Organic farming as an European innovation system

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Implications

The paper explores how organic agriculture fits into the framework of innovation systems that is becoming more widely accepted in supporting innovation also in agriculture which is faced with many societal challenges. The paper explores the need to better understand the role of different types of innovation and in particular the role of knowledge and how joint learning systems for sharing different types of knowledge can be developed.

Background and objectives

Innovation and agriculture have always gone "hand in hand" because working with dynamic geographic, climatic, market and political conditions requires constant change (EC SCAR, 2012). Today, innovation is also seen as the primary instrument for overcoming the future challenges for agriculture of food security, climate change and the conservation of natural resources. For example, the European Innovation Partnership for Agricultural Productivity and Sustainability was set up in response to these challenges (EIP, 2012).

Innovation is a broad concept. OECD defines it as the implementation of a new or significantly improved product (good or service), a new marketing method or a new organisational method in business practise, workplace organisation or external relations (EC SCAR 2012). The concept of innovation refers not only the invention itself, but also to the embedding of that idea in a relevant sector. The whole process has three stages of (1) invention, when ideas and concepts are developed or prototypes built, (2) innovation focussing on how to put ideas into practice and (3) diffusion with more widespread application of the innovation at different social and economic levels (Schumpeter et al., 1980).

In looking at how this applies to organic farming two possible perspectives can be adopted: (a) Organic farming itself can be seen as an innovation. I looked into whether conversion to organic farming can be interpreted as a typical example of the diffusion of and innovation by applying the adoption/diffusion model (Rogers et al., 1971) to organic farming. Based on a review of various studies I confirmed that to some extend farmers, who had converted organic farming, showed similar characteristics to innovators and early adopters in the model (Padel, 2001).

(b) Innovation in the organic food and farming sector also depends on the functioning of the innovation system as a whole (Häring et al., 2012). This systems perspective is becoming more widespread in designing innovation support also for agriculture, such as the European Innovation Partnership (EIP 2012). The focus of this paper is the relevance of this perspective to the organic sector, building on work in the EU funded SOLID project[1] (in particular "Innovation through stakeholder involvement and participatory research WP1)" and the technology platform TP organics[2].

The innovation system framework

The first problem to overcome is that in the context of agriculture, innovation is nearly always understood as being only technical, with most experts not sufficiently aware of social/societal innovations (Bokelmann et al., 2012) that could be particularly important for achieving societal and political goals. This is maybe not so surprising, given the long period during which progress in agriculture was understood is increasing the efficiency

[1] Sustainable organic and low-input dairy systems (EU-P7:266367) http://www.solidairy.eu
[2] Technology Platform TP organics, http://tporganics.eu

through using new technology. Morgan et al. (2000) describe this for the cropping sector in England in the post war period as follows: "*Efficiency came very quickly to mean the application of the new agricultural technologies which were beginning to emerge onto the market. Input companies were investing heavily in research and technology development*". During developing the chemical inputs in arable production, the farmers' "know-how" was replaced by know-what, i.e. what input to use and when.

The systems perspective describes innovation in a more process-oriented, interactive and evolutionary way, whereby networks of organizations, together with the institutions and policies that affect innovative behaviour and performance, bring new products and processes into economic and social use (Hall et al., 2005). It looks at innovation as an emergent property not only of science or the market, but of interaction among stakeholders that allows opportunities to develop (Röling, 2009). Innovation is seen as the application of knowledge (of all types) to achieve desired social and/or economic outcomes. This may be acquired through learning, research or experience, but it cannot be considered as an innovation until it is applied (Hall et al. 2005).

The importance of the system perspective and of different innovation is increasingly recognised in agriculture (e.g. Bokelmann et al., 2012, EC SCAR, 2012). In the EIP this is expressed as the need for forming partnerships, on using bottom-up approaches and linking farmers, advisors, researchers, businesses, and other actors in so called Operational Groups.

The relevance to the organic sector

In the Implementation Action Plan of TP organics, we also argued for a broad understanding including social/organisational as well as technology innovations (Padel et al., 2010). We called organic farms "creative living laboratories", because the restrictions in the standards force them to think outside the box in finding new solutions to common problems. We also introduced a category of "know how" innovations. This emphasizes the importance of the application or leverage of existing knowledge, for example through developing and prototyping management practices. We argued that know-how is crucial to the farmer's ability to respond effectively to new challenges, such as saving and protection of natural resources, and for improving the multi-functionality and sustainability of agriculture.

Knowledge is of course importance in any innovation systems, but for organic and low-input some innovations consist only of knowledge. Examples of such "know-how" innovation include finding ways to secure essential supply of vitamins and minerals in organic dairy production through natural sources (ECOVIT-project), the use of compost in plant protection or to encourage predators by supporting their habitats (e.g. flowering field margins) (Padel et al, 2010). With such a strong focus on knowledge comes shift to learning, i.e. active knowledge construction rather than more passive "technology transfer" (Koutsouris, 2012). Morgan and Murdoch (2000) argue that in industrialised conventional supply chains the farmers' knowledge tends to be rendered into codified and standardised forms (blueprints) while in the organic chain there is increased scope for local, tacit forms of agricultural knowledge.

All this is not new to the organic sector, which has long been characterised as one that replaces inputs with knowledge (Lockeretz, 1991). In response, learning partnerships, group extension, farmer-field schools, communities of practice, study circles, farmer networks have emerged and are widely discussed. These are not always successful and the process can be very frustrating for the participants, but there is a growing number of good examples. In the SOLID project, we included a whole work package on farmer led innovation where we collaborate closely with farmers and SMEs partners (mainly organic and low-input dairy buying groups and processors). In a first step, we consulted for research priorities (using on farm interviews about sustainability as well as workshops (see Leach et al., 2013). At present we are developing on-farm projects in several countries, with the aim to test ideas of farmers for relevance and feasibility and also for acceptability with various stakeholders.

Where next?

One problem for "know-how" innovation is that it is often difficult for projects to generate something that is useful beyond the actual participants. One reason might be the importance of tacid knowledge. This knowledge is un-codified and contextual and the user might often not even be aware that she/he possesses it (Morgan and Murdoch, 2000). So, if the user does not what they know, how can it be shared? Also there is an urgent need to reflect about different types of knowledge held by different participants (the lay-expert gap of Koutsouris, 2012), and the ownership of knowledge and associated conflicts between protecting intellectual property and open-access.

So, the challenge we face in organic farming is moving beyond recognising the importance of knowledge, but to remain innovative in how we work with this mixture of different and very diverse sources and types of knowledge in developing joint learning approaches for researchers, farmers and advisors. In this way, I believe we can achieve that novel approaches developed in organic agriculture become true innovations that are more widely applied and used.

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