstruct efforts for deliberation attempts do exist and should be taken into consideration by policy-makers and analysed by forest policy researchers. Zachrisson and Beland Lindahl (2013) point to the presence of strong economic interests, un-successful mobilization of weaker parties, and absence of enabling institutional and discursive factors to explain the lack of collaborative forest planning in Sweden. There is a need to look out for local power relations that can distort efforts for deliberation (Beland Lindahl, 2008).

The positive response from local stakeholders in Helgeå and Vilhelmina towards the joint landscape visioning (Paper IV) does, nevertheless give some hope and could be built upon, so that "*small wins*" could be made locally (Ansell and Gash, 2008). Local collaboration could then create momentum to reach

larger-scale collaboration in later stages. This more bottom-up approach to collaboration finds support in the literature as being better adapted to local conditions and desires (Valente *et al.*, 2015; Macura *et al.*, 2016).

Policies that are respectful of local social conditions and have the capacity to take into account the variety present in the system under regulation are superior and needed in the case of forest governance (Ostrom, 2013). This entails protection of the institutional diversity of evolved governance regimes, not simplification. Learning to deal with the resulting complexity is consequently the task at hand (Arts *et al.*, 2010; Bernstein and Cashore, 2012). Changing to a highly regulated forest sector instead may inspire resentment between authorities and land owners and lead to mistrust and inflexibility, focusing on compliance instead of solutions and requiring vast amounts of information (Ellefson, 2000). Regulations often become inflexible and it can be a struggle to keep them updated with the latest science and best practice. A salient historical example of this situation is given in Paper I where the old 5 § 3 in the Forestry Act was initiated during the peak of forest regulations in Sweden and after a few years had to be withdrawn after massive protests that it destroyed forests valuable for biodiversity. But for a few years, important forest structure were destroyed due to compliance with the law.

Policies should avoid eroding the trusting relationships between authorities and land owners as mistrust disrupts activities and necessary actions (Ellefson, 2000). Efforts to accommodate institutional change and create new arenas for deliberation are helped by strong social capital (Idrissou *et al.*, 2011; Jones *et al.*, 2012; Górriz-Mifsud, Secco and Pisani, 2016), a perception of interdependency (Ansell and Gash, 2008) and mutual positive and strong emotions in relation to the forest (Buijs and Lawrence, 2013). These are all features found in the local context and forest management in Hallaryd. The importance of trusting relationships is further supported by recent research findings where successful public-private-partnerships for the protection of valuable forests in Sweden were found to be reliant on the discretion of actors involved and the institutional ability of authorities to develop well-functioning, trusting relationships (Widman, 2016). The willingness to participate in the programmes was more dependent on how the forest owners were approached than on their individual motives, the voluntary element being essential for deliberation. Social practices that promote trust, social capital and interdependencies at the local level are hence critical for the realisation of collaborative forest governance as a whole.

6.3 Reflections about research approach & methods applied

Phronetic research into forest management and governance

The phronetic approach to social sciences has been the foundation for much of this doctoral project and especially the synthesising analysis of social practices in the discussion section of this summary chapter. More specifically, the phronetic approach has inspired the questions asked, use of methods and application of theoretical perspectives. Here the resulting degree of phronesis applied in the project and different papers is evaluated, based partly on the questions put-forth by Landman (2012) concerning the added value of phronetic research.

The aim of the phronetic approach has had a strong influence on the direction of the project: to do social science that matters, to improve practices and policy by undermining dubious practices through problematisation. All papers in this thesis have a bearing on this aim and, to varying degrees, uncover the difference between what is said and what is done in forest management and governance in Sweden. First by revealing the importance of social practices including personal relationships and trust. Second, in re-evaluating multiple-use as a boundary object highlighting the abstraction of the concept but also the practical implementation as standardised in forest certification. Third, the contradiction of national policy makers expressing great willingness to cooperate between different levels and then in the evaluation disregarding, to a certain extent, local knowledge and rights.

