

Strategy for Formas' role for forest-related research and innovation



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Foreword

The world, the EU and Sweden face complex challenges, both in forests and in society. Forests can play an important role for the economy, climate, security of supply, biodiversity and human wellbeing and quality of life. The different expectations of forests can provide potential synergies, but they can also present trade-offs. They are also important for the development of forest management and governance, as well as the use of forest resources. A strengthened knowledge base can enable further development so that forests, in different ways, can meet the many needs of society both today and tomorrow.

In the coming years, we at Formas intend to strengthen and deepen our efforts relating to forests, forestry and forest-related value chains. We have therefore developed a strategy for Formas' role relating to forest-related research and innovation. The strategy is intended to guide Formas' efforts and activities in the field, both nationally and internationally, over the next few years.

We at Formas would like to express our gratitude to the researchers and other stakeholders who provided input on knowledge needs through our survey during the autumn 2023. We would also particularly like to extend a thank you to Formas' advisory group for forest-related questions, which at various stages provided valuable input and reflections that have helped lay the foundation for this strategy.

Stockholm, June 2024

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Summary

The many values of forests to society are becoming increasingly recognised. Research and innovation play a key role in laying the foundations for future development. Formas as a research council for sustainable development within environment, agricultural sciences and spatial planning, funds research relating to forests, forestry and forest-related value chains. The funding landscape for forest-related research in Sweden is relatively broad and complex. This strategy therefore aims to clarify where Formas funds and initiatives should be prioritized, so that they strategically complement other initiatives and provide the greatest benefit to society. The strategic process aims to create effective interaction in the funding landscape, provide direction for Formas' own work, and create clarity and foresight for the research community and other stakeholders.

The overall aim of Formas' efforts for forest-related research is to build and make available a comprehensive and robust knowledge base. The knowledge base shall be able to help support a variety of possible development paths both in practice and in policy. The strategy's framework consists of a variety of formally-expressed national and international objectives, strategies and legislation that Sweden has affirmed.

To identify areas where Formas' funding could be of particular benefit, the strategy development consisted of a number of parts to: analyze formally expressed objectives, identify knowledge needs, and map the funding landscape, including Formas' existing funding portfolio. Based on these analyses, four priority themes were identified. Across these themes, Formas intends to prioritize upcoming thematic calls and other types of activities to promote research, innovation and utilization in the coming years. The themes include (1) The role of forests and the forest sector for a sustainable development of society, (2) People and forests, (3) Sustainable forest management and future-proof ecosystems, and (4) Forest management and governance for a multitude of perspectives. In addition to the thematic dimension, the design of Formas' activities on these topics also requires a strategic evaluation to make suitable choices, for example regarding the type and design of funding instruments and around collaboration and co-creation. The strategy development is to be complemented by an ongoing plan for more concrete actions, collaboration with other funders, and revision, follow-up and updating of the strategy. Information on more concrete initiatives can be found on Formas' website.

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1 Introduction

The multiple benefits and values of forests and forestry for society have become an increasingly important issue in Sweden, the EU and globally. There are many expectations on the forest from different parts of society. This has led to increasing complexity and has also gradually created tensions around how the forest and forest raw materials should be used and managed. Within the EU, there are several policy processes underway within the framework of the EU Green Deal with considerable implications for forests and the forest sector, such as the EU's new forest strategy, the nature restoration law and the regulation on land use, land use change and forestry, the so-called LULUCF regulation. In Sweden, there is also a lot of work around potential development paths in forest policy, with several government assignments ongoing at sectoral authorities.

Formas is a government research council for sustainable development. We fund research and innovation in our three areas of responsibility: environment, agricultural sciences and spatial planning. Over the past few years, Formas has funded forest-related research with between approximately SEK 120 and 250 million per year. To further strengthen and deepen Formas' efforts and role for forest-related research, we have developed this strategy.

