



MISTRA SWECIA
CLIMATE, IMPACTS & ADAPTATION

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Discussions about adaptation to climate change in Sweden have until now been based primarily on an analysis of how the local climate will change. However, for many countries, especially those that are rich, it is likely that climate change will have a large effect on the economy, policy and international commitments through the indirect influence of changes to the climate in other parts of the world.

Adaptation to the indirect impacts of climate change

FURTHER ANALYSIS IS REQUIRED of the global effects on our societies in order to better understand how we can adapt to the full extent of the effects of climate change. Adaptation to climate change has thus far been discussed primarily as something which is driven by expected changes in the local climate. The majority of the research and scientific literature in this area shares this view.

In Sweden in 2007, an extensive analysis of the effects of climate change on Swedish society was conducted in a report by the Commission on Climate and Vulnerability. The report includes a short chapter on “changes in the world around us and their effects on Sweden”, but the Commission’s assessment and proposals are nevertheless limited to the direct effects of the changes to the climate within Sweden. The same pattern can be seen in comparable Danish, Finnish and Canadian documents.

Indirect impacts of climate change

By indirect impacts we mean effects that are experienced in a certain location as a result of the effects of changes to the climate of another geographic location. A simple example of such a connection is the relationship between the upper and lower reaches of a large river basin. Let’s take the Nile as an example. Reduced or redistributed precipitation in the Ethiopian highlands can have serious consequences for the Nile’s flow through Egypt. The Nile’s water plays an important role in Egyptian

agriculture, which means that adaptation to climate change in Egyptian agriculture must take into account changes to the climate in Ethiopia, more than one thousand kilometres away.

Indirect impacts of climate change are not always foreseeable. Our world is interlinked via complicated flows of capital, products and people. Climate change will affect individual regions and countries in different ways and contribute to changing the conditions for competition between regions and countries. For example, the conditions for agricultural production can become worse in certain regions, which results in reduced export opportunities or increased requirements for the import of food. Climate change, with heat waves and droughts, is expected to lead, for example, to a deterioration of the conditions for agriculture in southern Europe, which will put the EU’s Common Agricultural Policy under pressure.

When environmental conditions in poor countries worsen, the living conditions of people are affected. This results in the need for increased international efforts, both urgent - when extreme weather hits - and long-term - when employment opportunities are created or disappear in sectors that are affected by climate change. One possible consequence is seasonal or permanent migration within or between countries. The Arctic is an example with an additional dimension. Melting sea ice makes it easier to access natural resources in the area and increases individual countries’ interest in the region, which has



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consequences for the international security situation.

Research interest in the indirect impacts of climate change has been limited and has rarely been linked to the adaptation discussion. However, there are a number of studies which have analysed how climate change may affect international security, global health and the global food supply. The economic effects of efforts to reduce emissions have also been studied and models have been constructed in order to study the combined effects on ecosystems and the economy. There is now a section of the climate negotiations which deal with how rich countries should take responsibility for climate effects in the poorer parts of the world.

In summary, it may be said that both research and policy have now begun to pay attention to the indirect impacts of climate change as something which is important for individual countries and sectors, as well as for the world as a whole. However, the knowledge-base is, at the moment, more preliminary when it comes to indirect impacts, compared with the more direct effects. Estimates of the indirect impacts do not exist and they are generally not dealt with in the ongoing efforts to adapt to climate change within individual countries or regions.

The way ahead

From the point of view of research, there is a need to better understand the relative importance of the direct and indirect

impacts of climate change. It is reasonable to assume that there are many decision-making situations that are affected by the expected changes in climate, in which it would be advantageous to pay attention to a broader range of climate impacts. In the same way that long-term irrigation planning must take into account long-term access to water (including the impacts of climate change), strategic planning and policies for Swedish and European forestry would probably be helped by a better understanding of the consequences of climate change in the countries we are competing with and in the markets on which we sell our products. Mistra-SWECIA will lay out the ways in which the indirect impacts of climate change involve new or altered threats and opportunities. The starting point is the Swedish forestry sector and research is conducted through interviews, as well as by studying important documents and plans in order to understand what analysis should be carried out. Examples of concrete issues can be whether the effects of climate change in the world around us should to a greater extent affect the choice of tree species to plant or affect the design of Swedish strategies and regulations for the production of biofuels (see p. 25 and p. 29). This work should lead to new knowledge about the requirements and opportunities of public decision-makers and the private sector so that they are better able to take into account all the impacts of climate change.

