

**ACTION PLAN
FOR INNOVATION
AND LEARNING**

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ACTION PLAN FOR INNOVATION AND LEARNING

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INTRODUCTION

The world doesn't stand still: nature is evolving, the climate is changing, populations are rising, markets are developing, consumer expectations are increasing. Thus agriculture is under pressure in all sorts of ways. All those involved have to adapt to meet and overcome these challenges if their businesses are to thrive so they can sustain their livelihoods.

How do they do this, and turn these challenges into opportunities? Where should we look for successful examples out there? What are the key components of context, of strategy, of practice that enable success? What institutional policies can facilitate and support these? Learning and innovation are increasingly recognised as being at the heart of successful adaptation and change to meet the challenges facing Europe and indeed the World.

The intent is clear in the EU's wider policies.

- The EU's Innovation policy is geared towards "smart, sustainable and inclusive growth".
- Putting ideas into practice has become the central goal of Horizon 2020, the EU's Framework Programme for Research & Innovation for 2014-2020. In comparison with earlier EU research policy, the focus has shifted from research for its own sake to innovation with tangible impact.
- Innovation support has been strengthened in the EU's Common Agricultural Policy (CAP).
- The objective of the new European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI) is to bridge the gap between agricultural researchers and practitioners. It will operate through Horizon 2020 and the Rural Development pillar of the CAP.
- Erasmus+ recognises the need for "education, skills and creativity in a knowledge society".

In fact, the EU's policies and instruments are becoming more closely aligned with organic and agroecological objectives, so the door is opening

for these approaches. The EIP-AGRI aims to marry productivity and sustainability, contributing to a "steady supply of food, feed and biomaterials, developing its work in harmony with the essential natural resources on which farming depends". The new rural development regulation requires the EIP-AGRI to promote a resilient agricultural sector working towards agroecological production systems.

More specifically, the European Commission's recently published Organic Action Plan recognises that "organic production has to maintain its innovative role, in influencing non-organic production with its rules and the techniques applied." It also recognises that "organic production has become a highly specialized agricultural system, which requires specific professional education, knowledge and technologies."

Bearing the above in mind, this publication will set out a blueprint for learning and innovation in organic and agroecological farming (chapter 1). It is intended to be an exemplar for learning and innovation in farming and food systems generally.

How this blueprint operates in action will be set out in 13 examples covering a wide range of innovative methodologies for learning, stakeholder participation, research and innovation (chapter 2). Indeed, organic and agroecological farming has a long history of strong collaboration between researchers and practitioners and across disciplines.

The next chapter will analyse what opportunities current EU policy instruments offer for organic and agroecological innovation (chapter 3).

Based on the experiences with agroecology and organics, the publication will finish with policy recommendations for better promoting innovation and learning support in Europe's food and farming sector (chapter 4).

01



LEARNING AND INNOVATION IN ORGANIC AND AGROECOLOGICAL FARMING

1.1. SOME DEFINITIONS

Whilst first publications mentioning **agroecology** already appeared in the early 20th century, it was only after the 1970s that studies in agroecology grew more rapidly. A milestone in the development of agroecology was the publication of Miguel Altieri's book "Agroecology, the Scientific Basis of Alternative Agriculture" in 1983. Altieri defined agroecology as the application of ecology to agriculture. However, he gave it a political dimension too, embodying a strong criticism of the impacts of the Green Revolution. Twenty years later, Francis et al. (2003) enlarged agroecology to the whole food system linking production with the food value chain and consumption. It is now more than just a scientific discipline, and is also a movement, and indeed a practice (Wezel et al., 2009), with a global presence, but by its inherent nature, with very regional manifestations.

As a scientific discipline, agroecology studies the four properties of agroecosystems (productivity, stability, sustainability and equitability) through an interdisciplinary lens. It encompasses agronomy, ecology, sociology, economics and indeed politics, and at all relevant scales from gene to biome, from field to global.

As a movement, agroecology has become a framework for integrating ecological, socio-economic and political aspects of agro-food systems. This framework challenges stereotypical boundaries between society and nature, likewise boundaries between science and society.

As a practice, agroecology eschews the dominant monoculture model with its dependence on external inputs, where maximising yield (output per hectare or per man hour) is the main criterion of success. It questions likewise the dominant model of nature conservation that separates the protection of

biodiversity and the environment from the production of food (land sparing as opposed to land sharing). Rather, agroecology emphasizes inherent linkages between them. It explores alternatives based on autonomy and the careful use of resources (Stassart et al., 2012), so as to reduce dependence on external inputs and improve sustainability. At the same time, agroecology is becoming a new buzzword, perhaps analogous to 'sustainable agriculture'. The term 'agroecology' has been recently adopted by some actors who also promote conventional agriculture.

Organic farming first emerged in Europe, and was the result of several influences. Rudolf Steiner gave a series of eight lectures in Austria in 1924 that laid the foundations of biodynamic agriculture. Then Lady Eve Balfour espoused the links between the health of soil, plants, animals and people, founding the UK Soil Association in 1946. Also in the 1940s in Switzerland, Hans and Maria Müller and Hans-Peter Rusch developed a natural approach to farming particularly using rock dusts. There were developments in the USA too, where J.I. Rodale started publishing *Organic Farming and Gardening* in 1942.

Most of the organic movements around the globe are united by the International Federation of Organic Agriculture Movements (IFOAM). It has developed four principles of organic agriculture, specifically: health, ecology, fairness and care. These encapsulate the ethos and practice of organic production and are widely supported.

Organic agriculture is now also well defined in law. Its production rules, marketing requirements and control procedures have legal status in many countries, also in the EU and the Codex Alimentarius Commission of FAO. Despite this, with the widely differing geographical, climatic and developmental conditions in different

countries, there is variation in legal standards around the World - though practices on farms often exceed the minimum legal requirements within each country. Nevertheless, all follow the same broad principles and objectives and there is a huge international trade in organic products.

In addition to the regulated organic farming of the major organic markets, there is also much unregulated, smallholder/peasant-based organic farming supplying local markets. However, unregulated does not necessarily mean uncontrolled: there are often sophisticated, self-organised systems ensuring integrity, good practice and information sharing. Some call themselves agroecological, not organic.

Notwithstanding their different histories, there are strong overlaps between organic agriculture and agroecology. Both promote a 'closed system' approach to minimise external inputs, use multiple and diverse crops and/or animals, and rely on biological processes for building soil fertility and controlling pests and diseases (Bellon et al., 2011). Both tend to favour more direct links with their customers and to engage with social movements. Both seek to improve wider agricultural systems towards greater sustainability using similar approaches, and both are open to learning and are ambitious to probe, to improve and to develop their practices towards this goal – exactly one of the goals of this publication.

Thus, whilst not quite synonymous, organic farming and agroecology are strongly related and are complementary bedfellows.

Innovation is a broad concept that is generally defined as the development, introduction and application of new ideas, processes, products or procedures where an economic or social benefit is assumed for individuals, groups or entire organisations (Maier, 2001; Aichner et al., 2000). Put simply, it is something original, therefore new, that "breaks into" a market or society.

Innovation could be seen as sitting in between invention and improvement. Invention is the creation of an idea or method, whereas innovation is developing and implementing a better, novel idea or method. It refers to the notion of doing something different. Improvement, on the other hand, is simply about doing the same thing better.

Many scientists and researchers have studied innovation with the aim of identifying the different forms of innovation and documenting the associated structures and policies. These include:

- Schumpeter et al. (1980) defined three phases of the innovation process: invention (when ideas are generated), innovation (putting ideas into practice), and diffusion (the widespread application of the innovation);
- Smits et al. (2010) described innovation as either macroeconomic (more linear, like 'technology transfer'), or institutional (more the whole innovation system);
- Li et al. (2008) differentiated between exploitative (refining, leveraging and extending existing knowledge) and explorative (searching for new alternatives or unfamiliar, distant and remote knowledge);
- Meißner (2001) and Knickel et al. (2009) identified different groups who perform different tasks in the various phases of the innovation process: knowledge producers (researchers, R&D departments), knowledge users (commerce, consumers, farmers), knowledge brokers (advisory services, the education system, NGOs) and political decision-makers;
- Padel et al. (2010) in the TP Organics Implementation Action Plan argued for a broad understanding of innovation, distinguishing between:
 - technology innovation, generated mainly through lab-based science and technology, and then transferred to users such as farmers, advisory services, and policy makers;
 - know-how innovation, knowledge around methods and practices, often the result of participatory research, spanning the normal boundary between knowledge producers and users; it makes 'tacit knowledge' explicit and often combines new and traditional knowledge;
 - organisational innovation, changes in management and cooperation among stakeholders across the agro-food value chain (e.g. researchers, seed breeders, extension services, farmers, retailers, consumers, civil society);
 - social innovation, change of behaviour of groups in wider society establishing new relationships.

In the food & farming sector, the term **Agricultural Knowledge & Innovation Systems (AKIS)** is often used to describe all the various actors and their interactions. Originally, AKIS was the acronym for Agricultural Knowledge & Information Systems and defined as “a set of agricultural organisations and/or persons, and the links and interactions between them, engaged in the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilization of knowledge and information, with the purpose of working synergistically to support decision making, problem solving and innovation in agriculture” (Röling & Engel, 1991). The AKIS concept has since evolved as it has opened up to more public tasks and to the support of innovation (Klerx & Leeuwis, 2009).

