The Swedish forestry model: More of everything?☆,☆☆

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ABSTRACT

"The Swedish forestry model" refers to the forest regime that evolved following the 1993 revision of the Swedish Forestry Act. It is key to Swedish forest politics and used to capture the essence of a sustainable way of managing forests. However, the ideas, institutions and practices comprising the model have not been comprehensively analyzed previously. Addressing this knowledge gap, we use frame analysis and a Pathways approach to investigate the underlying governance model, focusing on the way policy problems are addressed, goals, implementation procedures, outcomes and the resulting pathways to sustainability. We suggest that the institutionally embedded response to pressing sustainability challenges and increasing demands is expansion, inclusion and integration: more of everything. The more-of-everything pathway is influenced by ideas of ecological modernization and the optimistic view that existing resources can be increased. Our findings suggest that in effect it prioritizes the economic dimension of sustainability. While broadening out policy formulation it closes down the range of alternative outputs, a shortcoming that hampers its capacity to respond to current sustainability challenges. Consequently, there is a need for a broad public debate regarding not only the role of forests in future society, but also the operationalization of sustainable development.

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1. Introduction

"The Swedish forestry model" is key to Swedish forest politics. The concept has been frequently used by leading politicians and other forest sector actors to capture the essence of a Swedish way of managing forests sustainably (e.g. KSLA (Royal Swedish Academy of Agriculture and Forestry), 2009; The Swedish Forest Industries Federation, 2011). However, references to the "Swedish model" are often ambiguous (KSLA (Royal Swedish Academy of Agriculture and Forestry), 2012), partly at least because key elements of the model have not been thoroughly analysed before. Clearly, given its central role in debates regarding uses, abuses and conservation of Swedish forests it is important to understand what the concept actually entails. Thus, in this paper we try to capture the essence of the current Swedish forestry model and associated responses to pressing sustainability challenges (Beland Lindahl and Westholm, 2011).

Sweden is a heavily forested country with a large, export-oriented forestry sector. In 1903, a forestry act was established with the explicit aim of ensuring continuous regeneration of the raw material base in privately owned forests. It was gradually reinforced and by 1948 it included strong regulations promoting afforestation and even-aged stand management to sustain (or increase) yields, and thus maintain supplies for industrial users. These regulations were extended to apply to all forests, regardless of ownership, in 1979 (Jansson et al., 2011). References to the Swedish forestry model date back to this time (KSLA, 2009). The term is currently used to describe the forest regime that evolved following the 1993 revision of the Swedish Forestry Act (SFA, SFS 1979:429) (KSLA, 2012). This legally enshrined a major policy shift, whereby the Swedish parliament relaxed national forestry regulations and established an environmental goal in parallel with the long-standing goal of maintaining high wood production. However, due to the long tradition of prioritising wood production for industrial use, there was a strong legacy of a highly production-oriented forest policy when forest owners gained greater freedom to manage their land. They were

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☆ Defined in accordance with the FAO as areas with a tree height over 5 m and a tree cover over 10%, or areas where these levels may be reached without efforts to increase forest productivity.
☆☆ In this context SMART stands for: specific, measurable, accepted, realistic, time-bound (Claesson et al., 2013).
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subsequently expected to improve environmental conditions while maintaining high wood production, a policy known as 'freedom with responsibility' (Appelstrand, 2012). In an attempt to characterise the Swedish forestry model, KSLA describes it as "...shaped by the country's natural conditions and constraints, its history, the knowledge and experience of the forest owners and the tradition of consensus policies based on mutual respect, understanding and compromise" (KSLA, 2009:1). According to the authorities involved, this applies not only to forestry per se, but also to the governance and management of the forest sector, the actors engaged in it, and the predominant policy styles (SEPA (Swedish Environmental Protection Agency) and Swedish Forest Agency, 2006). However, the model has been strongly criticized by the environmental movement for being unsustainable (e.g. SSNC (Swedish Society for Nature Conservation), 2011), seriously failing to meet environmental objectives connected to forests (SEPA (Swedish Environmental Protection Agency), 2015), and retaining an anomalously strong production-orientation in an international perspective (McDermott et al., 2010).

Increasing numbers of studies have explored elements and functions of the Swedish forest governance system and its implementation in recent decades (Kleinschmit et al., 2012). Several publications show how a number of global trends and forest discourses are challenging the current Swedish forestry model (Beland Lindahl and Westholm, 2011,

2012). These include: the need for actions to mitigate or adapt to risks posed by climate change (Pettersson and Keskitalo, 2012; Keskitalo et al., 2011; Klein and Juhola, 2014; Lidskog and Sjödin, 2014), such as transition to low carbon energy production (Helmisaari et al., 2014; Pedroli et al., 2013); the importance of evolving international institutions (Bjärstig, 2013: Bjärstig and Keskitalo, 2013; Lindstad and Solberg, 2012); and the implications of changing values, attitudes and practices of forest users (Eriksson et al., 2012). Several studies also discuss effects of collaborative and voluntary instruments on the Swedish forestry model (Klenk et al., 2013; Appelstrand, 2012; Widman, 2015).

