



# CIRCLE 2 Policy Brief

## - COMMUNICATE UNCERTAINTIES -

### Design climate adaptation measures to be flexible and robust

#### Summary

This policy brief is directed towards funders and managers of climate change impacts and adaptation research programmes as well as policy makers in this area. It notes various challenges in addressing uncertainties in climate change research and policy and provides suggestions on how to address them.

Projections of future climate change and associated impacts are riddled with uncertainties – a great challenge at all levels of policy- and decision-making. There is uncertainty about observed climate changes and its past effects on natural and human systems. There is uncertainty about the current state of the environment and its resilience to changes. And there is even larger uncertainty about future changes in the climate system and their potential consequences for the environment and human societies.

Planning for climate change adaptation (e.g. developing political strategies or deciding on the implementation of adaptation measures) is a relatively new challenge for national and local decision makers. Planners and managers across sectors have to take decisions now about future strategies, measures and investments that are expected to protect their systems against potential climate vulnerabilities. This means taking into consideration an immense and yet growing amount knowledge and data about climate change projections, socio-economic scenarios, and methods for assessing impacts and vulnerabilities.

In order to account for national and local decision makers' perspectives and support better informed decisions, knowledge about the climate system and impacts has to be communicated in a clear and meaningful way taking proper account of associated uncertainties. New focused research is required to advance the knowledge and understanding of how to present uncertainty so that it can inform policy and decision makers most effectively. At the same time, training should be provided to the current and next generation of researchers to communicate effectively on these complex issues. Policy makers should be supported to appreciate and interpret the uncertainty information that science is providing.

*Reference: van Pelt, S., D. Avelar, T. Capela Lourenço, M. Desmond, M. Leitner, C. Nilsson and R. Swart, 2010. Communicate uncertainties - design climate adaptation measures to be flexible and robust.. Proceedings of CIRCLE-2 workshop on Uncertainties in Climate Change Impacts, Vulnerability and Adaptation, Stockholm, 11-12 November 2010.*

## Communicate uncertainties

### Design climate adaptation measures to be flexible and robust

1. **A disconnect between the scientific and 'colloquial' interpretation of the concept of uncertainty complicates communication.** The scientific method is predicated on the existence of uncertainty, which science seeks to reduce but cannot eliminate. In many contexts uncertainty is interpreted as a deficit of knowledge. There are challenges to bridging this disconnect. The common ground may be the assessment and communication of risk, which has a reasonably uniform interpretation across many sectors.
2. **Adaptive action is justified regardless of remaining uncertainties.** There is overall agreement on the robustness of trends and projections of key climate variables and associated impacts such as temperature and sea level rise at global and continental scale. However, many uncertainties will remain, especially with regards to precipitation and extreme climate events at the regional and local level, where the information is needed most. Climate change uncertainty adds to the variety of other decision criteria that decision makers have to deal with in their day to day activities. However, climate information, including its associated uncertainty, can still be very informative. Many methodologies exist to take potential climate change impacts into account in policy development and investment decisions that recognize uncertainties but do not require precise and accurate quantification (robust decision making). Rather than a barrier to action, uncertainty may be treated as a motivation towards a precautionary approach.
3. **More relevant information on uncertainties requires new scientific approaches.** In the absence of perfect knowledge, decisions are still made. The challenge is to communicate evolving scientific knowledge on the climate system, the human impacts and the associated uncertainties in a clear and useful manner that better matches the decision makers' perspectives. Knowledge and understanding of what information about uncertainty makes it decision and policy relevant requires a focused research effort. New methods which formalize the treatment of uncertainty in decision making and present flexible and robust options are required. Also, a need exists to better synthesize existing data and tools, to enhance their usefulness for the decision making process. Importantly, questions on uncertainty management cannot be answered solely by the research community, practitioners and policy makers have to be involved to enhance the relevance of the information provided.
4. **The capabilities of the scientific community to communicate scientific information should be enhanced.** European researchers are not trained to communicate complex scientific information to policy makers and the public. Addressing this communication deficit could be taken on board as a priority issue by research funding agencies, e.g., through skill enhancement training programmes for selected experts and "knowledge brokers", in collaboration with communication specialists. Collaborative climate communication programmes could be established with professional networks and organizations. Rather than characterizing and quantifying uncertainties they could be framed and communicated in a more decision and policy-relevant manner, e.g. in terms of societal acceptability and perception of risks and accompanied by positive options to deal with them, e.g. by exploring ways to turn risks into opportunities.

5. **Uncertainty guidance can support researchers and practitioners.** There is an urgent need for concise, practical guidance to support climate researchers and practitioners to better recognize, interpret and communicate uncertainties. Available materials often relates to communication of uncertainty among the research community. This should be adapted and augmented to support decision and policy makers. Experiences with such guidance, e.g., by the IPCC and in The Netherlands, can serve as starting points. Due to the context-specific nature of impacts and adaptation questions, generic principles can be complemented by tailored guidance for specific sectoral or regional research and policy questions. When developed and tested, such guidance could be provided to relevant project leaders and practitioners in national and European (FP7) research programmes and made available through existing and new information exchange mechanisms such as the Adaptation Clearinghouse for Europe (ACE) and national information systems. Sustained and informed engagement of (and support to) users and providers are necessary.
6. **Selection and analysis of climate scenarios should be rationalized.** Usually for reasons of limited time, resources and accessibility, climate impact researchers often pragmatically use a limited set of scenarios-model combinations. The full range of possibilities and the associated policy implications remains hidden. Although guidance for selection and analysis of climate scenarios for impact research is available, this is often insufficiently used. The current round of new climate scenario analysis will increase the number and complexity of climate projections available. Easily accessible guidance would be required to facilitate proper scenario selection, analysis and use. For climate change impacts and adaptation analysis, combination of climate scenarios and socio-economic scenarios and sets of nested scenarios at different spatial and temporal scales would be required.
7. **Probabilistic scenarios have advantages but also serious constraints.** Following the publication of probabilistic scenarios for climatic change and selected impacts in the United Kingdom, the demand for this kind of scenario output has increased, adding a quantitative idea of likelihood of future changes. The potential and the benefits of their use is still not fully understood and early indications are that these warrant further exploration. However, producing and communicating them well is very resource intensive, while they still do not capture all uncertainties. Their complexity tends to make them difficult to interpret for practitioners and policy makers. The interpretation of climate risk information and its use for adaptation decision making should be carried out with extreme caution: over-interpretation of such projections could lead to mal-adaptation and have cost implications. When making probabilistic scenarios available to policy-makers care should be taken to always provide guidance and other support on their use.
8. **Visualizing research results can greatly enhance communication, if implemented properly.** Visualization greatly enhances communication, but also involves risks when uncertainties are not well captured. Maps or 3D imagery are powerful tools and can trigger a dialogue with stakeholders. Visualization can disclose scientific information, can have a dramatic effect through localizing and personalizing information, and hence stimulate dialogue, but should always be scientifically defensible. A case-specific balance should be sought between the need to provide simple information and the need to reflect uncertainties properly. Maps and 3D-visualization bring only those variables to the fore that can be visualized, ignoring other options, and hence, in an adaptation context, should always be accompanied by information on the broader context.

CIRCLE-2 WP4: Workshop on CCIVA uncertainties.