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Who pulls the strings? - Key stakeholders in Swedish forest policy development

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Abstract

Forest policy is subject to much debate due to its significance for both biodiversity, climate change mitigation and economy. This study uses the Institutional Analysis and Development (IAD) framework and a Linear Probability Model regression analysis to estimate the impact of different stakeholder groups on finished forest legislation. I make use of data from a referral round of a recent official Swedish forest investigation (SOU 2020:73), consisting of 158 stakeholder inputs on 63 policy change proposals. I find that positive input from stakeholders is positively correlated with the chances of the policy change to be included in the final policy legislation. Also, input from stakeholders more interested in wood and biomass production correlates more strongly with the final policy than input from the groups more interested in the environmental and cultural values of the forest. The findings highlight potential differences in stakeholder impact on forest policy, and a method to empirically investigate this further.

Abbreviations

FES - Forest Ecosystem Services
IAD - Institutional Analysis and Development framework
LPM - Linear Probability Model
SOU - Statens Offentliga Utredningar (Swedish official investigations)

Contents

1 Introduction and background

1.1 Forest policy

Natural resource governance has become increasingly relevant in light of the changing climate and governments' willingness to take part in climate change mitigation ('Structure — IPCC', 2022). But the processes of creating new policy and at the same time making sure that all the relevant stakeholders are heard can be difficult, especially when it comes to natural resources connected to several ecosystem services.

The involvement of civil society in policy making is encouraged in modern democracies. Not only for transparency and implementation reasons, but also to make sure new policy is expedient for the ones affected by it, the stakeholders. From the side of the policymakers, there is an interest in making sure that the relevant stakeholders get their say, and corresponding influence of changing the policies. But figuring out who the stakeholders are is not always easy.

The structure for owning forest property in Sweden is regulated in pursuit of preserving the current share of approximately half of the forested area belonging to private owners (Riksdagsförvaltningen, 1979). Corporations, the Church of Sweden, and the state own the rest. The motivation behind this legislation is to ensure diversity in forest stakeholders. From the legislators' point of view, civil society with its private forest owners and non-profit organisations should be mixed with corporate and state interests to warrant enduring forest management (*Proposition 1990/91:155 - Riksdagen*, 1990).

The combination of forest, forestry, biodiversity, and climate change mitigation has been subject to a lot of debate during the last decade in Sweden. Strong opinions of preserving large forest areas to not interfere with biodiversity has been put up against the ambitions to increase forest productivity in favour of using wood and biomass as substitute for fossil raw material.

This vivid debate went as far as being part of the formation of government after the 2018 Swedish election. Point 26 in the so-called January agreement, a 73-point checklist for the minority government to agree to before being accepted from some of the opposition parties, specifically points out that an official investigation should go through the current state of forest and forestry and suggest policy changes to strengthen property rights for forest owners. This was supposed to ease the tension between the different sides in the debate. The investigation was launched in 2019 and finished in 2020 (SOU 2020:73), resulting in new policy voted on in the parliament in 2022.

1.2 Problem, method, and previous literature

The problem this paper analyses is if it is possible to say that stakeholders in general affect forest policy making. And if some stakeholders, grouped by their interest, have bigger impact than others.

An important part in making sure new policy is efficient and to the point is to evaluate past policy changes, and in that process also evaluate who influenced those. Stakeholder analyses are often done ahead of launching new policy to make sure that every point of view that

should be considered is. But as a part of that process, it is also important to investigate who influenced past policy to avoid iterating previous mistakes.

This paper compares finished new Swedish forest legislation with the first policy draft and the changes proposed in the round of referral by different stakeholders. I first test if there is any significant correlation between stakeholder input and the outcome of the policy proposal being included in final policy. The next step is to divide stakeholders into groups based on their interest. I then run Linear Probability Model (LPM) regressions, with Probit as a complementary specification, where I estimate the correlation of the output with the different stakeholder groups' input.

The findings are that input from stakeholders correlates with the outcome of the policy changes. For every additional stakeholder backing a policy change, the chances of it becoming new policy increases by 0.93 percentage points (2.66 percent relative increase). Further, when splitting the effect by stakeholder groups the input from the production-oriented stakeholder group has a significantly higher correlation with the policy outcome than that of the environmental-oriented group (p-value 0.001). Positive input from the Production group increases the chances of the policy change making it to the final stage by 3.24 percentage points (9.26 percent relative increase), while the correlation for the Environmental group is negative and statistically insignificant. No significant correlation is found on negative input from the stakeholders and policy changes not becoming new policy.

Previous literature on policy analysis, stakeholder analysis, and Institutional Analysis and Development (IAD) focuses on creating frameworks for simplifying the policy process to be able to structure the analysis (Paul A. Sabatier, 2019). Stakeholder analyses mainly use qualitative methods to evaluate stakeholders and their input, while policy analyses and IAD mostly provide theoretical approaches. I contribute to the existing literature with empirical estimates of stakeholder impact, based on the theory of the IAD framework and a unique dataset. To the best of my knowledge, this application is novel in using a quantitative approach to evaluate stakeholders in forest policy. My findings can be used to help policy makers in the forest sector to get a better understanding of the stakeholders' impact.

1.3 Aim and delimitations

The aim of this study is to investigate if stakeholders in forest ecosystem services affect Swedish new forest policy, and in that case who has the most influence.

The paper is limited to analysing one major policy process, which has been subject to a comprehensive national debate about Swedish forests in general. The paper follows the policy process from start to finish, beginning with the official investigation (SOU 2020:73) launched in 2019, then going on to the referral round and then re-processed by the government and put to a vote in the Swedish parliament in March 2022.

Stakeholders and policy changes are divided into groups based on their main focus. This choice of grouping is based on literature on stakeholder analyses for natural resource management (Raum, 2018). The biggest group of stakeholders are local, regional, or national authorities who in this paper are considered neutral since they are expected to act on behalf of the collective good of all stakeholder interests. As a reflection of the public debate that preceded the investigation, the other groups included in the analysis have a clear interest in either environment, culture/recreation, or wood and biomass production.

An interesting next step would have been to divide both the policy and the stakeholders further into their respective focus on different forest ecosystem services, but with the limited amount of time to collect data, the sample of policy changes did not prove to be large enough to be separated into more groups without impairing the precision of the econometric results from the regressions.