Despite these studies of various aspects of the Swedish forestry model, the ideas, institutions and practices comprising the model, and its contribution to sustainability, have not been comprehensively analysed previously. Thus, here we address this knowledge gap, applying frame analysis (Perri 6, 2005; Schön and Rein, 1994) and a Pathways approach (Leach et al., 2010; Beland Lindahl et al., in this issue) to explore what the Swedish forestry model entails. More specifically, as outlined in Fig. 1, we investigate the underlying governance system that evolved following the policy shift in 1993, focusing on the way policy problems are addressed, goals, implementation procedures, outcomes, and the capacity to respond to sustainability challenges facing the forest sector (Beland Lindahl and Westholm, 2011). In the rest of the paper we outline the analytical framework and apply it in a
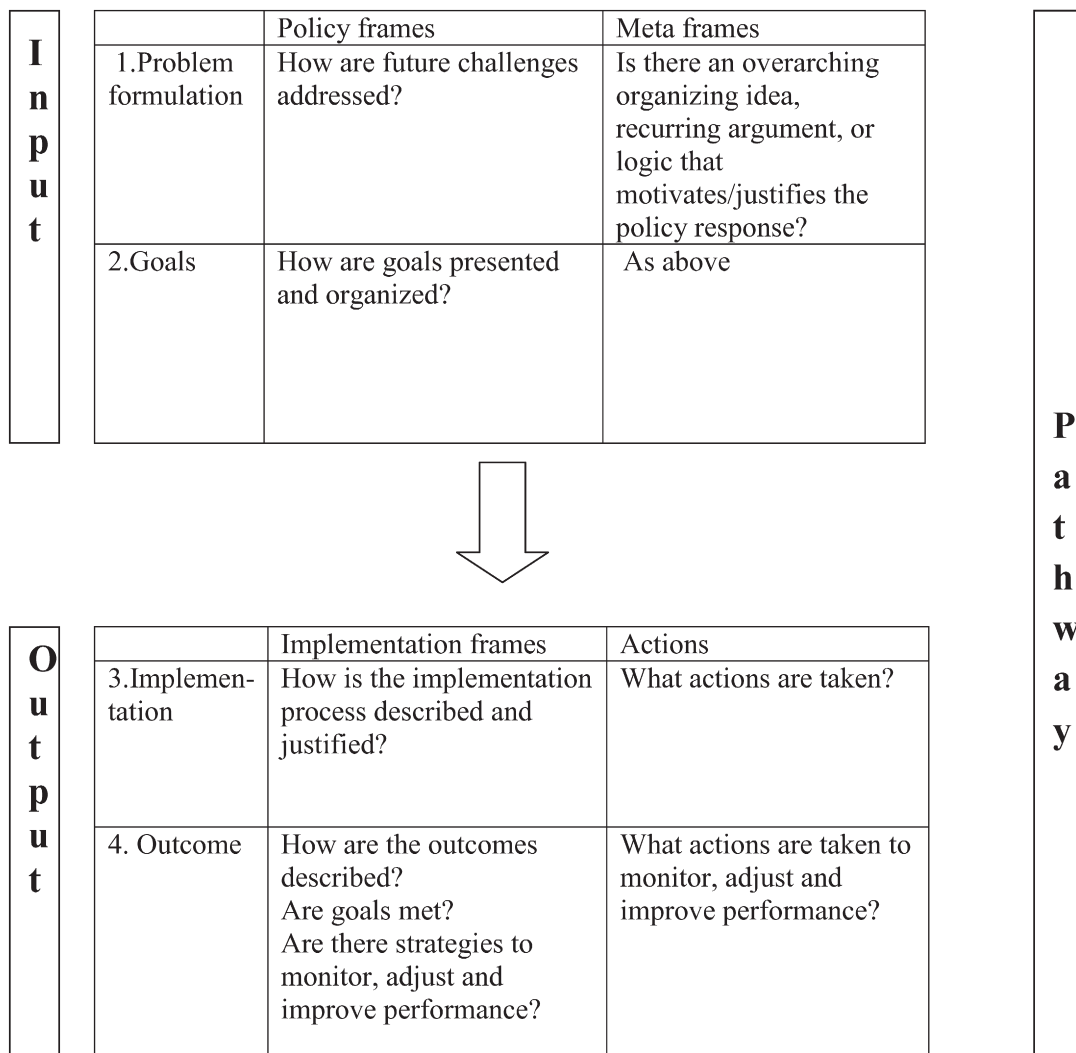
Input		Policy frames	Meta frames
	1. Problem formulation	How are future challenges addressed?	Is there an overarching organizing idea, recurring argument, or logic that motivates/justifies the policy response?
	2. Goals	How are goals presented and organized?	As above

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Output		Implementation frames	Actions
	3. Implementation	How is the implementation process described and justified?	What actions are taken?
	4. Outcome	How are the outcomes described? Are goals met? Are there strategies to monitor, adjust and improve performance?	What actions are taken to monitor, adjust and improve performance?

Pathway

Fig. 1. Framework for analysis.

systematic analysis of selected policy documents. We conclude by discussing the prescribed governance model, i.e. the "Swedish forestry model", and the particular pathway to sustainability that it promotes.

2. Theoretical framework and methods

In the context of forest policy the term "models" refers to conceptualisations of general state-specific or regional (international) ways of coping with relevant politico-economic issues (Lehtinen et al., 2004, p. 13). They incorporate understandings of accepted and historically repeated ways of facing and finding solutions to societal challenges, and illuminate the practical administrative organisation of social relations and vested interests (Lehtinen et al., 2004). Accordingly, we see a forest governance model as a context-specific combination of particular ways to view the world, policy goals, tools for implementing policies and management solutions applied at given places and times (the extent and duration of which may vary enormously). Such models guide policy-makers and other actors in the governance and management of forests. Recognising that governance is an ambiguous concept (Arts, 2014) it refers here to the strategic task of setting goals, directions, and limitations as well as defining methods of accountability (Peters and Pierre, 1998). Governance may thus be understood as steering on a higher level than management, understood as the allocation of resources and overseeing the day-to-day interactions and manipulations of forests in efforts to meet defined governance objectives.

The Swedish forestry model is widely presented as a way to achieve sustainability and sustainable development (e.g. KSLA, 2009). Following Leach et al. (2010), we see sustainable development as an essentially political process that can be analysed as a tension, or struggle, between competing pathways to sustainability. Accordingly, we use an analytical framework drawing on frame analysis (Perri 6, 2005; Schön and Rein, 1994; Beland Lindahl, 2008) and the STEPS Pathways approach (Leach et al., 2010). Pathways to sustainability can be briefly defined as possible trajectories for knowledge, interventions and change that prioritize different goals, values and functions (Leach et al., 2010). According to Leach et al. (2010), issues and problems can be framed in diverse ways by different actors. The resulting frames include different perceptions of relevant policy problem(s), promote different goals, suggest various solutions and evaluate outcomes in various ways. Frame analysis offers a way to explore these differences and their implications for policy-making and implementation. By supporting a certain understanding, a frame promotes a specific agenda and a certain way of action (Perri 6, 2005; Schön and Rein, 1994), i.e. a pathway. Whereas a frame is a cognitive phenomenon, a Pathway includes the activities that the frame fosters. A Pathway may thus be understood as a more or less enacted action strategy consistent with a particular way of seeing the world. Drawing on Schön and Rein (1994), we distinguish between three kinds of frames: "policy", "meta" and "implementation". Policy frames are used by institutional actors to construct the problem(s) associated with a specific policy situation. Meta frames are understood here as expressions of broad, culturally shared systems of beliefs and styles of argument that inform the construction of policy frames. Implementation frames are those used by institutional actors to justify and promote a particular implementation strategy. Fig. 1 shows how these concepts are used in an analytical framework which guides the empirical policy analysis.

A need recurrently identified in the Pathways literature (Leach et al., 2010, p. 122) is to "broaden out" inputs, i.e. inclusiveness in terms of actors and perspectives, and "open up" the outputs, i.e. increase the range of alternative options. "Closing down" outputs, in contrast, involves highlighting a small subset of possible actions, or policy choices (Leach et al., 2010, p. 105). These concepts guide an analysis of the input-side (policy and metaframes) as well as output-side (implementation frames and actions) of the policy-making process. The latter includes a discussion of actors and their role in the implementation process. Moreover, we use the concepts "ecological modernisation" and "sustainable development" to illuminate principal differences between alternative pathways. In line with Langehelle (2000), this analysis departs from the view that there are essential differences between the two concepts. Ecological modernization is a theory of social change that explores attempts in Northern industrial societies to respond to the negative environmental impacts of modernization without the course of action being completely redirected, for example by retaining the notion of progress based on economic growth (Langehelle, 2000; Baker, 2007). In contrast, a strategy of sustainable development based on the original Brundtland formulation (WCED (World Commission on Environment and Development), 1987) recognizes that there are biophysical limits to growth, acknowledges the responsibility of present generations to future generations, challenges the traditional growth paradigm and addresses questions of distribution between North and South (WCED, 1987; Baker, 2007).

While situating our analysis in a historical context, we concentrate on current understanding of the Swedish forestry model. Accordingly, we focus our investigation on forest policy from 1993 to date. To capture influential policy frames, we focus on policy documents with a certain degree of authority, such as legal acts and bylaws, Governmental Bills and reports of Commissions. In accordance with our research aim, the selection of documents has been based on an assessment of their importance to forest governance and management, contribution to a future-oriented discussion about global change and sustainability, and relevance to our analysis of mechanisms for participation, trade-offs and handling choices. The selected documents are briefly described in Table 1. The operationalized questions listed in Fig. 1 have guided a qualitative analysis of the selected documents. A focused coding (based on the questions) was used to identify central themes and statements, then frames and Pathways were constructed by grouping similar themes and statements in the documents.

