

**DeSIRE tenure track position #16:  
Governance of social-ecological-technical systems for improving resilience**

University: Wageningen University & Research  
Faculty: Social Sciences Group  
Department: Department of Information Technology  
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Expected to open: October 2018

**Description:**

For achieving the required level of resilience of social-ecological-technical (SET) systems one of the key issues is governance. Governance is all of the processes of governing that is undertaken by different stakeholders including a government, a market or a network, through defining and applying the laws and rules of a social system. One of the key challenges in governance is the development and application of proper processes of interaction and decision-making among the actors involved in collective problems of the social system. Current SET systems, however, are characterized by complexity and nonlinearity, and likewise traditional modes of governance, such as planning and control, are deemed ill-equipped to result in better and more resilient outcomes. Due to the inherent complexity and emergent behavior it is also not trivial to evaluate and guide SET systems. Hence, when modelling the processes for governance of social-ecological systems, complexity and self-organization should be taken on board. This project aims to provide a generic framework for development and evaluation of governance of SET systems for improving resilience. In particular the project will focus on:

- *Workflow modelling and alignment of IT infrastructure to support management for resilience*  
For developing resilient systems, a systems design thinking needs to be adopted which requires modeling the relations and interactions among the system elements in a SET. In this context, the corresponding workflows of SETs, the underlying IT elements, as well as the alignment between the business process and IT elements need to be developed. The project will aim to enhance existing workflow patterns, and develop the business-IT alignment models for highly adaptive and complex systems such as SET.
- *Agent-based modeling for simulating and managing resilience*  
An agent-based model (ABM) is a class of computational models for simulating the actions and interactions of autonomous agents (both individual or collective entities such as organizations or groups) with a view to assessing their effects on the system as a whole. ABM aims to search for explanatory insight into the collective behavior of agents obeying simple rules, typically in natural systems. The project will aim to develop ABMs for enhancing the resilience of SETs.

**Position in framework of the programme:**

- Approaches/discipline:  
Process-tracing of governance mechanisms (Public Administration/Governance studies),  
Workflow modeling, and Agent Based Modelling
- Scale/application area:  
Agri-Food

**Synergy with other tenure track position(s):**

Governing Resilience of RUBAN Metropolis (UT, BMS)  
Flood Resilience (DUT, CEG)  
Modelling and governance for the response to large-scale interruptions DUT, TPM)  
Resilient supply chains (TU/e, IEIS)  
Life course epidemiology: Modelling resilience (TU/e, MCS)  
Resilient business Information systems