

Summary of findings from JPI-Climate, Module 4, Workshop:

## **TOWARDS JOINT RESEARCH PROGRAMMING ON CLIMATE CHANGE IMPACTS AND ADAPTATION ECONOMICS**

Venice, 13 - 14 November 2014

### **Background**

The workshop focused on priorities for a socio-economic research agenda on climate impacts and adaptation from an economic perspective. Climate change impacts and adaptation are complex and dynamic processes, requiring adaptive management and specific decision making capacities. Robustness of decision making needs to be based on integrated interdisciplinary (natural, social, economic) analysis, which addresses explicitly uncertainties and non-linearity of climate, social and economic processes. For this purpose, decision makers, but more generally speaking all stakeholders, require tools which are simple and transparent as well as applicable for decision processes at different levels and for different sectors and timescales.

Research activities underpinning decision making on climate impacts and adaptation need to distinguish between (a) system understanding and (b) the development of tools, services and models that allow assessing possible responses and inform robust decision-making strategies under uncertainty. In other words, research needs to understand how the climate changes and how adaptation is taking place in natural, economic and social systems, as well as identify and investigate options available now and in future to respond to the challenges posed by climate change impacts and their socio-economic implications.

Notwithstanding the connections between these two dimensions, it is helpful to keep in mind this fundamental distinction in the definition of a research agenda. The workshop further made evident that even though social and economic systems can adapt to many - also dramatic - changes there are thresholds and tipping points in natural and social systems beyond which adaptation reaches limits. To avoid such thresholds or tipping points, adaptation may have to change from an incremental process to a transformational one with large implications for economic processes, social and natural systems. The workshop therefore concluded that socio-economic climate change research should address both, short-term incremental responses as well as the need for longer term societal transformation.

### **Cornerstones of a strategic research agenda**

Research on climate impacts and adaptation should be structurally driven by the demands of decision-makers and stakeholders, not by model development. At the same time, it needs to attend to the fundamental knowledge gaps that prevent progress in integrated analysis of risks and options associated with climate change impacts and adaptation.

Against this background, the workshop identified the following **key research and methodological needs** for **JPI Climate research as a whole**:

- ***Identification and analysis of the implications of possible thresholds and tipping points.*** These are likely to be related rather to extreme changes, in natural and social economic systems, than to “changes of averages”. The role of innovation and of societal transformation to address such changes is fundamental.

- **Development of robust decision making methodologies in the presence of uncertainty** including development and extensive use of multiple socio-economic scenarios and models to better capture uncertainty and improve consistency between socio-economic and climate scenarios, and the application of specific analytical tools.

This research needs to be conducted with:

- a multi-disciplinary, a multi-scale (spatial and temporal) and a sector integration approach;
- a multi-level governance framework (local to transnational) - a particular issue worth investigating is “policy lock in” i.e. regulatory frameworks, taxation systems, organizational and institutional structures, preventing successful adaptation;

Furthermore, the workshop identified **specific research needs on economics climate change impacts and adaptation** as part of an integrated research strategy. They address existing **fundamental knowledge gaps**:

- **Improve understanding and estimates of past and present market and especially non-market impacts.** This might require e. g. a systematic and concerted effort to gather and consistently use measurements and observations and produce data sets derived from a network of new and past cases that allow empirical econometric analyses. Learning from past good/bad practices can be particularly fruitful to support adaptation analysis.
- **Focus on market and non-market effects of climate change in less well covered areas**, such as on ecosystem services, health or cultural heritage. These are still poorly investigated and assessed because they are hard to measure and quantify. Also the analysis of systemic impacts and implications of climate changes elsewhere on the European economy was noted as a priority.
- **Integrate economic damage assessment with biophysical impact models** to derive indices and estimates for physical and economic damages at different time scales, including cascading effects.
- **Analyse in systematic empirical studies the processes of autonomous adaptation** from social and economic perspectives (e.g. *behavioural economics and econometrics*)
- **Develop and test simple methods and tools for socio-economic assessment of response options**, explicitly including “soft” measures such as communication and mainstreaming of climate adaptation in non-climate policies. Coordinated development of such methods and tools will facilitate international learning and comparability of results.

#### **Operational aspects:**

- The translation of research findings and tools into effective support to actual decision making processes require experimental lab-like settings, allowing for iteration and collective learning.
- A research programme supporting such settings can be organised through a combination of a group of relatively small and focussed projects (e. g. for econometric modelling, for specific adaptation questions at a particular scale such as urban) together with coordinated flagship initiatives (e. g. for transnational data collection or integration, improvements and consistency of modelling).
- These flagship initiatives would ideally be cores of international networking efforts (building on existing networks, which however are still weak in this particular area). Also scientific capacity building should be considered in this connection and open data access is a requirement here. There is also a potential to link to activities of other JPI (like JPI Urban Europe) and the proposed research can either be developed only in Europe or integrated with global programmes (e.g., through the Belmont Forum).