Although extension, education and research are often considered as the most essential parts of AKIS, it is important to realise that there are many more actors in the food chain that directly influence the decision making of farmers and their innovations (figure 1.1). Which actors are the most important depends on

the actual problem to solve and farming systems. For example, input suppliers only play a minor role in organic farming. On the other hand control bodies have in many cases a strong influence on the decisions taken by the organic farmer. Citizens and NGOs can also have a stake in the innovation process, as organic farmers tend to favour direct links with consumers and to engage with society (figure 1.2).

The Standing Committee on Agricultural Research (SCAR) set up a Collaborative Working Group on AKIS (CWG AKIS) to review the ‘state of the art’ of AKIS throughout the EU. Its report in 2012 revealed a wide variation in structures, activities and cohesion in AKIS between European countries, regions and sectors (EU SCAR, 2012). In a subsequent report, it recommended that AKIS themselves need to innovate, to adopt new ways of working, including facilitating more interactive innovation and incentivising innovation processes within research (EU SCAR, 2013).

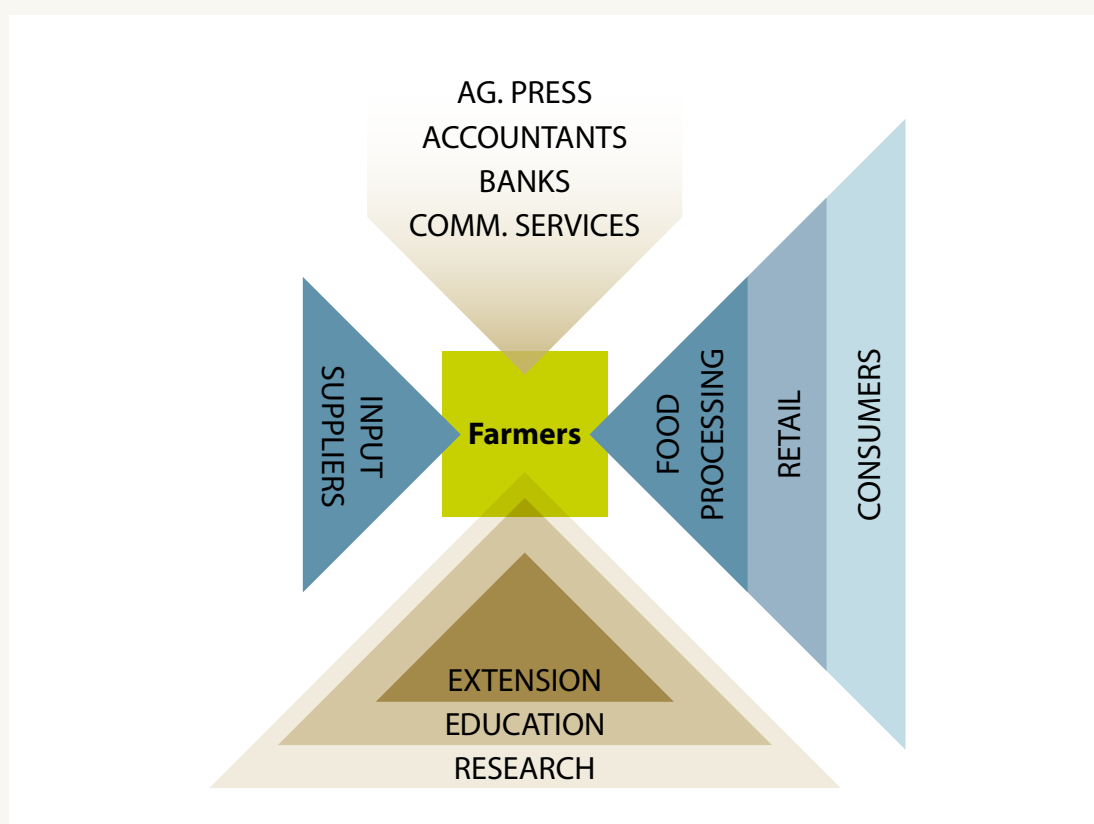


Figure 1.1. Actors in the AKIS directly relevant for agricultural innovation in the food chain. Source: EU SCAR (2012) modified. Note: Commercial services include laboratories, veterinarians, management software, notaries, land brokers etc.

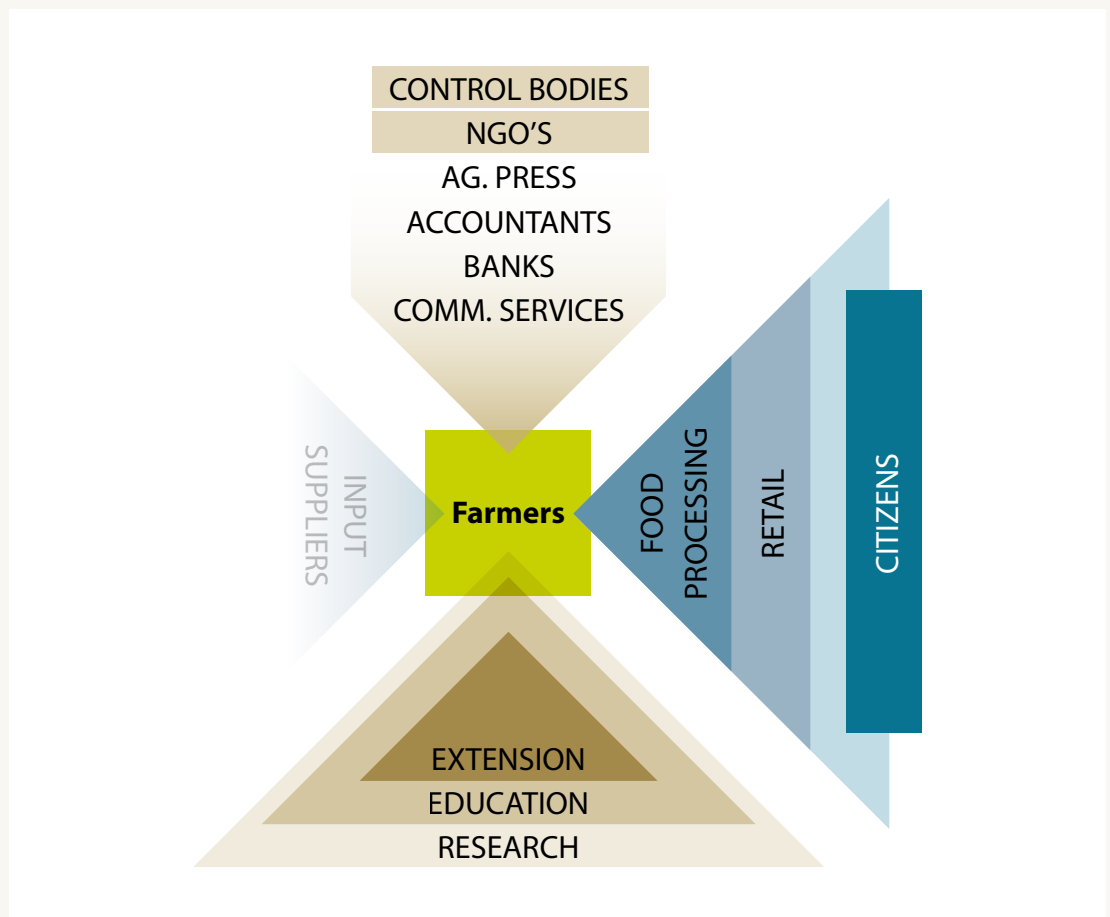


Figure 1.2. Actors in the AKIS relevant for innovation in the organic and agroecological food chain.
Source: EU SCAR (2012) modified

1.2. A SYSTEMS APPROACH TO INNOVATION

All these terms and concepts are useful in understanding the possible range of innovation models, the actors involved and the stimuli that help to facilitate innovation. However, innovation by its very nature is not necessarily so quantifiable, nor indeed so easily categorised. In essence, it is a creative, often bottom-up process that happens in response to pressure or need (of whatever kind); it may not sit so comfortably in the more top-down, linear, institutionalised environment of conventional policymaking and research.

Of course, elements of the former are increasingly being found in the latter:

- inter- and trans- disciplinary research is becoming commonplace (i.e. combining disciplines, and crossing disciplinary boundaries, within research);
- NGOs and SMEs are now often required partners in EU research consortia;
- advisory services are responding to the changing policy climate and are innovating in their own right;
- farmers and consumers are more and more involved as active players;

- all these are often stimulated by new and emerging research policy decisions, of which a prime example is the recent Horizon 2020 and its various associated instruments.

The AKIS model is beginning to reflect this (though there still is some way to go) and all these developments are to be welcomed. Innovation is likely to be fostered when the divisions between knowledge producers, users and brokers, and indeed decision-makers, are broken down. For all actors have, use and distribute knowledge in their different ways. All need to be able to contribute their perspectives and needs, their experience and expertise, their knowledge and ideas. It is when such equality is recognised and respected that knowledge can circulate and the spark of cross fertilisation can happen. Then, the creative process is most likely to be productive.

This is what might be called the systems approach to innovation. The challenge, therefore, is to ensure the right environment for the creative, bottom-up process to flourish.

The importance of overall policy for creating the right environment is key. Just because the policy framework, the research funding conditions and the hierarchy of decision making are all made at 'the top', the result does not have to be linear, top-down structures and stultifying bureaucracy.

For example, the meso-level of municipalities, cities and regions are increasingly becoming important players in promoting innovation in the food & farming sector. Many alternative food networks have steadily gained ground with support from local public authorities. Many municipalities use their public procurement policy (e.g. for schools and hospitals) to support regional and organic producers and simultaneously deliver their own health and education policies, and boost the local economy.

In fact, many of these innovations were only supported by the municipalities **after** they had been launched and had demonstrated they were successful, or the social pressure became too much to ignore. However, they at least had the freedom and the vision to take action when they felt able, and then to support further innovation and development.

