Planning for the future

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Living With Environmental Change
LWEC

Key global challenges

Population growth

Technological change

Globalisation

Food, water and energy security

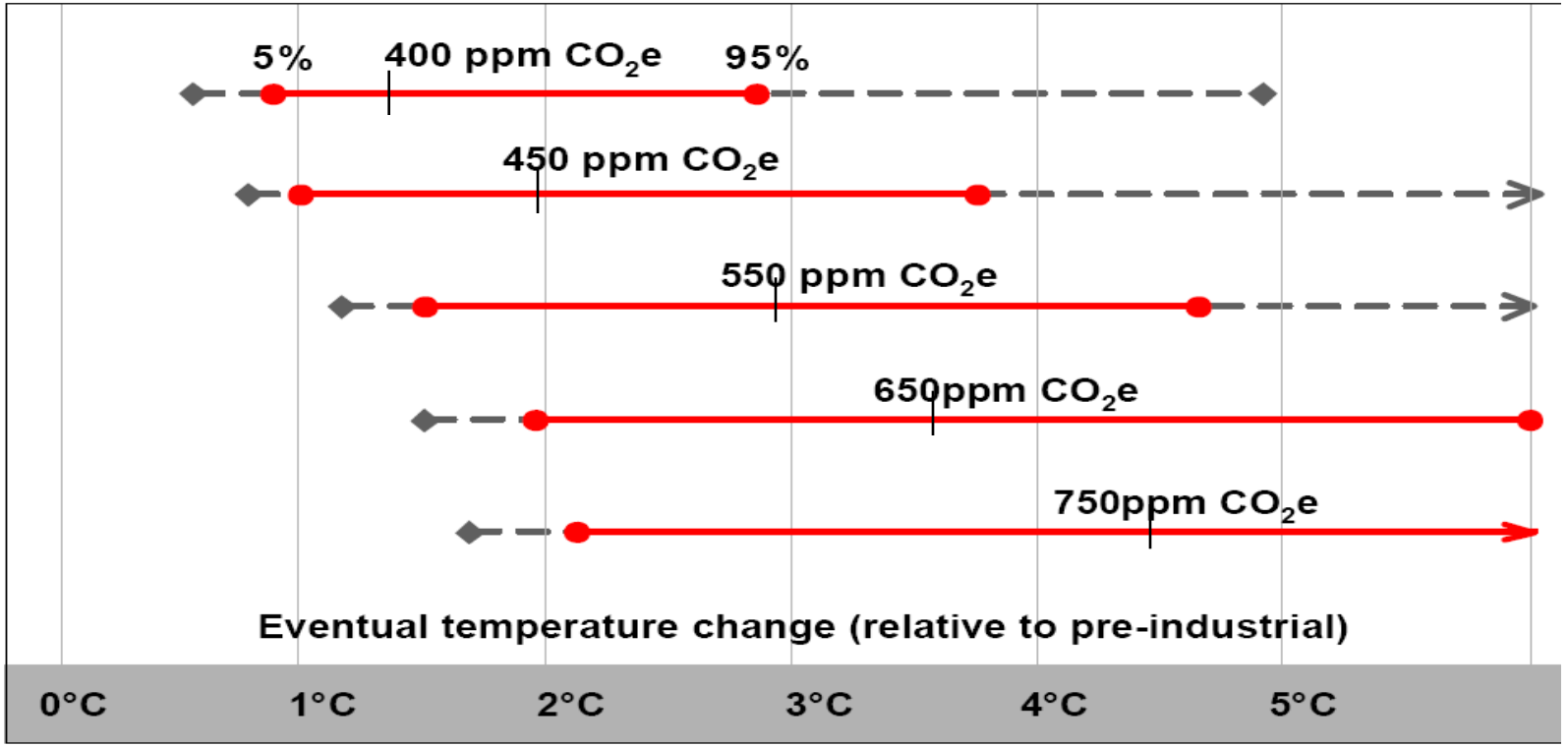
Urbanisation

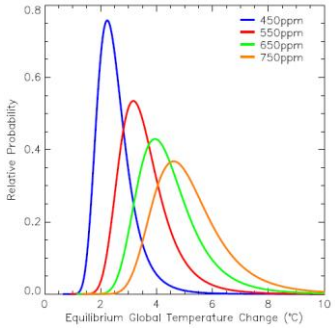
Biodiversity loss

Poverty alleviation

Infectious diseases

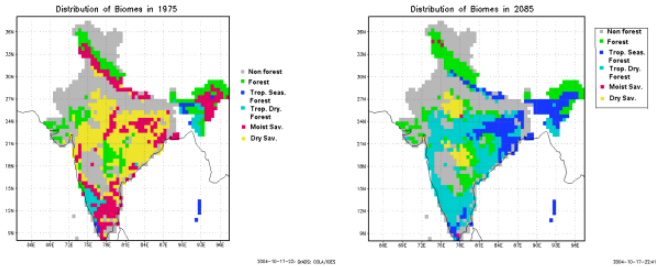
Climate uncertainty