1.4 Background

In the process of creating new Swedish policy, the government usually issues a formal investigation into the matter, called a Swedish official investigation (SOU). The investigation is often given between one and two years to be completed. Its purpose is to collect and compile a vast base of information on the matter and formulate suggestions on policies to improve the current policy.

When finished, the investigation is presented to the public and officially handed over to the government, who has the formal power to initiate new legislation. The government then usually issues a "round of referral", i.e., the policy changes suggested by the investigation (sometimes slightly altered by government before being issued) is sent out to a selected number of stakeholders to have input on. This is done both to make sure that the new policies suggested are efficient for the ones who will be most affected by it, and also to ensure that the implementation when realised will be smooth (Riksdagsförvaltningen, 2022).

The referral bodies, the stakeholders, are usually given a few months to provide their input which is to be a written document submitted to the responsible governmental department and published online for public access. There is an official list of referral bodies, but anyone can send in input on the suggested new policy and expect to be considered. However, the input from the stakeholders not officially called upon are not published by the government, only the names of the stakeholder organisations. This may be a source of omitted variable bias in this project, since information shared in these inputs may correlate with the input from the groups of official stakeholders and thereby affect the outcome indirectly, thus biasing the observed estimates. However, these inputs should have less value to the government since they are not officially invited, implicating that they are not considered having vital stakeholder status.

The freely accessible publications of the investigation, the policy proposal, and the input from the referral round makes it relatively easy to follow the official process. Of course, lobbying and opinions shared outside of this official process will also affect the policies in a way that is harder to quantify. But the statements in the official referral inputs reflects the opinions that the stakeholder actors have and are probably lobbying for in other arenas as well. A referral input is a public positioning in the debate, clarifying the opinions of the stakeholder.

The policy proposals chosen to be analysed in this paper comes from a single, substantial investigation, SOU 2020:73 launched after the January agreement in 2019. It was chosen on the grounds of being a highly anticipated investigation following years of political debate and the rise of forests as an important resource in climate change mitigation.

The January agreement of 2019 is a list of 73 policy change agreements laid forward by four political parties in the Swedish parliament, Centerpartiet, Liberalerna, Miljöpartiet and

Socialdemokraterna (the Centre party, the Liberals, the Green party, and the Social Democratic party). After the 2018 parliament election, there was no base for a majority government to be formed. For the Social Democratic party to be able to form a minority government, they had to collect support from other parliament parties, and did so by promising to implement all of the 73 policy suggestions during their term in government. Point 26 in this agreement is about protecting and strengthening property rights for forest owners and states that "Official investigations are appointed on strengthened property rights, new flexible protection and forms of compensation for land protection and how international commitments on biodiversity must be compatible with a growing circular bioeconomy. Official investigation 2019. New legislation from 1 July 2021".

The next point in the agreement, point 27, states that the new government should "Secure resources for the protection of valuable nature. Appropriations for protection of a valuable nature strengthened. A new Sveaskog program will be implemented. The state must be a forerunner in sustainable forestry and show great consideration for nature."('Sakpolitisk överenskommelse mellan Socialdemokraterna, Centerpartiet, Liberalerna och Miljöpartiet de gröna', 2019).

The official investigation from point 26 was given the name "Strengthened property rights, new forms of flexible protection and nature conservation in the forest" but was called "the forest investigation" (Skogsutredningen) in short. It was officially initiated by the government on 18th of July 2019 and was supposed to publish the results on 1st of July 2020, but was delayed due to the official investigator wanting more time, and was not published and handed over to the government until the 30th of November 2020. When an official investigation is published, it gets a name based on which number of official investigations it is in the year it is finished, so "Skogsutredningen" received the name SOU 2020:73 since it was the 73:rd official investigation to be published in 2020.

SOU 2020:73 consisted of a total of 1298 pages divided into three parts. The investigation performed a thorough description of Swedish forests and implications of earlier forest policy and made suggestions of new policy changes in several areas connected to forestry, property rights for forest owners and protection of valuable nature resources (Regeringskansliet, 2020). It is safe to say that both point 26 and 27 from the January agreement were implemented.

After the launch, the official investigation was subjected to criticism in the public debate for being too focused on protection of forest areas. Many, approximately half in a rough estimation, of the policy change proposals focused more on preserving forest areas, while the other suggestions were more in line with strengthening property rights for forest owners. The criticism was grounded in the notion that the main focus of the investigation was supposed to have been on property rights, but was now making a lot of policy suggestions on excluding more forest area from production (*Altinget.se*, 2020).

But the official investigator, who lead the work and has the main responsibility for the results, claimed that all of the policy change suggestions should be viewed as a uniform reform to make Swedish forest policy more expedient as a whole (*ATL*, 2020).

After a few months of debate, the government issued a referral round in February 2021 for all of the policy changes made by the investigation. The referral bodies were supposed to hand in their input before the end of April same year.

Some examples of suggested policy changes were:

- Formally protected areas of forests should be based on voluntary involvement
- Requirements for knowledge base of environmental information for forest owners
- Shortened notice time for felling report
- 500,000–525,000 hectares of productive forest land are set aside for nature conservation, mainly in mountain areas

Based on the official investigation and the inputs on it, the government published a proposition called “Strengthened property rights, flexible forms of protection and increased incentives for nature conservation in the forest based on voluntary involvement” (Prop. 2021/22:58). 21 out of the approximately 63 suggested policy changes from the investigation made it to this proposition.

The proposition was processed in the parliament and put to a final vote in March 2022. The parliament voted in favour of all the proposed policy changes, and also added an additional four “announcements” (prompts for the government to implement).

SOU 2020:73 yielded at least two policy change propositions from the government, an additional to the one voted about in the parliament in March 2022. But the one chosen for this paper was the only one that was finished in time to be analysed in this thesis. However, the other one and maybe more to come, would have been interesting to add and may be subject to further research.

2 Theoretical framework and literature review

2.1 Theoretical framework

Chapter 2.1 provides an overview of the theoretical background to the paper. This section introduces policy analysis in general, stakeholder analysis as a concept, and IAD specifically. The literature review is found in Section 2.2.

2.1.1 Policy analysis

Policy analysis can be defined as a scientific field of evidence-based advice giving. It evolves around systematic comparison of strengths and weaknesses of alternative ways of addressing a problem (McDonald, 2019).

This field of study answers to a societal need of making sure policies and institutional structures are expedient in serving all affected parties in the best possible way. When the outcome in an economy is somehow suboptimal, it is by economists often referred to as a market failure where an idealised standard is unreachable without interference of an organised structure, which public policy strives to be (Weimer and Vining, 2017).

