

cpb

Climate changes Spatial Planning

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Climate adaptation the Dutch experience and perspective

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7 categories of climate problems

- sea level rise
- river discharges
- groundwater level (rainfall)
- storm
- drought stress
- heat stress
- growth stress of plants and animals

Water safety most serious one in the Netherlands

Costs of adaptation

- Cost of water safety now 0.1 to 0.2% of GDP
 - ▶ currently below norm
- Commission advise:
 - ▶ raise with 1 billion per year, that is 0.2% of GDP
- Over time costs are declining as % of GDP
 - ▶ productivity growth

Timing of adaptation

- Focus on 10 - 40 years, not longer
 - ▶ current expectations of sea level rise (IPCC)

- Uncertainty on:
 - ▶ nature, place and size of problems
 - ▶ nature, place and size of effects
 - ▶ size of population (replacementfactor < 1)

- Time to act in the future
 - ▶ postponing costly measures pays off

Example uncertainty effects: CBA Delta Works

- In 1953 big flooding in Zeeland
- How to adapt to the new reality?

- Choice between:
 - 1 heighten existing dikes
 - 2 close off sea-arms

- Tinbergen 1960 cost-benefit analysis:
 - ▶ close off sea-arms, the Delta plan

Ex post evaluation CBA Delta plan

- Main benefits not taken into account
 - ▶ economic effects of opening up of Zeeland
- Main costs not taken into account either
 - ▶ environmental and ecological costs
- Lessons
 - ▶ An ex post evaluation of investments made now will, most likely, reveal big surprises in 50 years
 - ▶ Apart from *known unknowns* there are also *unknown unknowns*

Role of Spatial Planning

- Current residential situation
 - ▶ 11 out of 16,5 million people in dike ring areas

- Spatially limited room to manoeuvre
 - ▶ till 2020 growth of employment
 - ▶ till 2035 growth of housing stock
 - ▶ relative small additions (15%)

- Limited role for spatial planning in adaptation
 - ▶ adaptation in current residential areas necessary
 - ▶ expansion restricted to near future

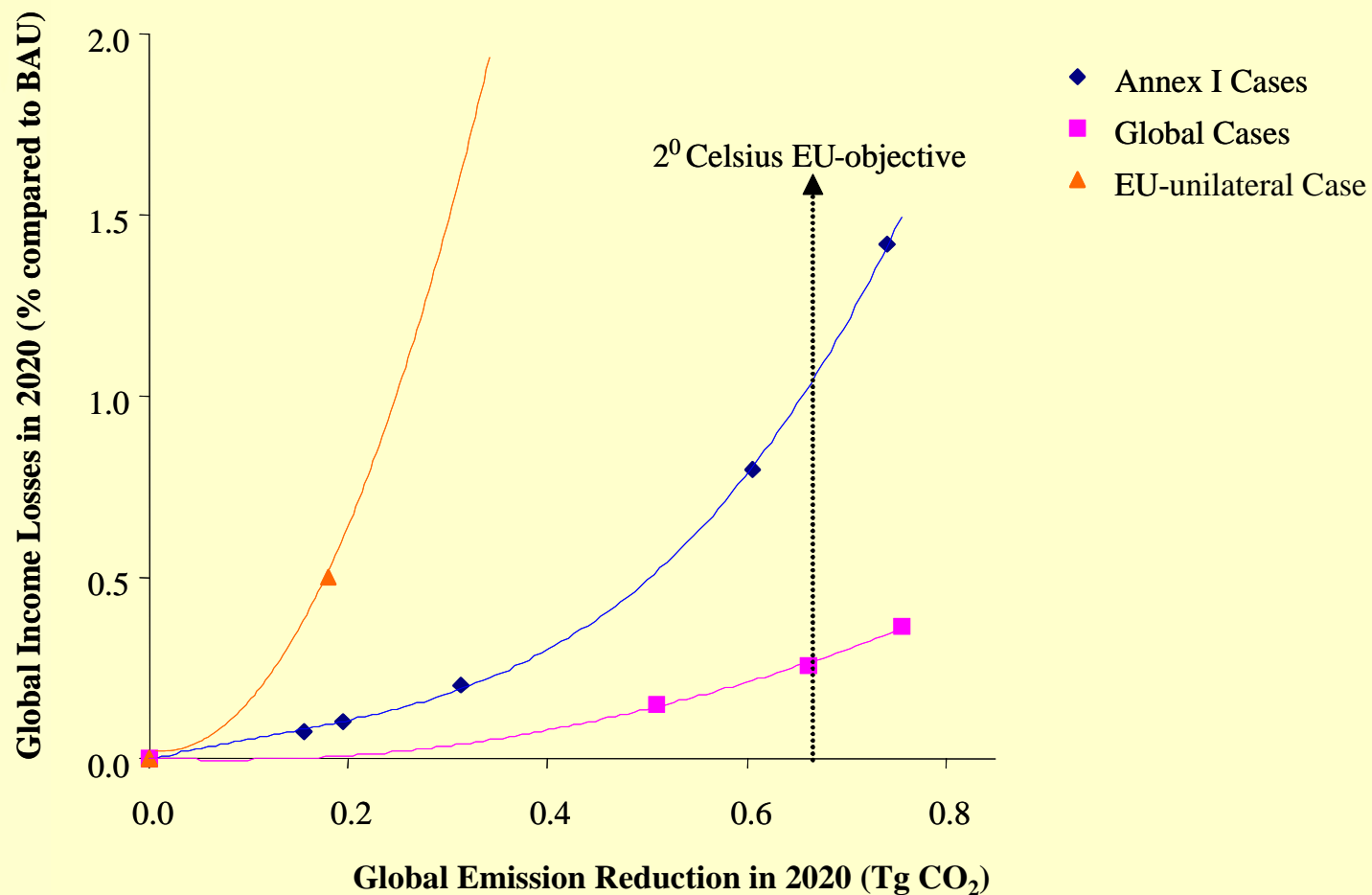
Most difficult region for adaptation in the Netherlands

- Probably peat regions in Middle Holland
- Subsidence and oxidation of peat during drought
- Difficult and costly to build and maintain dikes
- Salt water intrusion

Mitigation is also necessary

- Far future: prevent very large sea level rises
 - ▶ impossible to adapt to for the Netherlands
- International solidarity with regions affected
- World-wide problem
 - ▶ requires world-wide solution

Lower costs with larger coalitions



Conclusions

- Adaptation for water safety
 - ▶ biggest problem in the Netherlands
 - ▶ can be done without exceptional costs
 - ▶ in the foreseeable future

- Adaptation via spatial planning
 - ▶ limited scope
 - ▶ most opportunities: next 20 to 30 years

- Mitigation
 - ▶ prevent cumulative effects in the far future
 - ▶ only really effective on a world-wide scale