So, the systems approach to innovation is fostered by both a favourable policy environment, and conditions on the ground that facilitate information sharing and mutual respect. These two influences together can unlock creativity and foster cooperation.

1.3. LEARNING AND INNOVATION IN ORGANIC AND AGROECOLOGICAL FARMING

Learning and innovation in organic and agroecological farming happen through the whole farming system and food chain, in rural society generally. There are numerous and inspiring examples. These are sometimes because of, and sometimes in spite of, relevant policies and support. The quality of innovation they demonstrate and their sheer variety are testament, not only to the ingenuity and boldness of those involved (sometimes forced into self-reliance by the lack of institutional support afforded to agroecological and organic farming), but also to the creativity and open mindedness fostered by agroecological and organic approaches.

It is through these examples that we set out a blueprint for learning and innovation in organic and agroecological farming. This section, therefore, will cover a wide range of innovative methodologies for learning, stakeholder participation, research and innovation that have been developed around the world. More detailed information on many of these various examples can be found in the next chapter.

Applying agroecological principles to learning leads to methodologies where the main focus is in exchanging knowledge between involved stakeholders. Therefore, those methodologies are going to vary depending on where and with whom the learning experience is held. These interactions can be classified into four broad areas, though there is considerable overlap:

- Self-help
- Extension
- Research
- Education

1.3.1 Self-help

Normal extension activities involve advisors or other 'experts' visiting a farm or organising a course to dispense their knowledge to the farmers concerned. In developing countries, there are few advisors, and sometimes no extension infrastructure at all. Where there is, it is often associated with aid-financed, export-oriented production, wholesale changes of cropping, agrochemical usage and the accompanying burden of tied contracts and deepening debt cycles as soil fertility drops and/or prices drop. But mostly, the farmers are left to their own devices to sink or swim. In the global North, most extension activity is geared towards larger farms, and smaller farms tend to be ignored.

It is therefore amongst smaller farmers, in both the global South and North, that the most innovative means of extension have emerged, founded on self-help and the resourcefulness of the farmers themselves. Actually much early development of organic farming in Europe was based on self-help and in many countries farmer networks are still an important motor for this, e.g. Bioland in Germany or AIAB in Italy. Below are three types of self-help models that have developed where there has been no extension infrastructure to help farmers with the problems they encounter.

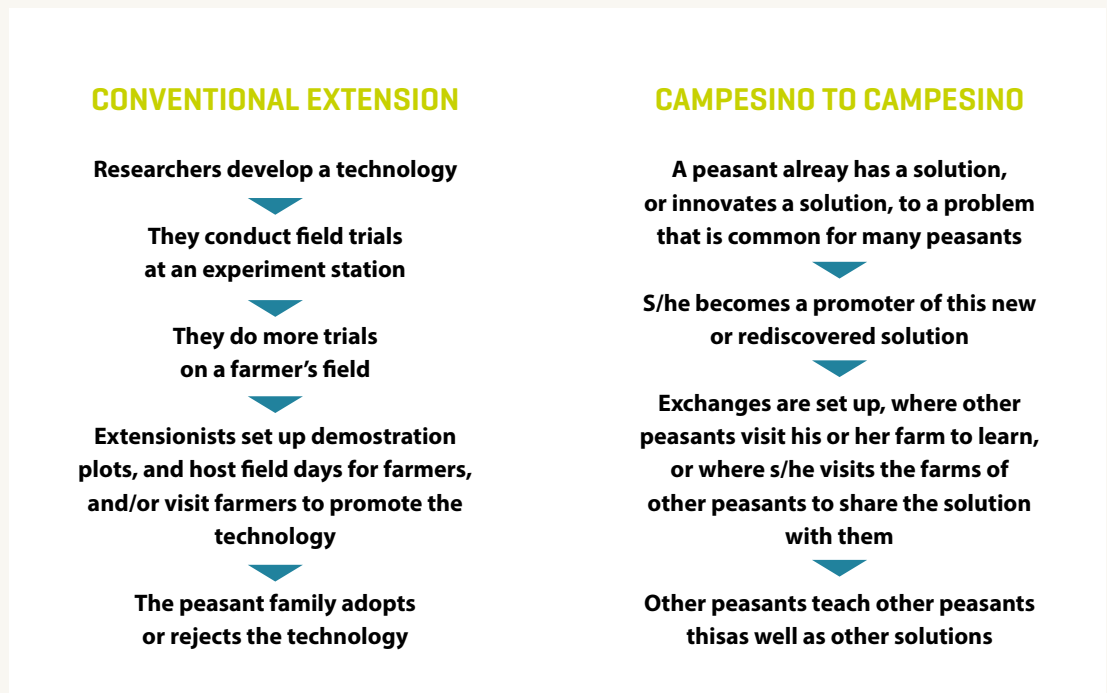


Figure 1.3. Conventional agricultural extension versus Campesino-a-Campesino. Source: Machín Sosa et al. (2010)

The **Campesino a Campesino** movement was created and developed in Guatemala during the 1970s (Holt-Giménez, 2006). Basically, farmers exchange knowledge among themselves to solve problems. It is a participatory method based on local needs, culture, and environmental conditions. The innovative aspect is the central role that farmers play as well as the new role that the technician, should there be one, has to assume. S/he does not come with a recipe solution, but has to support and facilitate the exchange processes. Exchanges take place at the farms that are well known environments for farmers. As a result, they feel more comfortable and will be more motivated to participate and express themselves (Figure 1.3).

Campesino a Campesino is now well established throughout Central America. It has several hundred thousand farmer-promoters and has helped rural farming families improve their livelihoods and conserve their natural resources. Through this, hundreds of thousands of smallholders have been able to develop sustainable agriculture, even under highly adverse conditions – indeed for many it has been the lifeline of their survival.

Campesino a Campesino's extensive knowledge networks have been highly successful in generating and spreading sustainable agricultural practices on the ground. In effect, it has decentralized the practice of

agricultural development. This is both a measure of and an explanation for its successes. If agriculture is to be sustainable, it must not only be based on the ecology of the specific agroecosystem where it is being practiced, it must evolve from the social structures and cultures in which the system itself is embedded. The opportunity is then for these embedded, agroecological experiences to scale out, geographically, and up into the institutions that shape agriculture's social, economic, and political terrain.

Participatory Guarantee Systems (PGS) were originally created by local farmer organisations to provide cheaper organic certification for their small farmers supplying local markets. One of the first PGS of Europe is that of Nature & Progrès in France. PGS have now been developed in every continent. They often include consumer organisations for better communication between the two constituencies.

The starting thesis is that farmers want to adhere to the standards, so certification is not seen as a repressive tool. On the contrary, it is a helpful one that supports farmers and processors to improve their procedures. PGS promote, within the standard requirements, an on-going process aimed at increasing sustainability performance. They finally turn into a learning experience, based on exchange between farmers themselves and with consumers.

PGS work on the basis of six principles: common vision (described by the standard), participation, horizontality, transparency, trust and learning process. Peer-review¹ is at the centre of the system. The inspection is done by a farmer, who is clearly a professional with empiric knowledge and a full understanding of the local farming conditions. Every member stands at the same level and each member is responsible for one of the certification steps, on a rotational basis. Transparency and trust go together and build naturally upon these foundations.

The learning process is one of the main characteristics of PGS. The certification becomes an opportunity for farmers to get to know other farms, to discover other farming methods, and to exchange experiences with peers that work in the same region with the same agronomic and socio-economic problems. Even though PGS were originally created as a certification tool, they are actually multidisciplinary networks, locally based, where farmers and stakeholders meet to exchange and to create solutions based on a diversity of views, experiences and knowledge.

Community supported agriculture (CSA) is an alternative, locally based economic model of farm management and food distribution. Its origins stem from biodynamic farming in Europe, but it became established in the 1980s in the USA, and then spread back to Europe, especially in the UK as a response to the economic recession and the resulting pressure on small organic producers.

CSA members or subscribers pledge to support one or more local farms and pay a subscription at the onset of the growing season for a share of the anticipated harvest. This is distributed weekly, often by means of a box scheme. Thus growers and consumers share the responsibilities, risks and rewards of food production.

There are almost as many models as there are CSAs, with varying levels of support right up to the farm being owned by its CSA members. Similarly most CSAs involve their members in the work of the farm. This can range from simple open days right up to regular work weekends which may or may not count towards the financial subscription.

CSAs are perhaps the most sophisticated and innovative example of short supply chains around the World. What they all have in common is the direct link

¹ By peers we understand farmers that are producing the same crops or breeding the same animals.

between farmers and consumers. Besides the marketing aspect and security for the farmers, these initiatives are also platforms for learning and exchange. The farmers are in direct and continuous contact with their customers, so get almost instant feedback on the quality of their produce and what their customers want; the consumers have access to all the production information of the farm and can experience farming first hand.

Furthermore, some of the CSA members are likely to have additional skills, e.g. accountancy, marketing, conservation, etc., that the farmer and the farm can benefit from – a skills resource 'on tap'. Finally, with the added security afforded by sharing risks, farmers are more able to free up resources and experiment with new practices, becoming in themselves a source of new information for other farmers.

1.3.2 Extension

Traditionally the mainstream system of agricultural advice did not cover the needs of the organic sector or agroecological farmers. Alternative extensions services have been created that facilitate the exchange of knowledge among organic farmers, help improving production techniques and empower rural communities while increasing overall sustainability. Many initiatives grew out of the niche and are now recognised and supported by authorities at local, national or EU level. Six interesting and ground-breaking examples are given below (and expanded in chapter 2), showing a range of aims, partners and methodologies.