Formas sees three main purposes in developing a strategy:

1. **Effective interaction in the funding landscape.** The funding landscape for forest-related research in Sweden is relatively broad and complex, with several sources of government funding as well as extensive funding from major foundations and within the scope of the forest industry's own activities. It is therefore valuable to identify where Formas can complement strategically other efforts and act as a catalyst to stimulate further knowledge development in the area. To specify and communicate Formas' role and priorities also provides a basis for clearer and more effective interaction throughout the entire system of funding, both nationally and in international collaboration.
2. **Direction for Formas' own work.** The strategy helps to ensure a more long-term approach and agreement within the organisation. It also provides a starting point and a basis for the design of a number of different types of initiatives in the area. The strategy also provides greater confidence and transparency when the agency provides input to various processes, such as government bills or investigations, and for joint research agendas in international cooperation.
3. **Clarity and foresight for the research community and other stakeholders.** A clearer picture of Formas' priorities, work processes and a more concrete plan for future initiatives from Formas, with an increasing level of detail in the near future, provides a long-term perspective for the research community and other stakeholders. This also enables a more systematic and inclusive process for collecting input from researchers and other societal stakeholders when revising the strategy and developing specific initiatives. In a more general sense, this can contribute to well-developed research proposals and more relevant and effective research.

Formas sees that a wide range of measures is necessary. In addition to strengthening research and innovation on key issues, we will work on utilization, synthesis of existing knowledge and dialogue processes, in close collaboration with other funders and sector authorities. Formas is also working actively with the upcoming EU partnership on forest and forestry, where our national efforts link and contribute to common priorities at the EU level. In addition, Formas' efforts for forest-related research includes a government annual envelope of just over SEK 50 million per year for activities at the Forestry Research Institute of Sweden (Skogforsk).

The content of the strategy for Formas' role for forest-related research has been anchored with and approved by Formas' Scientific Council.

The overall aim of the strategy

The overarching aim of Formas' initiatives for forest-related research is to build and provide a robust and multifaceted knowledge base. This knowledge base can then help enable a wide range of potential future paths of development, both in policy and in practice.

2 How the strategy was developed

2.1 Overall logic for identifying priority areas for Formas

The strategy's framework consists of a variety of formally expressed national and international objectives, strategies, and legislation that Sweden has affirmed.

To ensure the greatest possible benefit of Formas' available resources for the area, Formas' efforts are focused on areas where all the following aspects are met:

- There are formally expressed objectives, strategies/agendas or legislation relating to the area in question and that lie within Formas' areas of responsibility.
- There is a clear gap between the current situation and the “desired situation” and that an incomplete knowledge base contributes to this gap.
- Limited efforts are being made by the overall funding landscape, in relation to identified needs.

To identify these areas, the process of developing the strategy consisted of a number of parts to: (1) analyze formally expressed objectives and goals, (2) identify knowledge needs, and (3) map the funding landscape, including Formas' existing funding portfolio.

2.2 Goal context

A starting point for the strategy is the national, European and global goals that Sweden has committed to and that have relevance for forest, forestry or forest value chains. This includes formally expressed societal goals that are found in national goals, strategies, legislation (at national and EU level), agreements and other types of political commitments that Sweden has affirmed.

Central objectives that Formas' strategy aims to contribute to are the Swedish forest policy objectives (in the Forestry Act, forest bills and the strategy for Sweden's National Forest Program), the Swedish environmental quality objective of Sustainable Forests, and the EU's forest strategy. In addition, we also see several broader societal objectives that have direct bearing on forests and forestry: other national environmental quality objectives, the Sustainable Development Goals, the EU's Green Deal, the EU's and Sweden's bioeconomy strategies, the Paris Agreement, and the Kunming-Montreal Global Biodiversity Framework. Legislation related to these goals is also included, such as the LULUCF regulation, the Nature Restoration Law, and the Habitats Directive.

In the process of developing the strategy, we also considered adjacent goals and strategies that have a clear direct or indirect relevance to forests or forest value chains, such as tourism, sustainable regional development, deforestation, climate adaptation, water, and soil health.

At an overarching level, we see that many of these objectives are interlinked, have overlaps and influence each other. An important role for Formas' strategy is therefore also to be able to address these cross-cutting aspects. This includes the challenges and opportunities that come from addressing multiple objectives and their synergies and tradeoffs simultaneously.

In addition to contributing to fulfilling existing policy objectives, Formas' strategy also aims to encourage research that looks further and has the ability to question, shape and alter existing objectives. Calls for proposals and other activities within the strategy will therefore promote a diversity of research approaches and perspectives, in order to contribute to a more comprehensive understanding of the complex challenges and opportunities related to forests.

