

Adaptable or Vulnerable? Understanding and Shaping the Impacts of Global Environmental Change Through Inter-Disciplinary Research

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Introduction

How do we understand and influence the ability of
different places and diverse social and economic groups
to respond to different forms and levels environmental change?

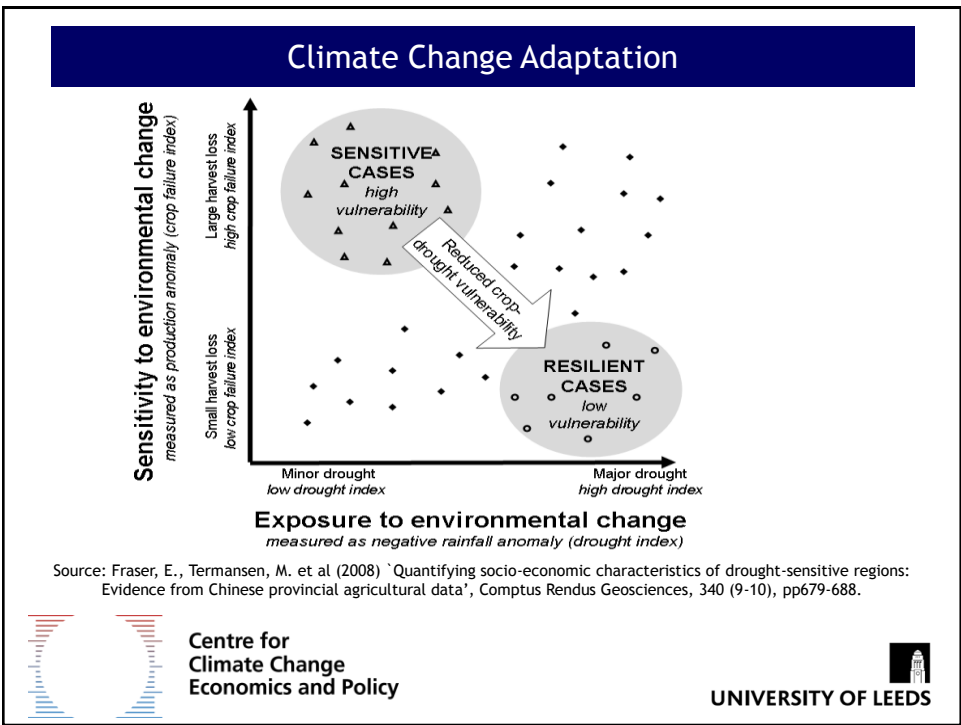
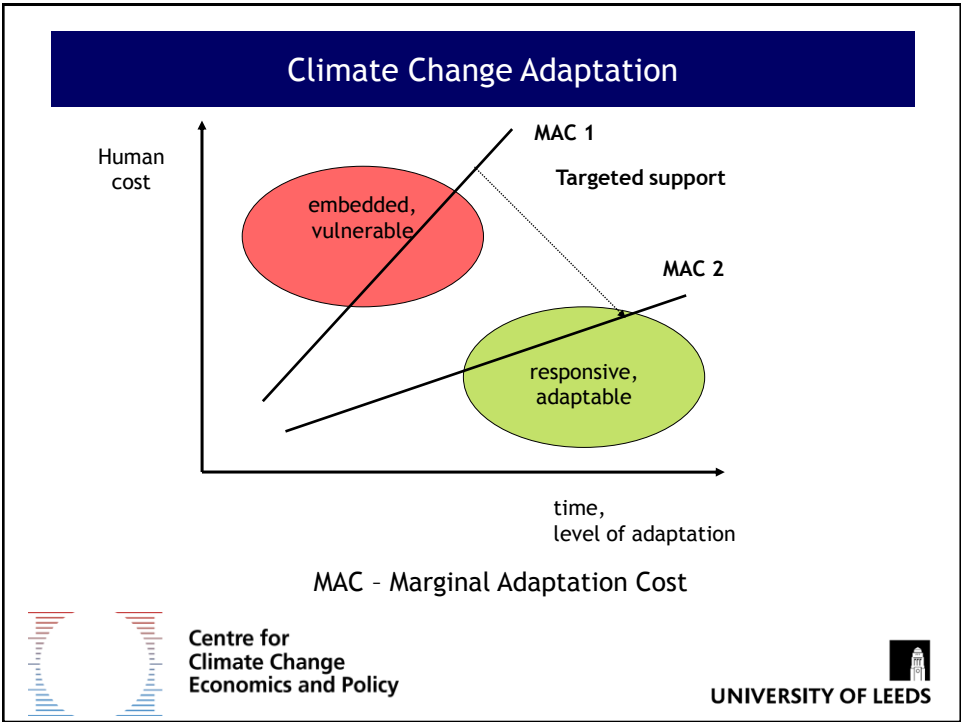
Focus on climate change adaptation and mitigation,
on some of the knowledge gaps and
the need for scientific advances in some key areas.