The net benefit consumers and producers receive from participating in the open market can be denoted social surplus, which is a positive feature produced in efficient economies. However, public decision makers or other members of society may find it worthwhile to compromise with economic efficiency to protect human life, "artificially" increasing the social surplus for selected areas or individuals often at the expense of producers. This has shown to be frequently occurring in the context of climate change mitigation. But interfering by excludability, which is often the case in climate policy trying to reduce emissions, is risky because of its interference with property rights. Trying to perfect society through too much public intervention should be used with caution because it arises from imperfect collective choice and may require challenging implementation efforts (McDonald, 2019). The implementation process may for example be slowed by different stakeholders opposing public intervention that is somehow inconvenient for them. An example of this can be an environmental activist opposing a felling of forest in an area which the activist is valuing based on biodiversity, but the public authority steps in to defend the forest owners right to use their forest. Or vice versa, a forest owner is stopped by public intervention from felling their forest because of the argument of biodiversity loss if the felling is conducted. In both cases, there is a balance act of how much and in what way the public authorities should intervene to protect interests of the common good, maintaining maximum value of social surplus, at the expense of for example economic efficiency or property rights.

Policy analysis is often done in steps of first structuring the policy problem, then forecasting expected policy outcomes, prescribing preferred policies and finally monitoring and evaluating the outcomes and how well the policies performed on handling the initial policy problem (Dunn, 1981). To be successful, policy analysts should assess the political feasibility of specific policy proposals in specific contexts. To make sure of the efficiency of new policy, it needs to be very clear who is targeted and that there are no severe "side effects" in inefficiencies unaccounted for (McDonald, 2019). For example, a policy solution to recover watered down property rights for forest owners is to formulate laws that allows them total freedom to use their forest properties for whatever they find useful. But this may cause severe side effects in terms of loss of ecosystem services that are viewed as common pool resources.

2.1.2 Stakeholder analysis

A stakeholder is since the early 1700s defined as “a person who holds the stake or stakes in a bet” but has since then developed in modern day to imply a “person with an interest or concern in something” (Ramirez, 1999). However, in the literature connected to natural resource management the stakeholders concerned are “natural resource users and managers” (Ibid). In a stakeholder analysis, these “users and managers” are investigated in hope of giving an identification and description of them as close to the truth as possible. This is often done by examining their attributes, interrelationships and interests related to a given issue or resource.

The stakeholder analysis becomes a part of analysing the efficiency of current policy and trying to predict possible outcomes of future policy. A good knowledge of the stakeholders involved can be useful in avoiding aggravating conflicts, make sure marginalised groups get to participate, and make a fair representation of diverse interests (Prell, Hubacek and Reed, 2007).

However, it can be a fair challenge to know which stakeholders to focus on and limit the analysis to. The analysts are therefore at risk of bringing their own views on the subject into the selection process of picking the stakeholders of interest, bringing bias into the analysis (Brugha, 2000). Different tools can be used to try and make a structure for avoiding bias. One of these tools is the “4Rs” which divides the stakeholders into rights, responsibilities, relationships and revenues (benefits), and then assessing the relationship between these roles (Janssens de Bisthoven *et al.*, 2022). Using this kind of tool to make sure all relevant parties are included is not only useful for the analyst but also of course for policymakers. In the Swedish process of policymaking, the referral rounds are used as a tool to get stakeholder input and the choice of which stakeholders that are to be included falls upon the government. Policy analysts can then evaluate the choice ex post.

Usually, a big part of doing stakeholder analysis is interviewing the stakeholders to get information on their views. It is also possible to get results without their active participation. Where there is substantial documentary evidence of the stakeholders standpoints, or the analyst have good comprehension of their stake in the subject under investigation, there should be no need to engage the stakeholders themselves (Reed *et al.*, 2009). Stakeholder analyses that are done using documented data rather than interviews, leaning more towards quantitative than qualitative measures can also be easier to aggregate and replicate.

2.1.3 Institutional analysis and development framework

Institutional analysis and development framework provides structure on how to understand policy processes and the development of institutions. Given the complexity of policy processes, analysing it must contain simplification on some level (Paul A. Sabatier, 2019). One of the main contributors in this area is Elinor Ostrom, who created guidelines for analysis simplicity. In the IAD framework, Ostrom divides the different policy processes into “action arenas”. For this arena to exist, situation is fixed in the short term, and there are “actors in position” meaning they are able to affect the policy somehow. Dividing a big political change

into these smaller pieces of action windows and analysing them separately makes it easier to understand the bigger picture in a later stage (Andersson, 2006).

The IAD framework puts emphasis on how the institutions themselves affect the policy process. An institution in this context should be thought of as a widely understood rule, norm or strategy that pushes incentives for certain behaviours in repetitive situations. These institutions are used to ease the necessary coordination between different groups or individuals in the many situations that require it (Polski and Ostrom, 1999).

2.1.3 IAD and natural resources

In economics, the nature of a good or service can be specified by two attributes: 1) the extent to which access to consumption can be controlled (excludability) and 2) the extent to which one person's consumption reduces the supply available to others (subtractability) (Polski and Ostrom, 1999).

Forests as a natural resource are subject to political considerations on how to gain maximal utility from the forests by controlling the excludability to make sure the subtractability is low and that there are no "free riders" who diminish the collected value of the ecosystem services that the forest supplies (ibid).

2.2 Literature review

In "Theories of the Policy Process" by Paul A. Sabatier, a substantial part of the theoretical groundwork for analysing the processes of the making, implementation and evaluation of policies is laid out. Sabatier makes it clear that simplifying the policy process of interest is necessary to be able to get any outcome in terms of knowledge from the analysis. To do this, the analyst is often aided by its own previous knowledge and presuppositions. Many economists in this field are prone to rely on rational choice approaches, which provides a frame on what to focus on. The priorities outlined are: (1) focusing on formal leaders of a selected institutions with formal decision-making authority (2) assuming that every actor is pursuing self-interest (material wise) and (3) grouping actors based on what type of institution they belong to (e.g. legislatures, administrative agencies, and interest groups) (Paul A. Sabatier, 2019)

However, when looking to analyse policies concerning natural resources, other bases for grouping actors can also be relevant to consider. Susanne Raum states in her study "A framework for integrating systematic stakeholder analysis in ecosystem services research: Stakeholder mapping for forest ecosystem services in the UK" that linking the actors affected by for example forest policy to forest ecosystem services and systematically map them into groups based on these "will be essential for equitable and sustainable ecosystem governance and management". In the stakeholder analysis Raum makes, she divides the forest ecosystem services into regulating, provisioning and culture (Raum, 2018). The choice to map actors in accordance with their respective interest in ecosystem services has been done in several other studies concerning natural resources and has proven to be useful in stakeholder analyses.