From a democratic planning perspective, phronetic research should address the issues of future direction and desirability of current developments. *Does your analysis of the narratives uncover and/or challenge dominant modes of power?* In Paper IV a participatory action research methodology was developed and applied with the direct purpose of achieving policy change, which proved difficult as institutionalisation of local visions at the national level was not achieved and local claims to rights and knowledge were partly delegitimised by national policy-makers.

The methods applied in this thesis are further coherent with the phronetic approach as theory is not applied *a priori* and investigations were conducted more inductively, remaining open to the empirical data collection. Practices, narratives and action research are all depicted as suitable methods for phronetic social science. Phronesis is about the social as localised phenomena and contextual knowledge with a strong focus on expert knowledge. In this regard, the application of a multi-level case study approach with a special focus on one local case study, this thesis stays true to the phronetic approach.

Phronetic research requires in-depth understanding of the situation and context of the social actions and practices under study. Being a forester by training gave me such benefits, but could have produced bias. It has thus been important to ask the question; *in what ways will your own expert status have bearing on what you do for the definition of the research question through the analysis and interpretation of the results?* The subjective meanings held by me as a researcher and the possible effects on the analysis coming from my training as a forester I found primarily related to a strong wish to quantify the outcome of forest management by the forest owners interviewed. How could I know that the forest owner gave correct descriptions of their management without seeing the forest and having some numbers? A certain bias cannot be avoided in the stories told by the forest owners but it is the owners' perceptions that forms the core of the whole story. Conducting qualitative interviewing, where time was given to ask counter-questions also helped to diminish this problem. Being familiar with forest management plans, qualities of tree-species and consequences of storm fellings for forest management at large were the main advantages given to me by my expert training. Looking back at the project as the whole, my self-assessment is that the benefits of the forester training outweighed the disadvantages. In addition, the ideal of the researcher being only one voice among many and staying close to the empirical material has been adhered to.

To what extent did the thesis address the second core question of phronetic research, namely "*who gains and who loses, and by which means of power*"? The phronetic analysis of findings in section 6.1 provides evidence of power relations and dependencies that were more implicit in the original papers. Otherwise, Paper IV best answers this question by revealing a partial rejection of local rights and knowledge by national policy-makers. Problematizing social practices and describing tension points between forest governance and forest management in section 6.1 provides the main answer in this thesis to the question of who gains and who loses.

Last but not least one major point for discussion regarding the application of the phronetic approach in this thesis arises from the application of CUAR and the use of Habermas' Theory of Communicative Action (Habermas, 1984) in Paper IV. The contradiction between CUAR and Habermas' philosophies on one hand and the philosophical basis of phronetic research on the other comes down to the question of whether or not there exists universal human values. Habermas famously argues for a 'thin' universalism based on procedural requirements for deliberation whereas phronesis is all about context and expert judgement. Flyvbjerg argues that the fundamental problem of Habermas' universalism is that it contains an insufficient conception of power (Flyvbjerg, 1998, 2000). Instead, Flyvbjerg builds the phronetic approach to social sciences largely on