Bio-districts, the organic approach to rural development, were pioneered by local organic farmers and their association in Southern Italy. A bio-district is a geographical area where farmers, citizens, tourist operators, associations, industry, research and training centres, and public authorities enter into an agreement for the sustainable management of local resources.

Bio-districts create a local network of natural, cultural and productive resources, reinforced by local policies oriented towards the protection of the environment, traditions and local knowledge. They promote the natural, typical, organic products of the area, together with short food chains, also supplying public offices and schools. These are inextricably linked with the promotion of the land itself and its special characteristics, so together they can fully realise their economic, social and cultural potential. This benefits tourism and the local economy whilst ensuring sustainability of local resources.

This innovative process is a workshop of ideas and initiatives aimed at fair trade and local development based on the organic production model.

Flourishing Farm (Bloeierend Bedrijf), a Dutch agri-environment scheme for sustainable crop protection, is a collaborative project funded by the Common Agricultural Policy in which hundreds of farmers are working together with scientists and a range of local organisations. They are increasing beneficial biodiversity by developing flower-rich field margins for natural enemies (beneficial insects) of crop pests.

Key to the project are the Flourishing Farm field meetings. In these, discussions, demonstrations and interaction between farmers and scientists create a participatory learning environment. The farmers start experimenting with more sustainable crop protection, which is followed by group evaluations allowing further exchange. The Louis Bolk Institute, as coordinator, supports these with on-farm monitoring and sharing results from international research.

By working in participatory collectives, innovations develop and are put into practice rapidly. The result has been significant reductions, sometimes elimination, of pesticide use in the crops next to the field margins.

Bucegi Mountains Brânză de Burduf cheese is the most valuable among Romanian cheeses. A Presidium of the Slow Food Foundation for Biodiversity was established to help safeguard this ancient cheese, and the way of life and the environment it helps to sustain.

Made only in summer, droving shepherds collect heritage sheep breeds from local farmers and take them up to the high mountain passes. Here they process the raw milk, keeping some cheese and some lambs as payment. However, this traditional herding and production practice was under threat from social and economic pressures and overly rigid application of EU regulations. With the participation of producers, the Slow Food Presidium drew up a production protocol that was recognised by the authorities. This assures the authenticity and traditions of the cheese making, and that it meets legal standards. This has allowed the cheese to find new markets and has brought higher profits, helping to sustain both the mountain pastures and the local culture.

The regular meetings of the Presidium producers have helped to bring them all together, to cooperate and to share knowledge. Not only this, the exposure to the wider Slow Food movement and the higher profile generally has interested the younger generation who are beginning to value the heritage that they previously shunned. Innovative structures that have helped producers to help themselves are now giving new life to the mountains and their inhabitants.

Sustainability Training for Organic Advisors (STOAS) believes that farm development should primarily be achieved by motivating farmers and enhancing their skills (production techniques, entrepreneurship) rather than by regulations and labels. Thus farm advisors can have a prominent role to play in further increasing the sustainability of organic farming. The EU's Lifelong Learning Programme funded eight European organic associations in the STOAS project to develop two training courses for advisors. These included using some recently developed tools to evaluate the overall sustainability of organic farms. By helping farmers to come to grips with sustainability goals and their own objectives, the advisors can motivate farmers to go beyond the minimum organic criteria.

The MAIE project (Multifunctional Agriculture in Europe) recognises the wider role that agriculture needs to, and can, play. Funded by the Lifelong Learning Programme it explored models for social farming: integrating education, therapy and rehabilitation, and also providing the farm with additional income and labour. The project aimed to promote social farming, produce training materials to assist farmers wanting to engage in social farming, and generally to provide support towards further development.

FECD (Fondo Ecuatoriano de Cooperación para el Desarrollo) in Ecuador believes that agroecology is not only a matter of (technical) knowledge, but needs to be complemented with shared values and environmental awareness. The programmes of this NGO help farmers in building respectful relationships with the family, the community and the environment. Farmers develop new attitudes and start to plan farming activities more carefully. This has resulted in higher productivity and has generated alternative agricultural technologies.

1.3.3 Research

By definition, research should be innovative, as it probes the unknown to find answers. Of course it has to follow well-defined protocols to ensure rigour and objectivity. Sometimes however, the protocols and other 'standard practice' can get in the way of innovation in research techniques and of exploring new approaches. As organic and agroecology have a more holistic perspective, this encourages not only a different attitude, but also different methodologies, and indeed sometimes different objectives, all providing opportunities for innovation.

The Duchy Originals Future Farming Programme is truly farmer-led and seamlessly combines extension and research. Whilst the funding and coordination are external, the research topics are put forward by farmers, with the aim of finding low-cost sustainable answers to farming problems. In addition to these research projects, 'field labs' are held on already-innovating farms so that participants, both organic and non-organic, can share best practice, learn how to run their own trials and review progress over several meetings.

The Flemish Research & Knowledge Network for Organic Food and Farming brings together several networks of farmers, researchers and other stakeholders to coordinate needs-oriented research, facilitate participatory knowledge exchange for innovation, and also disseminate research results using a variety of means to reach all stakeholders. It also integrates both extension and research, with farmers at the centre of the structure.

The SOLIBAM project (Strategies for Organic and Low-input Integrated Breeding and Management) is taking an almost contrary approach to seed breeding. It recognises that in-crop diversity is actually a strength rather than a weakness for crop health, giving better resilience to stress in fluctuating environmental conditions. It has developed participatory plant breeding and management strategies using diverse germplasm and involving all relevant stakeholders. So innovative is this approach that it is coming into conflict with the current (and proposed) seed laws.

Increasing specialisation of farms clearly reduces biodiversity and increases the risks associated with higher and more uniform population densities. It also makes

cycling of nutrients more difficult. **The CANTOGETHER project (Crops & Animals Together)** is working to design innovative and viable mixed farming systems that improve sustainability at both the farm and regional levels.

1.3.4 Education

It is quite normal for part of agricultural education to be field based, for example out on the college farm, and for students to take placements away on commercial farms. This is clearly important for learning practical skills and gaining basic farming experience. Important as this is, it is generally more physical than intellectual, and therefore does not engage the enquiring mind or stimulate deeper learning. Nor does it help those farmers beyond a bit of extra (and cheaper) labour.

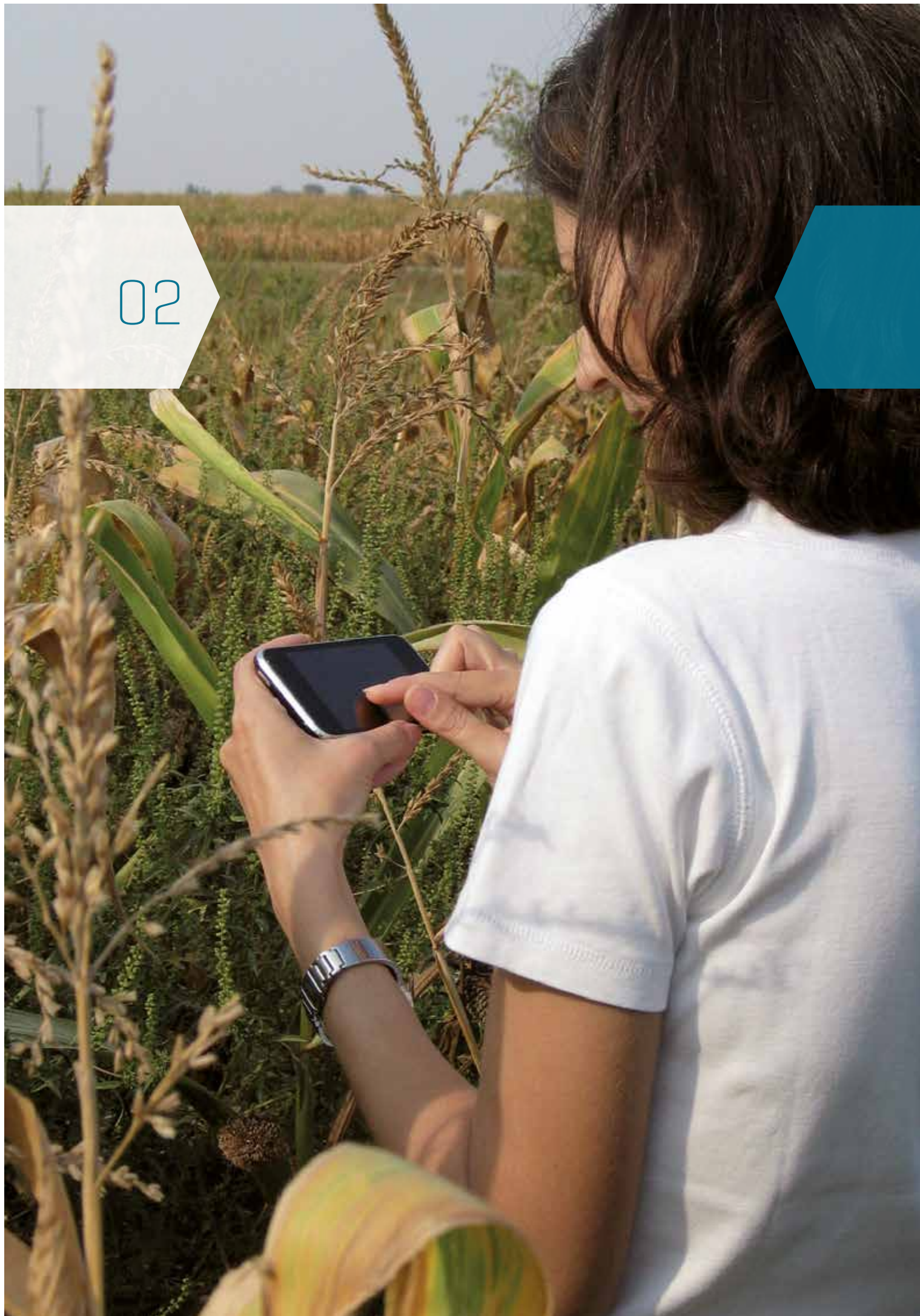
Innovations in learning are addressing these deficiencies, both enhancing the learning experience for students and giving real benefit to the farmers and food businesses themselves.