To further understand the context of forest governance in particular, the analytical tools presented by the Institutional Analysis and Development framework (IAD), championed by Elinor Ostrom, has been used in several analyses. One of the main goals with the IAD

Framework is to study the patterns of interaction by the main actors in the action arenas to be able to predict outcomes of similar governance in the future. This provides a valuable tool for policy makers and analysts (Ostrom *et al.*, 1994). Applying IAD on the forestry sector has proven to be quite a good match for understanding the institutions governing the resource.

In 2006, Krister Andersson applied the IAD framework to test hypothesises about optimal institutional settings for a sustainable decentralised forest governance, using data from Bolivia. Andersson's main focus is on decentralisation and measuring governance outcomes on actors that are as close as possible to the governed forests. But whether looking at the hierarchical top or bottom in the governing system, he stresses that the IAD framework helps to establish boundaries for the analysis, which in the framework is described as deciding what action arena to focus on. It can for example be defined as the forestry sector in a particular level of governance, or as in Andersson's case the local forest-related actors in Bolivia (Andersson, 2006). After the action arena is decided upon, the main actors should be found. Deciding who these are is usually done using the analyst's knowledge about the sector. In this paper, the action arena of interest is the referral round and the actors involved are the referral bodies/stakeholders.

In a Swedish setting, the IAD framework has been used previously to analyse optimal settings for forest management in the north. In northern Sweden there is a conflict of interest between land use for forestry and reindeer husbandry that sometimes leads to conflicts. Camilla Widmark of SLU applies the IAD framework in her 2009 paper "Management of multiple-use commons - focusing on land use for forestry and reindeer husbandry in northern Sweden". Using this framework, Widmark concludes that the present institutional setting of using consultations between the different interest groups was not sufficient to overcome the conflicts in the base (Widmark, 2009).

3 Method and empirical model specification

3.1 Data collection

Chapter 3 provides an overview of the data used for the empirical analysis in this paper and the regression specifications used to capture the stakeholder impact.

3.1.1 About the data

As mentioned, I compare finished new Swedish forest legislation with the first draft and the changes proposed in the round of referral by different stakeholders. Based on the IAD framework definition of action arena, I use the referral round of one legislative process to proxy the general debate about Swedish forest and forestry policy and opinions expressed in it.

The policy proposals chosen for analysis in this paper comes from a single, large investigation. This investigation is chosen on the grounds of being a highly anticipated investigation following years of political debate and given the rise of forests as an important resource in climate change mitigation. It also contained a large enough number of policy changes to be suitable for a quantitative analysis.

The referral bodies received the formal referral from the Ministry of the Environment on the 12th of February 2021 and were obliged to submit a written answer before the 30th of April. However, some referrals were sent in a few days after the deadline and were still considered.

158 referral input documents were manually read through and classified. These were downloaded from the Government Offices of Sweden official website (Regeringskansliet, 2021). But beyond the official referral bodies that were called upon by the Ministry to give input, there were an additional 65 stakeholders that chose to submit referrals which everyone is allowed to. It is hard to say how much these additional entries were considered by the Ministry, and they are not published for the public to review. In this paper they are excluded from the analysis.

There were approximately 63 different policy changes to have input on. It is an approximate number because some suggestions contain several smaller changes that the stakeholders may react to as a package or separately. Some policy changes only refer to text-change in the legislation and are considered their own even though they somehow refer to other policy changes that are described in other text in the investigation. The ultimate demarcation is arbitrary but there are arguments backing the selection of defined policy changes.

Interview answers, that are commonly used in other studies of stakeholders within the IAD framework, bear a close resemblance to the data used in this paper. The difference being that the answers are put to a government referral instead of to a question from an interviewer. This could make the answers more heterogenous since the format for referral input is not specialised. But there should be no reason to believe that the expressed opinion of the stakeholder would vary conditional on which one of these methods are used to collect their answer.

3.2 Data definition and delimitation

3.2.1 Definition of variables

Input from the referral body in favour of the policy proposal was included as a category in the data set. On the opposite, a disapproving input from the referral body on the proposal was coded as a different category than positive input. No input or input that could not be interpreted as either in favour or unapproving of the proposal are missing values in the dataset. For example, wordings like "if this policy is put in place, we think it should be changed in this way…" has been considered as a missing value.

Even though the referral bodies were encouraged to clearly link their input to the specific policy propositions in the official investigation, many chose to share general opinions about the subject area. In some cases, the opinions shared were implicitly connected to the policy propositions and could be inserted in the data set. In other cases, they were not and were therefore not considered.

Some referral bodies chose to only give input on the policies that would affect them directly, others chose to give input on every section. Some inputs were given to a specific subsection, other to a whole chapter and all the levels in between, therefore the risk of misinterpreting their input is positive. The length of the input documents from the referral bodies varied from 1 to 38 pages.

The outcome chosen for analysis is binary, where I assign the value 1 (one) to policies included in the final policy proposal, and 0 (zero) otherwise. In this analysis, 21 out of 63 policy changes made it to final policy. This outcome is not a 100 percent precise measure since the policy changes that didn't make it this time can be put to vote later or realised in a different manner, without being voted about in the parliament. This is a limitation, but the official process is interesting enough to analyse on its own and is most likely indicative of a larger trend. Using the data from the referral rounds, I then create explanatory variables counting the number of positive/supportive inputs and the number of negative inputs for each policy proposal.

3.2.2 Definition of groups

The groups of interest are stakeholders with main interest of either production values or environmental values. The division into these two groups is based on the debate preceding the investigation, resulting in two main groups. However, a further distinction was done trying to sort on basis of forest ecosystem services separating a "culture/recreation group" of stakeholders, valuing ecosystem services like hiking or historical artefacts. This grouping is part of defining the main actors in the IAD framework. Earlier stakeholder analyses have successfully used forest ecosystem services as a base for differentiating the groups.

112 stakeholders are authorities that are defined as neutral. 43 are defined after interest. See Table 1 below for the number of stakeholders by each interest group.

