

Approaching the valuation of climate change vulnerability as (social) risk assessment

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A report to the UK Department for Environment, Food and Rural Affairs (Defra) evaluated the sources of uncertainties, plausible ranges of estimates of the SCC and areas for further research and assessment. This presentation reflects on a risk assessment framework presented in the report. Paul Watkiss and Richard Tol provide details on the social cost of carbon.¹

Uncertainty is inherent in estimates of the social cost of carbon (SCC). An analytical framework based on risk assessment brings together elements of uncertainty in climate change and its impacts with uncertainties in economic valuation; both are related to the context of decision making.

Key messages are:

Understanding of the social cost of carbon:

- Our understanding of future climatic risks, spanning trends and surprises in the climate system, exposure to impacts, and adaptive capacity, is improving, but knowledge of the costs of climate change impacts is still poor.
- The lack of adequate sectoral studies and understanding of local to regional interactions precludes establishing a central estimate of the social cost of carbon with any confidence.
- The balance of benefits and damages in the social cost of carbon shifts markedly over time, with net damages increasing in later time periods. Estimates of the SCC are particularly sensitive to the choice of discount rates and the temporal profile of net damages
- Vulnerability and adaptation to climate change impacts are dynamic processes responding to climatic signals, multiple stresses, and interactions among actors. Large scale impacts, such as migration, can be triggered by relatively modest climate changes in vulnerable regions.

Uncertainty and risk:

- Climate uncertainties and the climate sensitivity are key factors in larger estimates of the social cost of carbon.
- Uncertainties in coverage, sectoral assessments and regional processes are likely to be significant, but are difficult to judge without further model development and inter-model comparison.
- Decision variables such as the discount rate and equity weighting also are extremely important.

Significant improvement in estimates of the SCC will require well validated assessments at the regional scale of the dynamic processes of vulnerability and adaptation. Partnerships among researchers and stakeholders in developing countries are essential.

¹ See Downing, et al. 2005. Scoping uncertainty in the social cost of carbon. Report to Defra. Oxford: SEI. Preparation of a final paper from this workshop will invite additional authors from the Defra project.