The Knowledge and Innovation Network for Organic Food and Farming in Berlin-Brandenburg is run by **Eberswalde University for Sustainable Development**. It consists of a range of professionally facilitated innovation projects addressing the needs of single or groups of businesses in the food and farming sector with student involvement as part of their learning. The students are therefore experiencing, and solving, real life challenges, but also support local farms and businesses.

Phenomenon-based, experiential and just-in-time learning are several methods that are being employed at the **Norwegian University of Life Sciences**. It takes the students out to the farm to be fully immersed in the phenomenon itself. Here, students learn from the experience of the farmers themselves and come to value them as much as academics and books.

Experiential learning has been enhanced by using open-ended cases, i.e. putting the students with the farmer or business client and the teacher to look at a real life problem. Finding solutions necessitates study of the associated context and conditions and stimulates both visionary thinking and finding more practical actions – quality learning for the students and real assistance to the client.

02



INTRODUCTION

EXAMPLES OF LEARNING AND INNOVATION IN ORGANIC AND AGROECOLOGICAL FARMING

Just-in-time learning means scheduling learning of modules for when the information is needed. At this time it begins to have context and the students, seeing the relevance and indeed applying it immediately, will absorb it better.

Learning and innovation in organic and agroecological farming happen through the whole farming system and food chain, in rural society generally. There are numerous and inspiring examples. The quality of innovation they demonstrate and their sheer variety are testament, not only to the ingenuity and boldness of those involved, but also to the creativity and open mindedness fostered by agroecological and organic approaches.

It is through these examples that we set out a blueprint for learning and innovation in organic and agroecological farming. This chapter will cover 13 examples of innovative methodologies for learning, stakeholder participation, research and innovation. These examples have been introduced and put into context in chapter 1.



2.1

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THE PARTICIPATORY GUARANTEE SYSTEM OF NATURE & PROGRÈS (FRANCE)

Before organic standards were officially recognised by governments, many organic associations established their own, private certification scheme. When Nature & Progrès developed its scheme in the 1970's it chose for a Participatory Guarantee System (PGS). Nature & Progrès sees organic farming as a process in which producers and consumers work together to continuously improve methods and techniques. Certification is considered a tool rather than an aim by itself. It is just one step in that process to meet, exchange knowledge and support each other. In PGS the certification process is an opportunity for farmers to get to know other farms, to discover other farming methods, and to exchange experiences with peers that work in the same region with the same agronomic and socio-economic problems.

Forty years later, the standards of Nature & Progrès are still defined collectively by all members. In this regard, the charter of Nature & Progrès serves as a double reference. On the one hand it clearly defines the goals of the organisation and all its member and assures these are respected. On the other hand, it is the reference for assessing which improvements have been obtained and which is the way to go.

The PGS of Nature & Progrès is organised at three levels:

- On-farm visits by experienced inspectors accompanied by volunteers. The inspections are carried out in full transparency. They are meant to control compliance with the standards as well as to

stimulate further development along the principles of the Nature & Progrès charter.

- Meetings of the "Joint Commissions for Agreement and Control" (COMACs). The COMACs are in charge of the collective evaluation of the inspection reports. These local commissions issue an advice on the granting of the Nature & Progrès certificate. In addition, they propose recommendations, corrections and/or sanctions in order to improve the farm management.
- Final approval from the national federation. At the national level a committee composed of representatives from the local COMACs takes the final decision on the granting of the label. The same body also ensures the coherence and well functioning of the whole organisation.

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BIO-DISTRICTS: THE ORGANIC APPROACH TO RURAL DEVELOPMENT (ITALY)

The Cilento bio-district, in the Campania Region in Southern Italy, was launched in 2009 by AIAB (Italian Association for Organic Agriculture). A bio-district is a geographical area where all stakeholders (farmers, consumers, public authorities, research and training centres, industry, tourist operators and associations) enter into an agreement for the sustainable management of local resources. This creates a strong local network reinforced by local policies oriented towards the protection of the environment, traditions and local knowledge.

In bio-districts, the promotion of organic produce is inextricably linked with the promotion of the land and its special characteristics so that together they can fully realise their economic, social and cultural potential. This benefits tourism and the local economy, all based on the respect and protection of local resources.

About 400 local organic farmers (23% of the region's organic farms) promoted the creation of the bio-district, and they are the major stakeholders. By joining the Bio-district Pact, they guarantee that their produce is typical of the area, organic and GMO-free.

Thirty-two municipalities are involved in the Cilento bio-district, providing information and promotion, nutrition education in schools, and activating organic canteens and other green purchase initiatives. The Province and the Campania Region also provide funds and direct their own programmes. Many other municipalities in the district, impressed by the results, have applied to join the initiative. AIAB Campania is the overall coordinator responsible for managing it.

In July 2009, with the participation of the local authorities, the bio-district's first ethical purchasing groups and several

organic markets were inaugurated. Since then, the bio-district has created a network of 20 restaurants and 10 seaside resorts (bio-beaches), committed to promoting the produce of farms and farming associations. The bio-beaches have exceeded all expectations, with territorial marketing initiatives and stands promoting local organic food. As a further promotion of ecotourism, a number of bio-routes have been set up that take in farms, bio-towns, organic state-owned land, environmental sites linking inland rural areas and coastal tourist areas.

Many enterprises, driven by the increasing demand for local goods, have presented structural modernisation projects to the Campania Region, to improve production, promote diversification or protect the environment. All bio-district actors participate in a round table to identify sources of available funds for annually programmed activities.

Results are very positive: Demand for organic products is growing; supply chains have shortened; more farms are becoming multifunctional and converting to organic; more environment protection initiatives are in place; and tourist flows are increasing throughout the year and not just in the summer months.

Towards a European and international network of biodistricts

Having seen the economic, environmental and social impact of the Cilento Bio-district, AIAB is actively engaged in promoting and coordinating bio-districts in other areas of the country. Bio-districts have already been set up in the Calabria, Lazio, Tuscany, Liguria, Piemonte, Trentino-Alto Adige, Molise and Marche regions.

At the international level, efforts are made to establish a network of bio-districts and similar types of projects. More specifically, the Cilento Bio-district has recently signed a collaboration agreement with Biovallée in France.

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FLOURISHING FARM: PARTICIPATORY INNOVATIONS IN AGRICULTURE AND NATURE CONSERVATION (THE NETHERLANDS)

Biodiversity plays key roles in sustainable agriculture. Within the collaborative project “Bloeiend Bedrijf” (“Flourishing Farm”), hundreds of farmers are working together to increase beneficial biodiversity and collaborate with scientists in developing flower-rich field margins for natural enemies (beneficial insects) of crop pests. They are supported by local organisations for agricultural landscape and nature management, nationally coordinated by the Louis Bolk Institute and Veelzijdig Boerenland, and regionally by over 30 organisations. The farmers have created over 1200 kilometres of flowering field margins in 2013, and the number of participating farmers has grown from 300 in 2011 to over 570 in 2013.

Bloeiend Bedrijf is an example of participatory innovations in operational groups. In close interactions, farmers and scientists implement scientific knowledge into innovations for sustainable crop protection. The Louis Bolk Institute provides expertise and support, and organizes field demonstrations and field group discussions together with organisations for agricultural landscape and nature management. The project has support from the Dutch ministry of Economic Affairs and the European Agricultural Fund for Rural Development until 2015.

Efficient knowledge exchange leading to participatory innovations

From 2011 to 2013, more than 200 field meetings were organized throughout the growing season, drawing many hundreds of interested farmers. The main objective

is to exchange knowledge and experiences – about how to create and manage wild flower field margins, how to identify and increase beneficial biodiversity, and how to translate that into sustainable agricultural practice.

“Flourishing Farm” is strongly participative: innovations are developed as a result of interactions between farmers and scientists. First, farmers acquire new knowledge during the many field demonstrations and discussion groups. They study and discuss beneficial biodiversity and the possibilities for more sustainable use of insecticides. The Louis Bolk Institute also shares results from international scientific research. Second, based on their own knowledge and observations they start practicing with more sustainable crop protection. Third, these are followed by group evaluations that allow them to exchange experiences with colleagues and scientists. The Louis Bolk Institute also conducts on-farm monitoring of beneficial biodiversity and management practices. Finally, the results are used in annual feedback to the farmers.

Measurable results

By working in participatory collectives, innovations develop rapidly. Because farmers participate in the innovations, it is more likely that these are applied and indeed result in more sustainable practice. In 2012 67% of the participating potato and cereal growers reduced their insecticide use in the crops adjacent to the flower-rich field margins. 40% did not even use any insecticide in the crops along the flower-rich margins.

2.4

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SLOW FOOD FOUNDATION FOR BIODIVERSITY - BUCEGI MOUNTAINS BRÂNZĂ DE BURDUF (ROMANIA)

In the high Bucegi Mountains in Transylvania, droving shepherds still make a living as cheesemakers. At the beginning of summer the herders collect sheep of local breeds from local farmers and herd their flocks to mountain dairies. Here they process the raw milk and, in return for this service, keep part of the cheese and several lambs.

