

Special issue: Innovations in farming systems approaches

Introduction

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Farms in Europe are under pressure. They are leaving behind the certainty that characterized the second part of the twentieth century. Then, the Common Agricultural Policy (CAP) constituted a tightly knit security net (subsidies, guaranteed prices and so on) and the social contract with European society was clear: produce enough food and ensure efficient supply chains. Research and extension were set up to deepen biological knowledge and to develop technologies that would increase biotechnical and labour productivity.

At the beginning of the twenty-first century, complexities and uncertainties abound. Farmers face erratic commodity markets, the impact of climate change, ongoing revisions of the CAP and a range of new societal demands. They are expected to produce high-quality products at competitive prices using environmentally

friendly production methods that maintain cultural landscapes. With the growth of multifunctionality, farmers also provide open spaces for recreational activities to urban populations and are actively engaged in a broad range of rural development activities. Being a farmer, however, is still a particular way of life, shaped by the biological nature and rhythms of farming activities, with a specific relationship to the land and the landscape, and a tradition of collective work and actions (as in cooperatives and insurance, for example). All this is, of course, changing with new knowledge, new technologies and the processes of automation. It is also changing because the European archetype of farming as a family activity is no longer the only image of farming – on the one hand, there is the industrial model of technology and labour organization and, on the other hand, there are

multiple activities in the farm household, with one partner earning money outside the farm (and often working both outside and inside). A key aspect of the changing context is that farmers now find themselves increasingly confronted with the concerns of others (both urban and rural dwellers) with regard to their practices, their impact on the landscape and the quality of the food they produce.

These pressures and changes also affect agricultural research and extension – their goals, their activities and their contribution to innovation. The time for top-down innovation by researchers and linear extension to farmers has faded away, as have technical proposals that ignore:

- farmers' values and attitudes (entrepreneurial, crafts-oriented, etc), their mode of problem formulation, their perception of constraints and their need to preserve the farm's adaptive capacity – innovation now needs to be locally adapted and reformulated by the farmers to fit their own contexts and priorities;
- the diversity of farming systems and their contribution to the multifunctionality of rural territories, as well as their close relationship to product quality and value chains; and
- the socio-technical content of the new contracts farmers negotiate and debate with the rest of society.

An understanding of the centrality of the farmer – purposively adapting technologies, carefully shaping the farm and constantly adjusting its organization – is at the heart of the 'farming systems approach'. This approach is a research and extension framework that the International Farming Systems Association (IFSA), and here notably its European group, has developed. Its objective is to connect the diverse elements and thereby propose knowledge, models, methods and tools that can empower farmers in their activities. The goal is to contribute to sustainable rural development – a sustainability that depends on a shared vision between farmers and other stakeholders as to which development paths will lead to a better future.

The farming systems approach (FSA) emerged in Europe in the 1980s when the drawbacks of the productivist model became apparent. FSA focuses on farm scale. It has a systemic and multidisciplinary framework, designed to identify the farmer's reasons for acting as he or she does. An understanding of what lies behind farmers' actions allows us to devise ways of increasing their room to manoeuvre and their opportunities to improve efficiency or to innovate. The 'farming system' is understood as including all members of the farming family and all the biotechnical processes involved in farming. These elements interact dynamically on-farm and off-farm with a changing economic and social environment. Because it identifies farmers' norms and attitudes and their information and decision systems as central points of investigation, the FSA draws on the social sciences. The goal is to evaluate the effectiveness of innovations, to analyse their translation into a set of practices and to understand their interaction with the domains of technology sciences, second pillar of the FSA pluridisciplinarity. With the rise of multifunctional agriculture, farming systems approaches are no longer limited to the farm level, but include the 'horizontal' (that

is, the territorial) integration of farming as well as its 'vertical' (market) integration. To face the new societal demands, farming systems researchers are also developing participatory methodologies to support dialogue and the exchange of knowledge between farmers and other stakeholders, allowing them to develop and intensify new forms of collective action.

This special issue of *Outlook on Agriculture* contains examples of recent research into farming systems. The papers, which have been refereed and revised for publication, were presented and discussed at the last European Symposium of IFSA, held in Clermont-Ferrand, France, from 6–10 July 2008. They cover a wide spectrum of disciplines, approaches and themes, illustrating one of the basic characteristics of the farming systems community – being open to innovative research.

The first three papers focus on the farm level and explore the adaptive capacity of farming systems. This includes the abilities to change and adopt new technical or organizational schemes and to face shocks, profound changes and/or long-term uncertainties. In the first paper, Gueringer *et al* consider the role of land-use practices in landscape preservation in the mountainous regions of central France. Their aim is to identify the key factors that allow for adaptability on livestock farms. Toillier and Lardon then analyse the unequal adoption of community-based forest management schemes proposed by Malagasy institutions. They distinguish between coping strategies that are immediate reactions to a quick change and adaptive strategies that address stresses and long-term changes in livelihood strategies. The diversity of livelihood systems in two rural communities and their responses to national forest management schemes lead the authors to discuss the determinants of room for manoeuvre. In the third paper, Cialdella *et al* analyse the long-term trajectories of family farm systems in the Alps. They identify those paths that allow farms to survive and clarify the overall logic of action. The underlying concept is to consider adaptation as a process in constant movement, modified continuously to a greater or lesser degree. As in the previous studies, several strategic patterns of change are identified, underlining once again that diversity is a fundamental characteristic of farming systems.