Table 1
Selected policy documents for the frame analysis.

Title of document	Context and relevance
The Swedish Forestry Act (SFA) (SFS, 1979:429– SFS 2014:890)	Framework legislation regulating Swedish forest management and governance. Substantially revised in 1993 and repeatedly amended. Main legislative document.
Forestry ordinance (SFS, 1993:1096–SFS 2014:1027)	As above but with associated and subordinated bylaws that further clarify regulations enshrined in the Act.
Swedish Forest Agency's prescriptions and general advice (SKSFS, 1993:2– SKSFS, 2011:7)	Non-legally binding prescriptions and advice supplementing the SFA. Responsibility of the Swedish Forest Agency. Guide forest management and management trade-offs.
Bill, 1997/98:145 and Bill, 2004/05:150: Swedish Environmental Quality Objectives (EQO)	Bills stipulating a new structure for Swedish environmental politics (1998) and inclusion of an additional Objective (2005). Includes outlooks and rationale of a major policy change.
The Swedish Environmental Code(1998:808)	Framework legislation regulating activities with respect to the environment including the EQOs. Adopted in 1998 and repeatedly amended. Main legislative document.
Bill, 1992/93:226 and Bill, 2007/08:108: A forest policy in line with the times.	Bills proposing changes to the SFA in response to contemporaneous trends and challenges. The most authoritative documents discussing future challenges. Adopted in 1993 and 2008, respectively.
Bill, 2013/14:141: A Swedish strategy for biodiversity and ecosystem services	Bill proposing new interim targets to reach EQOs; a response to international commitments (The Convention on Biological Diversity, CBD). Adopted in 2014. The most recent forest related policy outlook.

3. Exploring the Swedish forestry model

3.1. Historical and institutional context

Sweden's rich forest resources have been highly important for the country's industrial development and economic welfare for hundreds of years. Proximity to the European market has facilitated export of wood products, and by the 1860s timber exports accounted for more than a third of the country's export revenues. Industrial wood pulp and paper production began in the 1850s, became the most important export industry by 1917, and Sweden is still one of the world's largest paper producers (Pettersson, 2005; Jansson et al., 2011; The Swedish Forest Industries Federation, 2014).

The production and export of forest products have steadily increased since the 19th century and the forest industry is still one of Sweden's biggest net export sectors (Pettersson, 2005; Statistics Sweden, 2014). This success is the result of deliberate efforts to increase Swedish forests' productivity during the 20th century, in which the government played a crucial role. As mentioned above, in 1903 it introduced a new forestry act, which prescribed regeneration of forests owned and harvested by private forest owners. In line with a traditional Swedish co-operative and consensus seeking policy style (Lundqvist, 1997), the act had the character of framework legislation with relatively vague action prescriptions. The best implementation results were presumed to be achieved, not by strict law enforcements, but through counselling, education and persuasion (Appelstrand, 2007). Prescriptions to increase forests' industrial productivity were steadily increased thereafter, a process culminating in the 1980s when silvicultural measures to be applied in all key rotational stages were strictly prescribed in attempts to guarantee supplies of raw material for the strategically crucial forest industries (Table 2; Jansson et al., 2011). It should be noted that state and publicly owned forests were not covered by the SFA until 1979, in sharp contrast to the situation in many other countries, where such forests were regulated from much earlier dates.

Besides making policy, the Swedish government introduced County Forestry Boards in 1905 to help implement forest-related law and provide forest owners with information, consultation and silviculture grants. A central administration was introduced in 1941 when the Swedish Forest Agency was established (Jansson et al., 2011). The government increasingly used economic incentives to motivate forest

Table 2
Development of the Swedish Forestry Act (SFA) since 1903. Grey boxes indicate stages when provisions were included. Source: Jansson et al. (2011, p. 118).

Provision	1903	1918	1923	1948	1974	1979	1983	1993	2008
Mandatory regeneration	▓	▓	▓	▓	▓	▓	▓	▓	▓
Protection for young to medium–aged forest		Temporary	Permanent	▓	▓	▓	▓	▓	▓
Sustainable forestry stipulated				Production Objective	▓	▓	▓	Environmental Objective	▓
Consideration for nature conservation and the environment in forestry stipulated					▓	▓	▓	▓	▓
Clear–fellling operations notifiable					▓	▓	▓	▓	▓
Cleaning obligatory						▓	▓		
Planting of new trees obligatory if existing forest sparse or has unsuitable composition						▓	▓		
Thinning of young forest obligatory							▓		
Cutting of a certain proportion of older forest obligatory							▓		
Possession of forestry plan obligatory							▓		

owners to produce more and cheaper wood to ensure a steady supply of raw material to the expanding forest industry. State subsidies peaked in the 1980s when the state regulations were most extensive (Siiskonen, 2013).

The combination of counselling (by the County Forestry Boards) and subsidies increased forest owners' levels of forestry activities, especially during the second half of the 20th century. The government led the way in the 1950s by changing the forest management regime from selective cuttings to clear cuttings. Sparse forests were replaced by plantations and productive young forests. Planting, fertilisation, ditching, use of genetically improved seedlings and afforestation of abandoned arable land and pastures have all contributed to steep and steady increases in standing timber volumes since the mid 1900s (Jansson et al., 2011).

These efforts led to even-aged forest stands with a single dominating tree species replacing previously diverse forests, to accommodate the forestry industry (Pettersson, 2005; Axelsson and Östlund, 2001). However, in the 1970s and 80s the industrial use of forests was increasingly criticized by the environmental movement. Consequently, environmental and recreational, aesthetic and cultural considerations were included in the SFA. Nevertheless, the industries' need for wood was given higher priority than ever (Table 2; Jansson et al., 2011).

As further explored below, the Swedish forest governance system has changed significantly in recent decades, notably through increasing internationalisation and integration with other policy areas and sectors, a shift from "government" to "multi-level governance" (e.g. Keskitalo & Pettersson, 2012), and introduction of economic and market-based instruments such as certification (Johansson, 2013). The strong regulations of the 1980s have been replaced by "freedom with responsibility" and environmental objectives have been introduced. However, these changes should be considered in the context of the strong historical and institutional legacy prioritising economic profitability and high wood production for the benefit of the Swedish welfare project (Sandström and Sténs, 2015).

3.2. Frame analysis of the current model: problem formulation and goals

Drawing on Leach et al. (2010), we argue that policy frames include problem formulations and goals that prioritise particular agendas and action strategies. In the following sections, we analyse the policy frames used to formulate problems related to Swedish forestry and set goals during the focal period, and the implementation frames that justify and promote particular implementation strategies, and thus shape the outcomes. Fig. 2 summarizes the findings of the frame analysis. The upper half of the figure shows how problems and goals are framed (the input side), while the lower half summarises the output side.

As outlined above, the historically dominant forest policy frame (forest industrial development, Fig. 2) prioritises wood production for industrial use. The "problem" is formulated in terms of identifying and implementing practices to maximize sustained supplies of raw materials and other resources cost-effectively, thereby optimally exploiting the wood production potential to promote industrial and economic development. This frame is still prominent and reflected in the Production Objective of the SFA:

"Forest and forest land must be used efficiently and responsibly so as to produce a sustained good yield. Forest production must give freedom in regard to the utilization of what the forest produces." (Bill [Proposition], 1992/93:226, p. 32).