This seasonal tradition to produce Brânză de Burduf, which is matured in fir tree bark, is still commonly practiced. Despite being the most valuable of Romanian cheeses, an overly rigid application of European hygiene regulations was putting traditional herding and production techniques at risk.

The Slow Food Foundation for Biodiversity aims to sustain quality production at risk of extinction, protect unique regions and ecosystems, recover traditional processing methods, and safeguard native breeds and plant varieties. It creates a Presidium to define a specific product, its region, the people who may produce it, and the specific production techniques. It encourages innovation by local producers and sharing of knowledge.

A Presidium for Brânză de Burduf was formed with also the producers as members. It drew up a production protocol which all producers sign. This preserves the traditional production techniques and guarantees the authenticity of the cheese whilst also ensuring consistent high quality. Later it helped to build a shared facility for further processing and ageing of the cheese.

An important and innovative initiative is now underway to ensure that the first processing phase, which takes place in the individual mountain dairies, meets hygiene regulation standards.

The Presidium producers meet three times a year to make decisions about promotion and issues relating to production. They are acquiring a greater familiarity with the national and international market, building up a network of contacts and learning the best way to present their product. This has brought higher profits, encouraging the producers to maintain the mountain pastures and safeguard the cheese, which is a symbol of the local culture. They are currently working to register a shared brand.

Herding is of little interest to younger generations, being considered an inferior, old-fashioned activity. But now the Presidium coordinator, who is also a cheesemaker, is 32 and other young people are becoming interested in the project.

The Presidium is helping to improve production and spread knowledge about the area and the product. It plays an essential role in maintaining the culture of mountain cheesemaking and preserving the landscape and the biodiversity of the pastures, including the two local sheep breeds.



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SUSTAINABILITY TRAINING FOR ORGANIC ADVISORS (STOAS)

The STOAS partners consider organic agriculture as a development process of ever increasing sustainability. In this, farm advisers have a prominent role to play. By helping farmers to come to grips with sustainability goals and their own objectives, they can motivate farmers to go beyond the minimum organic criteria and to enhance their production and entrepreneurial skills in pursuit of increasing the sustainability of their farms.

The STOAS project, funded by the EU's Leonardo da Vinci's programme (part of the Lifelong Learning Programme), has involved the partner organisations in developing the concept and use of sustainability assessment tools and providing curricula for training workshops. The workshops introduced organic farm advisers and other professional stakeholders to these tools and provided practical training on sustainability to those working with farmers.

Three Sustainability Assessment Tools: RISE, FAST and Bioland Tool

Originally developed at the Swiss College of Agriculture, Response-Inducing Sustainability Evaluation (RISE) was commissioned by the World Bank to assess the sustainability of farms in the tropics. The Research Institute for Organic Agriculture (FiBL) has produced a version for organic farms under temperate conditions. It is both scientifically sound yet practical for use on-farm. Based on an extensive interview with the farmer, the RISE model calculates 68 sustainability parameters and summarises them in 10 indicators. The results are presented in an easy-to-read 'cobweb' diagram.

The Farm Sustainability Assessment Tool (FAST) was developed by the Organic Research Centre. Its aim is to provide a simple, measurable and accessible way to show 11 public good indicators that result from the farming systems and management. As with the RISE-tool, the results of the assessment are presented in a cobweb diagram that can quickly be understood by the land manager.

The Bioland Tool aims to raise awareness about the Bioland principles of organic farming among the members of the Bioland Association. The assessment consists of a 3-hour farm visit and interview with the land manager. From the seven Bioland principles, two or three are chosen that are of particular relevance to the farm. Compliance to the chosen principles is assessed in detail and based on this a set of goals and recommendations are formulated.

Two courses: each of two x two-day workshops, spread over 6 months

Course 1 is for executive staff of farmers' associations and experienced advisers. Its aim is to enable organisation managers to be better informed generally about sustainable farming principles and practices and the assessment tools available and to be able to develop policy and/or advisory or other services.

Course 2 is for practising advisers or inspectors working with farmers and aims to integrate sustainability as the guiding principle of the service they offer. They learn how to use the sustainability assessment tools and explore practical measures which they can use to advise farmers in becoming more sustainable across all aspects of their farms.

The STOAS partners promote an alternative way for increasing the sustainability of the organic sector, namely by motivating farmers through advice, training and offering information. Rather than providing ready solutions, they stimulate farmers to find solutions themselves. This is a dynamic, more progressive approach, and leads to more diversity and more satisfaction. Farmers take responsibility and get involved. They also develop a deeper understanding of all aspects of their farm: social, financial and governance as well as environmental.

2.6

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MULTIFUNCTIONAL AGRICULTURE IN EUROPE - SOCIAL AND ECOLOGICAL IMPACTS ON ORGANIC FARMS (MAIE)

Agriculture is no longer solely about the process of food production. Farming can be augmented by a variety of different activities, including the active marketing of farm produce, added value processing, eco-tourism, cultural opportunities, (preventative) environmental conservation, health and healing services and social and educational activities. Agriculture thus becomes multifunctional.

Social farming is one field of multifunctional agriculture that includes: looking after people's health and healing; integrating education and therapy objectives; and undertaking a role in rehabilitation and social reintegration.

Social farming encompasses agricultural cooperatives and market gardens and also school and kindergarten farms. The aim is to provide a service to certain sections of society such as people with physical disabilities or learning difficulties, the long-term unemployed, addicts, the socially disadvantaged, people with severe mental illness, offenders, children and young people with behavioural and/or learning difficulties and the elderly. These people participate in the daily routine of the farm, for example gardening, cultivating the fields or animal husbandry. Through providing a safe, positive environment caring for living things, this results in healing, learning, inclusion and a better quality of life (Witzenhausen Position Paper on the Added Value of Social Farming).

The project "Multifunctional Agriculture in Europe - social and ecological impacts on organic farms" was funded by the Lifelong Learning programme. It brought together players from education, agriculture, consumer advice and public relations from Bulgaria, the Czech Republic, Italy, Portugal, the Netherlands, Finland and Germany with the following goals:

- Raising the awareness about the importance and potential of social farming

- Supporting networks and cooperatives in rural areas
- Developing training material for farmers
- Improving rural structures through alternative employment models and sources of income from multifunctional agriculture

The project started with a bottom-up, participatory analysis of the target group (farmers and trainers in the health, social work and justice sectors) to identify their needs. Then national Focus Groups with representatives of different sectors (professionals from agriculture, social, health care, justice and education) were formed to support the partners during the project.

The project analysed the state-of-the-art in the social farming sector to gather all existing information, tools, materials and projects. This was the basis for developing a multilingual vocational training curriculum for farmers who wish to integrate social programmes into their agricultural enterprise. It has been developed in accordance with the European Credit System for Vocational Education and Training (ECVET) which is recognised throughout Europe.

The final step of the project was the creation of competence centres for social farming in every country taking part in the project plus a virtual competence centre at international level. Several project partners are now implementing the curriculum. For example, the curriculum will be offered at universities in Bulgaria and Czech Republic. In Germany an advanced training for farmers and social workers has been developed by the farmers association Thüringer Ökoherz e.V. and the University of Erfurt. Also in Portugal and Italy the curriculum will be used to train farmers and other people interested in social farming.

2.7

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AGROECOLOGICAL VALUES AS BASIS FOR DEVELOPMENT (FECD, ECUADOR)

Funded by the United Nations Development Programme (UNDP) and other donors, Fondo Ecuatoriano de Cooperación para el Desarrollo (FECD) works to improve in a sustainable manner the living conditions of the most vulnerable groups in Ecuador. The work of FECD is based on a method called the pause. The underlying principle of the pause is that one should learn to listen to oneself in order to be able to listen to others. Attentive listening generates respectful relationships with the family, the community and the environment. The farmers participating in this learning process discovered different ways of relating to the soil, water, vegetables and animals.

The pause methodology has reduced levels of violence in families and farmer cooperatives. Farmers have learnt to plan their activities more thoughtfully. This has resulted in higher productivity and has generated alternative agricultural technologies adding value to their products.

How this process has resulted in a culture of agroecology was illustrated by the reaction of coffee growers to a break-out of rust. Instead of using the agrochemical package offered by the government, they chose to sacrifice one or two harvests and planted new more resistant varieties. This is an example of how agroecology is not only a matter of (technical) knowledge, but needs to be complemented with shared values and environmental awareness.



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DUCHY ORIGINALS FUTURE FARMING PROGRAMME (UNITED KINGDOM)

The Duchy Originals Future Farming Programme focuses on low-cost, sustainable answers to farming problems using farmer-led, participative approaches. It aims to boost innovation in organic and non-organic farming and helps farmers to produce healthier food in ways that are better for the environment and farm animals. The programme not only benefits farmers, but helps identify research priorities for researchers and scientists creating integrated ways of thinking from field to lab. This unique programme aims to inspire mainstream research funders in the UK to try practical, farmer-led approaches that give farmers a real say in the research that is done in their name.

Launched in April 2012, the programme is delivered by the Soil Association, in partnership with the Organic Research Centre and funded by the Prince of Wales's Charitable Foundation and Duchy Originals from Waitrose. An independent steering group of scientists and farmers from within and outside the organic movement gives critical scrutiny.

Field labs

At the heart of the programme are field labs. They bring like-minded farmers together to discuss problems, create trials and test solutions that could be applied in a practical environment. The same group of farmers meets two to four times through the season on farms that are already trialling new techniques, to monitor progress and discuss alternative approaches. So far 450 farmers have taken part in field labs and there are more than 30 planned for 2014.

