# Discussion Minutes

## B1: Capturing complex Interdependencies through Modelling

**Chair:**      Jiagou Qi
**Speakers:**   Mohamad Al-Saidi, Rossella de Vito, Sandra Venghaus, Dale Rothman, Peter Burek
**Minutes:**    Hannes Thomsen

## Discussions after each presentation

**Dale Rothman** - **The Challenges of the Water-Energy-Food Nexus for Integrated Modeling**

- It is important to pay attention on what is important and start as basis from there

**Mohamad Al-Saidi  - Towards Understanding the Integrative Approach of the Water, Energy Food Nexus**

- Is there a difference between practicability  and implementation roadmap?
- Is IWRM more successful than the WEF-nexus?
    - Hard to say and both opinions are mentioned
    - Refers to the general dilemma of simple vs. complex models
- The WEF-Nexus needs indicators, should there be one indicator for all dimensions? Is there one? Is it better to have more indicators?
    - The presenter suggests to have several indicators

**Rosella de Vito** - **System dynamic modelling to evaluate water-energy-food Nexus at local scale**

- It is not clear how farmers influence each other in the model (was not asked in the interviews) but it might be an important issue
- There is a plan to implement the model through stock and flow diagrams as second step of the system dynamic approach
- Sources of the model are individual semi-structured interviews with farmers, consortium members  and available data

**Sandra Venghaus** - **From a few assessment tools to a FEW assessment tool – a modular, stakeholder-based framework for the integrated assessment of the food, energy, water nexus**

- systematic operationalization of the complex, multi-dimensional challenges
- translation into modular sub-systems to reduce complexity
- index-based coupling of the different modules
- The scale of the research will be European

**Peter Burek** -  **Looking at the spatial and temporal distribution of global water availability and demand**

- Pro global scale:
    - Identification of hotspots possible (areas for possible case studies)
    - Allows regional comparison

- Such models face the problem of validation
    - Example: water scarcity -> hard to validate (impossible?)
    - How can validation be achieved on global scale?

## General discussion

- How can science more effectively provide input for decision-making?
    - Science has to be 'translated' for decision-makers
- In the process of modeling you learn a lot about the system under study
    - It makes it possible to identify uncertainties
- It is difficult to validate models and even if it is possible with statistics, people remain skeptical
- The purpose of the model has to be kept in mind for validation
- Any decision faces uncertainty
    - Important to define your own opinion (based on the model) clearly
- Modeling is about conceptualizing the perceptions of how things work
    - It can therefore be a basis for a dialogue about the system
- Modeling can bring together uncertainties and the understanding of the WEF-nexus
- Challenge of model development: decisions have to be made in very short term, modeling needs time
- Decision advice for policies not always possible
    - BUT if you cannot give an answer, they will look for someone , who can (with another model)
- Next to the uncertainty in the model, there is the uncertainty in data
    - How are they collected?
    - Where are potential uncertainties?