Foucault and Nietzsche whose philosophies engage directly, and for science more productively, with issues of power. In real life value judgements are contextual, building on our generalisations of multiple cases and reflection, not on universals (Blaug, 2000). In this thesis the main contradiction between the philosophies of Habermas and the phronetic approach lies within the perspective on conflict, which, within phronetic research is not necessarily destructive and in need of being contained as in Habermas' perspective according to Flyvbjerg (1998). In the Foucauldian interpretation, suppression of conflict is suppression of freedom. The participatory action research method developed in Paper IV however had an explicit aim to accomplish consensus amongst the local stakeholders' future visions for the forest landscape. This contradiction remains and cannot disappear through argumentation. I would however argue for the rationality behind our choice of method in Paper IV, proving there to be less of a contradiction than at first glance. In developing the participatory action research method we wanted to connect the local level with the national policy-making level through deliberation around future visions for the forest landscape. We based this aim on the discovery of few such links and an interpretation that there is a need for a landscape perspective in forest planning. The creation of a common vision for the landscape through participatory action research workshops was meant to lift the perspective of the participant and look beyond the boundaries of today. This proved very powerful at the local level, where the participants greatly appreciated the exercise and found agreement on many issues. They were also intrigued by the fact that we planned to bring the results of their visioning to national policy-makers whom they felt needed to better understand what the reality at the local level is. There is clearly a point to CUAR in its capacity to empower participants. In this I see a connection to the Foucauldian embrace of partisanship and thus to phronetic research. Action research is a method integral to the phronetic approach and has the advantage of the researcher engaging with the local community through co-creation of knowledge (Simmons, 2012). This was a truly positive experience for us as researchers and for the participants. The later stage of failing to gain legitimacy for the local visions among the national policy-making level exemplify the existence of power structures and the difficulties in achieving ideal deliberation. In conclusion, while the contradiction between Critical Theory and the phronetic approach regarding the departure-point of the research and underlying philosophies about consensus and power still exist, I believe there is merit to the development and execution of the participatory action research method that is coherent with the phronetic approach.

Case study approach and generalisation of research results

The main empirical materials arrive from two case studies selected for their representativeness of existing forest and forestry conditions in Sweden. Paper I-II only include empirical material from the one case study area located in Southern Sweden and are in addition focused on the smaller scale landscape laboratory in Hallaryd. The representativeness of this single case study, the rich contextual descriptions and the disclosure of how the interviews and workshops have been conducted enable an analytical generalisation of the results (Kvale and Brinkmann, 2015). Given the fact that similar structures, including the same main stakeholders (NIPF owners, FOAs and the SFA), good possibilities for selling timber and pulp-/paper wood and the same urbanisation trend, are found elsewhere in Sweden it is reasonable to expect that at least closely comparable situations and dynamics in forest management and governance exist also outside the case study area and landscape laboratory. In the study performed in Paper IV we for example observed rather many similarities between the visions for the future landscape discussed by the respondents in Helgeå and Vilhelmina case study areas despite many dissimilarities in forest characteristics and other social conditions. Rural development was a consistent theme for example.

Case studies are however not only valuable in terms of generalisations, but make important contributions through providing rich contextualised examples exposing the particular (Flyvbjerg 2001, pp. 66-87). In comparison with a study of several hundred sampled stakeholders, the single case study performed here has a value in providing in-depth and context-dependent knowledge (Flyvbjerg, 2006). The context-dependent knowledge about the concrete and particular provide a valuable basis for human learning and a pathway to true expertise.

6.4 Future research

Achieving desired changes in Swedish forestry requires in-depth understanding of the present state and critical assessments of future promises. Here forest policy and governance research has an important role to problematise and provide new perspectives and understandings regarding wider issues and contexts. Future studies could be better designed to analyse the role of power in forest management and governance, analysing the consequences for everyday life. Including multiple case study areas would be central to future studies of social practices in forest management, exploring the possibility of other factors being decisive for local conditions. The inclusion of contractors and entrepreneurs in the research is desirable as for example Erlandsson (2016) could show great importance of the social relationship between owners, contractors and FAOs in forest management. One other important step would be to have a

multi-sector perspective on land-use issues, something that this thesis did not have. Studies of the science-policy-stakeholder interface are of special interest in relation to collaborative forest governance. Social network analysis was attempted during this doctoral project but could not be accomplished based on the available empirical data. If elaborated, such analysis could provide valuable information about feedback-loops to structural elements for example within multi-level organisations (Secco *et al.*, 2013), but also more details about alliances among forestry organisations (Tikkanen, Leskinen and Leskinen, 2003).