However, since 1993 the SFA has also included an Environmental Objective, which is supposed to carry equal weight. The policy frame (biodiversity under threat) justifying the inclusion of an additional objective highlights the environmental impacts of industrial forestry and associated threats to forest biodiversity (Bill [Proposition], 1992/93:226,

p. 26–32). Accordingly, the Environmental Objective focuses on biodiversity:

"...woodland's natural productive capacity must be preserved. A biological diversity and genetic variation must be secured. Forest must be used so that plant and animal species which naturally belong there must be given such conditions as to survive in viable populations. Endangered species and ecosystem must be protected. The forest's cultural heritage and its aesthetical and social values must be cared for." (Bill [Proposition], 1992/93:226, p. 27).

The inclusion of an Environmental Objective in 1993 implied a significant change and expansion of the forest governance system. As evident by the quote above, an additional policy frame acknowledging social and aesthetic values is embedded in the SFA. This frame also acknowledges subsistence values and needs of the indigenous reindeer herding Sami population (SKSF, 1993:2 and SKSFS, 2011:7). However, the wording and structure of the objectives indicate that the important social and cultural values-frame is less prominent than the forest industrial development-frame and relatively weak. It is not reflected as a separate objective but included as part of the Environmental Objective. Social and aesthetic values "must be cared for", while endangered species and ecosystems "must be protected" and forest land "must be used" efficiently to produce a sustained good yield (Bill [Proposition], 1992/93:226, p. 27 and 32). Similarly, forestry is "to take account of" essential reindeer husbandry requirements and it is "desirable" that the Reindeer herding communities be given annual access to grazing areas, etc. (SFS, 1979:429). Hence social, aesthetic and subsistence goals are treated as secondary to the production and nature conservation objectives.

In 1999 the Parliament decided to completely re-structure Swedish environmental politics in response to perceived problems in co-ordinating and integrating implementation and assessment of the contemporaneous environmental objectives across policy sectors. The policy frame (ecological sustainability and ecosystem services) underlying this change expanded the rationale for action from a primary concern with biodiversity loss to that of ecological sustainability and needs of future generations (Bill [Proposition], 1997/98:145, p 3). Fifteen, and subsequently 16, national Environmental Quality Objectives were adopted, several of which affect forest management (Bill [Proposition], 1997/98:145; Bill [Proposition], 2004/05:150). With the integration of additional international and European Union environmental regulations (Bill [Proposition], 2007/08:108) the forest governance system further expanded.

Since 1999, the Production and Environmental Objectives stipulated by the SFA have operated in tandem with the government's Environmental Quality Objective "Sustainable Forests". Together they guide the operations of the Swedish Forest Agency. To fulfil its task to coordinate and implement these and other relevant goals and visionary statements, the Forest Agency developed its own operational "SMART objectives". In 2005, these were expressed as 13 specific interim targets, all intended to ensure "sustainable development" by the year 2010 (Swedish Forest Agency, 2005). This goal structure (Fig. 3) was abandoned in 2010 and a new one is expected to be developed as part of a newly instigated National Forest Program process (Bill [Proposition], 2013/14:14).

Swedish forest policy has addressed sustainability challenges, risks and uncertainties in ways that have varied over time. In the early 1990s most sustainability challenges were framed as concerns to address in a vaguely defined future, and the focus was primarily on global air pollution and its consequences for forest productivity (Prop. 1992/93:26). Adoption of the Environmental Quality Objectives broadened the scope of concern (particularly to incorporate biodiversity) and the challenges were recognized as urgent, to be met within one generation, defined as by 2020 (Lönnroth, 2013). In the most recent forest-related Bills, global change is seen as a clear and present threat, which must
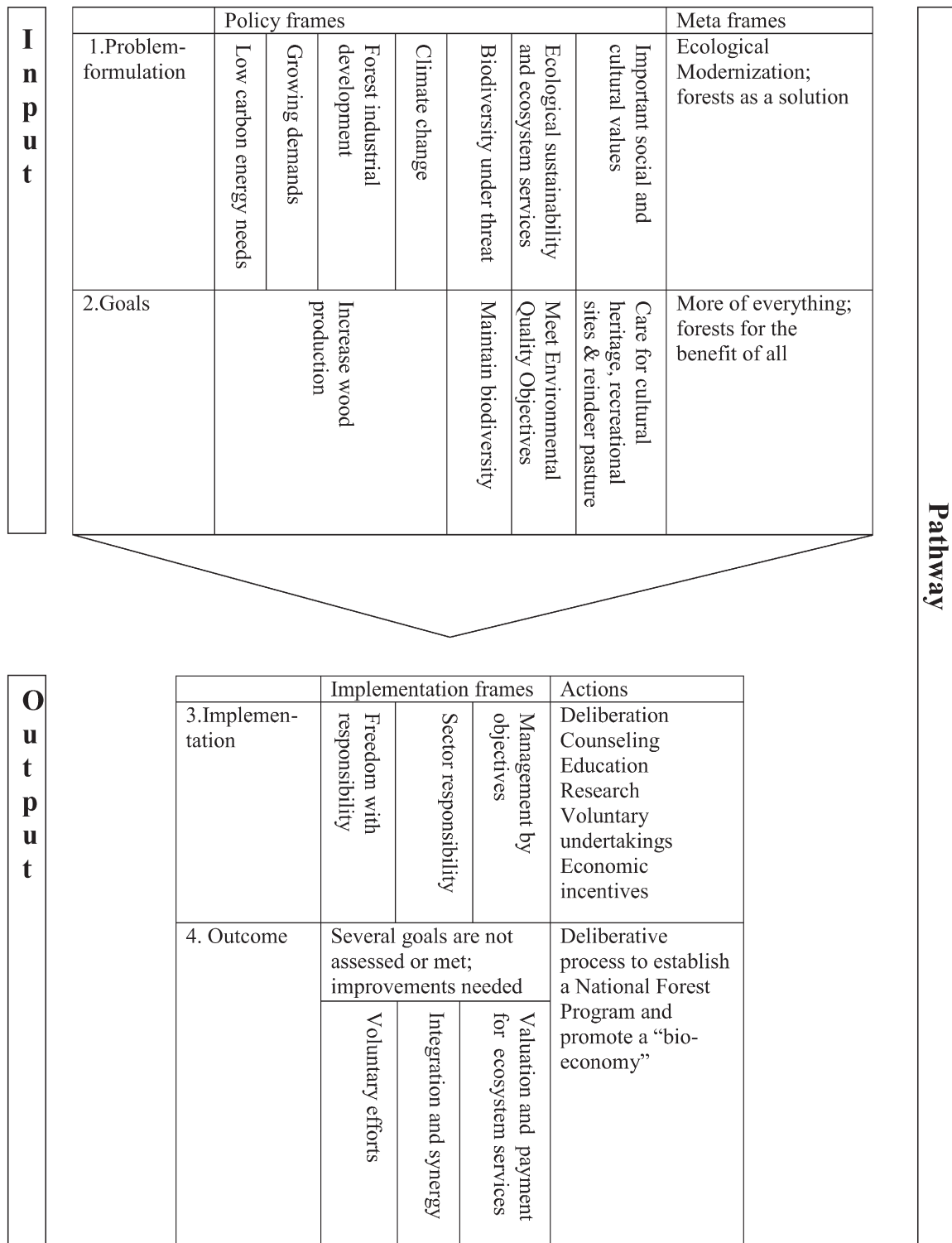
Input

