

The Certainty of Uncertainty:

The challenge of planning for a changing climate

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Assumptions:

- We are in a process of global warming and climate change
- Global warming is mainly man-made, caused by emission of greenhouse gases (CO² being the most important)
- Even if the world succeeds in halting the emission of greenhouse gases to the atmosphere (which does not seem very likely), the globe will get warmer and the climate will change.

Planning challenge

- From adapting to a known climate ("normal climate") to adapting to a future and unknown climate.
- Question for discussion:
 - How has climate change – or more precisely – our knowledge about climate change – caused new challenges for policymaking and planning?

Possible responses

- The common response is to call for more precise knowledge – forecasts
- My argument: More precise modelling of global temperature will not help planning at the local level
- The closer we get to policy-relevant knowledge, the less scientific certainty!

Why uncertainty – and how?

- The relationships between nature and society is changing
- *"There is no longer such a thing as a natural weather event"* (Mike Hulme)
- Towards a "hybrid climate": A climate that is a co-produced natural-cultural system

EU's Water Framework Directive as example

- Aim: to secure "good ecological status" in all EU freshwater.
- "Good ecological status" is a scientifically decided "baseline"
- Climate change may affect water quality and hence change the "baseline"

IPCC's report on freshwater:

- *‘Traditionally, it has been conveniently assumed that the natural water resource base is constant, and hydrological design rules have been based on the assumption of stationary hydrology, tantamount to the principle that the past is the key to the future. Now the validity of this principle is limited. For example, water quality systems may need to be redesigned to cope with less self-purification in warmer water with low oxygen concentration, and less increased turbidity may increase significantly the costs and challenges of treating water to potable standards’ (Kunzewicz, et al., 2008, p. 6)*

Climate science

- During the last 30 years the scientific study of climate has changed from that of analysing the physical reality of climate to that of aiming at *predicting the development of global temperature and hence global climate*.
- Climate modelling has changed climate science

A hybrid science

- Predicting climate requires modelling of both nature and society.
- But society cannot be modelled in the same way as physical reality – Therefore social drivers of GHG emission are included as alternative scenarios or “story lines”.
- Therefore, in addition to the uncertainty inherent in the complicated climate modelling based on physical science comes the uncertainty inherent in predicting socio-economic development in the future.

How adapt to uncertainty?

- The yardstick for "good ecological status gets lost
- Should one compensate for possible climate effects?
- Or should we accept nature to change? Accept new species?
- Adaptation to compensate for climate change may lead to reduced biological diversity

The danger of mal-adaptation

- Example: building of flood walls.
 - Flood walls have been constructed to adapt to present climate
 - To meet climate change by building new and higher flood walls, may actually lead to mal-adaptation and higher risks.
- The dilemma:
 - Adapt by compensating for the effects of climate change or adapt by making society more resilient to an unpredictable and uncertain future?

A turn to adaptive planning?

- We shall need to include include uncertainty, ambiguity and risk as definitional properties of the planning process.
- Aaptive management or adaptive planning is a planning approach *based on the insight that the ability to predict future key drivers influencing an ecosystem, as well as system behavior and responses, is inherently limited.*
- *From prediction and control to management as learning*

Conclusion:

- Climate science has provided us with solid knowledge that we are heading towards an uncertain climate future which current planning practices are poorly equipped to handle.
- Adaptive planning may be one possible response to the challenge