

# Developing indicators for environmental, social and economic sustainability

Tom Kuhlman



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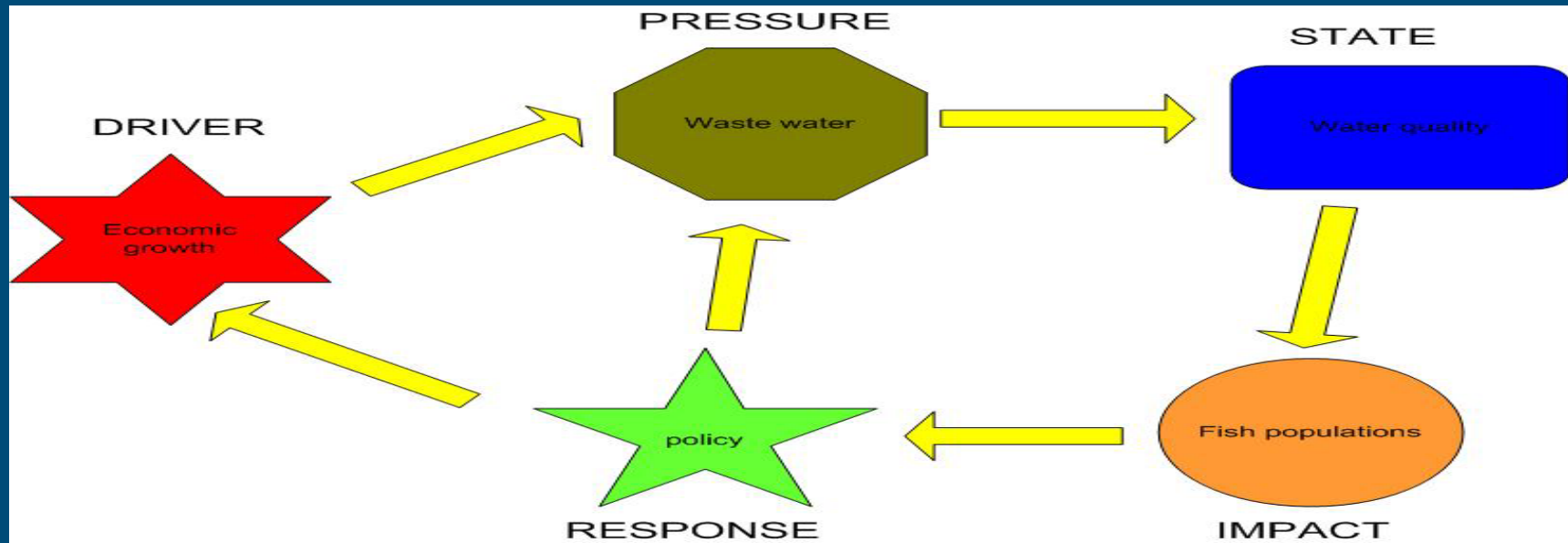
# The rationale for impact assessment

- Prediction of policy effects
  - In relation to objectives
  - Side effects
- Can that be done?
- IA vs. CBA:
  - Quantification of impact
  - Valuation
  - Transparency of decision-making

# The concept of sustainability

- Brundtland (1987):
  - meeting the needs of the present without compromising the ability of future generations to meet their own needs
- The Triple Bottom Line
  - Environmental, social, economic
  - Adopted in EC Guidelines for Impact Assessment
- Intergenerational sustainability:
  - What will the needs of future generations be?
  - What technology will they have to fulfil them?
- Weak & strong sustainability:
  - Substitution
  - Sustainability & welfare

# Causality: the DPSIR approach



- Indicators: impact
- But sometimes not practicable: pressure or state

# Criteria for identifying indicators

- Political relevance: stakeholder involvement
- Scientific validity
- Practicality: capable of being modelled
- Responsiveness to policies being assessed
- As few as possible!

# Sustainability indicators (1)

- Air quality ( $\text{NH}_3$ )
- Water quality (N & P surpluses)
- Water quantity (abstraction rate, water balance)
- Soil erosion
- Soil sealing
- Greenhouse gas emissions ( $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{N}_2\text{O}$ )
- Carbon sequestration & carbon stocks

## Sustainability indicators (2)

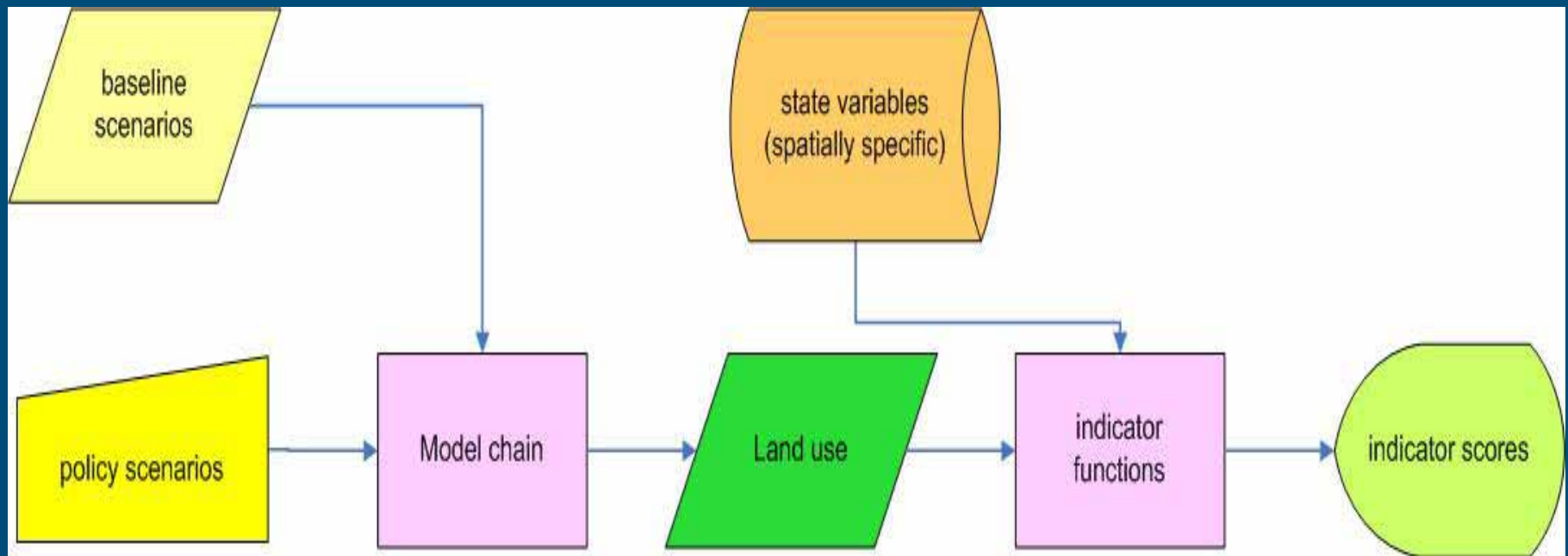
- Habitats at risk from eutrophication
- Populations of farmland birds
- Area of High Nature Value farmland
- Volume of dead wood in forests
- Consumption of pesticides in agriculture
- Spatial cohesion of nature areas
- Diversity of landscapes
- Landscapes as cultural heritage



# Welfare indicators

- GDP
- Employment by sector
- Administrative costs
- Exposure to toxic chemicals (NO<sub>x</sub>, pesticides)
- Exposure to disasters (floods, forest fires)
- Tourism pressure
- Visual attractiveness of landscapes
- Interregional migration

# Application to land use



# Thank you

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