2.3 Identifying knowledge needs

How far we are from the “desired situation” relating to different objectives was analysed partly through reports on goal attainment (such as the evaluation of the Swedish environmental objectives), partly through knowledge and development needs expressed in various forms of dialogue with societal actors, and partly through actively and continuously keeping up to date on the area. In this type of analysis, it is important to be able to distinguish between genuine knowledge needs, where Formas' efforts can potentially drive development forward, and areas and challenges where, instead, other types of efforts and trade-offs need to be made by different actors in society.

To broadly and openly collect thoughts on knowledge needs and other input to Formas' strategy, a simple and openly formulated questionnaire was sent out through Formas' newsletter in the autumn of 2023. A total of 111 responses were received, most of them from researchers at universities and research institutes.

In connection with the start of the strategy development, an advisory group was set up to support the development and implementation of Formas' strategy in this area, and to serve as a national reference group for the forthcoming EU partnership on forest and forestry. The group currently consists of 14 people and its composition follows the so-called quadruple helix model of collaboration, with representation from academia, the public sector, industry and civil society. The advisory group is an important link towards more systematic co-creation and has provided input at a more general level on knowledge needs for Formas' strategy and initiatives in the area.

This is also complemented by actively keeping up to date via a broad range of external seminars, publications and by closely following relevant policy developments.

2.4 Mapping the funding landscape and Formas' own funding portfolio

An overall picture of the broader funding landscape for forest-related research and innovation is needed both to determine and craft Formas' role in the system and to identify areas where limited efforts, in relation to needs, are made in the funding landscape as a whole. Therefore, an analysis was made of Formas' own funding portfolio of forest-related research, as well as a survey of forest-related research funded by Swedish government funders (in addition to Formas) and, at a general level, by the EU as well as foundations and industry in Sweden.

Formas' funding of forest-related research has varied between approximately SEK 120 and 250 million per year during the years 2018–2023 (Figure 1).

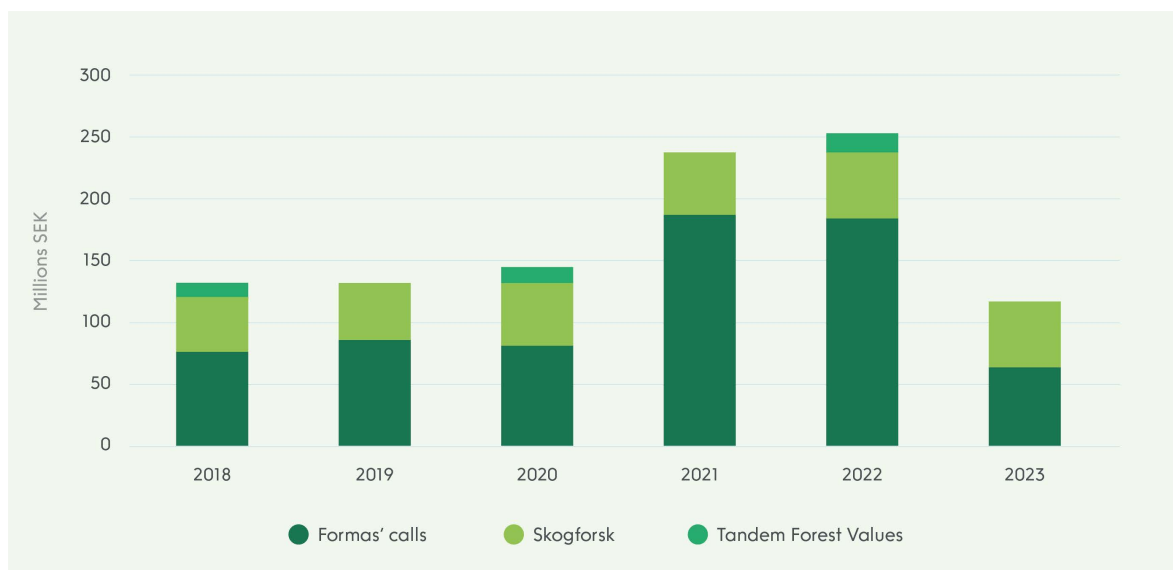


Figure 1. Formas funding of forest-related research over the years 2018–2023.

