

## Final publishable Summary Report

The overall aim of this research project was to improve European climate policy by addressing a set of philosophical questions primarily related to climate adaptation. The work focused on three themes: (a) goal conflicts, (b) gender issues, and (c) timing and evaluation of adaptation policies. In addition, a number of closely related themes were covered in the project: the rationality of climate mitigation goals; time perspectives of climate adaptation/mitigation policy decisions; and the concept of urban sustainability.

### *Goal conflicts*

A central hypothesis in this part of the project was that goal conflicts are common in climate adaptation but that policy-makers responsible for making adaptation decisions (i.e., primarily local municipalities and county administrative boards) do not have sufficient knowledge or adequate tools to deliberate about and/or address these conflicts. A central part of the project was therefore to investigate what goal conflicts could arise in local climate adaptation and what methods, or strategies, could be used to deal with those conflicts. This research resulted in two articles submitted for publication in peer-reviewed international journals, of which one has been published and one is awaiting an editorial decision. In Edvardsson Björnberg and Hansson (2011) (published in *Local Government Studies*) five types of value issues arising in local adaptation to climate change are identified, among them issues concerning goal-conflicts and prioritizations between policy goals. In Edvardsson Björnberg and Svenfelt (2012) (*Society and Natural Resources*, under review), four strategies for dealing with goal-conflicts in local climate adaptation – conflict-identifying, conflict-preventing, conflict-resolving, and goal-prioritizing strategies – are analysed on the basis of planning horizon, urgency of the climate problem, and available organisational resources. In Edvardsson Björnberg (2012) (forthcoming in Vries, Hansson and Meijers, Eds., *Norms and the Artificial: Moral and Non-Moral Norms in Technology*, Springer-Verlag), goals and goal-conflicts arising in large-scale water engineering projects designed to reduce vulnerability to flooding are discussed, with the Mose Barrier in Venice as an empirical example.

### *Gender*

A central hypothesis in this part of the project was that there are gender differentiated impacts associated with climate change and also with the policy responses designed to abate those impacts. Accordingly, there is an urgent need to address gender issues in climate adaptation. In Edvardsson Björnberg and Hansson (2012) (forthcoming in *Local Environment*), five factors that combine to make women and girls particularly vulnerable to climate change are identified: lack of political power, small economic resources, gender-bound patterns in the division of labour, entrenched cultural patterns and biological differences. Three examples are given of how adaptation measures, unless carefully designed from a gender perspective, could contribute to preserving prevailing gender inequalities and reinforce women's vulnerability to climate change. Based on the assumption that institutions and decision making processes need to be remodeled so as to guarantee that gender issues are adequately targeted within adaptation, the article identifies a number of methodologies and decision tools that could be used to mainstream gender in local adaptation planning. An abbreviated version of the article was published in Swedish, with Swedish local municipalities as primary target group. This abbreviated version was published in 2012 and is available online at: <http://www.foi.se>, "Integrera genus i klimatanpassningen! Vägledning och råd för det kommunala klimatarbetet" (Swedish title).

### *Timing and evaluation of climate adaptation policies*

In this part of the project, two questions were addressed: "When should local planners take adaptive action given the uncertainties involved?" and "What tools are needed for making multi-objective evaluations of different adaptation alternatives?" The second question is addressed in Baard *et al.* (2012) (published in *Local Environment*). In this article, a tool for evaluating climate adaptation options based on how they affect other policy goals is presented, and the results of two case studies in which the tool was tested are discussed. The tool, "Sustainability Analysis", consists of three parts: a mandatory part that is designed to help local decision makers identify the consequences of different adaptation options and two voluntary parts, one of which can be used to

perform a simple cost-benefit analysis of suggested adaptation options and the other of which can be used to identify conflicts and synergies with a local municipality's other policy (environmental, social and economic) goals. A Swedish version of the tool is available in Baard, Vredin Johansson and Edvardsson Björnberg (2011). In Hansson, Edvardsson Björnberg and Vredin Johansson (2012) (*International Journal of Sustainable Society*, under review) a framework for studies of environmental efficiency are proposed in the form of a conceptual policy cycle consisting of six major elements: goal-setting, choice of policy instruments, enforcement, changes in behaviour of public and private agents, effects of policy measures and evaluation. Through iterating the policy cycle (or parts of it), it is argued, efficiency in environmental policies can be improved. In the paper, the policy cycle is applied to climate policies (mitigation and adaptation) and important areas for future research are identified.

#### *Additional themes*

Climate adaptation and climate mitigation are two separate but closely related policy fields. This is, for example, evident from the goal conflict that can arise between adaptation and mitigation (e.g., adaptation can facilitate or counteract mitigation and the extent to which mitigation efforts are successfully implemented affects the need for adaptation). Mitigation (and to some extent adaptation) decision-making has longer time horizons than what is commonly the case in municipal planning. Decisions are often institutionally complex in the sense that they involve many different actors with different responsibilities and competencies. Long time frames and institutional complexity contribute to making climate policy a particular challenge for local decision makers. It forces planners and decision makers to address issues related to, for example, goal-setting under epistemic uncertainty. This question is addressed in Edvardsson Björnberg (2012) (*Energy Policy*, under review). In this article, three types of mitigation goals – temperature, atmospheric concentration and emissions targets – are analysed using a set of rationality criteria previously developed by Edvardsson Björnberg.

Another theme that has been covered in the project is urban sustainability. In Gunnarsson-Östling, Edvardsson Björnberg and Finnveden (2012) (forthcoming in Metzger and Rader Olsson, Eds., *Sustainable Stockholm: Exploring Urban Sustainability through the Lens of Europe*, Routledge), the difference between various conceptualizations and interpretations of sustainable development, and how these can affect and direct concrete practices and interventions, is discussed using the City of Stockholm as an empirical example.

#### *Potential socio-economic impact of the scientific results*

The scientific outcomes of this project are expected to be of significant interest to municipal planners and decision makers responsible for making decisions about adaptation to climate change. This applies in particular to the work on goal-conflicts/multi-objective evaluation of adaptation options and gender. Relatively little has been written about goal conflicts in climate adaptation. There is some literature on conflicts and synergies between climate adaptation and mitigation (one example is the 2007 IPCC report, which contains a section on this topic). There is also some literature on the criteria commonly used for evaluation of adaptation policies (examples include effectiveness, cost-efficiency, flexibility, and robustness). Occasionally, the relations between climate adaptation and other policy goals are mentioned; however, usually with little (if any) detailed analysis or practical “hands-on” relevance. Through this project, we hope to have made this interesting and important issue more visible.

With regards to gender and climate adaptation, we have made a significant contribution to the academic policy literature. Our focus is on adaptation in industrialized countries. Industrialized countries have seldom been mentioned in international research on the gender-differentiated distribution of impacts of and responses to climate change. Although the gender issues in climate mitigation and adaptation in developing countries are more pressing, we believe that the effects in industrialized countries are sufficiently serious to warrant more attention than they have so far received. Interestingly, this part of the project is also that which has received most intense attention from people working outside academia (We've received invitations to make presentations, had queries via email, etc.).