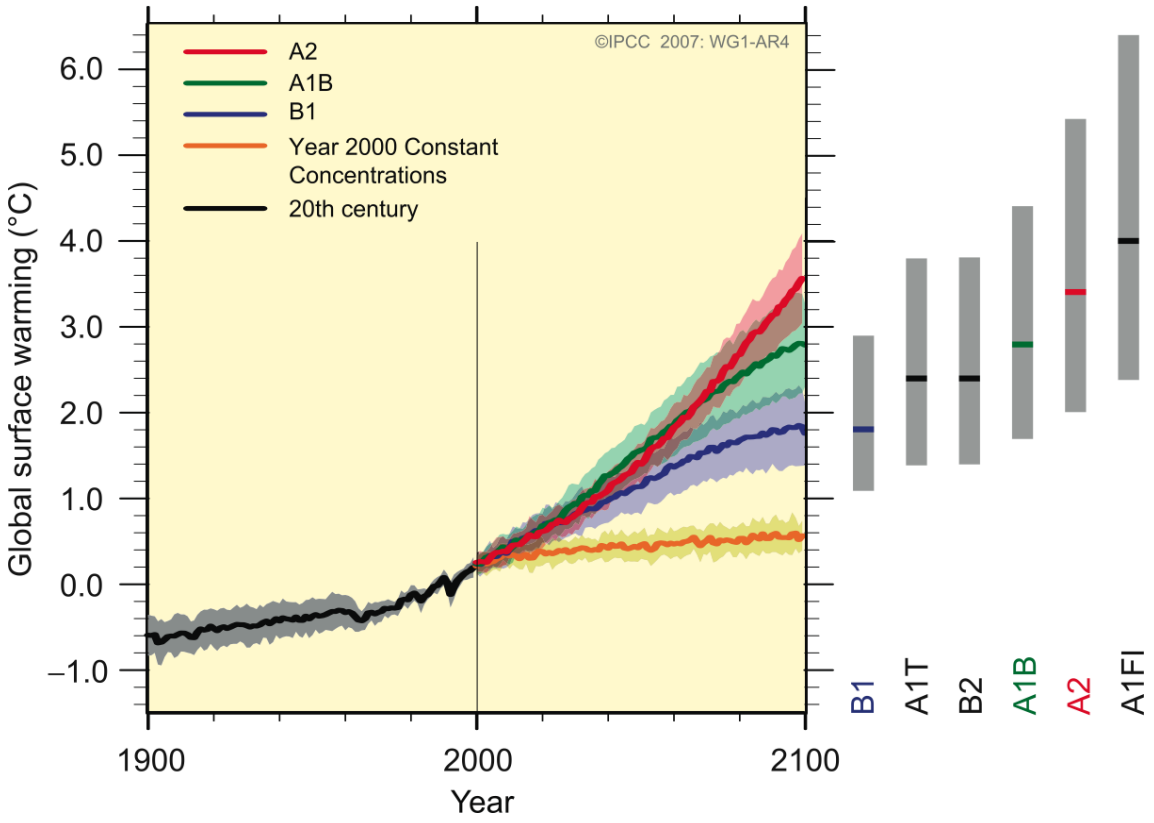


DEPARTMENT OF ENERGY & CLIMATE CHANGE

AVOID



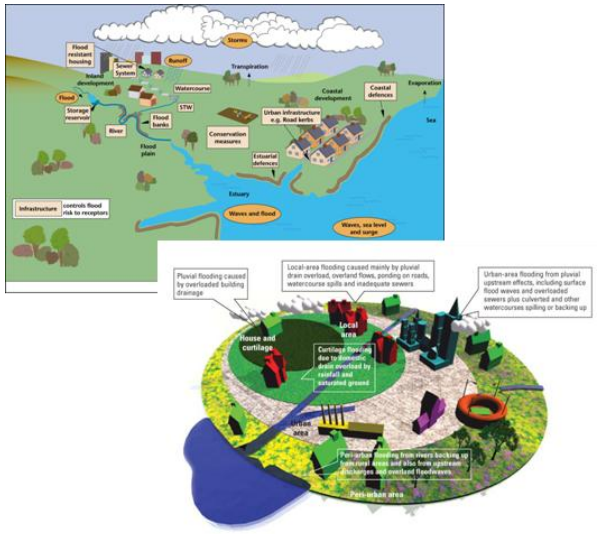
Socio-economic uncertainty



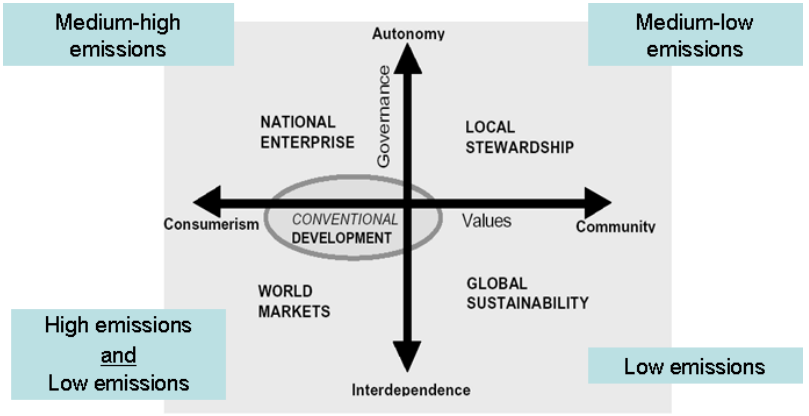
Source: IPCC AR4

Scenarios and uncertainty:
the Foresight approach

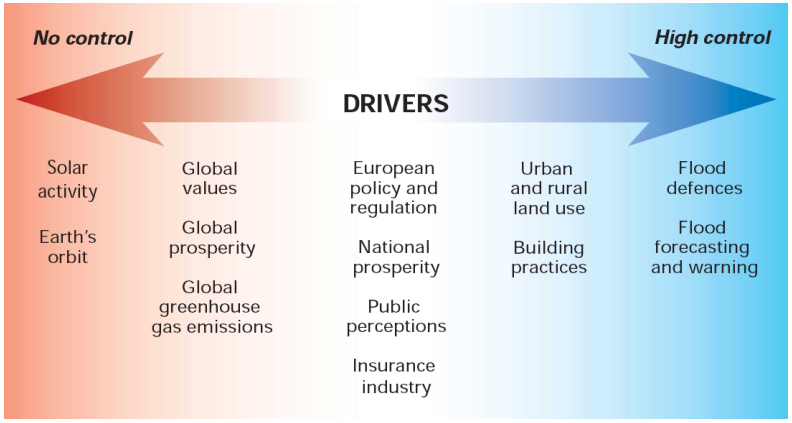
The Flooding System



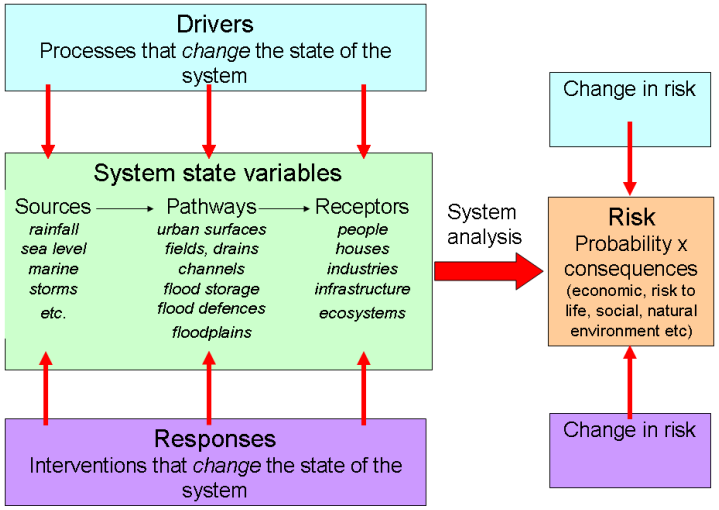
Scenario Analysis



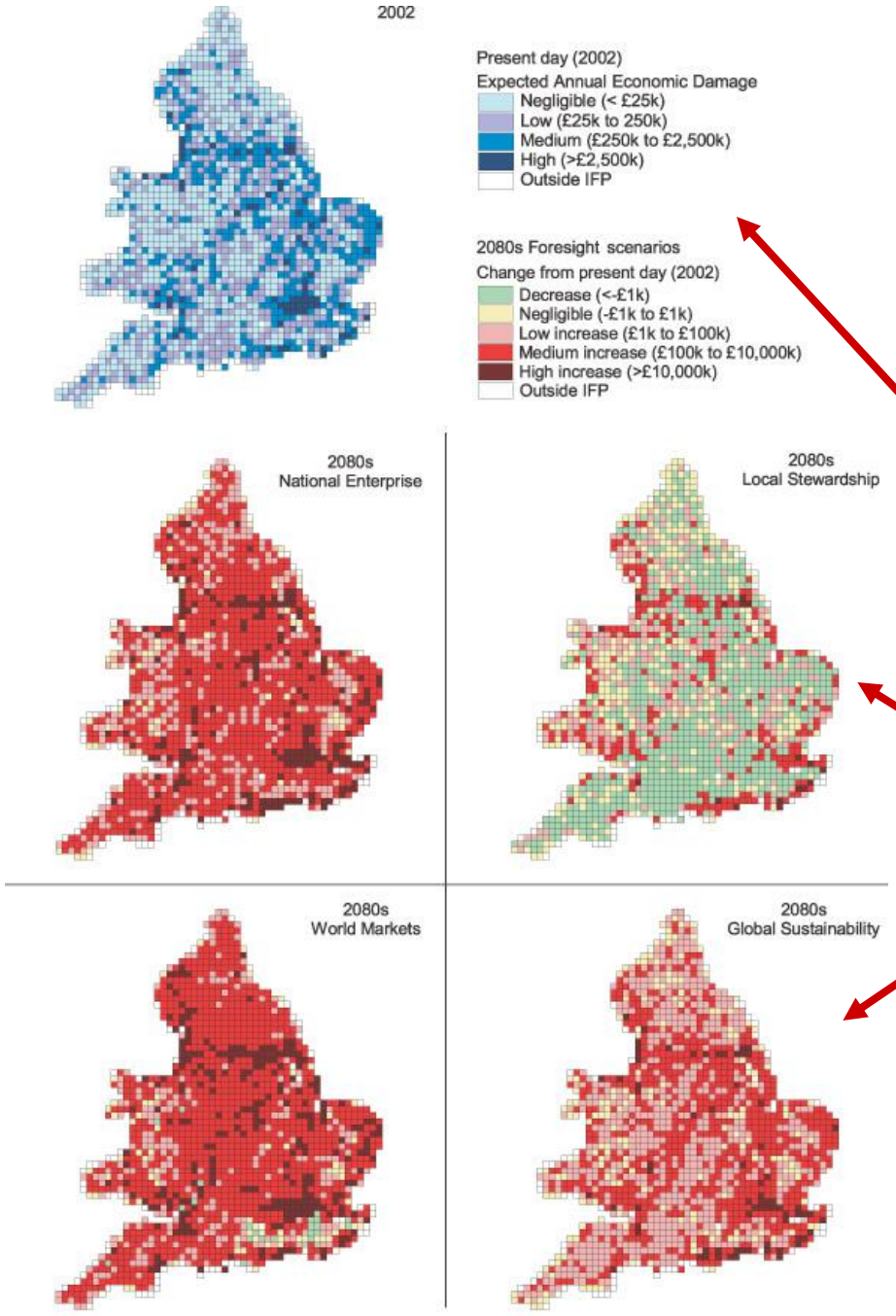