Thinking about innovative ways of farming that increase sustainability requires reflexivity and social learning. As Bos *et al* note in their paper, the different mindsets of farmers, retailers and citizens make it difficult to define straightforwardly what is sustainable, especially in animal production: conflicting interests result in a co-evolution of values, practices and institutions. Bos *et al* propose reflexive interactive design as a form of purposeful and participatory technology assessment that takes into account both the social and technical features of production systems. They illustrate the steps of such a participatory design process in the case of a Dutch dairy production project that aims to improve its sustainability in various ways. Pereira-Querol and Seppänen focus on social learning experiences in environmental management, taking the case of an innovation in on-farm biogas production for carbon credits supported by a group of pig farmers. The authors show how the 'activity' theoretical approach can help our understanding of social

learning through a historical analysis and the transcription of a succession of activities as a sequence of phases. An activity is conceived here not only in terms of its objective material nature, but also in terms of the subjective reflection of the actor. Magne and Cerf offer another perspective on collaborative approaches by focusing their examination on another critical factor – the farmer's 'knowing' process. How do farmers transform part of their environment into resources for action? The authors highlight how individuals assess information according to its usefulness and usability. The whole process of sense-making and using information to act can be considered as an information activity, in which information resources are a mediating tool influencing the farmer's interpretation of a given situation.

Farming is connected to the market chain – in the form of either a commodity system or a local food system. These systems have their own dynamics and pressures to change, with sustainability arguments always a major consideration, and they interact with farming practices, culture and regional specificities. De Greef and Casabianca analyse why the Dutch pork market chain appears so robust – 'robust' here indicating insensitivity to alternative production scheme initiatives. The goal of cost reduction per unit and the need to cope with environmental and animal welfare directives remain the major drivers in spite of diversification initiatives (which fail to acquire a substantial market position). Schönhart *et al* present, through a literature review, an exploration of local food system characteristics and their presumed advantages, and draw up a research agenda on the basis of their findings. They start with the definition of a 'local food system' as a food supply chain (including labour and raw materials for production) entirely located within the same region. The authors detail arguments for and against a local food system (environmental, social, economic efficiency) and highlight the existing lack of knowledge and 'controversial' results from isolated case studies. Bouche and Moity-Maïzi discuss specific local food systems that take advantage of a product's origin, emphasizing the local landscape or production and transformation processes. But does such a strategy arise simply from processes and landscape? The authors' example of the territorial anchorage of Corsican cheeses focuses on the know-how entrenched in a product. This 'know-how' derives from a local system of knowledge – the knowledge is acquired, incorporated into the product,

developed and then transmitted in a process that combines tradition and innovation. In this context, the know-how is the core resource in the definition and protection of a product as something more than local – as, in fact, part of the region's heritage.

Landscape, in the context of farming systems approaches, is a melting pot for multifunctionality. It is a product and a resource for farming activities; a resource for non-productive functions; a resource for non-agricultural activities; and it satisfies diverse human needs. Surová and Pinto-Correia illustrate a methodology for obtaining knowledge about how landscape is valued from different points of view. Their study concentrates on the Alentejo region of Portugal, where the cork-oak Montado is dominant. Categorizing the landscape's functions according to the activities of its various users (such as landowners, bee-keepers, mushroom pickers, local or new rural inhabitants, visitors) helps to clarify issues relating to the maintenance of the Montado from a wide-ranging social perspective. It offers guidelines for public policy administered through contracts with landowners and users. For Knickel and Kasperczyk, the challenge is to deepen our understanding of the interrelationships between farming and the multifunctional landscape and, against this background, of the management of agri-environmental schemes. Their aim is to monitor and assess changes in these interrelationships to evaluate the effectiveness of a management scheme. The Agri-environmental Footprint Index, with its Assessment Criteria Matrix, is proposed as a means of achieving this – the Matrix being applied through interactive, process-oriented cooperation among practitioners, evaluator and administrators (the evaluator here being more moderator than controller). Ecological networks interconnect natural reserves to support more biological diversity than is found in non-connected forms. Tiemann and Siebert consider such networks as integrative – innovative initiatives that bring coherence to a fragmented natural system. In these networks, stakeholders' involvement and participation are important factors. Tiemann and Siebert explore the role of participatory approaches in ecological network implementation in Germany.

We hope that this collection of papers will serve to shed light on the challenges of farming research and on how farming systems approaches can provide a means of addressing farming-related issues in all their complexity.