Table 1. Summary of stakeholder groups.

Main interest of stakeholder group	Number of stakeholders	Example of stakeholders belonging to this group
Production	25	Södra skogsägarna, IKEA

Environment	8	Greenpeace, Fältbiologerna
Culture/recreation	10	Naturturismföretagen, Friluftsfrämjandet
Neutral authorities:		
National level	39	Vinnova, Naturvårdsverket
Regional level	45	Länsstyrelsen Dalarnas län
Local level	28	Municipality of Högsby
Undefined:	3	

3.2.3 Summary statistics

63 policy changes were analysed. 21 made it to the final proposal and 42 did not. Out of the 63, the number of inputs from the stakeholders on the separate policy changes ranges from 0 to 79 per policy change with a mean of 16. The policy changes have a categoristion on whether they mainly concern environmental or production issues. 14 of the policy changes are in legal formulations only and therefore not categorised into being a part of either environmental or production profile change, that is why the "Share production profile" and environmental ditto only have 49 observations. See table 2.

The mean value of the number of different input categories is generally quite low. This is because many stakeholders chose to have input on only a few policy changes, leaving missing values on the rest.

Table 2. Descriptive statistics.

Variable	Obs.	Mean	SD	Min	Max
# of inputs	63	16.2381	20.16922	0	79
# of backing inputs	63	11.93651	14.94061	0	57
Share environmental profile	49	.4693878	.5042338	0	1
Share production profile	49	.5306122	.5042338	0	1
# of negative inputs	63	4.301587	7.03364	0	29
Share backing inputs	53	.7702458	.2455651	0	1
# of production stakeholders inputs backing	63	3.619048	5.271434	0	17
# of production stakeholder inputs	63	4.47619	5.610638	0	17
# of national authorities backing	63	2.31746	2.872705	0	10
# of national authorities	63	3.269841	4.020939	0	15
# of regional authorities backing	63	3.698413	5.275124	0	24
# of regional authorities	63	4.460317	6.119312	0	25
# of local authorities backing	63	1.174603	2.549761	0	12
# of local authorities	63	1.460317	2.844493	0	13
# of environmental stakeholders backing	63	.6349206	1.235256	0	5
# of environmental stakeholders	63	1.460317	1.838876	0	6
# of culture stakeholders backing	63	.4920635	.8589757	0	4
# of culture stakeholders	63	1.111111	1.566907	0	5

3.3 Empirical model specification

To capture the correlations, I use regression specifications based on the Linear Probability Model (LPM) to fit a line that minimises the squared residual deviation. As an additional verification, I also use a Probit model specification to better capture any non-linearities in the data.

The LPM model is chosen based on the simplicity of interpreting the results when the outcome is binary. The model fits a straight line between the biggest clusters of outcome, a linear proxy on how the explanatory variables affect the outcome. The main argument against using LPM is that the true relationship between a binary outcome and explanatory variables rarely is linear, and the results of running a LPM regression can in some cases give results on impact-probability interpretations exceeding 100 percent. Therefore, the Probit model is chosen as a complemental specification to further establish the reliability of the results. A Probit regression fits a nonlinear trend for binary outcomes and the interpretation of its results on probability are bounded between 0 and 100 percent.

Two main specifications are outlined in the regression equations below:

$$y_i = \beta_0 + \beta_1 Input_i + \epsilon_i$$

Where y_i is the binary outcome of the policy change making it from the official investigation to becoming new policy, and $Input_i$ is the number of positive or negative input from the stakeholders. The first regression tests the correlation between all stakeholder input and outcome, investigating positive and negative input separately. Second, a correlation test is run to test the difference in input from the different groups. And lastly, a regression testing the influence but splitting the correlations by group status is run. The last specification is outlined in the regression equation below:

$$y_i = \gamma_0 + \gamma_1 Prod\_supp_i + \gamma_2 Env\_supp_i + \epsilon_i$$

Where $Prod\_supp_i$ is the number of production-oriented stakeholders supporting the policy change, and Env_supp_i is the number of environmental oriented stakeholders supporting the policy change.

These specifications capture the linear effect of stakeholder input, where I expect additional support for the policy change to have a positive impact on the outcome.

4 Results, analysis, and discussion

Chapter 4 presents the results of the main analyses and discusses the different findings.

4.1 Results

The results section consists of results from the regression tests in three steps. First, I estimate the correlation between the policy outcome and the combined input from all stakeholders, after which I run a correlation tests between the different stakeholder groups, and lastly the main test exploring the partial correlations between positive input from the different stakeholder groups and the outcome.

4.1.1 Stakeholders differ between groups and affect what policy changes made it to final proposal.

1. Correlation between all input and outcome

The first regression is a try to test whether the policy changes that make it to the final parliament proposal are at all affected by the stakeholders' collective input. The results show a significant and positive increase of the chances to be included in the final policy for every additional stakeholder support by 0.9 pp. (0.009, s.e. 0.004). Meaning that policy changes backed by positive stakeholder input increases the chances of it becoming new policy. This effect is small but still enough to conclude that there is an effect to further explore.
The effects are also present in the Probit specification, where the marginal effect is evaluated at the mean number of input. It is positive and significant of a similar magnitude as the LPM specification (0.009, s.e. 0.004). The number of observations here are 60 instead of 63, since the outcome status for three of the policy proposals could not be determined.

Table 3. Correlation test of positive stakeholder input.

	LPM	Probit	Probit Margins
	Prop. status	Prop. status	Prop. status
Variable			
# of inputs backing	0.00928**	0.0251**	0.00925**
	(0.00364)	(0.0107)	(0.00428)
Constant	0.235***	-0.710***	
	(0.0748)	(0.227)	
Obs.	60	60	60
Adj. R2	0.086	0.065	0.065

Heteroscedasticity robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Since 35 percent of the policy changes made it to the final proposition, the relative increase of the impact factor is 0.009/0.35 = 0.026 making it roughly a 3 percent relative increase of the policy change to happen for every additional positive stakeholder input.

I also explore if the negative input from stakeholders affects what policy changes did not make it to the final proposal. The LPM results for this outcome are small (0.005, s.e. 0.009) and not significant here at all. The same holds for the Probit specification. See table 4. However, the main focus in this paper is looking at the positive feedback.

Table 4. Correlation test of negative stakeholder input.