Driver and Response Analysis



Risk Analysis



Foresight: expected increase /decrease in annual economic flood damage



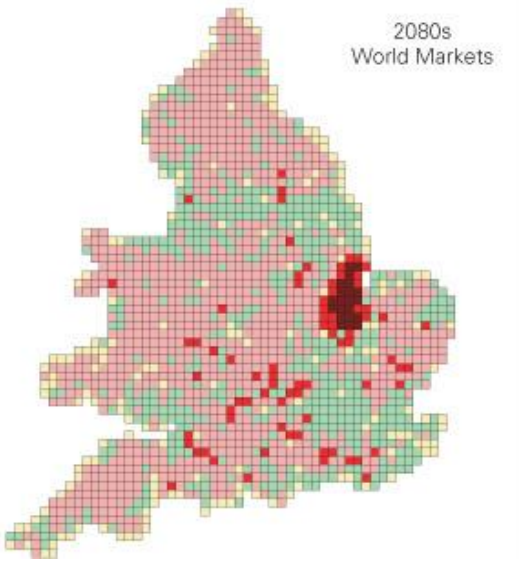
Present day values

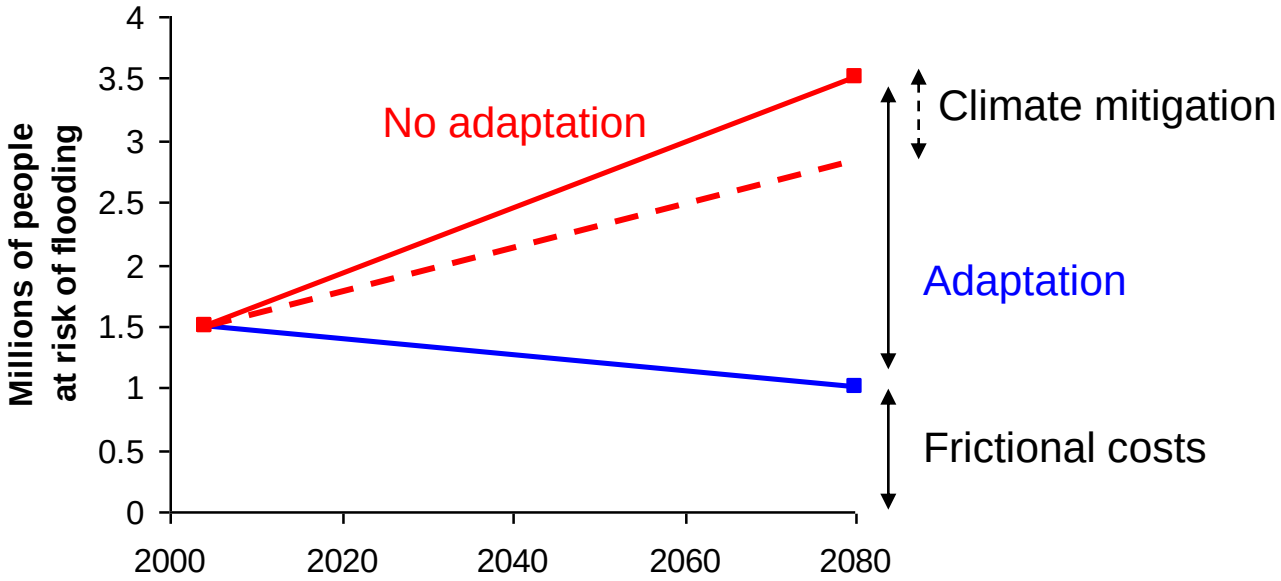
The four scenarios for the 2080s: change in risk

Source: Evans et al 2004

Responding to the increase in flood risk

Costs of flooding in terms of the number of people at high risk from flooding over time with and without adaptation



