

The specifics of agricultural innovation and their implications for innovation assessment, findings from Austria

P. Walder, J. Kantelhardt, F. Sinabell and F. Unterlass¹

Abstract - According to Schumpeter, economic change is mainly rooted in technological competition and the resulting innovations. Taking this into account and aiming at sustainable intensification, European agricultural policy tries to facilitate agricultural innovation by means of rural development programmes.

This study explores the nature of innovation processes and their idiosyncratic characteristics in the agricultural sector and puts them in context to other economic sectors. In order to gain insights into the perception of innovation processes in agriculture we interviewed a purposive sample of experts.

First results show that farmers have a wide range of motives and are pursuing multiple goals that are not limited to maximizing profits when new products, production- or organisational-processes are innovated. Policy instruments like extension and funding are considered crucial in fostering innovation. Equally important is the multiplying role of farmers in this respect. Moreover, agriculture and its specific structure and framework conditions seem to enable or require a kind of "trial-and-error" or "step by step" approach.

Based on the findings of our study we clearly see the need for an enhanced assessment method of agricultural innovation that takes idiosyncrasies into account and is not limited to a single dimensional concept of innovation.

INTRODUCTION

Innovation is considered an important determinant for long-run economic development and growth (Fagerberg et al., 2005; World Bank, 2006). As already proposed by Schumpeter, the entrepreneurial function, which is inevitable for change, is mainly seen in creating new combinations of given resources (in: Fagerberg et al., 2005, 6). As farmers face new challenges, be it economically, social or environmentally, the importance of entrepreneurial activities must not be neglected since innovations are crucial for sustainable intensification and securing the global food production (FAO, 2014).

Until now, innovation research in the agricultural sector is mainly focused on upstream-industries. This leads to the current situation characterized by a need for information on ways to improve, foster or speed up agricultural innovation. Hence, precisely targeted measures are neither impending nor are they even designable given the missing underpinnings about innovation (Ariza et al., 2013).

Moreover, although innovation is a widely used term, for instance in the latest rural development programme (BMLFUW, 2014), a working definition or distinction of what precisely is meant by agricultural innovation is still missing.

Thus, the aim of this study is to explore the role and nature of innovation processes and their idiosyncratic characteristics in the agricultural sector and to put them in contrast to other branches. This understanding will subsequently lead to innovation assessment and measurement instruments that are bridging existing approaches in the manufacturing industries with those specifically designed for the agricultural sector.

METHOD

In order to obtain illuminating insights as to how the perception of innovation within the agricultural area is shaped, we decided for a mixed methods design composed of an expert workshop as well as guided in-depth expert interviews. The workshop served as an initial step to gain a comprehensive understanding of agricultural innovation

Subsequently, we conducted four in-depth interviews with experts and two in-depth interviews with farmers, using an interview guideline which covered the most salient topics (e.g. aims, innovation processes, and knowledge diffusion). In order not to exclude potential participants we were seeking for a theoretical sampling as described by Strauss (1994, 70ff).

The interviews were transcribed and partially paraphrased. Subsequently, the transcripts were coded in atlas.ti and selected codes were further investigated to specifically answer the question of the idiosyncratic characteristic of agricultural innovation. The analytical procedure followed in large parts the one proposed by Meuser and Nagel (1991).

¹ Peter Walder is from the University of Natural Resources and Life Sciences Vienna, Institute of Agricultural and Forestry Economics, Vienna, Austria (peter.walder@boku.ac.at).

Jochen Kantelhardt is from the University of Natural Resources and Life Sciences Vienna, Institute of Agricultural and Forestry Economics, Vienna, Austria (jochen.kantelhardt@boku.ac.at).

Franz Sinabell is working at the Austrian Institute of Economic Research (franz.sinabell@wifo.ac.at).

Fabian Unterlass is working at the Austrian Institute of Economic Research (fabian.unterlass@wifo.ac.at).

RESULTS

As closely connected to innovation, the concept of *development* is an integral and recurring aspect of the innovation perception across the interviews. The addressed level, however, is varying from a farm to a network or an association up to the national and international agricultural sector level. Critically reflected in this respect is nonetheless that innovation and the associated development do not necessarily encompass an improvement, but this might in most cases only be recognised retrospectively. Development is not limited to its economical meaning but can of course also entail social as well as environmental advancements.