	Policy frames							Meta frames
1. Problem-formulation	Low carbon energy needs	Growing demands	Forest industrial development	Climate change	Biodiversity under threat	Ecological sustainability and ecosystem services	Important social and cultural values	Ecological Modernization; forests as a solution
2. Goals		Increase wood production			Maintain biodiversity	Meet Environmental Quality Objectives	Care for cultural heritage, recreational sites & reindeer pasture	More of everything; forests for the benefit of all

Pathway

Output

	Implementation frames			Actions
3. Implementation	Freedom with responsibility	Sector responsibility	Management by objectives	Deliberation Counseling Education Research Voluntary undertakings Economic incentives
4. Outcome	Several goals are not assessed or met; improvements needed			Deliberative process to establish a National Forest Program and promote a "bio-economy"
	Voluntary efforts	Integration and synergy	Valuation and payment for ecosystem services	

Fig. 2. Summary of the findings of the frame analysis.

be addressed now. Notably, a Bill issued in 2007, "A forest policy in line with the times" (2007/08:108), places climate change at the centre of attention. Four interrelated policy frames (*climate change, low carbon energy, growing demands for wood* and *forest industrial development*) inform the problem formulation and suggested solutions. The Bill argues for a renewed focus on increasing production to meet increasing demands for wood, by both the traditional forest industry and the growing bioenergy sector. In accordance with the *growing demands for wood-* and the *forest industrial development*-frames, the Bill recommends establishment of a commission to explore the potential of "intensive forestry" and a range of silvicultural measures to increase wood production, e.g. of exotic tree species, fertilisation, and stump-harvesting (2007/08:108). Including the term "renewable resource" in the opening paragraph of the SFA is also suggested (p. 6). The renewable nature of forests is thus used to reconcile a call to increase wood production with maintenance of environmental commitments, here primarily
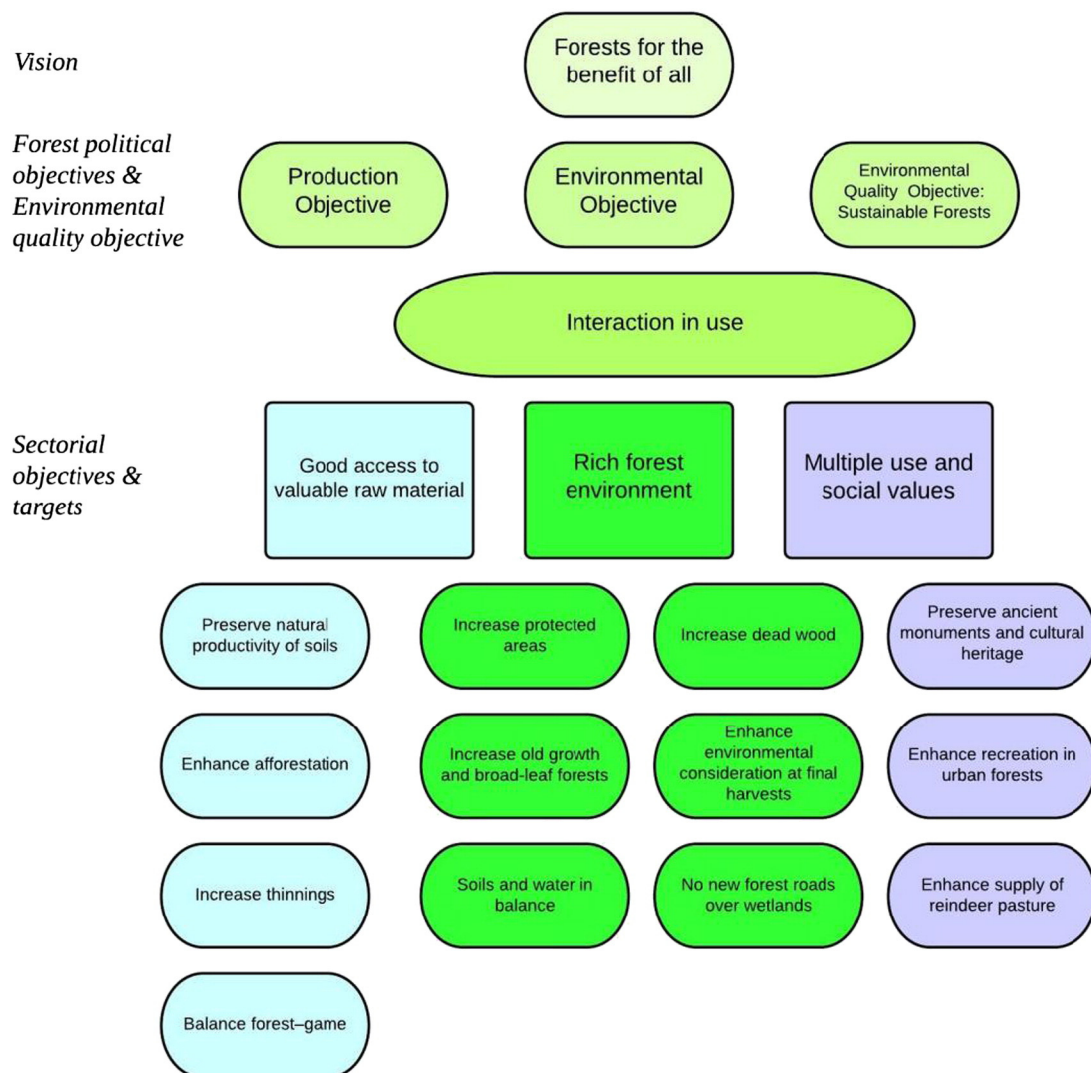
Fig. 3. Organisation of formal forest policy objectives in 2005–10. Source: Swedish Forest Agency, 2005.

understood as an ambition to mitigate climate change. By increasing carbon dioxide uptake and contributing to substitution of fossil-based materials and fuels, increasing wood production is framed as both economically and environmentally favourable. Climate change is primarily portrayed as a factor that will extend vegetation seasons and enhance growth (Bill [Proposition], 2007/08:108, p. 24).

The latest relevant government Bill, issued in 2014, "A Swedish strategy for biodiversity and ecosystem services" (Bill [Proposition], 2013/14:141), extends the previously established *ecological sustainability*-frame, by strengthening elements related to the ecosystem services concept. This Bill evolved in the wake of the UN Convention on Biological Diversity (CBD) and the Conference of the Parties in Nagoya, and is Sweden's response to the so-called Aichi goals. Although the scope of the Bill goes beyond forest management, it is strongly linked to forest policy. The Bill integrates the *ecological-sustainability*-frame with the *growing-demands*-, *low-carbon-energy*- and *forest-industrial-development*-frames which have permeated recent forest policy (e.g. Bill [Proposition], 2007/08:108). A strong *ecological-sustainability*-frame promotes an ecological understanding of the problem by using terms that are commonly applied in sustainability science, e.g. "resilience" and "ecosystem services". It also expands the temporal and spatial boundaries of the forest governance system by making explicit connections between the long-term capacity to deliver ecosystem services and human welfare. For example, increasing protected areas and

ecosystem- and landscape-level connectivity (linkage of protected areas that facilitates movement and hence survival of threatened organisms), is portrayed as crucial for the maintenance of biodiversity for future generations (Bill [Proposition], 2013/14:141, p. 12). It also introduces novel types of governance and management, such as adaptive management. However, it also expands the range of services that domestic forests are expected to deliver, in line with the *growing-demands*-, *low-carbon-energy*- and *forest-industrial-development*-frames: "the forest and its value chain is expected to further add to sustainable development and a growing bio-economy" (Bill [Proposition], 2013/14:141, p. 24). In accordance with ideas of ecological modernisation (Pülzl et al., 2014, Langehelle, 2000; Baker, 2007), environmental protection and an expanding bio-economy are seen as mutually reinforcing. In this policy context, ecological modernisation is used as a meta frame reconciling a set of policy frames focusing on ecological sustainability, biodiversity protection and climate mitigation, with another set focused on increasing wood production, energy supply and industrial competitiveness (e.g. Bill [Proposition], 2013/14:141, p. 25).