	LPM	Probit	Probit Margins
	Prop_status_no	Prop_status_no	Prop_status_no
Variable			
# of negative input	-0.00524	-0.0139	-0.00515
	0.00910	(0.0233)	(0.00852)
Constant	0.673***	0.450**	
	(0.0725)	(0.199)	
Obs.	60	60	
Adj. R2	-0.011		

Heteroscedasticity robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

2. Correlation between the input from the different groups

The classification of groups was done on basis of how they present themselves, the underlying idea was that they would have different opinions and input on the policy.

The scatter plot in Figure 1 confirms that the stakeholders mostly interested in production indeed differ from the stakeholders interested in the environment based on which policy changes they support. The dots in Figure 1 represent policy changes, and to the upper left there is a policy change supported by 100 percent of the environmental stakeholders but 0 percent of the production stakeholders. To the lower right there is a dot representing the inverse.
The stakeholders categorised as having environmental interest are quite homogenous in their input compared to the Production group. The difference in number of stakeholders can play a part in this difference, the Environmental group consists of only 8 stakeholders, while the production stakeholders are 25.

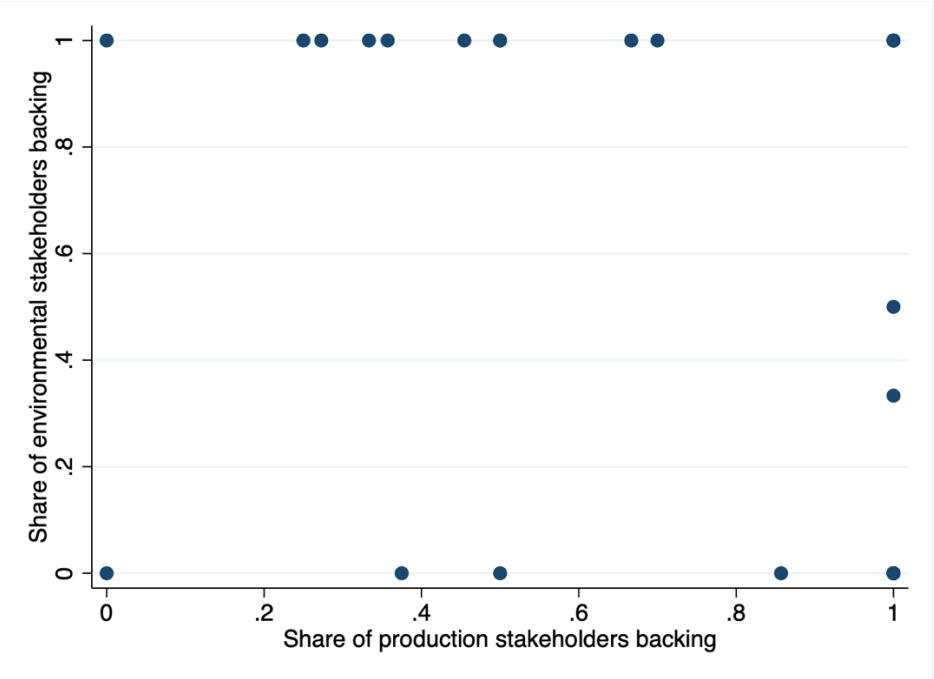

Figure 1. Scatter plot on share of environmental/production stakeholder backing policy changes.

A correlation test between the different stakeholder groups was done, see Table 5. Results show a high correlation on the input from the National authorities and the Production-oriented stakeholders, and almost zero between Environmental and Local authorities. But in general, the high correlation between several groups indicates that there are policy changes which align with many interests. However, the correlation between the number of positive policy input from the Environmental and Production groups only amounts to approximately 16 percent.

Table 5. Correlation on the number of positive policy input from the different stakeholder groups.

	Culture/ recreation	Environmental	Local authority	Regional authority	National authority	Production
Culture/ recreation	1.0000					
Environmental	0.6281	1.0000				
Local authority	0.2768	-0.0665	1.0000			
Regional authority	0.6170	0.4209	0.5700	1.0000		
National authority	0.6416	0.4877	0.5846	0.7685	1.0000	
Production	0.3662	0.1591	0.6878	0.6495	0.7782	1.0000

3. One group affects more than the other

The main aim of this paper is to investigate evidence on whether one stakeholder group affects the policy process more than the other. The results from regressions in Table 5 testing this is that yes, the input from the stakeholder group representing the production side of the forest ecosystem services have a greater positive correlation on what policy changes

suggested by the investigation that made it to the final proposal. Positive input from a production stakeholder means a 3.2 percentage points increase (0.032, s.e. 0.010) in the chances of it being included in the final policy with the LPM specification, and very similar result from the Probit model.

On the other hand, input from the Environmental group had a negative (–0.063, s.e. 0.033), although only statistically significant on a 10 percent level, effect on the policy changes, see Table 5. With the Probit model, the results are highly similar for the production-oriented stakeholders but not statistically significant for the Environmental group.

Table 6. Correlation test of input from the Environmental and Production group.

	LPM	Probit	Probit Margins
	Prop. status	Prop. status	Prop. status
Variable			
# of production-oriented inputs backing	0.0324***	0.0896***	0.0329***
	(0.00996)	(0.0314)	(.01162)
# of environmental-oriented inputs backing	-0.0633*	-0.206	-0.0756
	(0.0332)	(0.133)	(0.04915)
Constant	0.271***	-0.606***	
	(0.0770)	(0.227)	
Mean dep var.	0.35	0.35	
Obs.	60	60	
Adj. R2	0.140	0.110	

Heteroscedasticity robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Since 35 percent of the policy changes made it to the final proposition, the relative increase of the impact factor is 0.032/0.35 = 0.091 making it almost a 10 percent relative increase of the policy change to happen for every production-oriented group stakeholder supporting it. This is showed in the positive slope of the fitted line for the positive input from the production-oriented group in Figure 2. In the same figure, the negative correlation in the case of the Environmental group is clear.

