TEXT: ÅSA GERGER SWARTLING, KARIN ANDRÉ, GREGOR VULTURIUS

Value-determined factors, such as trust in climate science and personal objectives, are of great importance for shaping opinions and behavioral intentions to respond to climate change. Beliefs in self-efficacy are also found to increase engagement of forest owners in adaptation. These are some of the findings of Mistra-SWECIA, that have emerged through the development and application of a methodology for participatory research on climate change adaptation.

Adaptation processes in Swedish forestry

Risk perceptions, drivers and communication

In 2008, when the Mistra-SWECIA programme was established, research on climate change adaptation in Sweden had just begun to receive increasing attention from researchers, policy-makers and practitioners. This was in part due to two major storms, Gudrun (January 2005) and Per (January 2007) which hit Swedish forests hard, particularly in the southern parts of the country. The Swedish Government's Commission on Climate and Vulnerability had just delivered its final report and recommendations in 2007, and adaptation had started to become a factor in both policy-making and research. However, at that time the recognition of adaptation and what it entailed was generally limited, and was often confused with the efforts to reduce greenhouse gas emissions to combat climate change.

The aim of the social science-based research within Mistra-SWECIA was initially to improve the understanding of social factors that determine the success of adaptation, and to investigate what stakeholders can do to overcome barriers to maximising adaptation. This featured taking a broader perspective on climate risks, vulnerability and adaptation in the real-world context of urban planning in the Stockholm region, as well as Swedish forestry. The programme participants designed and applied an interdisciplinary, participatory research approach combining climate science, climate impacts and social science theories and methods. The focus was on the respective responsibilities of various stakeholders involved in adaptation; their perceptions of risk and uncertainty; the current and potential use of climate information; as well as opportunities and motivations for stakeholders to engage in a learning process on adaptation.

In the early focus groups with local government officials in Stockholm County, it became clear that climate change adaptation had generally not been prioritized to any noticeable extent at the political level. The demand for knowledge, support and guidance was high for raising awareness and for pushing climate change-related risks higher up on the policy agenda. The results also showed that many of the adaptation challenges were clearly linked to rapid urban growth, such as deteriorating air quality, demand for housing, transportation and water resources, where climate change was expected to put increasing pressure on infrastructure and use of land. Barriers to implementing adaptation that were highlighted included integration of climate risks in planning processes; collaboration within and across municipalities and other actors; prioritization; differing time perspectives (e.g. short-term immediate issues