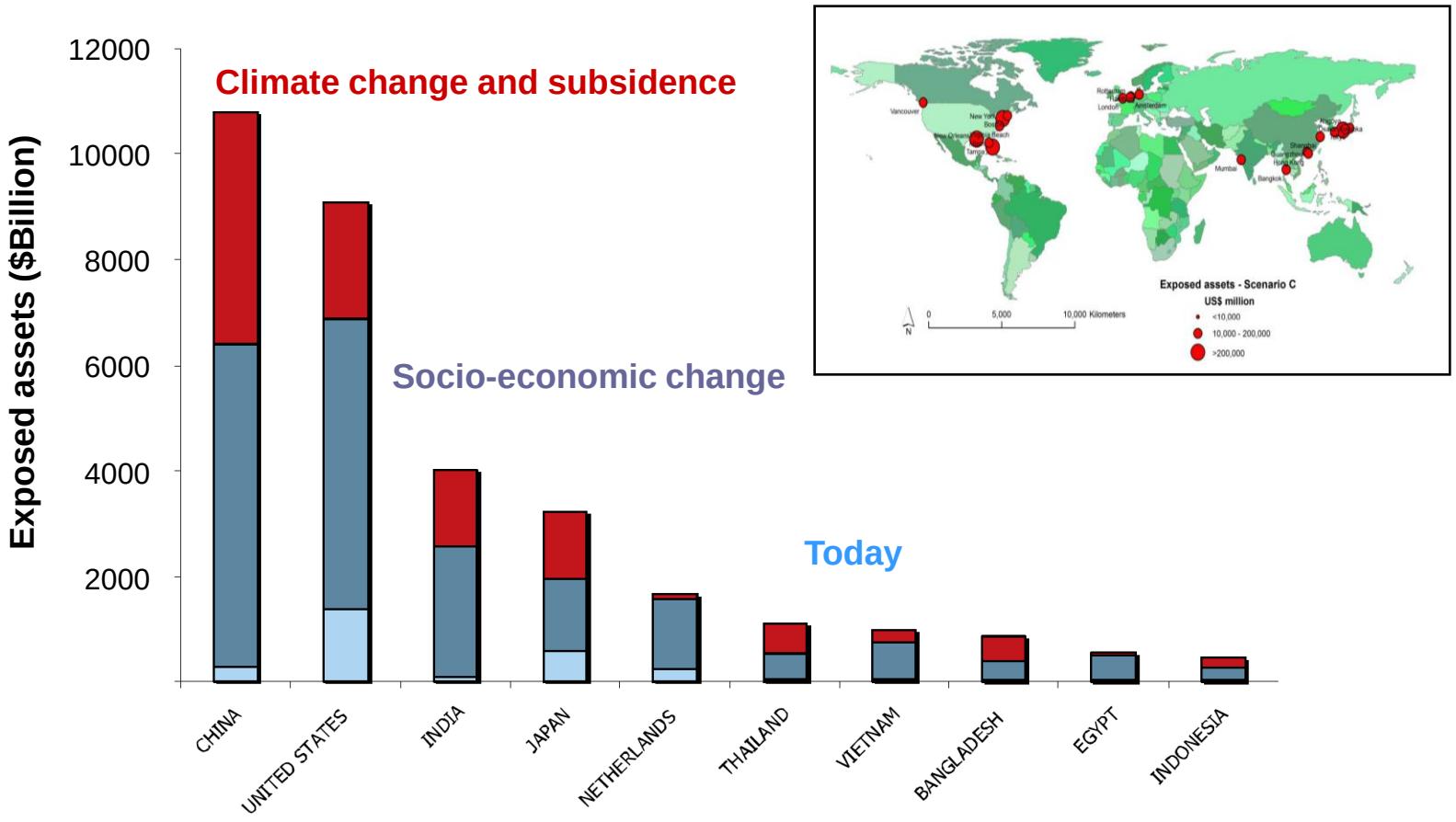


World Markets scenario

Source: Evans et al 2004

The drivers of the change in risk

Exposed assets in coastal ports



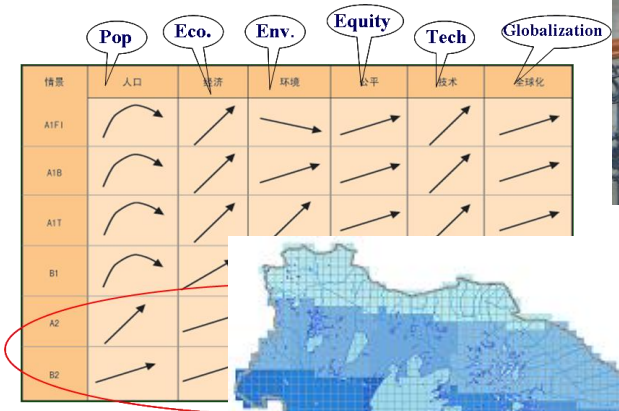
Source: Nicholls et al 2007

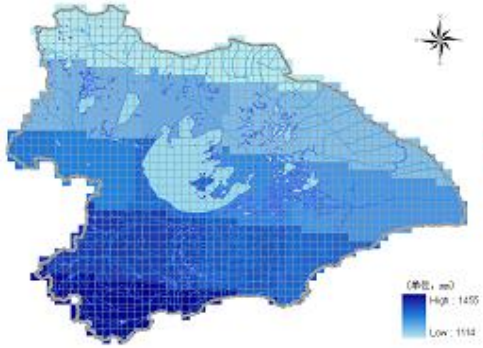
Foresight: international developments