One of the current field labs is looking at improving soil organic matter levels on arable and vegetable growing farms using green manures. Alongside the importance of maintaining soil fertility the farmers involved are also conscious of rising chemical inputs costs and are interested in replacing these with green manures and still maintaining good crop yields. This field lab aims to give the farmers and growers involved the knowledge and confidence to grow green manure crops and to evaluate the benefits this can give to their farm in terms of improving soil structure and fertility and lowering their cropping costs.

Another field lab addressed the issue of antibiotics in dairy cows. This field lab gave the group valuable insights into herd management and, by the last meeting, the average infection indicators had fallen significantly. Not only did those attending the field lab benefit from the discussions, but they have established a useful network forum.

Farmer led research fund

Another key element of the programme is an innovative research fund focussed on farmer's needs. The fund supports research into innovative and sustainable solutions that rely on management or renewable options. Alongside four initial projects selected in the first year of the programme, funding for another three innovative research projects was announced in March, 2014.

The projects have been devised to practically and innovatively address a number of important issues facing farmers. The research topics were suggested by farmers, working with scientists. The projects tackle a number of challenges for organic and low-input agriculture including managing weeds without herbicides and finding affordable protein feed for poultry.

Innovation Award

The Innovation Award was launched in July 2013. This new award, in association with Nesta, celebrates outstanding innovators in farming and growing across the UK. It recognises the achievement of individuals, teams, companies or organisations, which are pioneering practical new approaches to farming and growing, achieving real benefits for people, the planet or animal welfare and promoting sustainable agriculture in line with organic principles.

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FLEMISH RESEARCH & KNOWLEDGE NETWORK FOR ORGANIC FOOD AND FARMING (BELGIUM)

In 2012, three networks in Flanders supporting research and knowledge exchange for organic farming (NOBL, CCBT and BBN) decided to work together in one research and knowledge network for organic food and farming. This new network, called the FORK-network, aims to maximise the benefits of cooperation with complementary activities, multidisciplinary competencies, exchanging capacities and avoiding duplicate efforts.

Biobedrijfsnetwerken (BBN) brings together organic farmers of the same subsector (poultry, dairy cattle, beef cattle, vegetables & arable crops, goats, berries and greenhouse crops) meeting regularly for the exchange of technical knowledge and experiences, often the result of informal research on their own farm.

The Coordination Centre of Applied Research on Organic Farming (CCBT) coordinates and stimulates research and extension on organic farming in six applied research centres. The CCBT launches small-scale research projects financed by the Flemish Government. Farmers are involved in determining the topics of these research projects.

The Network for Research in Organic Food and Farming (NOBL) brings together researchers, policymakers, farmers and consumer organisations to share knowledge, ideas and experiences and to formulate advice on priority research topics and the organisation of research for organic food and farming in Flanders.

The FORK-Network works on three levels:

1. Needs-oriented research – ensuring research is well aligned to the needs of the sector, in either small scale practical research projects (CCBT) or more profound research (NOBL), and defining the organic research strategy and agenda in Flanders.
2. Participatory knowledge exchange for innovation – building on the synergy between the different actors and enhancing the applicability of research by stimulating participatory projects.
3. Disseminating research results to reach all relevant stakeholders, using reports, databases, newsletters, field trips, meetings, including cooperating with The Netherlands through the joint knowledge platform www.biokennis.org.

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STRATEGIES FOR ORGANIC AND LOW-INPUT INTEGRATED BREEDING AND MANAGEMENT (SOLIBAM)

Funded by the EU's 7th Framework Programme for Research and Development, the SOLIBAM project is developing new breeding approaches and management practices. The project's underlying hypothesis regarding seed breeding for organic and low-input systems is that diverse populations are more resilient to stress and can therefore better adapt to fluctuating environmental conditions.

SOLIBAM designs, develops and tests innovative arable and vegetable cropping systems based on high levels of agrobiodiversity. Field trials across environments are evaluating the behaviour of crops that contain different levels of diversity. New populations and varieties are being developed through innovative methods. A series of cereal, legume and vegetable crops are tested in different agroecological conditions in Europe and sub-Saharan Africa to provide models for various climates and breeding approaches.

The SOLIBAM project involves a large number of academic institutions, farmer associations and commercial seed companies, coming from 12 countries, representing many different regions from the North of Europe to Africa. Trans-disciplinary thinking is central to the success of SOLIBAM.

A large part of the project is dedicated to developing participatory plant breeding and management (PPBM) strategies specific to marginal areas or small-scale agriculture in Europe and Africa. It is based on:

- using diverse germplasm (e.g. locally adapted varieties, old landraces, mixtures, new populations);
- involving all the relevant stakeholders, including end-users and consumers;
- assessment by farmers to ensure that crops are 'fit for purpose' on-farm;
- testing in different case studies across countries;
- reviewing methodologies to identify best approaches, efficient procedures and effective evolution of diversity and performance within a given agroecological context.

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CROPS & ANIMALS TOGETHER [CANTOGETHER]

European agriculture has become increasingly specialised with large distances between areas of crop production and areas of animal production, mainly because of economic drivers. This has resulted in a number of problems, among them:

- High synthetic fertiliser use;
- Less recycling of nutrients in manure but over-fertilization of fields in areas with intensive livestock production;
- Decline in biodiversity due to the specialisation of crop and animal production and low crop diversity;
- Increase in transport costs to bring the crops for feed to the livestock.

The CANTOGETHER project is working to design innovative and sustainable mixed farming systems that overcome these challenges and aims to demonstrate the relevance of combining crops and animals to increase sustainability of farms and regions. The project started in January 2012 and is supported by the 7th Framework Programme. 28 organisations (both research and small to medium sized companies) across 10 European countries (France, the Netherlands, Switzerland, United Kingdom, Sweden, Ireland, Germany, Poland, Spain, Italy) are involved.

The project incorporates six steps, using iterative cycles of design, assessment and adjustment for ongoing validation and improvement of the systems being tested:

1. Identify new combinations of agronomic and livestock practices at farm, district and landscape level that will focus on optimizing the use of energy, carbon and nutrient flows by rural communities;
2. Design innovative mixed farming systems for different European contexts which combine food (animal and plant), feed and energy production

(from biomass and animal wastes) through diversified land use;

3. Test innovative combinations of practices and mixed farming systems at farm and territorial level using a network of 24 case studies across Europe;
4. Assess the environmental, economic and social viability of the most promising innovative mixed systems at farm and territorial levels across Europe;
5. Identify farm business, farmers' preference, food supply and legislation related issues influencing the implementation of innovative mixed farming systems;
6. Disseminate innovations to key stakeholders through a participatory framework.

Sustainable agriculture to counterbalance the current drivers of specialization

By combining systems of crop and animal production at both farm scale and district scale, CANTOGETHER optimizes energy, carbon and nutrient flows, conserves natural resources, improves biodiversity and landscape diversity, and promotes production and the use of manure as a fertiliser. It also produces economic benefits, for example:

- Improve the volume of home-grown feed to reduce reliance on imports and the problems of price volatility;
- Increase the volume of legumes produced locally and decrease reliance on e.g. imported soybeans;
- Improve the exchange of goods between feed producers and organic manure producers;
- Reduce transport costs.

Overall, CANTOGETHER will increase sustainability and competitiveness of European agriculture contributing to increase food security and environmental quality.

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KNOWLEDGE AND INNOVATION NETWORK FOR ORGANIC FOOD AND FARMING AT EBERSWALDE UNIVERSITY FOR SUSTAINABLE DEVELOPMENT (GERMANY)

Eberswalde University for Sustainable Development (HNEE) started to facilitate an organic food and farming knowledge and innovation network in 2004. It combines education of students (through solving real world challenges) and innovation projects for businesses. The vision was to foster a trans-disciplinary network that closes the gap between food and farming businesses, advisory services, agricultural research and university studies as well as administrative and policy bodies. Within a few years, this network has become a knowledge facilitating institution fostering sustainability, competitiveness and resilience of agricultural farms in the State of Brandenburg, and also an innovative learning platform for the students.

A bottom-up multi-stakeholder process by innovation brokerage

The partners in the network are farmers, representatives of regional and national agricultural organisations, and the scientists and students at HNEE. A bottom-up multi-stakeholder process, driven by an innovation broker, facilitates to formulate the needs for innovation of individual businesses and of the organic sector or the region as a whole. The network facilitator then identifies – together with relevant stakeholders – the most appropriate format of cooperation: students projects at different levels of expertise, graduation theses, business internships, or cooperation within larger innovation or research projects that rely on external funding and are relevant to a larger group of stakeholders.

In addition to the student related projects, network activities have also inspired businesses to jointly work on

cooperative projects, for example “production specific innovation groups”. These contribute to the network through a structured and professionally facilitated knowledge exchange among farmers and between researcher, advisors and farmers. For example, farm adaptation strategies to climate change have been developed for selected agricultural sites in Brandenburg, looking at alternative crop rotation and soil cultivation techniques. The groups also focus on strategic farm development to foster competitiveness and resilience of typical farming systems. Examples include direct marketing, crop, beef or sheep farming systems. Farmers and experts together develop and analyse farm development strategies focusing on current challenges such as the changing policy environment or rising costs.

This unique approach receives very positive feedback from the involved practitioners. About 80 % of student projects on individual innovation needs of businesses are evaluated very positively. In addition, experience indicates that some 30% of cooperation partners express new innovation needs immediately after finishing a cooperation project, and about 50% of cooperation partners come back with new ideas within a year. New farmers become aware of and join the network every year. An analysis of a sample of 253 graduation theses at Bachelor and Master level showed that more than 50 % of these projects focus on regional innovation needs, while approximately 25 % focus on specific innovation needs of individual businesses, so contributing significantly to the innovation processes in the network.