With regards to the question what constitutes an innovation a conceptual distinction between a "real" innovation and an adoption of already existing solutions is made. However, a real or radical innovation (Fagerberg, 2005, 7f) is not seen as superior to copying and adopting. In fact, it is rather the dissemination, diffusion and adoption of existing solutions which seem to be more promising and also easier to foster and implement. In this respect, the multiplying role of farmers is emphasised by several interviewees since solutions from within the peer group, for instance through offering insights into best practice examples, is more accepted and thus convincing than a top-down know-how transfer. As one interview partner pointed out:

"[...] if it is communicated by a farmer, if it is developed by a farmer it is of complete different value than if it is introduced through scientific research. The significance for the farmer is entirely different." (IP1, 2015)

Nevertheless, some experts noted the indispensable relevance of various networks for innovation be they comprised of researchers, administration, farm advisors, neighbouring farmers, or industry. In fact, the importance of partnerships, which is an integral part of the current rural development programme, is not only fostered by the administration but is also a recurring topic in the interviews:

"[...] and they interrogate each other and new topics arise [...] and they puzzle over something and discover [...]", as IP6 (2015) mentioned.

Or IP4 (2015) who explained the relevance of cooperations between several actors for successful innovating:

"[...] on the one hand there was the funding and the [farmers' market] was established and [organisation XY] promoted this development actively. [...] and we had good press."

Accordingly, the prevailing perception of agriculture being embedded within an agricultural innovation system (AIS) is in large parts supported by the interviews. This AIS can also be seen as responsible for specifics in the innovation process. For instance, the position of the food retail sector influences on-farm innovation, as do laws and regulations:

"[...] the food retail sector has established know-how and personal resources [...] and increasingly the food retail sector is claiming: 'We want it that way.'" (IP2, 2015)

Consequently, the trial and error or step-by-step approach is frequently depicted as integral part of agricultural innovation by the experts because only if

the feedback loops are sufficiently convincing, next development steps can be implemented:

"[...] and repeated evaluations. Either it does not work or it needs adjustments". (IP3, 2015)

CONCLUSION AND DISCUSSION

Our results show that agricultural innovations are shaped and promoted by a complex network of actors, aims and framework conditions that must be taken into account when trying to measure, assess and subsequently foster innovation in the agricultural sector.

In line with the major findings of the World Bank (2006) constant societal change is demanding creative solutions and farmers are encouraged, if not forced, not only to adapt but to innovate in order to reach their goals whether those are economic or not.

Conceiving innovation only on a technological level or either upstream or downstream from agricultural production is clearly not how agricultural innovation is perceived and thus promoted by actors within the AIS. Hence, finding a common understanding of agricultural innovation and, maybe even more important, appropriately measuring and assessing it, needs the application of a holistic approach that goes beyond those in the manufacturing industry.

REFERENCES

- Ariza, C., Rugeles, L., Saavedra, D. and Guaitero, B. (2013). Measuring Innovation in Agricultural Firms: A Methodological Approach. *Electronic Journal of Knowledge Management* 11(3): 185-198.
- BMLFUW (2014). Programm zur Entwicklung des ländlichen Raums. Available at: <https://www.bmlfuw.gv.at/dam/jcr:9052ab14-5123-4387-ac27-59fa5ec07595/Programm%20LE%2014-20.pdf> (accessed: 30.04.2016).
- Fagerberg, J. (2005). Innovation: A Guide to the Literature. In: J. Fagerberg, D.C. Mowery, R.R. Nelson (eds). *The Oxford Handbook of Innovation*, pp. 1-25. New York: Oxford University Press.
- FAO (2014). The State of Food and Agriculture: Innovation in family farming. Available at: <http://www.fao.org/3/a-i4040e.pdf> (accessed: 30.04.2016).
- Meuser, M. and Nagel, U. (1991). ExpertInneninterviews- vielfach erprobt, wenig bedacht. Available at: <http://nbn-resolving.de/urn:nbn:de:0168-ssoa-24025> (accessed: 30.04.2016).
- Strauss, A.L. (1994). *Grundlagen qualitativer Sozialforschung*. 2nd ed. Paderborn: Fink.
- World Bank (2006). Enhancing Agricultural Innovation: How to Go Beyond the Strengthening of Research Systems. Available at: http://siteresources.worldbank.org/INTARD/Resources/Enhancing_Ag_Innovation.pdf (accessed: 30.04.2016).

INTERVIEWS

IP1-IP6 (2015). In-depth expert interviews. Salzburg, Upper Austria and Vienna, July-September 2015.