Russia

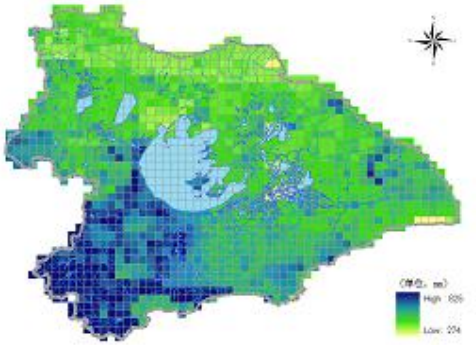
China

USA





(a) annual average precipitation

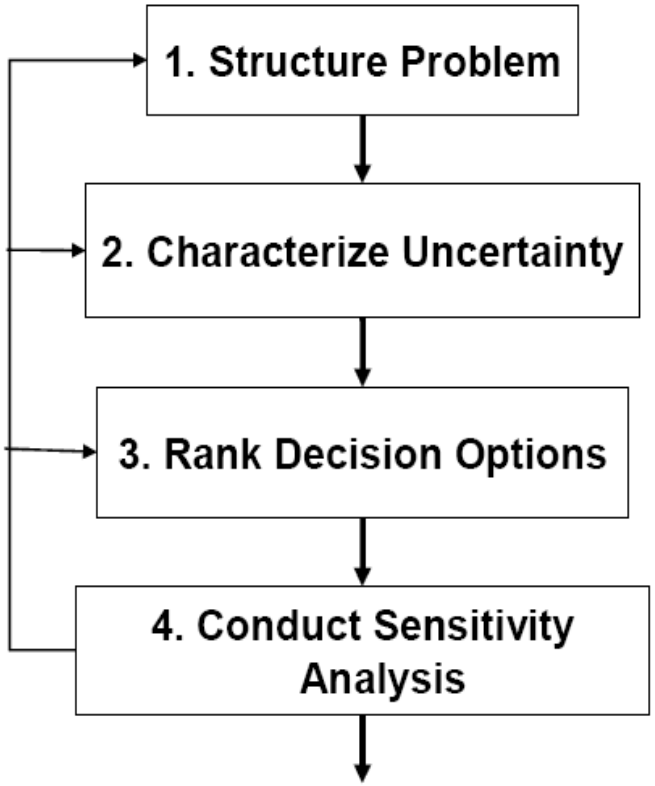


(b) annual average runoff depth

Drivers **Risk analysis** **Responses**

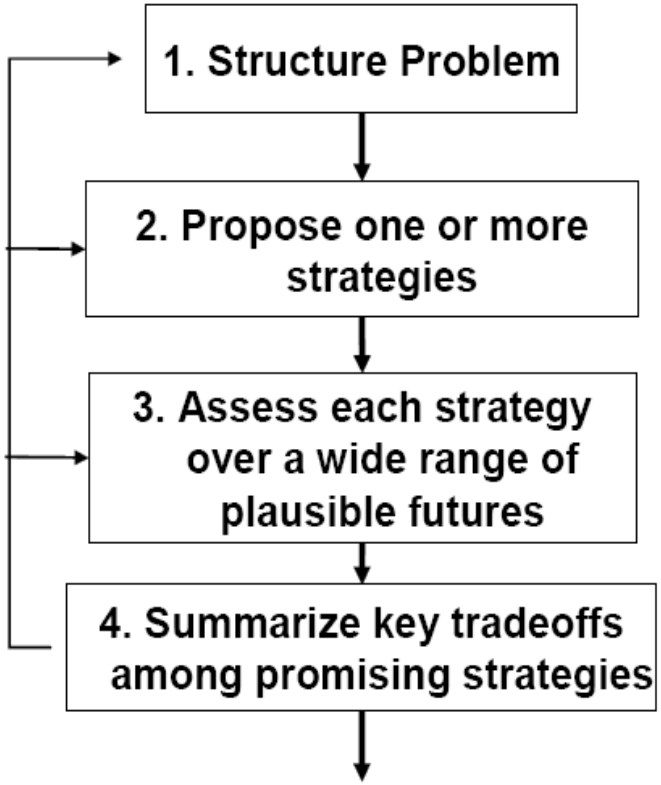
Robust decision making under uncertainty