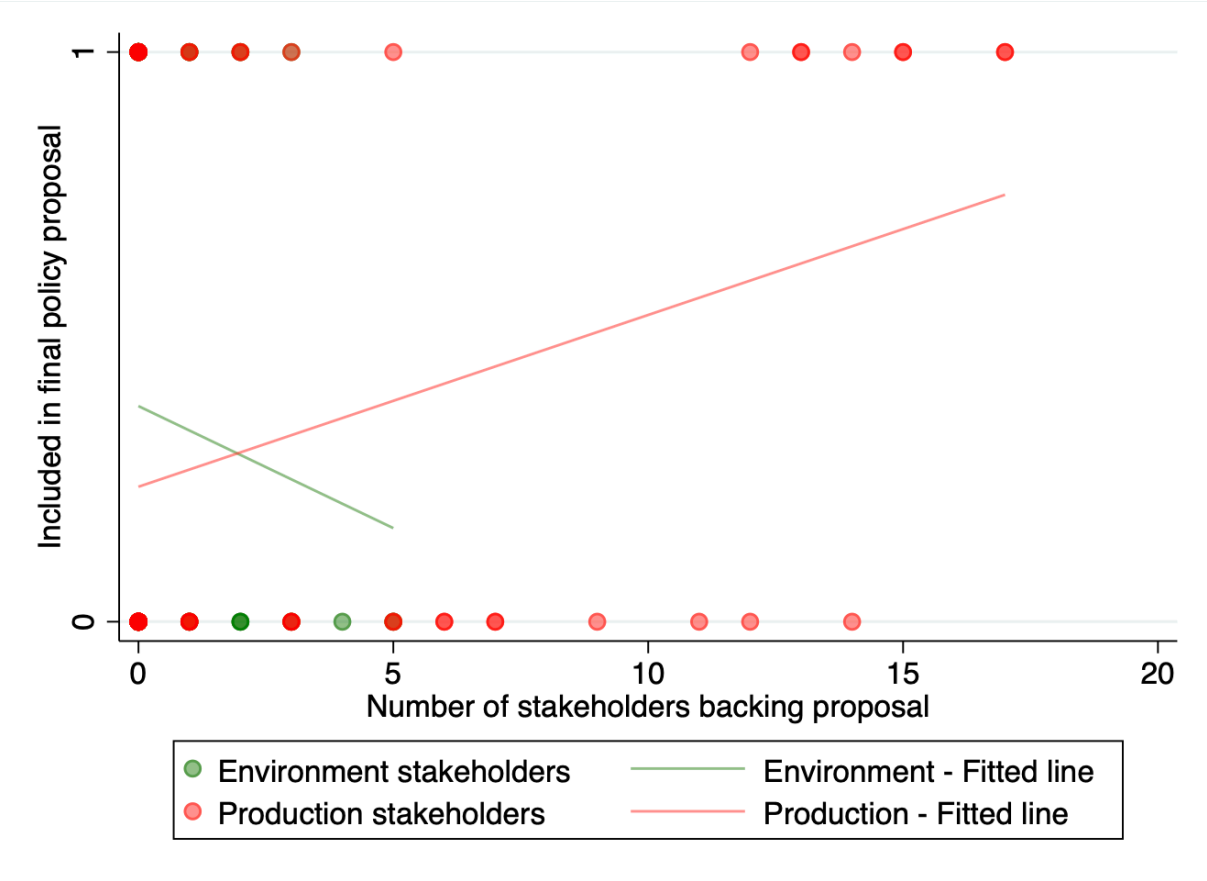

Figure 2. Fitted lines on the relationship of changes being included in final policy proposal and number of stakeholders backing it, divided on groups.

An F-test testing the hypothesis of the input from the two groups being equal can be rejected on a 1 percent significance level (Prob > F = 0.0081). This confirms that the two groups affect the outcome in different ways.

4.2 Analysis and discussion

4.2.1 Analysis

Brief summary:

1.Results indicate that the stakeholders affect whether the policy changes make it to the final legislation.

2.The input from the “Environment group” differs substantially from the input given by the “Production group”.

3.Policy changes were more likely to end up in final policy draft if they were backed by the Production group rather than the Environment group.

The results can be interpreted in a way that supports the notion of stakeholders impacting the policy outcome. In the first regression all input from stakeholders, no matter what group, were correlated with the final outcome and showed a positive but small correlation significant on a 5 percent level. This included all stakeholders, even the big groups of authorities considered neutral. The LPM and Probit models gave very similar outcomes which strengthen the results.

A correlation test shows that the two groups Environment and Production are quite different from each other when it comes to their input. So, when splitting the stakeholders and testing the correlation with the input from the Environmental group separately from the Production group, the regression analysis shows a larger positive correlation with the Production group and a negative correlation with the Environmental group. The different signs on the influence from the two groups might be an explanation to why the “impact factor” is less in the first regression, they simply cancel each other out.

It was expected that the impact from the input would correlate differently between the groups, but a bit surprising that one of the groups had negative impact from their input. It could be interpreted like the government is deterred from suggesting policies that are supported by environmentally interested stakeholders, but this is not the most credible explanation for the negative sign of the estimate. It is more likely that the policy changes that made it to the final proposal was more in line with the production-driven original purpose of the official investigation.

The final set of policy changes that were put forward by the government are most likely influenced by the political parties that initiated the official investigation in the first place. In the January agreement, it was clear in point 26 that the sought-after conclusion of the official investigation would be to strengthen forest owners right to use their forests in the way they seem best and to “further promote a growing forestry”. Which is very much in line with a production focus in terms of ecosystem services. But the result of the official investigation was policy changes to meet both sides of the debate leading up to it. This could be explained with the fact that Miljöpartiet (the Green party) was a part of the government in 2020 and the minister in charge of the department that initiated the official investigation (Miljödepartementet) was a member of this party. Miljöpartiet is clear on supporting policies that leans more towards preservation of forests rather than active forestry, so given the

opportunity they would probably have supported that the official investigation put forward suggestions on preserving environment rather than the original purpose of the investigation. In the end, the policy changes leaning more towards prioritising preservation of forests with protective measures may have been pushed out of the final proposition by the political parties behind point 26 in the January agreement, saying that they won't let it pass parliament otherwise.

The negative sign on the impact factor from the Environmental group could also be an indicator of the different grounds for interest. For an environmental organisation, it can be a part of long-term lobbying plan to support suggestions for policy changes even though that they might know are not feasible at this time. But it is still worth to support because it somehow pushes the debate in a favourable direction that will be more tangible in the future. Since there are no direct economic impacts for them in forest policy in the same way that it might be for a private forest owner, the agenda for participating in the policy making can be different.

Needless to say, the results would have been more reliable if the sample of policy changes would have been larger. Also, if there would have been more stakeholders that categorised in the different groups of focus on ecosystem services. The stakeholder sample is in this paper to a large extent consisting of authorities on local, regional and national level that are categorised as neutral. One could argue that depending on where in the country the local authorities are located, in an area with more or less forest with varying presence of forestry, they could have been assigned an interest, but it is harder to argue for.