Based on this frame analysis, we can conclude that the forest governance system, which was relatively lucid before 1993, has become a complex and confusing system of nested objectives (see Table 3). It has successively expanded to include an increasingly broad range of forest habitats, values, ecosystem services, goals and institutions. Seven partly overlapping policy frames inform problem formulation, which

Table 3

Forest policy objectives 1950–2015. Objectives explicitly mentioned as"goals" or as main directions are presented. Sources: Bill, 1948:34; Bill, 1978/79:110, 12; Bill, 1992/93:226; Bill, 2007/08:108; Bill, 2013/14:141; Swedish Forest Agency, 2005.

Governmental forest policy objectives:			
Decades	1950/60s	1970/80s	1990/2010s
Socio-economic objectives	Sustained and even yield of wood Even (all year around) employment Rural development Increase export revenues	Sustained, high and even yield of wood Full and even employment Regional balance Balance of foreign payments	Sustained and high/good yield of wood Employment, economic growth and welfare in the whole country Maintain a strong private ownership Increase gender equality and integration within the forest sector Increase Sweden's presence in international forest related activities Enhance diversity of forest products Decrease damage from game Improve afforestation Increase use of improved tree species Improve fertilisation Increase extraction of biofuels Increase pre-commercial thinning Consider/enhance supply of reindeer pasture
Environmental objectives		"Good" nature conservation Protect hardwood trees	Increase biodiversity Increase forest growth to mitigate climate change Contribute to a low carbon society Protect hardwood trees Increase dead wood Increase broad-leaf forest Increase old growth Enhance genetic variation Preserve quality of forest soils Stop invasive exotics Stop invasive genetically modified species Increase protected areas
Cultural and recreational objectives		Enhance recreation Enhance aesthetics Preserve cultural heritage	Preserve recreation Preserve aesthetics Preserve and enhance cultural heritage

can be condensed to three or four frames embedding the policy goals. As shown in Fig. 2, arguments presenting forests and increased wood production as solutions to multiple problems generate a strong and prominent policy frame supporting goals to increase wood production, for bioenergy as well as the traditional timber and pulpwood products. However, other goals can also be clearly discerned, particularly safeguarding biodiversity and a range of ecosystem services. In summary, the Swedish policy response to pressing sustainability challenges and increasing demands is one of expansion, inclusion and integration, based on the optimistic view that it is possible to create more of existing resources.

The SFA and associated bylaws provide few indications regarding the relationships and relative importance of the potentially conflicting goals. The Environmental and Production Objectives are framed as having "equal weight" (1992/1993:226), and this is not further problematised. In the later Bills, meeting both production and environmental objectives is framed as a win-win strategy and a precondition for transformation to a "biobased economy". The government claims that increasing wood production is possible without jeopardizing the environmental objectives (Bill [Proposition], 2007/08:108). However, several policy documents identify a range of new goal conflicts between bioenergy production and biodiversity protection, as well as, potentially, between management for carbon storage and biofuel production (e.g. SOU (Statens offentliga utredningar), 2006:81; Bill [Proposition], 2007/08:108; Bill [Proposition], 2013/14:141).

3.3. Frame analysis of the current model: implementation and outcomes

Although the inclusion of policy objectives described above has significantly broadened the scope of Swedish forest policy, the legacy of an economically important forest sector and production-oriented institutions is strong. Consequently, implementing the wide range of forest policy objectives (see Fig. 2) now requires active steering and monitoring by the state. Since 1999, the overarching implementation frame for

all natural resource management in Sweden is *management by objectives* (see above), generally paired with soft legal instruments that have somewhat weaker binding force than traditional hard law. This overarching approach is reflected in the studied policy documents, in which there are two prominent distinct but linked implementation frames: *strong sectoral responsibility* and *freedom with responsibility*, which lead to promotion of distinct sets of actions (outcomes), as outlined in Fig. 2.

The *sectoral-responsibility*-frame is rooted in the Swedish system of public administration, in which the regulatory authorities are independent organisations. Accordingly, each sector (e.g. the forest, agricultural and energy sectors) is responsible for implementing environmental policy within the corresponding authorities' mandate and power. "Sector responsibility" was introduced in the forest sector in 1988 and further strengthened as the biodiversity strategy was adopted in the early 1990s (Bush, 2010). More specifically, the relevant laws and bylaws (SFS 1979:429 and SFS, 1993:1096) stipulate that the Forest Agency is responsible for ensuring that Swedish forest policy (including policy related to environmental objectives) is implemented and realized in practice. This arrangement was reaffirmed in a Bill published in 2008 (Bill [Proposition], 2007/08:108, p. 15). However, the cited Bill also states that state authorities and forestry actors share responsibility for policy implementation, i.e. forest owners are given wide-ranging discretion to manage their forests in accordance with the "freedom with responsibility" principle. According to the *freedom-with-responsibility*-frame, the authorities' role is primarily to steer implementation of the overarching objectives using soft legal instruments. Consequently, actions such as support, advice, information, education, and (more recently) dialogue and consultation processes are promoted. In the recent Bills, voluntary agreements between public and private sectors, environmental policy integration and market-based instruments, such as certification and incentive-based tools, are highlighted. The incentives include, for example, economic compensation for achieving specific targets, such as ensuring that the proportion of broadleaved are maintained or increased,

and to safeguard and develop cultural environments and natural values (e.g. Bill [Proposition], 2013/14:141).

A fundamental idea permeating the *sector-responsibility-* and the *freedom-with-responsibility*-frames is that forest owners are expected to manage according to ambitions that exceed the threshold stipulated by the law (Bill [Proposition], 2013/14:141:127–8). This is particularly important in relation to environmental considerations. The measures stipulated by the SFA and its bylaws are thus considered minimum levels to meet the overarching objectives. The policy documents selected for study provide little indication of exactly how, and to what extent, the different objectives should be achieved. However, numerous evaluations by responsible authorities and official investigations have shown that many of the objectives, both environmental and social, will not be met within the stipulated timeframe (SEPA, 2015). Several reasons for this failure are highlighted, including (inter alia) mismatches between goals and measures, methodological problems in monitoring relevant environmental actions and outcomes, and inherent flaws in the governance system, notably conflicting objectives.

> "(T)here is an 'implementation deficit', that is to say, instruments and other measures have been decided on and put in place, but are not being applied on a sufficient scale. Where policy instruments fail to have the intended effect, it is often due to conflicts between competing interests, not uncommonly environmental versus economic." (SEPA (Swedish Environmental Protection Agency), 2014, p. 19).