Predict-then-act approach



Suggests Optimum Alternative

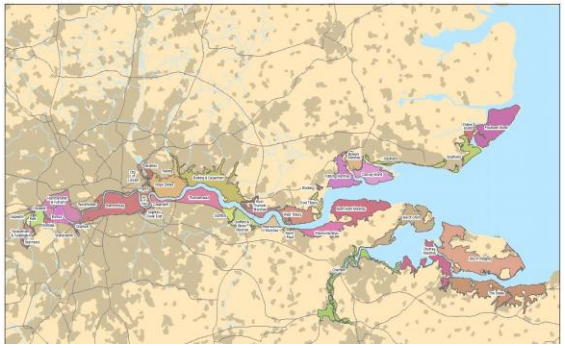
Assess-risk-of-policy framework

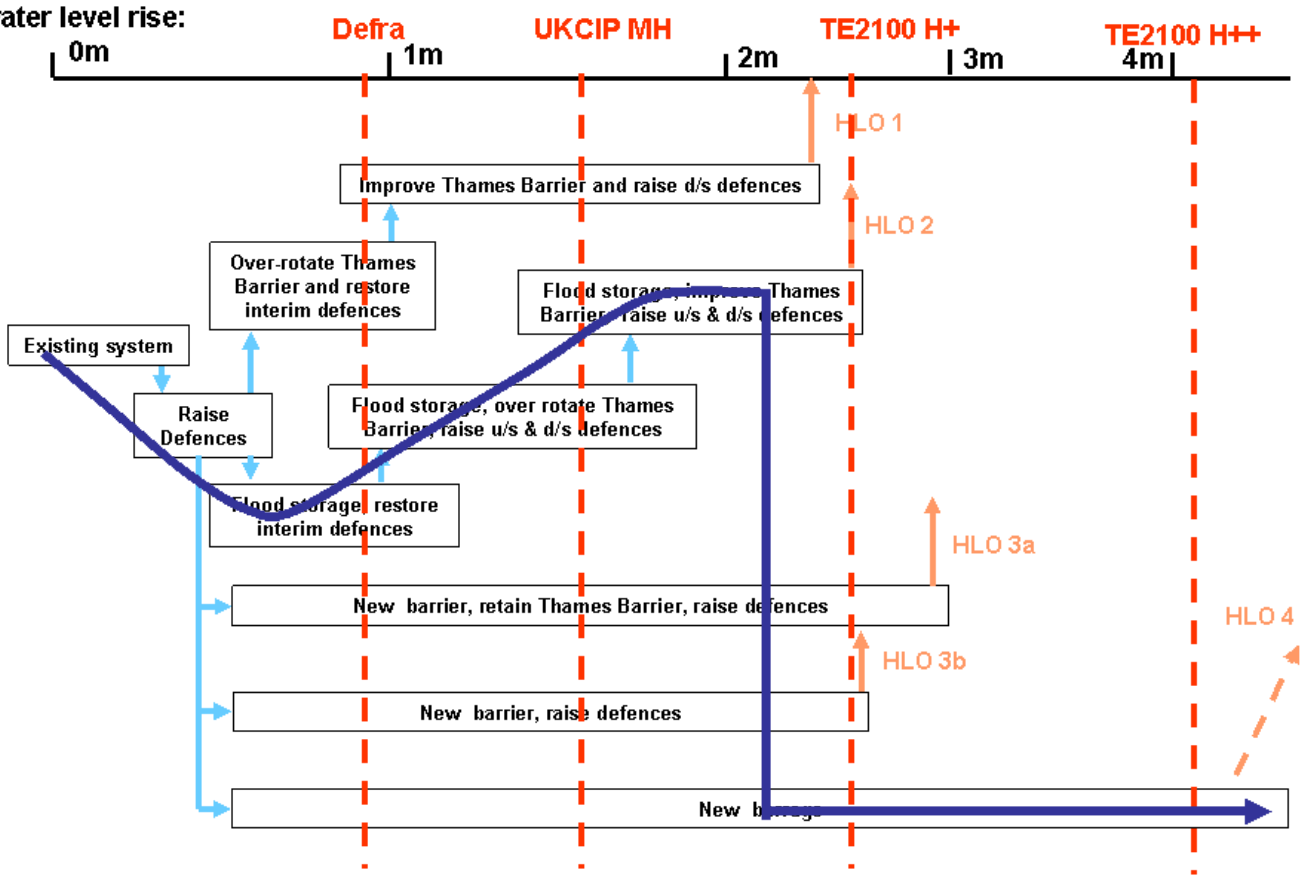


Suggests Robust Alternative

Source: Suraje Dessai

Robust decision making under uncertainty

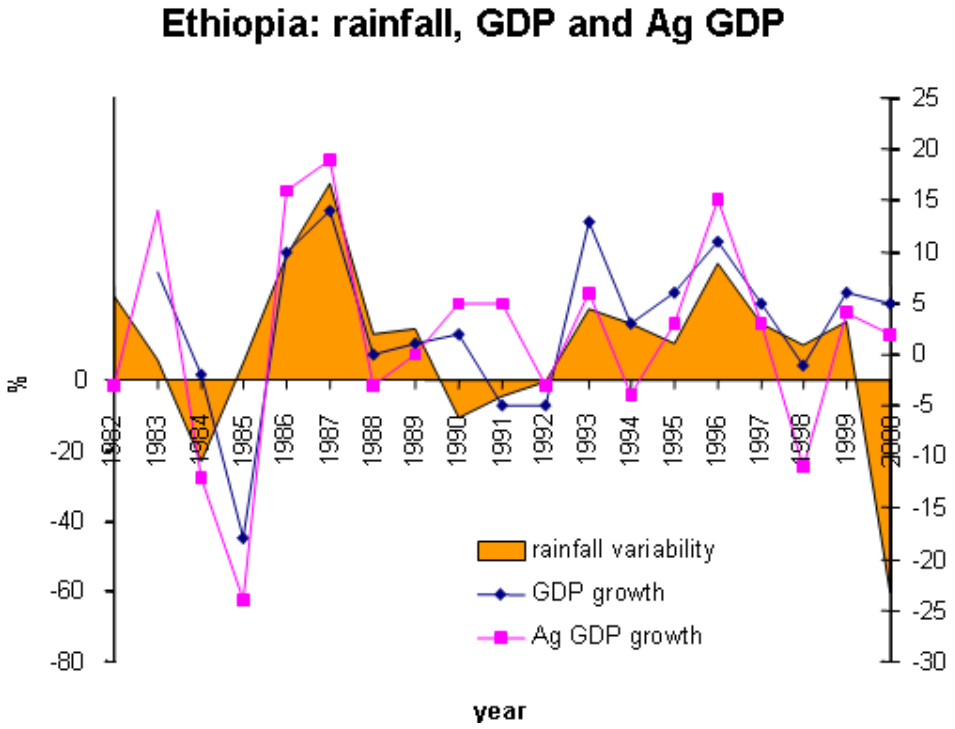




Starting with current uncertainty:
the human development approach

The starting point is the present; using climate change scenarios adaptation assessments are firmly anchored with an understanding of current climate risk

1. defining project scope
2. assessing current vulnerability
3. characterising future climate risks
4. developing an adaptation strategy
5. continuing the adaptation process



Source: Claudia Sadow and Dessai et al 2005