Formas' calls represents funding for forest-related projects in Formas' researcher-initiated and thematic calls. Forest-related thematic calls were held in 2021 and 2022, hence the higher funding in Formas' calls in those years. *Skogforsk* displays an annual envelope Formas provides to Skogforsk (the Forestry Research Institute of Sweden) of approximately SEK 50 million per year. *Tandem Forest Values* represents Formas' funds that in the years 2018, 2020, and 2022 went to thematic calls within Tandem Forest Values, which is a bilateral research collaboration between Sweden and Finland.

Together, the two mapping activities provided an overview of the distribution of funds between different disciplines and between seven overarching thematic areas¹ in forest-related research, at Formas and at other (mainly governmental) funders.

For the forest-related research funded by **Formas** in 2018–2023, the survey showed that:

- Natural sciences (52%), followed by agricultural sciences (22%) and social sciences (16%) are the disciplines that are most prevalent in Formas' forest-related projects. Together they make up around 90% of the total number of forest-related projects.
- Medicine and health sciences, followed by humanities and arts are the disciplines that are least prevalent in Formas' forest-related projects. Together they make up around 2% of projects.

¹ (1) Forest management and forest damage, (2) Climate, (3) Ecology and water (including biodiversity, restoration, etc.), (4) Wood processing, market, profitability and wood construction, (5) Genetics, digitalization and forest monitoring, (6) Policy, governance, advice, and land use questions, (7) Other uses of forest, indigenous rights, public access and recreation.

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- In terms of overarching thematic areas, most projects concerned *ecology and water* (including biodiversity, restoration), followed by topics within *forest management and forest damage* and *climate*. Together they account for around 60% of projects.
 - In terms of overarching thematic areas, the least number of projects relate to topics on *other uses of forests, indigenous rights, public access and recreation*. This accounts for around 7% of projects.

For the forest-related research funded by (mainly) **other governmental funders** in the years 2020–2022, the mapping showed that:

- Engineering followed by natural sciences are the most prevalent disciplines among the projects. Together they account for around 85% of the total funds granted.
- Medicine and health sciences and humanities and arts, followed by social sciences, are the least frequent disciplines. Together they represent around 2% of the total funds granted.
- In terms of overarching thematic areas, most projects have addressed topics in *Wood processing, market, profitability and wood construction*, followed by topics in *genetics, digitalization and forest monitoring*. Together, they account for over 60% of the total funds granted.
- In terms of overarching thematic areas, the least number of projects have addressed topics on *other uses of forests, indigenous rights, public access and recreation*. Together they represent less than 1% of the total funds granted.

3 Formas four priority themes for forest-related research and innovation

Formas' forest strategy identifies four priority themes (Figure 2), which together form a framework of key thematic areas that will guide Formas' forest-related efforts and activities in the coming years. The priority themes are:

- The role of forests and the forest sector for a sustainable development of society
- People and forests
- Sustainable forest management and future-proof ecosystems
- Forest management and governance for a multitude of perspectives

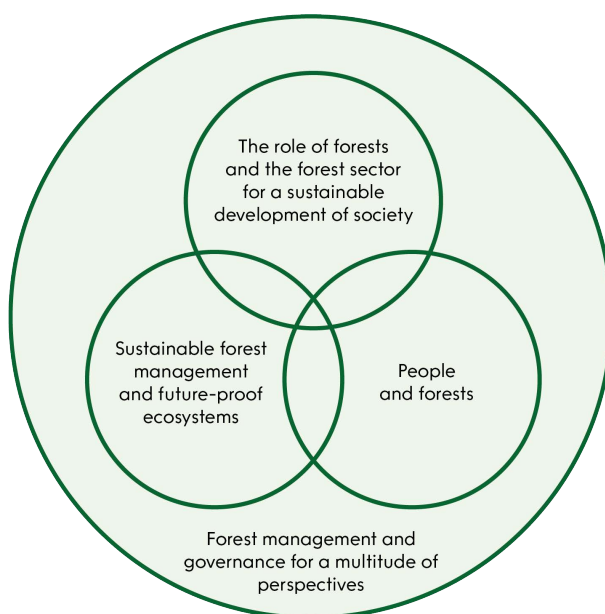


Figure 2. Formas' four priority themes for forest-related research and innovation.