Although goal achievement is not a focal point of the recent bills, a general lack of tools to facilitate trade-offs is acknowledged. To improve understanding of the situation, the most recent bill recommends that available monitoring instruments should be better coordinated, strengthened and improved through formal supervision and supervision plans (Bill [Proposition], 2013/14:141). In accordance with existing implementation frames, the Government proposes that dialogue should be extended, particularly between the Forest Agency and forestry actors, to define specific targets and criteria for environmental goals, and rules for prioritization of environmental and species protection. The actors involved in forestry activities are also expected to initiate an internal dialogue to increase awareness of the implications of sectoral responsibility (Bill [Proposition], 2013/14:141:118). In addition, the Government requests the Forest Agency to continue to "integrate" the partners in the broader sector, and to extend representation of the sector by including other interests. Currently, only a relatively limited number of non-state actors are formally recognised as having rights or duties according to the SFA, namely forest owners, forest industries, producers/retailers of plant material and the Sami Reindeer Herding Communities. However, consultations with municipalities are recommended when addressing issues of local importance (SFA, SFS, 1979:429; SFS, 1993:1096; SKSFS, 2011:7), and various other actors including E-NGOs, forest owner associations, forest industry associations, forest/industry corporations, universities, recreational organisations, tourist associations, hunting groups and fishing associations are usually consulted or involved in more informal capacities (see for example Appendix 8 of Bill [Proposition], 2013/14:141 for a full list of consultative bodies). The Government is now requesting the Forest Agency to integrate an even broader range of actors through deliberative and consensual practices, inter alia by providing arenas where diverse interests can meet to collaborate, address conflicting objectives, develop joint solutions and stimulate synergies (Bill [Proposition], 2013/14:141).

In the most recent bill three implementation frames that are not new, but more specifically formulated than in previous incarnations, can be discerned: *voluntary efforts*, *integration and synergy* and *valuation and payment of ecosystem services*. These frames inform strategies to improve performance with the overarching objective to develop a bioeconomy. By building upon a combination of existing instruments, dissemination of information and voluntary actions environmental

considerations are to be improved. By 2018, the economic value of ecosystem services, including biodiversity, is to be considered (when appropriate) in political decision-making. One important action point is the establishment of a National Forest Program:

> "Sweden should develop a national forest program encompassing the economic, social and environmental values so that the forest and its value chain further contribute to the development towards a sustainable society and a growing bio-based economy. An important part of the work of a national forest programs is to provide forums and forms of dialogue and cooperation that can provide a greater consensus on the role of forests in society and provide an opportunity to create a coherent long-term strategic focus on sustainable forest use and conservation." (Bill [Proposition], 2013/14:141:135–136).

4. Discussion

We have used the questions outlined in Fig. 1 to systematically investigate the Swedish forestry model and the pathway(s) to sustainability that it promotes. Following our frame analysis of key forest policy documents, we argue that the response to pressing sustainability challenges and increasing demands for products and services essentially consists of expansion, inclusion and integration. Based on this analysis we suggest that the current Swedish forestry model is promoting a Pathway to sustainability that can be labelled "more of everything". In the following section, we substantiate our argument and draw on the Pathways approach (Leach et al., 2010) to discuss how this pathway responds to future challenges, what dimensions of sustainability are prioritised, and to what extent it "broadens out" and "opens up" in terms of actors' participation and alternative solutions to sustainability challenges (see Leach et al., 2010 in Section 2).

As shown in Fig. 2, recent policy acknowledges the future and sustainability challenges in an increasingly open and holistic manner. This is reflected in seven policy frames on the problem formulation level. In addition to the historically dominant *forest industrial development*-frame, and the *biodiversity-frame* that has been legally enshrined for more than 20 years, new frames address: growing requirements for biomass and low carbon energy production; mitigation of risks associated with climate change; social and cultural values; and broader aspects of ecological sustainability. Adoption of concepts such as ecosystem services, adaptive management, cross-sectoral integration, landscapes and ecological connectivity (see Bill [Proposition], 2013/14:141) shows that importance of the *ecological sustainability and ecosystem*-frame is increasing. Accordingly, the view of sustainability challenges has shifted from concerns that will probably have to be addressed vaguely in a distant future (Prop. 1992/93:26) to urgent problems that must addressed immediately (Bill [Proposition], 2007/08:108; Bill [Proposition], 2013/14:141), while the timescale of policies has been greatly extended to cover the wellbeing of future generations (Bill [Proposition], 2013/14:141). The spatial scale considered has also expanded from the stand and estate level of primary concern in the SFA to cover concerns about landscapes and how habitats are spatially distributed and connected (Bill [Proposition], 2013/14:141). Consequently, problem formulations have been both broadened out and concretized, in ways that according to Leach et al. (2010) could allow timely and dynamic governance and management responses. Efforts to respond to anticipated challenges in more dynamic ways can also be discerned, for example in the introduction of "adaptive management" (Bill [Proposition], 2013/14:141).

However, in parallel with these efforts to "broaden out" problem formulations, there is a tendency to address new challenges by interpreting them in terms of, and incorporating them into, the historically dominant *forest industrial development*-frame which prioritises wood production. For example, climate mitigation arguments are frequently used to legitimise more intensive forest management methods,

and exploitation of the carbon assimilating capacity of growing forests is prioritised with little discussion. In the academic literature, the optimal management of boreal forest carbon stocks is fiercely debated, and numerous uncertainties are recognized (Pukkala et al., 2011), but the uncertainties and potential complications are not reflected in the analysed policy documents. Instead, a particular interpretation consistent with the traditional focus on maintaining high wood production is used to construct apparent synergies between production and environmental objectives. Increasing wood production is presented as the solution to multiple problems addressed by the *climate change-*, *low carbon energy-*, *growing demands-* and *forest industrial development-*frames. In accordance with a strong *ecological modernisation metaframe*, the idea that forests can provide "solutions" is used to reconcile potentially conflicting policy frames. Consequently, seven policy frames on the problem formulation level are reduced to four on the goal formulation level, where the historically dominant *increase wood production-*frame remains strong.

Key issues arising from our results concern the components of sustainable development that the more of everything-pathway prioritises. In previous comparisons of forest management models the economic effectiveness of the Swedish model has often been noted (McDermott et al., 2010). Similarly, our analysis shows that Swedish forest policy has traditionally prioritised the economic dimension of sustainable development. However, the weighting of a major element of the ecological dimension, biodiversity protection, was significantly raised in the 1993 revision of the SFA. Our analysis also shows that economic, social and ecological dimensions are all addressed in the current forestry model on the problem formulation level. However, as outlined above, increasing production continues to be prioritised because it is currently presented as a solution to several pressing economic and environmental problems and is therefore promoted for both economic and environmental reasons. Formally, the Production and Environmental Objectives, i.e. economic and environmental dimensions of sustainable development, are given equal weight in the SFA (Bill [Proposition], 1992/93:226, p. 27). However, what is meant by "equal weighting" in a practical management situation is far from clear. Moreover, a *more-of-everything-* and *forests-for-the-benefit-of-all* approach has resulted in numerous goals prioritising different, and potentially conflicting, dimensions of sustainability (see Fig. 2). There are goal conflicts, for example, between the SFA's Production and Environmental Objectives (Beland Lindahl, 2008), between the Production Objective and demands for considerations to Sami reindeer husbandry (Widmark, 2009), and between the Production Objective and requirements to protect cultural heritage sites (Sandström and Lindkvist, 2009).