Climate Change Adaptation in Africa:
a research and capacity development program

Aims to improve the capacity of African countries to adapt to climate change in ways that benefit the most vulnerable

DFID Department for International Development

Climate Change Adaptation in Africa:
a research and capacity development program

1. A significant and timely development
2. Delivering the adaptation agenda?
3. Climate change and climate variability
4. Integration and upscaling
5. Support networks and research capacity
6. Devolution of ‘ownership’

DFID Department for International Development

Watkinson et al 2008
Mid term review

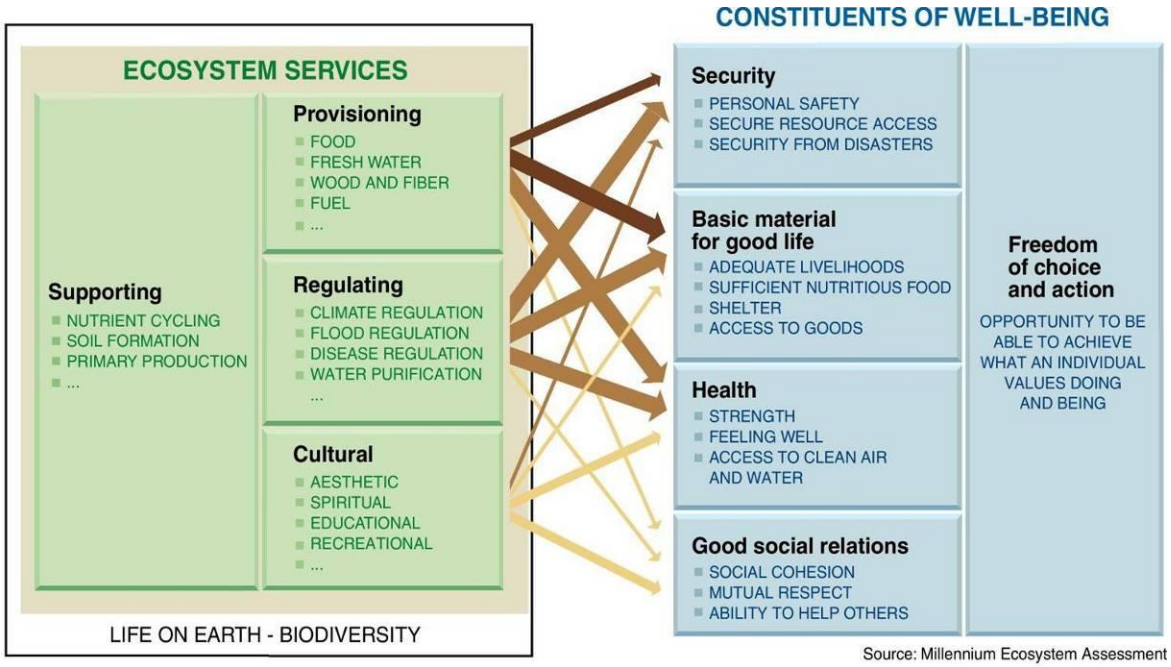
Placing climate change in a wider context

Ecosystem Services for Poverty Alleviation (ESPA)