Within these priority themes, calls and other types of actions and activities are then planned, focusing on a whole or a part of one or more thematic areas. The themes should not be seen as separate challenges, and prioritized knowledge gaps can relate to several themes. Formas' activities may therefore address more than one of the themes and may also be organized in collaboration with other research programmes and funders. Formas' toolbox for instrumentation of different activities includes a wide range of potential activities, ranging from research projects of different sizes and lengths (including projects relating to basic research), to synthesis studies, graduate schools, policy labs, dialogues, network and mobility support, as well as support for innovation and activities for utilization and communication. Below, the themes are described in an overarching and open-ended way, to allow and make room for multiple aspects depending on the approach. The

themes are intended to cover a broad range of perspectives, while specific calls and other activities may cover more specific and delimited topics.

Formas' four priority themes are based on the analysis of the goal context for the strategy, the identification of knowledge and development needs through dialogues with societal actors, and actively and continuously keeping up-to-date on the field. This was then placed in relation to existing national initiatives for forest-related research, including Formas' own initiatives, so that Formas' upcoming efforts, in an appropriate and effective manner, can complement the research funded by the system as a whole.

3.1 The role of forests and the forest sector for a sustainable development of society

The theme focuses on the important and complex roles that forests and the forest sector play for society and for sustainable societal development. Many questions within the theme deal with system perspectives on forests, what we use - and want to use - forests and their services and products for, and how the roles of forests and the forest sector are affected by development and changes in other sectors and in other countries.

This theme includes different types of interventions regarding the transformation and development of the forest sector, and the broader bioeconomy. This can include the use of raw materials for different areas and throughout the entire value chain (including residual streams and circularity), as well as changes in the product mix, for example towards increased added-value and climate benefits. It can also relate to the development of other forest ecosystem services for a variety of societal goals. The theme also includes how forest management systems and methods may adapt and change based on developments within the forest sector and in society.

Forests, as well as forestry and the forest sector in general, are also affected by developments and changes in other sectors and in other countries. The theme includes questions about the links and interactions between the development of forests and of different sectors, such as the industrial development in northern Sweden and in the energy sector, as well as developments in other countries (seen from several broader perspectives, such as land use, policy development and geopolitics). It can also touch on, for example, trade flows, value chains and consumption.

The theme also includes drivers and frameworks for the development, as well as system boundaries, scenarios and opportunities and barriers for different paths for future development.

3.2 People and forests

Forests can be seen as socio-ecological and socio-economic systems, where the forest is affected by what we humans do, and where we and our communities are likewise affected by forests. This theme focuses on the interaction between people and forests, with a focus on the importance of forests for people's lives, on how human drivers affect forests and on how forests are governed.

The theme includes the values and functions of forests for people and society across the country, in rural as well as in peri-urban areas. It can relate to profitability, employment, development and livelihoods in rural areas. It can relate to the role of forests for people's physical and mental health

and well-being. And it can relate to the connections between forests and culture, identity, tradition, and about experiences and tourism. The theme can also include questions about how different forest management methods affect and interact with these factors. The theme also encompasses questions about traditional use, reindeer husbandry, indigenous aspects, and cultural heritage with links to the forest.

The theme also addresses human factors and drivers behind decision-making around forests and the forest sector, such as among forest owners, along the value chain (including companies and financial actors), in governance and among politicians. This can include incentives, expectations, values, conditions and circumstances, traditions, knowledge, conflicts of interest, as well as advisory and organizational aspects. It can also include market mechanisms and opportunities for alternative sources of income or business models for landowners as well as throughout the value chain. Examples of this might include wind power, nature tourism, added-value and a broad range of products from forests, as well as certification, bio- and carbon credits or other innovative market mechanisms.

3.3 Sustainable forest management and future-proof ecosystems

For forests to be able meet their full capacity and role for a wide range of societal objectives, further development of sustainable forest management and future-proof ecosystems is needed. Within this theme, knowledge needs span a wide range of areas, from basic biological and ecological processes, through forest damage, forest management, new technologies and climate adaptation, to societal preparedness.