Consequently, tools for making efficient and legitimate adjustments, trade-offs and choices in the implementation process are crucial. However, the available implementation frames (*sector responsibility*, *freedom with responsibility* and *management through objectives*) support soft, non-coercive, policy instruments including dialogue and consultation processes, which are problematic means to resolve substantial goal conflicts (Beland Lindahl, 2008; Beland Lindahl et al., 2013; Sundström, 2010; Sandström and Sténs, 2015). The political adjustments required are relegated to enlarged, cross-sectoral deliberative arenas, and responsibility for trade-offs to stand-level decisions by forest owners. As further discussed below, these deliberative settings tend to favour the traditionally and economically strong production interests that have the resources to influence processes and outcomes (Sundström, 2005; Beland Lindahl, 2008; Beland Lindahl et al., 2013). Thus, we argue that, despite serious efforts to raise the weighting of environmental aspects, the current Swedish forestry model still prioritises wood production, i.e. the economic dimension of sustainability. Social, aesthetic and cultural values have a subordinated position in the SFA and lack the status of formal objectives. Hence, the social dimension is the weakest. This situation is reflected in outcomes that do not meet the desired objectives. Some of the survey and assessment methods are contested and outcomes in relation to reindeer husbandry, recreation and cultural

aspects are hardly assessed at all, despite strong indications that many of the stated environmental objectives are not being achieved (SEPA, 2014 and SEPA, 2015).

Clearly, strenuous efforts have been made since 1993 to balance the historically dominating production-oriented pathway with various environmental, social and cultural considerations, raising the question why is the economic dimension of sustainability still prioritised? We suggest that part of the answer lies in how sustainable development is operationalised. Since the 1990s, Swedish politicians have generally shown a strong preference for ideas of ecological modernisation, expressing a belief that economic growth and environmental objectives can be smoothly addressed in an integrated manner through technical innovations, green design and environmental reforms (e.g. Anshelm, 2004; Sandström and Sténs, 2015). Accordingly, a renewed focus on increasing wood production (Bill [Proposition], 2007/08:108) is represented as a means to mitigate climate change and boost the development of a bio-economy (Bill [Proposition], 2013/14:141). Reflecting a strong global ecological modernisation frame (Pülzl et al., 2014), a "win-win" situation between economic and environmental objectives is thus constructed. Hence, the *more-of-everything-*pathway is powered by the optimistic view that it is possible to create more of existing forest resources.

We recognise that sustainable development is a contested concept and that there are various interpretations of the original Brundtland formulation (WCED, 1987). However, in sharp contrast to the optimistic ecological modernisation frame, a more radical interpretation of Brundtland stresses her calls for a recognition of planetary limits, limits to unrestrained growth and a redistribution of resources between the global North and South (Baker, 2007).

A sustainable development frame has been reflected in international forest policy since 2000 (Pülzl et al., 2014), but largely absent in Swedish policy, except for a declaratory and symbolic recognition of the severity of global environmental challenges. However, from a sustainable development perspective, solutions to the problems are constrained by a reluctance to recognise limits or goal conflicts, and a lack of mechanisms to make trade-offs and choices. We recognise that efforts and progress to address these obstacles have been made in recent decades. Nevertheless, risks remain that the *more-of-everything* pathway will fail to implement structural change and maintain the status quo, pursuit of which has been referred to as a "politics of unsustainability" (Blühdorn and Welsh, 2008).

A recurring argument in the Pathways literature is that there is a pervasive tendency for powerful actors and institutions to "close down" around particular "framings" committing to particular pathways that emphasise the need to maintain stability and control (Leach et al., 2010). Addressing the full implications of change, according to Leach et al., requires an "opening up" to a diversity of actors, perspectives, methods and tools. Our analysis of the current Swedish model shows that adjustments and trade-offs are expected to be made through dialogue and consultation, consistent with a Swedish deliberative and consensual policy style (Lundqvist, 1997). In theory, this approach is also consistent with the recommendation to "open up" (Leach et al., 2010). However, the extent of any "opening up" inevitably depends on who is invited to participate, and how they participate. Our analysis shows that a relatively narrow range of actors is recognised as having formal rights or duties in the forest governance system, although a considerably broader range is normally consulted or involved in more informal capacities. The actors that are invited to participate in a specific dialogue or consultative process depend on the scope and context of the focal initiative. However, all forest policy debates are inherently political and power relations determine who is given voice and influence, and who is not, as illustrated by a state-initiated deliberative process to specify the Sectoral Objectives (see Fig. 3) analysed by Sundström (2005; 2010). He describes how required political adjustments became blurred and difficult to discern when relegated for resolution in enlarged, cross-sectoral deliberative arenas. Mandates and forms of accountability were

often unclear. A conclusion is that the blurring tends to benefit the traditionally influential forest sector actors, e.g. the state, forest owners and forest industry (Sundström, 2005). These findings are corroborated by analysis of another state-initiated consultative process on forest protection presented by Beland Lindahl (2008, 2013). Similarly, following analysis of representation in the Wilhelmina Model Forest (a deliberative process involving the state, private sector and indigenous Sami people) Klenk et al. (2013, p. 173) concluded that the process had legitimatised the dominant discourses rather than promoting "political participation". These studies suggest that uneven power relations, unclear mandates and vague forms of accountability favour the state, forest owners and forest industry. In effect, wood production and a productionist agenda are prioritised. Moreover, these deliberative and consultative processes primarily involve organised actors, leaving a large group of citizens, forest owners and users, who are not well organised and lack networks, with paltry means to exert influence (Beland Lindahl, 2008; Beland Lindahl et al., 2013). Despite an explicit ambition to "broaden out" policy formulation and involve actors in the policy-making process, the prevailing mechanisms for implementation and participation result in a relatively closed system for making decisions and trade-offs. Consequently, *more of everything* is likely to result in "more" for those who have voice and influence, and "less" for those who lack resources and networks.

5. Conclusions

Swedish forest policy has historically prioritised wood production and the economic dimension of sustainable development. Since 1993, many Swedish actors have made considerable efforts to balance the dominating productionist pathway with various environmental, social and cultural considerations. Based on our analysis, we suggest that the current Swedish forestry model is promoting a pathway to sustainability that can be labelled *more of everything*. Its strengths are its attempts to *broaden out*, to address new sustainability challenges, include new goals, seek ways to integrate policy across sectors, promote deliberation and introduce new management approaches. These strengths are primarily observed at the problem formulation level on the input side. However, weak mechanisms to implement policy and to make choices and trade-offs between conflicting goals hamper goal achievement. Political adjustments are relegated to enlarged, cross-sectoral deliberative settings where traditional forest sector actors are influential. This results in a relatively *closed* politics maintaining the status quo.

The *more of everything* pathway is influenced by ideas of ecological modernisation and the optimistic view that it is possible to create more of existing resources. However, while broadening out inputs it closes down outputs (cf. Leach et al., 2010, p.122), a shortcoming that hampers its capacity to respond to current sustainability challenges. Based on this analysis, we argue that the model still prioritises wood production and the economic dimension of sustainability. Consequently, there is a need for a broad public debate, not only about the role of forests in future society but also about the understanding and operationalisation of sustainable development.

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