NATURAL ENVIRONMENT RESEARCH COUNCIL

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

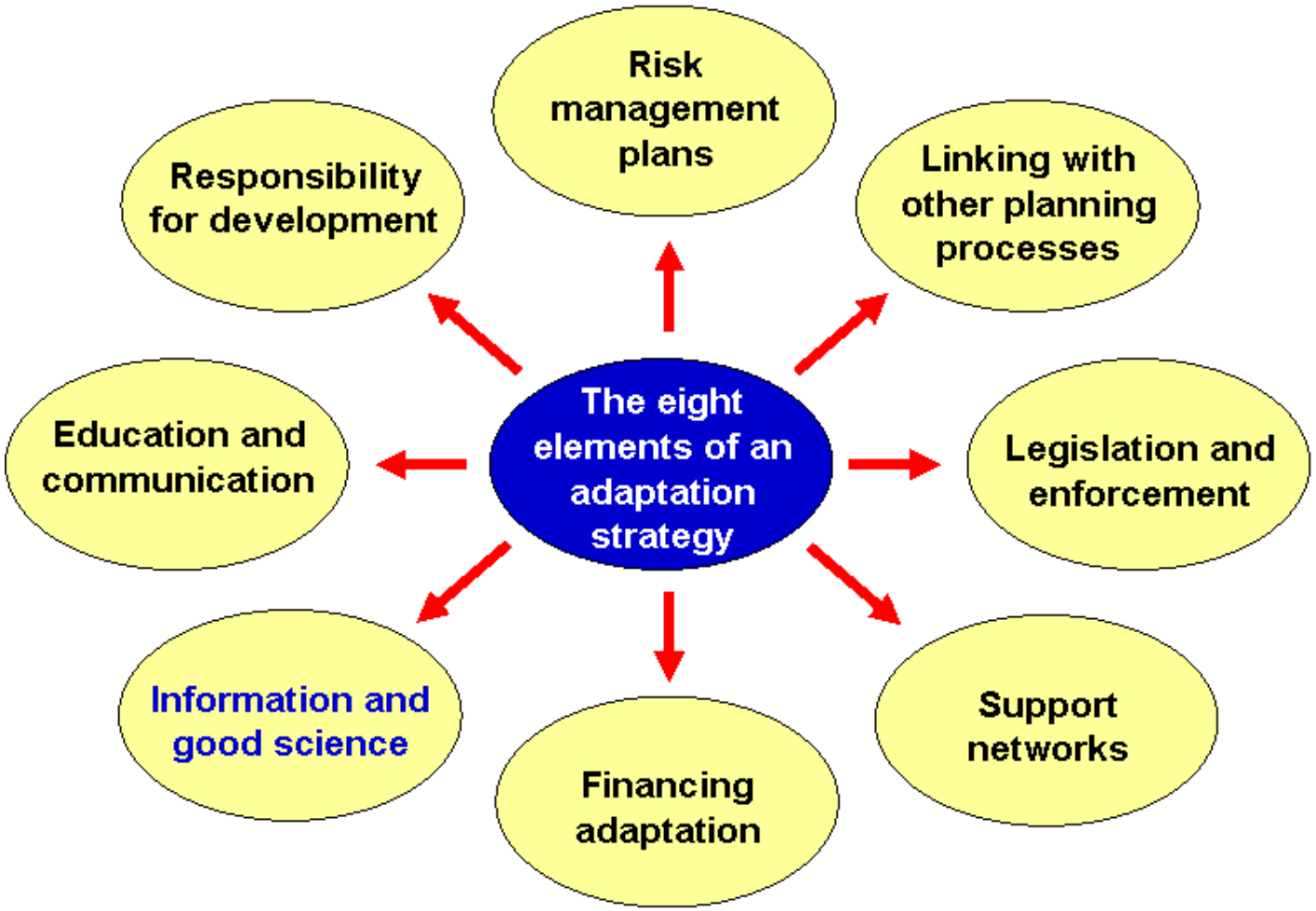
DFID Department for International Development



Source: Millennium Ecosystem Assessment

- Impact of climate change and on the water cycle and ecosystem services
- Environmental change, infectious disease ecology and human well-being
- Biodiversity and ecosystem services – ensuring a sustainable flow of goods and services to enhance human well-being
- Coastal ecosystems, regulating services and coastal populations
- Forests, land use change and ecosystem services
- The economics of ecosystem services for poverty alleviation

Placing the science in a wider context



EPSRC
Engineering and Physical Sciences Research Council

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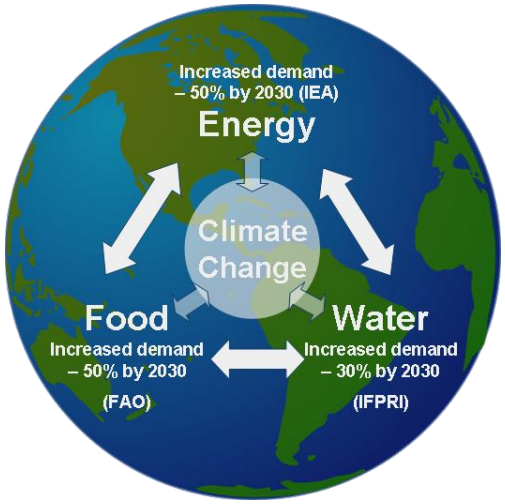
Integrating the challenges



1. **Can 9 billion people be fed equitably, healthily and sustainably? 50% increase in demand by 2030.**
2. **Can we cope with the future demands on water? 30% increase in demand by 2030.**
3. **Can we provide enough energy to supply the growing population coming out of poverty? 50% increase in demand by 2030.**
4. **Can we do this whilst conserving biodiversity and mitigating and adapting to climate change?**

Source: John Beddington

Conclusions

- Climate change is one of a number of integrated challenges that need to be addressed in planning for the future
- There is a need for better prediction of climate change at a range of scales that are relevant to the economy
- Adaptation efforts need not be limited by the lack of reliable foresight about future environmental conditions
- There are methods and tools that allow the planning of adaptation to climate change despite deep uncertainties

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