Nordic conference on adaptation to climate change

The 2012 Nordic International Conference on Climate Change Adaptation took place in Helsinki in late August. This was the second conference of its kind. As in Stockholm two years ago, Mistra-SWECIA contributed financially and our researchers formed part of the conference's scientific committee.

Text: Oskar Wallgren

The aim of the 2012 Nordic International Conference on Climate Change Adaptation was to create a venue for dialogue between researchers and professionals who work towards adapting society to a changed climate. An important issue that was addressed was whether today's decision-makers have access to the appropriate knowledge, skills and tools to enable them to make decisions motivated by adaptation needs. Questions were also posed about how adaptation policy should develop

and which stakeholders need to be engaged in order to implement it. Several researchers have taken an interest in the costs of adapting society to climate change. The conference demonstrated that we still have some way to go before we are able to produce reliable estimates of these costs.

Invitations to the conference were sent to researchers from within a range of disciplines, as well as decision-makers from both the public and private sectors, regional and local planners and also representatives of NGOs and international organisations. The Nordic countries were well represented, but there were also many participants from other European countries and the rest of the world. In total the event attracted around 250 participants. This event provided a unique overview of the adaptation-related research that is currently in progress, how this has developed in recent years and what type of results are, for the moment, lacking.

Read more at: nordicadaptation2012.net

Reinforcing co-operation with society's stakeholders

The programme's researchers exchange experiences with representatives from county administrative boards, the Swedish Forest Agency, and large and small-scale forest owners.

Text: Oskar Wallgren

As of 2012 the research conducted in Mistra-SWECIA has a strong focus on issues that concern adaptation to climate change within land use, focussing on Swedish forests and Swedish forestry. In light of this, the programme has raised its ambitions to reach out to and learn from stakeholders and those who make use of the results of the research. The programme invests in concrete work which reinforces the contact between researchers and practitioners, decision-makers and those who make use of the research results. The work builds on results from the programme's own research and represents a platform for a multidisciplinary approach.

In the spring of 2012, a working group was established with external partners. The working group's premise is that it should be a meeting point and provide new insights for both researchers and contributors from industry, public authorities and other organisations. The working group should also be something more than a conventional reference group and should play an important role in initiating both large and small-scale studies within the programme, studies which should be directed towards a specific problem. At present, representatives from

county administrative boards, the Swedish Forest Agency, forest owners, both large and small, and Mistra-SWECIA's researchers contribute to the working group.

The ambition of the working group is to initiate a joint activity or event every six months, throughout the second phase of the programme. The first result was an open workshop on the theme of systems to support climate change adaptation decision-making that was organised together with SMHI at the end of November. Based on current climate research, Swedish forestry's requirement for a system to support decision-making and for visualisation for adaptation to climate change was discussed. The workshop attracted 60 or so contributors from the forestry sector, climate-related research and those responsible for adaptation to climate change. Anna Maria Jönsson from Mistra-SWECIA and Lund University, Patrick Samuelsson from Mistra-SWECIA and the Rosaby Centre at SMHI, Tomas Lämås from SLU in Umeå and Mats Berlin from the Forestry Research Institute of Sweden talked about various tools which contribute to long-term forest-related sustainability analyses. They were in agreement that there is no need for additional tools, but that the aids to decision-making which exist today need to be further developed in order to better take into account the risks and opportunities of a changed climate.

Parts of the workshop in November were recorded and are available at: www.mistra-swecia.se