

## **Challenges related to bioenergy and supply chain organization: Insights derived from a systemic analysis of related innovation processes in Germany, Latvia, Switzerland, Italy and France**

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Bioenergy production and the establishment of the related supply chains has become a key concern for rural actors, businesses and policy-makers. The experiences gained in the last years show that there are tremendous opportunities as well as considerable challenges associated with bioenergy production and utilisation. Farmers and forest owners, municipalities, research and extension, governmental agencies and NGOs are engaged in jointly developing efficient connections between bioenergy production, processing, distribution and consumption. Rural entrepreneurs adapt themselves to the new sustainable consumption and production conditions, which are innovative and redefine their job. Often, however, there is a gap between the need for change and entrepreneurs' willingness to adjust, and the insufficient capacities of innovation agencies and advisory services to effectively support changes. In this contribution we want to discuss where precisely the gaps are and to sketch out ways and institutional arrangements that effectively improve the capacities of innovation agencies and advisory services. The main questions addressed include the following:

- How do key actors in the innovation system support rural entrepreneurship in the field of sustainable production and use of renewable energies? To shift for example the agri-food industries from a volume and output orientation to a more multi-functional strategic direction has major implications for knowledge and innovation systems. Innovation is now not only needed for raising production and increasing competitiveness in markets. It is also needed for the development of new products and services, and the creation of completely different supply chains.
- Which notion of innovation do we apply and what are the pros and cons of different notions and approaches? Innovations are commonly defined as the successful exploitation of creative ideas. They can concern products, processes, markets, institutions; they can be technological, social, and organisational. In a simplistic way, the adoption of an innovation can be seen as the result of a linear process from conception to adoption. In our contribution we take on a different perspective. We present innovation processes as the outcome of collaborative networks where information is exchanged and learning processes happen. We refer to changes in socio-technical configurations, and we will argue that technical and economic factors alone are not sufficient to understand innovation processes, drivers and barriers. In the contribution we want to address social and institutional aspects of cross-sector as well as intra-sector processes.

Overall, we will emphasize that innovation needs to be understood much less as a top-down process, and instead, as a process where rural entrepreneurs' knowledge, motivations and values play an important role. Innovation processes have a technical and an organisational side, for example the organising of producers' collective action in order to reach enough capacity and to better meet market demands. Actors involved in innovation systems are developing innovations that facilitate change and adjustment. Their reaction capacity, however, varies significantly. They do not have the same access to innovation management systems and do not have the same pressure to change. Institutions, whose mission it is to support changes, thus can become barriers to innovation. The question of up-scaling, institutional arrangements, factors limiting and enabling the diffusion and adoption of innovations, the role of organisations facilitating innovation as well as public innovation policies are critically important research questions that we like to address.

The contribution builds on the results of an on-going EU funded research programme coordinated by the main author. The IN-SIGHT project<sup>1</sup> involves seven multidisciplinary research teams from different countries. Empirical data collected with a mix of methods including interviews with relevant actors and experts, group discussions with actors and experts and participant observation will be presented. In the analysis of innovation processes and the description of effective innovation strategies, we build on concepts deriving from communication theories, education studies, social network studies as well as institutional economics.

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<sup>1</sup> 6<sup>th</sup> Framework Programme, Priority 8.1 Policy-oriented research, Scientific support to policies – SSP: 44510, IN-SIGHT: Strengthening Innovation Processes for Growth and Development. More info: [www.insightproject.net](http://www.insightproject.net)