



Climate change, ecosystem services, and costs of action and inaction: scoping the interface

Beatriz Rodríguez-Labajos*

Cost calculations related to climate change have accrued much intellectual effort. However, few works approach the assessment from the point of view of the effects of climate variability and change in ecosystem service provision. Failure to act plausibly leads to ecological, social, and economic damages as a result of ecosystem change. The necessary actions to cope with unavoidable damages from such change generate adaptation costs, while mitigation costs are associated with actions to tackle undesired future changes in the ecosystems. Examples of these effects and related costs, based on representative studies, are reviewed following the organizing scheme of the ecosystem services approach. The examination of case examples reveals the potential and limits of monetary versus non-monetary estimations of impacts in human wellbeing from climate change-related changes in the ecosystems, trade-offs between types of ecosystem service provision and implications of timing in action. This article further discusses the necessary steps to advance in an inclusive scrutiny of the costs associated with the effects of climate change on ecosystem service provision. © 2013 John Wiley & Sons, Ltd.

How to cite this article:

WIREs Clim Change 2013. doi: 10.1002/wcc.247

INTRODUCTION

Actions to mitigate climate change and its effects require financial and other inputs. Failure to mitigate will incur costs. The adverse effects of delay must be weighed against the risks associated with early measures when preparing strategies facing climate change.¹ The literature offers a variety of aggregate estimates of the economic costs of climate change at a global scale, based on a range of model types and metrics already reviewed in *WIREs*.² The best known are probably the results of the Fourth Assessment Report (AR4) of the United Nations Intergovernmental Panel on Climate Change (IPCC)³ and the Stern Review.⁴ Both expressed damages as equivalent percent in gross domestic product (GDP), ranging from net positive results to negative results

of 10% or more, depending on the different warming scenarios. Mitigation costs and adaptation costs (the knowledge of which is admittedly poorer) have been similarly calculated, often suggesting net positive outcomes of action against climate change.^{2,5}

Aggregation, discounting, equity, ethical considerations in valuation, are all concerns over such efforts, and, more broadly, over the role of economic assessment to shape policies against climate change.^{2,6–8} While often controversial, estimation of costs provides a signal of the disruptive effects of climate change, reminding us that impacts of anthropogenic climate change are no longer a hazard, but a feature of the present.⁹

In this context, there is increasing recognition of the role of ecosystem services (ESs) in societal perception of, and responses to, climate change variability and change.¹⁰ As explained below, a variety of impacts to ES and ecosystem-based measures for climate change mitigation and adaptation are already a part of the mainstream climate change debate. The counterfactual nature of the climate change estimates¹ adds uncertainty to the already difficult issue of selecting

*Correspondence to: beatriz.rodriguez@uab.cat

Institute of Environmental Science and Technology, Autonomous University of Barcelona (ICTA-UAB), Bellaterra, Barcelona, Spain

Conflict of interest: The author has declared no conflicts of interest for this article.