The theme covers forest damage and threats from, for example, pests, extreme weather, wildlife grazing and invasive species. Measures to increase resistance and resilience are central, as is restoration and the potential in new technologies (including genetics, data, and AI). The theme also addresses various nexuses, such as that between production, biodiversity and climate benefits/adaptation. It also includes forest management under a changing climate, and climate adaptation of conservation measures. The theme also includes uncertainties surrounding forests' development and climate benefits in a changing climate, and about the climate benefits of older forests.

The theme also includes the capacity and preparedness of society, and of various actors, to manage risks and crises. For example, this may involve policy, law, and capacity to manage forest damage, as well as foresight, scenarios and forest monitoring.

3.4 Forest management and governance for a multitude of perspectives

Society's varied demands and expectations on forests presents complex challenges concerning how management and governance can address a diversity of perspectives. To increase the likelihood that forests and its values, products, and services can contribute to fulfilling society's various goals, there is a need for knowledge development and utilization related to different aspects of forest governance and management. This theme is visually illustrated (in Figure 2) as encompassing the other themes in the form of a circle, since it includes elements that are relevant to all themes, such as policy instruments, knowledge and evidence bases, and interactions between different actors.

The theme includes decision-making, law, planning, and various types of policy instruments. It can involve questions related to ownership rights and structures, the right of public access, indigenous rights, power balances, and the management of "common goods." The theme encompasses governance for multi-objectives, adaptive governance and management, and organizational aspects, including the interaction between different types of landowners and actors along the entire value chain, as well as within management, governance, and policy at the Swedish, EU, and international level.

The theme also addresses planning from a landscape perspective and land use for multiple societal goals, such as reindeer herding, wind power, water management, biodiversity, hunting and wildlife management, tourism, civil defense, and preparedness. The theme also includes questions regarding knowledge and evidence bases, for example, for planning and management, including risks and opportunities with digitalization and AI.

4 The strategy's efforts, development, and evaluation

4.1 The design of efforts based on the strategy

In designing Formas' efforts for forest-related research and innovation, a strategic assessment is made to – in addition to the thematic dimension – make appropriate choices regarding (1) the type and design of funding instruments, (2) addressing challenges and questions with international dimensions and the value of international collaboration, and (3) collaboration and co-creation with a wide range of societal actors from academia, government, industry, and civil society in the development of efforts and in their application. These assessments are made, as applicable, throughout all phases of the design of each effort.

4.2 Upcoming initiatives based on the strategy

For information about current and previous calls, projects, communication activities, collaboration, and other activities related to the priority themes of the forest strategy, visit the Formas website (www.formas.se).

4.3 Development and follow-up of the strategy

The strategy and its concrete efforts will be updated, developed, monitored, and evaluated. The planning of concrete efforts is supported by regular dialogue with primarily Vinnova and the Swedish Energy Agency, to coordinate our respective plans for initiatives in the area, as well as, when needed, with the Swedish Research Council, Mistra, Skogssällskapet, and relevant sectoral agencies. Similarly, we also arrange regular strategic meetings with Formas' four national research programs and other related thematic areas. Where it may strengthen a given effort – for example, when an issue requires a broad thematic scope crossing multiple sectors and disciplines – the initiative may be co-funded or co-organized between several program areas.

The strategy and its priority themes should be updated regularly, for example, every three years, and evaluated appropriately to guide its development and revision. Specific efforts and completed activities are also continuously evaluated in accordance with the follow-up of Formas overall portfolio. On a longer time horizon, various societal impacts of the completed efforts, such as on policy development and in forestry in practice, can be examined using interviews and *impact stories*, to contribute to learning and understanding of the strategy's development on a more comprehensive level.



Ett forskningsråd för hållbar utveckling
A Research Council for Sustainable Development

Formas is a government research council for sustainable development. We fund research and innovation, develop strategies, and conduct analyses and evaluations. Our areas of activity are the environment, agricultural sciences and spatial planning. We conduct systematic reviews that aim to make it easier for Sweden to achieve our environmental goals. We also communicate about research and research results.

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