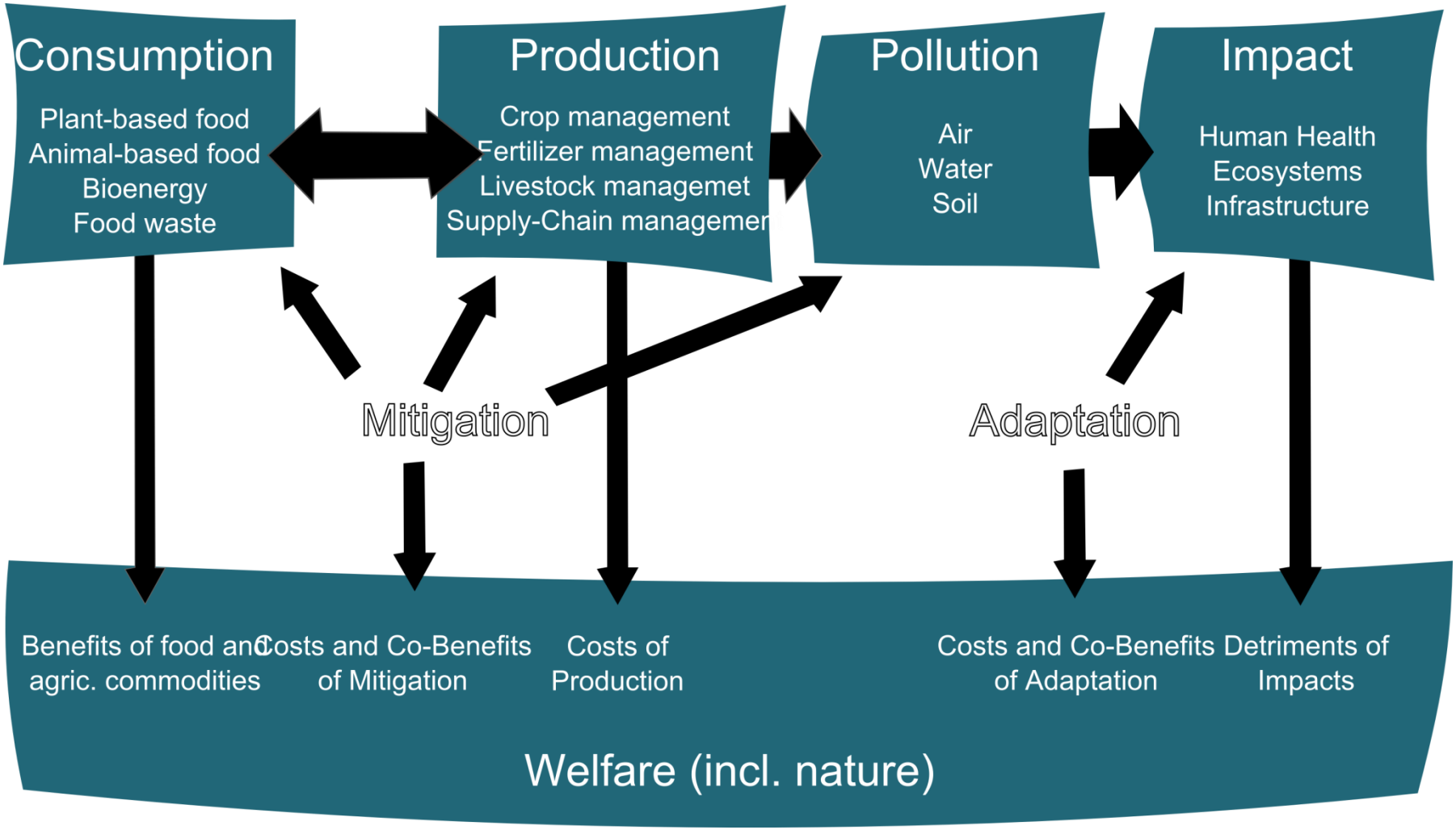
Four main questions were discussed

Questions tackled

- Which benefits and threats should be included in an INMS; Should we distinguish a detailed model system (for an elaborated evaluation of N management measures) versus a simplified system (to do cost-optimization)
- What global scale models are available, what are criteria to evaluate them for their potential use
- How can collaboration be organized within various modeling groups

What should be in the model system



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Distinction in various model systems

It was agreed that to evaluate policy options, we should

- have multiple approaches with cost-optimization being only one of them.
- look at cost effectiveness, with the target being a reduced threat or improved benefit or a combination of both of them

Available global scale models and criteria to evaluate their potential use

We will evaluate potential of available models, i.e.:

- *Scenario models* enabling the linkage between scenarios, consumption-production and nutrient inputs/air emissions and possible cost-benefit optimization: **Lex Bouwman**, Benjamin Bodirsky, Wilfried Winiwarter
- *Quality models:* assessing loads and concentration of nitrogen compounds (and other elements) in air soil and water: **Wim de Vries**, Penny Johnes, Dave Simpson, Claudia Staedner, Ying Zhang, Felipe Pacheo.
- *Impact models:* human health, productivity, climate, biodiversity etc. and related critical loads (regional N boundaries). **Wim de Vries,** Stefan Reis, Lex Bouwman, Penny Johnes, Baojing Gu, Benjamin Bodirsky.

Criteria to evaluate the models

- Model aim/Functionality
- Inputs considered: drivers of change
- Outputs considered: e.g. N forms, other elements etc.
- Biophysical representation
- Steady state vs dynamic
- Data needs
- Validity status
- Spatially resolution; Temporal resolution (and extent)
- Linkage to scenarios/measures
- Operational status, accessibility

Collaboration in N modeling community

Model development and data exchange

- We should not include/focus on development of new models unless an aspect is missing (model is really needed).
- We should focus on improving available models where needed not only within the modeling group itself but also by collaboration (new ideas outside the group).
- Data needs and data exchange is a crucial issue in the group

Model use

- There will be limited scenario models: their output should be used by multiple quality models and impact models
- If available: use more models and do a model intercomparison