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Climate Change Adaptation

- The Stern Review changed the political landscape by predicting that at the global scale the costs of climate change could be 1-2% of GDP with early action, or from 5-20% without early action.
- But the models are on the broadest possible scale, the methods are contested and the predictions are uncertain.
- In many instances, we simply don't know what impacts different levels of climate change might be, where the cost curves for adaptation are, what shape they are, what they depend upon, how they can be moved etc etc.

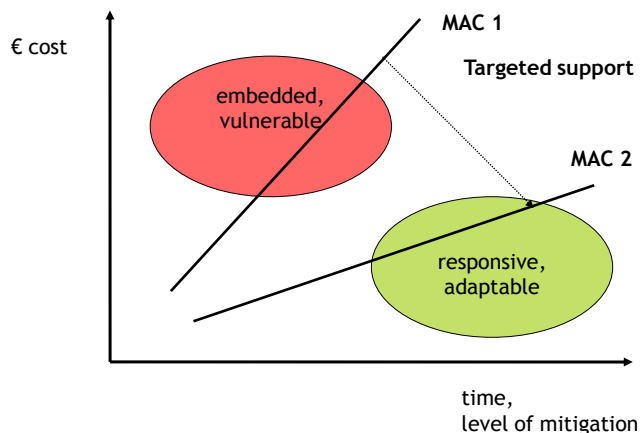


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Climate Change Mitigation



MAC - Marginal Abatement Cost



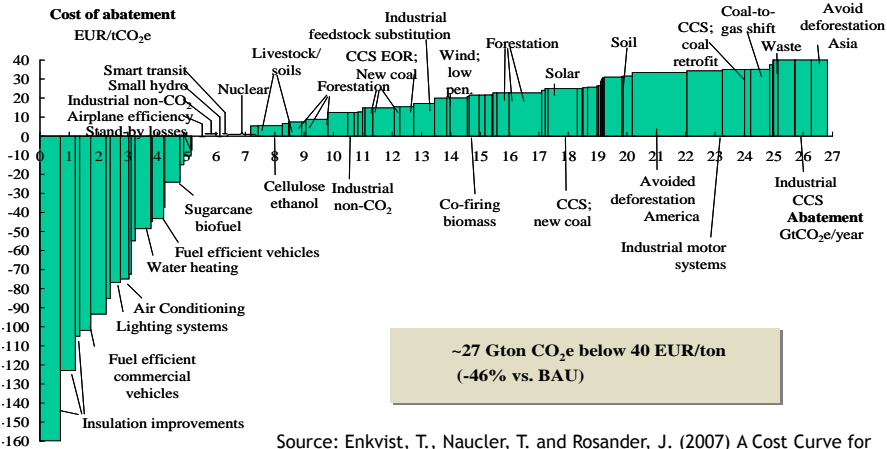
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Climate Change Mitigation

2030



Source: Enkvist, T., Naucler, T. and Rosander, J. (2007) A Cost Curve for Greenhouse Gas Reduction, McKinsey Quarterly, February.



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Climate Change Mitigation

- Such technology assessments have also changed the political landscape by predicting that at the global scale carbon emissions can be reduced by nearly 50% using existing technologies and for less than \$40 a ton.
- But again the models are on the broadest possible scale, the methods are contested and the predictions are uncertain.
- Again, we simply don't know what impacts different forms of climate policy might be, where the cost curves for mitigation are, what shape they are, what they depend upon, how they can be moved etc.



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Climate Change - Knowledge Gaps

- Climate models, economic models and technology assessments need to be downscaled, their predictions need to be 'ground truthed' and their contingencies and sensitivities need to be much better understood.
- Until this happens, our understanding of the scope for adaptation and mitigation
 - a) at different scales,
 - b) in different places,
 - c) for different social or economic groups and
 - d) to different levels of climate change and targets for decarbonisationwill remain vastly under developed.



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Key Challenges 1 - Inter-disciplinarity

To respond to these challenges we need to combine insights and approaches from across the natural, physical and social sciences.

Interdisciplinary work needs

- a) a shared vision,
- b) trust and mutual understanding,
- c) a willingness to take risks,
- d) an ability to develop and apply new methods and data sources,
- e) a willingness to engage in the co-production of knowledge with different stakeholders
- f) funders and reviewers who recognise that the sum is greater than the parts.

All of these take time to develop - and they depend on the coincidence of a range of other (often intangible) factors that are themselves poorly understood.



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Key Challenges 2 - Methodological Pluralism

Research communities should combine and integrate:

- Ex ante with ex post
- Macro with micro
- Model based with observation based
- Top down with bottom up
- Quantitative with qualitative
- Theoretical with applied
- Descriptive with prescriptive
- Conventional with controversial



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Conclusions

Problem oriented, policy relevant research demands inter-disciplinarity and methodological innovation.

Such research should be more than a relay race, either between disciplines or between research, policy and practice - we need to engage in the co-production of knowledge.

Key challenges relate to the downscaling and 'ground truthing' of models.

This requires capacity building and culture change in research communities.



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