ADAPT Project: Towards an integrated decision tool for adaptation measures
Case study: floods

Economic aspects
Follow up Committee Meeting
ULB, 29 September 2006
Plan

- Secondary impacts of climate change in Belgium - Economic aspects
  WP1 GENERAL STUDY AND EVALUATION

- Economic aspects of floods
  WP2 CASE STUDY– FLOODING
  A. Identification and evaluation of secondary impacts
    ➔ WP2.2 Evaluating secondary impacts of global change induced flooding on vulnerable sectors in river basins
  B. Adaptation measures
    ➔ WP2.3 Determining adaptation measures
    ➔ WP2.4 Evaluating adaptation costs
  C. Cost-benefit analysis
    ➔ WP2.5 Cost-benefit analysis
Secondary impacts of climate change in Belgium - Economic aspects

WP1. General study and evaluation

- Description of potential impacts of climate change for the economic sectors in Belgium
  - Secondary economic aspects
- Sectors covered: agriculture, energy, transport, tourism, services (financial), human settlements, ...

Current state of this task:
In finalization
  ➔ Still waiting for information from several actors (SNCB, Region Walloon)

➔ At the level of WP1 as a whole:
  - Compilation in WP1’s report with the others aspects of secondary impacts (social and ecological) and the primary impacts
  - Rereading for dissemination (website and others)
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A. Identification and evaluation of secondary impacts

This thematic is developed in:

☐ WP2.2 Evaluating secondary impacts of global change induced flooding on vulnerable sectors in river basins

Needs to identify and to evaluate flood damages to the economic, social and environmental aspects

Organisation:
1. Inventorying of elements at risk (population, infrastructure, socio-economically important activities)
   ⇒ Assess the direct and indirect impacts of floods on three pillars of the sustainable development
2. Developing cost relationship for various categories of damage
3. Calculating negative impacts in monetary terms
   ! Difficulties! ⇒ Complementary methodology to cost-benefit analysis, based on conventional impact assessment using sustainability indicators

⇒ Two methodologies for estimating the impacts
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The economic evaluation methodology

Total economic value

Use value

Revealed preferences
(conventional and surrogate markets)

Stated preferences
(Hypothetical markets)

Non-use value

Dose response relationship
(primary-secondary impacts)
WP2.1 and 2.2

Market Prices

Hedonic pricing

Travel costs method

Averting behaviour

= cost of losses (market price)

= decrease of property value

= travel costs

Property market

= Spend money to offset the environmental impacts
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Identification and classification of economic impacts (1)

Different categories of flood damage will be included in the economic analysis. Globally, these flood damages are categorised in two ways (Messner et al, 2006):

- Direct cost: “direct flood damage covers all varieties of harm which relate to the immediate physical contact of flood water to humans, property and the environment”
- Indirect cost: “indirect flood damages are damages caused by disruption of physical and economic linkages of the economy, and the extra costs of emergency and other actions taken to prevent flood damage and other losses”
- Tangible cost: “damages, which can be easily specified in monetary terms, such as damages on assets, loss of production etc. are called tangible damages”
- Intangible cost: “casualties, health effects or damages to ecological goods and to all kind of goods and services which are not traded in a market are far more difficult to assess in monetary terms. They are therefore indicated as intangibles”
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Example of economic flood damage

Economic flood damage

Direct

Tangible

Intangible

Degradation of:
- Buildings
- Household goods
- Equipment
- Inventories
- Cars
- Crops
- Transport infrastructure
- ...

Loss of life
- Biodiversity loss
- Health effects
- Spread of pollution & toxics
- Loss of irreplaceable items
- Stress / disruption of households & populations
- Loss of landscapes
- Loss of recreational values
- Erosion
- ...

Production losses
- Market disturbances
- Loss of time
- Use of equipment & personnel
- Impact on land value
- Lost income
- Cleaning costs
- Loss of property

Intangible

Intangible

- Psychological effects
- Health effects
  (allergies, rheumatism, contamination of water and food products,...)
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B. Adaptation measures

This thematic is linked to two sub-WPs:
- WP2.3 Determining adaptation measures
- WP2.4 Evaluating costs of adaptation measures

State of the art
- Numerous adaptation measures, both structural and non-structural, are being considered
- Measures depend on a variety of specific situations and their scope in time and space is variable
- Non-structural measures offer multiple possibilities of response
- Non-structural measures are also often less costly than structural measures

The main steps of these WPs will be analysed in the second phase of this project.
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C. Cost-benefit analysis

This thematic is linked to sub-WP:
- WP2.5 Cost-benefit analysis

The goal of this WP is to answer to the question of resource allocation using the decision-making tool of cost-benefit analysis

State of the art
The decision-making principles advocated by international programmes stipulate that adaptation measures must reflect a potential to produce benefits that exceed their costs

Methodology
The decision-making tool allows for the integration of environmental damage costs into the decision-making process, in the form of externalities that can be compared to mitigation costs

→ use to identify potential winners and losers, hence appreciating the acceptability of each adaptation measure to different groups of stakeholders