Furthermore, research can itself be an instigator of change and researchers can learn by trying to achieve change through conducting action research. A promising path in this direction is transition studies that to my knowledge have not yet been used in an forest governance and management context in Sweden, but has found wide applications in, for example, the Netherlands and Germany, mainly in consumption and developing studies respectively (Arts *et al.,* 2013; Rauschmayer *et al.,* 2015). Transition studies aim to produce transformative scientific knowledge that enhances policies aiming at sustainable transition in society (Rauschmayer *et al.,* 2015). They have a multi-level perspective and typically analyse changes to a system from niches (micro), regimes (meso) or landscape (macro) level. Changes can be top-down from the landscape level pressuring the regime level[7] or they can be bottom-up induced changes when niche initiatives gain importance and become dominant. Change can also start at the regime level and spread in a social learning processes to niches and landscape levels.

Transition management, as one methodology applied within transitions studies, makes use of action research methods and facilitates niche experiments where forerunners in a community or society are brought together to develop new approaches to sustainability challenges. The idea is that the niche experiments grow to become dominant in society and thus develop society towards sustainability. This more classical transition management approach is complemented by Rauschmayer *et al*., (2015) to include analysis of individual capabilities (motivations and well-being) and more structural practices (skills, materials and meanings) as factors guiding the analysis of transitions. Social practices are also the object of study in transition studies and the research in this thesis provides a good starting point for such endeavours. Governance with the normative goal of sustainability should allow for niche experimenting but also be able to "*reflexively cope with the learning- and engaging-dynamics at*

[7] In this context, regime means the meso level and the underlying societal structure (institutional and physical setting), the culture (prevailing perspective), and practices (rules, routines, and habits) (Rauschmayer, Bauler and Schäpke, 2015).

individual levels on which societal sustainability transitions are necessarily relying on" (Rauschmayer *et al*., 2015 p. 219). In order to achieve sustainable solutions, society has to engage with the deeper causes of unsustainable practices that are related to human actions, institutional dynamics and behaviour (Abson *et al.*, 2016). These can also be interpreted as deep leverage points, places in complex systems where a small shift may lead to fundamental changes in the system as a whole (Abson *et al.*, 2016). Having a focus on social practices in policy and in research can facilitate finding such leverage-points, avoiding an over emphasis on either structure or agency (Brand, 2010; Spaargaren, 2011). Integrating a perspective on forests and forestry as a complex adaptive system would further increase the capacity to handle future variability and uncertainty by providing a framework of guidelines based on science (Filotas *et al.*, 2014; Messier *et al.*, 2015).

7 Conclusions

The relationship between forest management and governance is multifaceted and the outcome in terms of services for society dependent on local social conditions. Through the social practices performed by forest owners and other stakeholders, forest management is an integral part of society and forest governance. The perspective of social practices provide a useful tool in order to better understand the dynamics in forest management and governance and opens up new policy solutions as the role of neither agency nor structure is overestimated (Spaargaren, 2011).

The identified tension-points in relation to social practices are: i) a tendency of local social practices to streamline rather than to diversify forest management and, ii) two partially competing logics of practice: the traditional versus the professional logic where the latter is perceived by the former as a threat to local social values. From a policy-making perspective, ways to address both logics of practice and the diversification of social practices should be explored in order to balance the different services from the forest.

Local stakeholders and especially trusted advisors, are the major agents determining forest management and policy outcomes. Internet services and digitalised communication are changing the relationship between forest owners, purchasers, contractors, planners and authorities. It remains unclear if the same high degree of trust can be reached through digital services as through face-to-face interaction. Current evolving practices of outreach strategies towards forest owners that decrease personal contact run the risk of eroding valuable social capital. New means of developing trust towards owners should be researched.

Efforts towards participatory and collaborative forest governance should build on available social capital and cohesion among local communities and the willingness to cooperate in order to empower the local level and find ways for mutual cooperation for building structures beyond property borders. Policy-makers aiming to find new solutions to problems of balancing forestry

production and environmental objectives should design policies that are well-adapted to the local context and promote trust-building social practices. Further research is needed to find smart regulations that can fulfil those requirements and meet future challenges for the sustainable use of forest resources.

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