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Structuring and guiding knowledge exchange within the organic farming sector in Flanders: A transdisciplinary and system approach

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Introduction

In Flanders, organic farmers, advisors and researchers within the "bio-firm network" meet on a regular basis to exchange knowledge related to farm management. These meetings take place at a farm and discussions are mainly focused on agro technical issues. However, to deal with environmental and societal concerns, besides achieving a satisfying income, organic farmers have to address a wide range of issues, when considering new farm strategies. This complexity calls for new ways of thinking and of structuring knowledge to improve strategy design and strategic choices on the farm. The farmers and advisors from the bio-firm network requested to guide and structure their knowledge exchange process. Literature provides two key issues in approaching this. First, a system approach delivers tools to understand the complex interactions within and between farming systems (Darnhofer et al., 2012). Second, a transdisciplinary co-production of knowledge is recommended (Aeberhard & Rist, 2009). Transdisciplinary research aims at identifying, structuring, analysing and handling real world problems by understanding complexity of the problem, by linking abstract and case-specific knowledge, with the ultimate goal to develop knowledge and practices that promote what is perceived to be the common good (Pohl and Hirsch Hadorn, 2007). The uniqueness of the approach lies in the partnership and sharing of knowledge between research of different disciplines and other stakeholders (farmers, advisors, farm networks, and educational institutions). As a result, this paper aims to describe a transdisciplinary and system approach to improve knowledge exchange in the organic farming sector.

Methodological approach

During the transdisciplinary process, we searched for techniques that include system thinking and explored both quantitative and qualitative techniques because a mixed methods approach can

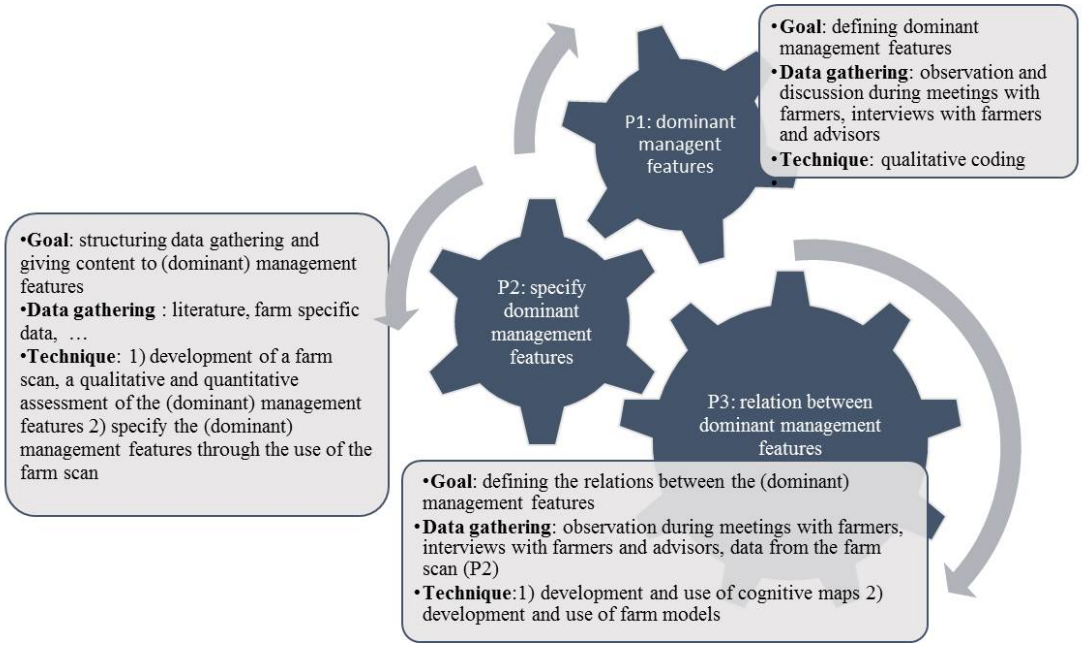

Figure 1: Overall framework to structure knowledge gathering on organic farming systems

provide strengths that offset the weaknesses of each type of research (Creswell & Clark, 2011). The combination of these techniques resulted in a framework (Figure 1). Throughout a first phase (P1), key management features for successful organic farming are captured during meetings of organic farmers and advisors and through observations and participation in discussion groups with farmers. Second (P2), a farm scan is developed and used to structure both quantitative and qualitative information on these key features in a collaboration between advisors, experts and researchers (Bijttebier et al., 2015). In a third phase (P3), the focus is on defining the interactions and trade-offs between the key features by use of both qualitative (e.g. cognitive mapping) and quantitative techniques (e.g. farm modelling). Cognitive mapping is a technique that captures an individual's view of a particular issue in a graphical representation. Cognitive maps were constructed out of interviews with the main question to elicit their perception on a successful organic agricultural system (Fairweather et al., 2010). This framework was applied for three organic production systems (beef cattle, dairy cattle, arable crops and vegetables).

Results – Discussion

The implementation of the framework on different production systems (beef cattle, dairy cattle, arable crops and vegetables) revealed differences with respect to the effectiveness of the process, the series and timing of the phases and convergent attention points. Within each sector, the phases were carried out not through a linear process and not even an iterative one. Instead, depending on the questions and needs of the farmers, the phases were succeeded organically. For example, in the case of the production of vegetables, we started with P1 to identify key management features and simultaneously conducted interviews (n=21) to capture farmers' and stakeholders' perceptions on trade-offs and interactions between key management features. The outcome of each interview was graphically represented by an individual cognitive map. These maps were subsequently merged into one social map which was used as input to feed farmers' group discussions on farm strategies on these management features.

Second, although the framework was applied separately for the three cases, outcomes converge to common key features of major importance. Insights in common attention points may incite cooperation and learning between different farming sectors and novel strategy search within the organic farm system. For the case study of organic vegetables production, analysis of the social cognitive map revealed labour organisation, marketing, weed management, crop planning, product quality, and decisions with respect to technology and mechanisation as management features highly impacting decision making processes on the farm. Exchanging these findings with the farmers, resulted in fruitful discussions further enriching our understanding of the decision making processes by farmers.

Conclusions

Through a transdisciplinary and system based approach, we were able to develop a framework to structure knowledge gathering and sharing on organic farming systems. Although the implementation differed a lot among the sectors, the common framework provides a tool for advisors and researchers to guide the knowledge structuring, depending on the farmers' needs. This approach can be used to structure and improve knowledge transfer during meetings of organic farmers. The cognitive maps supported farmers' sharing of experiences with respect to key dealing with key management issues and the reasoning behind their decision making process. This way, the framework might be a support to farmers decision making when adapting their strategies to fast changing socio-ecological demands. This approach might stimulate learning on common key features between sectors and even lead towards cooperation in the long term.

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