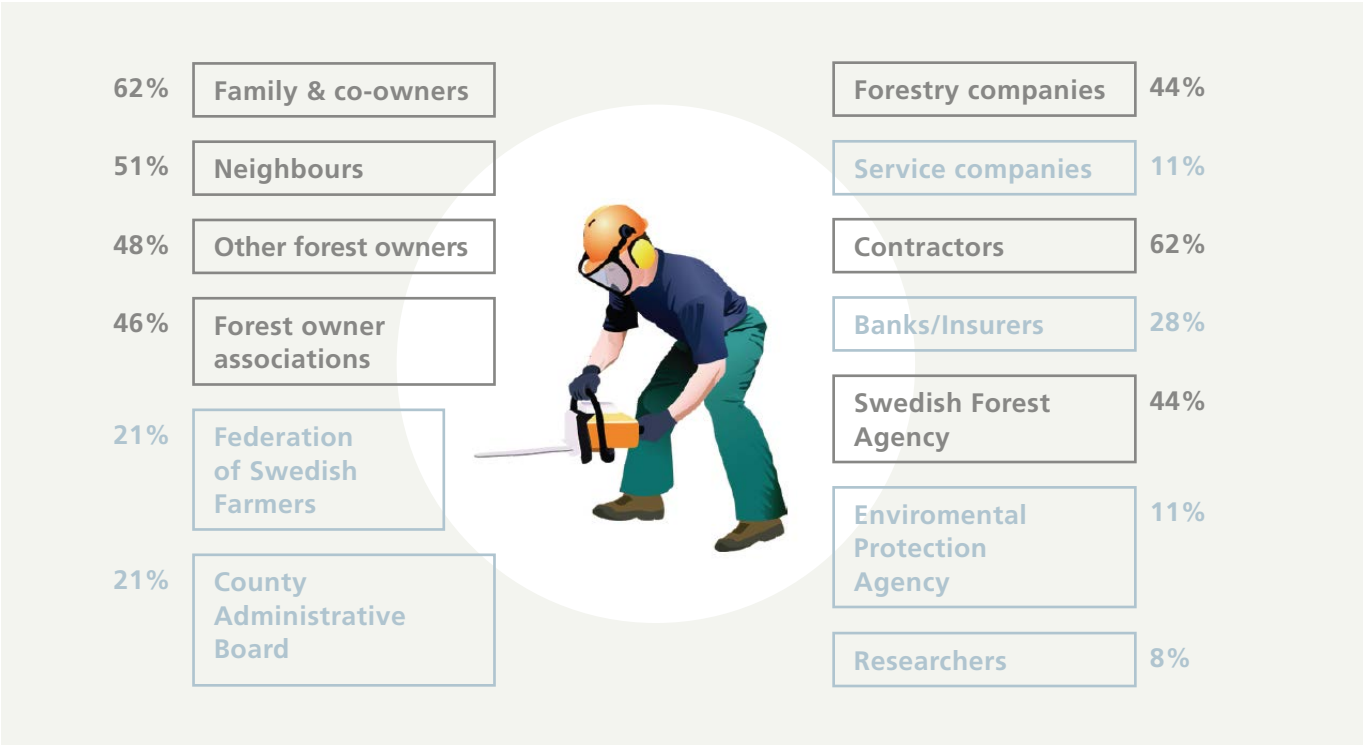

Figure 1: Most common actors (or alter groups) in percentage that forest owners communicate with about forestry and forest management decisions. Response rate 31 percent, or in total 932 forest owners. Source: André et al. (forthcoming).

Image: Tracey Saxby, Integration and Application Network, University of Maryland Center for Environmental Science (ian.umces.edu/imagelibrary)

versus long-term); uncertainty; and lack of scientific knowledge. This illustrates the importance of viewing climate change as an integrated issue, in close interaction with other societal development issues.

In the second programme phase (2012-2015), research on adaptation processes was widened to cover a broader geographical scope, and use was also made of a large statistical survey. The participatory research methodology was expanded, fine-tuned, and widely applied across four counties of Sweden (Skåne, Västerbotten, Gävleborg, Jämtland), and targeted private forest owners in particular. Use was made of science-based stakeholder dialogues that more directly address forest owners' questions and needs, as well as enabling knowledge sharing and collaborative learning among forest owners and researchers. Another focus was the role of social networks for sharing of different types of knowledge and information between actors that all underpin opportunities for, and barriers to, adaptation. In 2015, we finalized the survey of about 3,000 forest owners and 840 forestry experts. The results provide insights into who forest owners communicate with regarding forest management, the frequency of these contacts, and whether and how the features of social networks affect forest owners' perceptions of climate risks and adaptive capacity.

Overall, our research results highlight the importance of value-determined factors, such as trust in climate science and personal objectives, in shaping opinions and behavioural intentions to respond to climate change. Furthermore, beliefs in self-efficacy were found to increase engagement of forest owners in adaptation. In contrast, social and economic factors such as income, age and gender appear to play an insignificant or ambiguous role. Our findings also indicate that common goals and shared responsi-

bilities for adaptive forest management in response to climate change should be negotiated among stakeholders in a planning process that is external to the research process. Moreover, to foster adaptation by forest owners, climate information should be shared by actors who are in a position to communicate effectively, such as the Swedish Forest Agency and forest owner associations. At the same time, opportunities for stakeholder meetings where peers can meet and share their knowledge and experiences need to be created, for example through workshops.

Over the course of eight years of research by Mistra-SWECIA, we have seen how the knowledge on and commitment to climate change adaptation has gradually increased, although of course there is variation across individuals and organisations. For example, from the discussions with forest owners we note a growing insight into how climate change will/may impact the forestry sector and into the various options for adaptive forest management. Moreover, we have observed how the debate has shifted from being a question of "what" and "why", to "how". It is in this new era and new adaptation landscape that ongoing political and practical actions are geared towards challenges of governance and financing of adaptation at subnational levels.

Mistra-SWECIA has a wealth of findings to share with other communities of science, practice and policy-making engaged in current or forthcoming adaptation initiatives. The rather unique, multidisciplinary methodology for participatory research on adaptation will provide important lessons for future, demand-driven approaches to climate services and climate adaptation services in Europe and elsewhere. Experiences from Mistra-SWECIA, and our collaboration with the Swedish forestry and agricultural sectors, have shown that there is a great demand for such services in Sweden. The participatory research approach developed in Mistra-SWECIA offers methodological insights into the production, tailoring, translation and delivery of climate information, aimed at ensuring that the best available decision-relevant science is effectively communicated and easily accessed by stakeholders. We also hope our overall findings will help to develop policies, and to evaluate mitigation and adaptation strategies; and that it will help build the necessary skills and capacities of different user groups in applying this information to reduce climate-related losses and enhance benefits. □

FURTHER READING:

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