4.2.2 Policy relevance

Stakeholder analysis examining the stakeholders' interests related to a given issue or resource, in this case to specific policy changes regarding forest management.

In the framework of Institutional Analysis and Development, the referral rounds in the Swedish legislative process seems like an excellent "action arena" to study. The IAD framework has proven to provide useful tools to better understand policy processes, especially related to natural resource management, but like policy analysis in general and stakeholder analysis in particular, there are few ways to reliably quantify the results and make them replicable. This paper, using data open for anyone to control, contributes to the field by providing a replicable study of the stakeholders active in the arena of policy making.

Both policy analysis theory and the IAD framework emphasises the importance of evaluating past actions for it to be able to be a support for coming policy.

As the debate about forest and forest policy has been more present in the public in the last couple of years, it has inevitably also given way to a debate about the debate itself. The two main opposite sides in the public debate, production-oriented stakeholders, and the environmental ditto, both claim that the other side is getting more attention from the media, and therefore also politicians and in the end the governmental bodies in charge over forest related questions. This paper provides a way to test if this is true in a historic, but recent and important, case.

5 Conclusions

This paper investigates the influence of stakeholders in the policy making process of new forest policy in Sweden. It is clear that the different forest interests displayed in the public debate are also present in the process of referral rounds of new forest policy. This is indicated in the result of a correlation test on the input from the different stakeholder groups.

By comparing the input from the official referral bodies with the finished policy laid forward by the government, I find that the stakeholders' input correlates with the outcome in such a way that it can be interpreted as them being influential and that the stakeholders with bigger interest in biomass/wood production have a larger positive influence than the stakeholders more interested in environmental issues.

The data set used in this study is relatively small and consisting only of one policy process. Would it have been more comprehensive or including more policy processes, the correlation results would probably be more precise in describing the relationship. But the results still indicates that some stakeholders input clearly aligns more with the finished policy. The influence from the stakeholders does not necessarily affect the policy process within the frame of the referral round. It is probable that the stakeholder organisations have influenced the political parties in a much earlier stage, inspiring them to put forward an official investigation on the topic for example. But the core of their input becomes clear in the written form of the official referral document and is therefore easier to explore in that phase, rather than in any earlier stage.

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Appendix 1

List of official referral bodies/stakeholders

Arjeplogs Kommun.
Arvidsjaurs kommun.
Bergs kommun.
Bergvik Skog Öst.
Borgholms kommun.
Boverket.
Domstolsverket.
Dorotea kommun.
Drivkraft Sverige.
Energimyndigheten.
Formas.
Fortifikationsverket.
Friluftsfrämjandet.
FSC Sverige.
Fältbiologerna.
Förbundet Svensk Fäbodkultur och utmarksbruk.
Förvaltningsrätten Falun.
Förvaltningsrätten i Umeå.
Förvaltningsrätten Jönköping.
Förvaltningsrätten Malmö
Förvaltningsrätten Stockholm.
Greenpeace
Grästorps kommun.
Gröna arbetsgivare.
Göteborgs universitet.
HaV.
Holmen Skog.
Hudiksvalls kommun.
Hällefors Tierp Skogar.
Härjedalens kommun.
Högsby kommun.
IKEA.
Integritetsskyddsmyndigheten.
JO
Jokkmokks kommun.
Jordbruksverket.
Justitiekanslern.
Kammarkollegiet.
Kammarrätten Göteborg.
Kammarrätten i Jönköping.
Kammarrätten Sundsvall.
Kiruna kommun.
Kopparfors Skogar.
Krokoms kommun.
KSLA.
KTH.
Lantmäteriet.
Linköpings universitet.
Linnéuniversitetet.
LRF Skogsägarna.
Lst Kalmar.

Lst Blekinge
Lst Dalarna.
Lst Gotland
Lst Gävleborg.
Lst Halland.
Lst Jämtland.
Lst Jönköping.
Lst Kronoberg län.
Lst Norrbotten.
Lst Skåne.
Lst Södermanland.
Lst Uppsala.
Lst Värmland.
Lst Västerbotten.
Lst Västernorrland.
Lst Västmanland.
Lst Västra Götaland.
Lst Örebro.
Lst Östergötland.
Lunds universitet.
Malung-Sälen.
Mellanskog.
Mittuniversitetet.
Nacka tingsrätt.
Naturhistoriska riksmuseet.
Naturskyddsföreningen.
Naturturismföretagen.
Naturvårdsverket.
Norra Skog.
Nybro kommun.
Pajala kommun.
Polismyndigheten.
Preem.
Regelrådet.
Region Dalarna.
Region Gotland.
Region Gävleborg.
Region Halland.
Region Jämtland Härjedalen.
Region Jönköpings.
Region Kalmar.
Region Kronoberg.
Region Norrbotten
Region Stockholm.
Region Sörmland.
Region Uppsala.
Region Värmland.
Region Västerbotten.
Region Västernorrland.
Region Västmanland.
Region Örebro.
Region Östergötland.
Riksantikvarieämbetet.
Riksarkivet
Sametinget
SCA Skog AB
SFV
Skatteverket
Skogforsk
Skogsentreprenörerna
Skogsindustrierna
Skogsstyrelsen
Skogssällskapet
SKR
Skydda Skogen
SLU
Sorsele kommun
Spillkråkan
Stockholms universitet
Stora Enso Skog
Storumans kommun
Strömsunds kommun
Svea hovrätt
Sveaskog
Svebio
Svenska Botaniska Föreningen
Svenska Jägareförbundet
Svenska kyrkan
Svenska PEFC
Svenska Samernas Riksförbund
Svenskt Friluftsliv
Sveriges advokatsamfund
Sveriges Allmänningsskogars Förbund
Sveriges hembygdsförbund
Sveriges Häradsallmänningsförbundet
Sveriges Jordägareförbund
Sveriges Mykologiska Förening
Sveriges Ornitologiska Förening (Birdlige Sverige)
Södra skogsägarna
Tillväxtverket
Trollhättans kommun
Umeå tingsrätt
Umeå universitet
Vilhelmina kommun
Vinnova
WWF
Uppsala universitet
Vänersborgs kommun
Vänersborgs tingsrätt
Växjö tingsrätt
Åre kommun

Älvdalens kommun
Örebro kommun
Östersunds tingsrätt