

## Transformation in Resource Use: a Natural Science Perspective

### PhD 05a: Ecology

*A Social-Ecological System Perspective on the Disconnect between Food Production and Consumption (Working Title)*

#### *Research question*

The work focusses on the increasing gap between the production of food and the recognition of people who consume food within social-ecological systems. Building on network theory and methods, this research will investigate the gap between how people perceive their food consumption, and how distant most of our food is when it comes to production and flows. The core question is then consequently, how we can overcome this gap by identifying deep leverage points within systems that can enable us to create a transformation towards more sustainable systems, hence creating shortcuts between food production and consumption.

#### *Background / State of Research*

There is an increasing recognition of the disconnect between local and global flows, and food production and consumption are prominent examples of this sustainability challenge. While much of the global food production is driven by global dynamics, local consumption is often distant from the original production (Liu et al 2015). Understanding the economic reasoning for this disconnect is increasingly attempted (Garnett et al 2013), and in addition there are attempts to close the gap between global production and local consumption i.e. through regional consumption (Marsden & Smith 2011). Social-ecological system thinking offers a framework to conceptualize such approaches (Fischer et al 2015), and to offer holistic perspective that can enable a transformation towards more sustainable consumption and resource use. While numerous approaches are already available yet criticized (Pe'er et al 2014), there is an increasing recognition for the need to change the deep leverage points within systems in order to enable profound transformations towards sustainability (Abson et al 2016). This would allow deviation from the currently rather shallow strategies, such as subsidies of economic flows, which can widely serve as a means, but not as an end. Within this research, we propose that in order to enable sustainable food systems, we need to overcome the broad gap between food production and food consumption.

#### *Approach and Research Design*

This perspective uses a multi-step research approach. In the first step, a typology of food systems will be created based on the existing literature (Fischer et al 2017). A specific emphasis will be drawn on spatial scale effects, taking the disconnect between consumers and the production of food into the core focus of this step. Building on a systematic review, this research will enable a network-based understanding (Marsden & Smith 2005) of the different flows of food production, and will integrate scientific understanding into the current sustainability challenges related to food. This will be linked back to the impact of food onto the environmental integrity of systems, as well as the social relevance of food within social-ecological systems. In the second step, one or several specific systems will be targeted and investigated building on the experience of a stratification based on the review performed in the first step. By embedding empirical research into a global framework on food consumption within defined social-ecological systems, we will refine our global understanding to generate localized solutions that will allow for an accumulation of solutions to derive diverse approaches to solve the disconnect between food production and consumption. In the third step, we will develop a dynamic model to design potential solutions into our conceptual and empirical model, allowing to further refine the model to allow us to generate solutions that can be upscaled and are transferable.

*Expected Results*

This work will contribute to the wider research project by serving as a hub for initial literature screening as well as to serve baseline analysis for quantitative reviews based on previous experience (Luederitz et al 2016). The data generated in step one will allow for other studies within the overall project to inform and stratify their research designs. The model created in step three can be potentially further refined by results from other branches of the project, thereby allowing us to generate a more nuanced and holistic model.

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