To work effectively in the real world, it is essential that graduates have the knowledge, skills, and aptitude

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PHENOMENON-BASED, EXPERIENTIAL AND JUST-IN-TIME LEARNING AT THE NORWEGIAN UNIVERSITY OF LIFE SCIENCES

to identify and deal with a wide range of challenges at the farm and community levels. Innovative learning integrates experience and reflection. The best way of doing this is to enable the students to use the “world out there” as their classroom, where they can meet farmers, business people and consumers, and can engage with their problems and visions and help to improve their situations.



The approach demonstrates that learning from the experience of farmers and other extra-university stakeholders are valued as equally important as reading scientific and theoretical articles and book chapters. Recognizing multiple sources of knowledge is key to become competent to work constructively with farming and food systems as complex and dynamic entities.

Phenomenon-based Learning on Farms and in Communities

Rather than beginning in the classroom with theory and facts about farming and food systems, students start out on the farm with the farmer, with the students fully immersed in the phenomenon itself (Østergaard et al., 2010; Francis et al., 2012; Lieblein et al., 2012). A parallel learning situation in the food system is achieved by placing students in rural communities in Norway and having them begin by interviewing key stakeholders such as processors, marketers, food providers in schools and public agencies, and consumers. Further, they begin the semester’s immersion on the farm and in the community conceptually at the level of practice.

Experiential Learning using Open-ended Case Studies and Visionary Thinking


Decision case studies have long been a staple component of practical learning, originating over a century ago in business, law, and medical colleges. The conventional decision case deals with a real-world situation that has been studied and resolved, and thus the instructor is familiar with the outcome. In this course, much more excitement has been generated among students by using open-ended cases that deal with contemporary issues that are not yet resolved (Francis et al., 2009). Instead of seeking the ‘correct answer’, the students cooperate with clients who are facing difficult decisions, and as a team the students/clients/teachers search together for a series of action steps that could lead to a more viable and socially acceptable solution. The students are envisioning a desired future that could be pursued by the clients or stakeholders in the field. This method fully involves students in the study of local context, including natural resources, economic means, and human capital of current systems. By practicing visionary thinking together with extra-university stakeholders, the students are able to imagine alternatives that may not appear feasible in the short term but could be a part of an improved future situation if they can assist clients in looking ‘outside the box’, beyond present constraints, and imagine a desirable set of positive steps toward the future. The visions that are developed serve the purpose of providing direction for the action steps to be taken in the present situation.



Through this process the students, and stakeholders in society, are not only learning from past experiences but they are also learning from the future.

Just-in-time Learning Based on Thoughtful Scheduling of Learning Activities

In pursuing an undergraduate curriculum with specific hurdles to cross at certain phases of study, many students put off some topics because they do not appreciate any immediate relevance to their personal goals. One prime example is introductory chemistry, a class that some students delay from their suggested first-year programme until much later, even until the third year of study. When asked, students respond that the relevance is not obvious, that there is need for context and application. When they have been at the university for a couple of years, then the need for more basic information to understand mechanisms and system component performance becomes more evident. In this 'just-in-time' learning environment, students can step back to take a course or do a detailed literature review or web search to pick up the principles of chemistry that previously did not seem very important to them (Salomonsson et al., 2005; Lieblein et al., 2007).



03



THE EU FRAMEWORK FOR RESEARCH, INNOVATION AND LEARNING IN THE AGRICULTURE AND FOOD SECTOR

3.1. INTRODUCTION

Over the years that the EU has invested in agricultural research, the amount devoted specifically to organic systems has slowly but progressively increased. It was not until the 1990s that the first EU projects on organic farming were funded. Before that, private research institutes were the primary drivers, with the first universities including organic agriculture in their curricula in the 1980s.

The 3rd Framework Programme for Research and Development (1990-1994) funded the first EU projects on organic farming. Seven projects received a total budget of almost €3.7 million. In the 7th Framework Programme (2007-2013) the budget for organic research increased to €38 million. However, this accounted only for a mere 2.3% of the total €1.66 billion budget for agriculture (excluding ERA-Net funding). In other words, organic research still pales into insignificance, it is not even in proportion to the 5.6% of EU agricultural land farmed organically.

Nevertheless, the EU is an increasingly important investor in organic research, and hence in the development of the sector. Therefore, an understanding of the different EU instruments for research & innovation policy and how to influence them is essential.

and farming system. However, the organic sector does emphatically need a dedicated research programme given its specific standards and challenges.

Whilst organic and agroecological farmers strive to combine high environmental standards with high overall production, productivity and quality have in some cases been inadequate. Organic farmers can achieve higher productivity by more efficient use of natural resources, improved nutrient recycling techniques, and agroecological methods for supporting health of soils, crops and livestock. Conventional research programmes generally do not address these farming techniques.

Moreover, the agricultural supply industries have little interest in organic and agroecological farming, as they mostly cannot profit from these low external input systems. Their substantial research and development expenditure is directed elsewhere and is seldom relevant to organic systems. Organic farmers are therefore much more “on their own”; this self-reliance is one reason why they tend to be so innovative.

The organic food processing industry also has specific research requirements. Consumers expect organic food to be minimally processed: the “natural quality” of the products should be maintained. However, there are few processing techniques that are specifically developed for organic foods. Organic consumers also expect higher standards of environmental performance, such as water and energy efficiency, and less pollution and waste. Organic systems do deliver these, but further research and innovation could improve results significantly.

3.2. THE NEED FOR ORGANIC AND AGROECOLOGICAL RESEARCH AND INNOVATION

It need hardly be said that research and innovation are crucial for the development of the organic and agroecological food & farming sector. Of course, many scientific findings are generally valid for the whole food

Finally, organic and agroecological values give rise to specific questions in socio-economic research, such as the role of (organic/agroecological) farming in the empowerment of rural areas, and the promotion of healthy and sustainable diets.

3.3. OVERVIEW OF THE EU RESEARCH AND INNOVATION FRAMEWORK

Innovation is now at the heart of the EU research and development agenda, aimed at achieving “smart, sustainable and inclusive growth and jobs”. Being smart, the various instruments have been designed to complement and work with each other.

Most important is Horizon 2020, the EU’s Framework Programme for Research and Innovation for 2014-2020, the follow-up of the 7th Framework Programme (FP7). It is seen as a means to produce “world-class science, tackle societal challenges and take great ideas from the lab to the market”. It is the EU’s primary funding source for research.

The Rural Development Regulation (2nd pillar of the CAP) also prioritises innovation. The main instrument for this is the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI). Its aim is to create synergies between Horizon 2020 and Rural Development and to close the gap between research and practice.

A number of structures allow individual member states to pool national research funds, including for (organic) agriculture. These include ERA-Nets (European Research Area Networks) and JPIs (Joint Programming Initiatives).

Then, there are also structures that facilitate Europe-wide collaboration between research, training, commercial and non-commercial organisations. These include Knowledge and Innovation Communities (KICs) which are funded within Horizon 2020, and European Technology Platforms (such as TP Organics) which are independently funded.

Whilst not being specifically targeted at any one sector, the Erasmus+ Programme offers opportunities for innovation and developing new modes of learning, including in the area of organic and agroecological farming.

Finally, there is the EU Organic Action Plan. The ambition of the Action Plan is to support the growth of the sector in view of the forthcoming changes in the legislative framework. Research and innovation are included as one important area in this.

The following sections will explain these different instruments in more detail and where the opportunities are for organic and agroecological initiatives.

3.4. HORIZON 2020

The Horizon 2020 programme consists of three main parts: (1) Excellent Science, (2) Industrial Leadership and (3) Societal Challenges. For each of these parts, the Commission will publish work programmes with the actions to be financed, the amount allocated to each action and indicative timetables.

The Excellent Science programme aims at supporting world-leading scientists and developing future and emerging technologies and research infrastructures. The Industrial Leadership programme should help make Europe a more attractive location to invest in research and innovation. Biotechnology research will be funded under this programme, as well as a public-private partnership for the bio-based industries (bio-fuels, bio-plastics, etc.).

Of more importance for the agricultural sector are the Societal Challenges, in particular Societal Challenge 2: “Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bio-economy”. It will receive 5% of the total Horizon 2020 budget which amounts to €3.85 billion. This means the budget for the research areas covered by Societal Challenge 2 has doubled compared to the previous EU framework programme for research (FP7).

Two key points are also worth highlighting in Horizon 2020:

1. Both Horizon 2020 and the EIP-AGRI attach great importance to the multi-actor approach, to ensure “more demand-driven innovation through the genuine and sufficient involvement of various actors (end-users such as farmers/farmers’ groups, fishers/fisher’s groups, advisors, enterprises, etc.) all along the project: from the participation in the planning of work and experiments, their execution up until the dissemination of results and the possible demonstration phase”². This accords well with the participative approach that is common organic and agroecological practice.
2. The legal texts of Horizon 2020 explicitly state that organic agriculture should benefit from the programme. This is the first time legal texts of EU research policy recognise organic farming.

² http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-food_en.pdf

Societal Challenge 2

The first work programme of Societal Challenge 2 was published in December 2013 for projects in 2014 and 2015. It features two types of projects that contribute to the EIP-AGRI: multi-actor projects and thematic networks.

Multi-actor projects must involve stakeholders throughout the project (e.g. including farmers, advisors, consumers, NGOs and society at large) and need to be targeted to the needs and problems of end-users, being also complementary with existing research.

Thematic networks map the state-of-the-art of existing scientific knowledge & best practices for the theme in question. The aim is to develop accessible end-user material that will facilitate exchange of knowledge, and also generate a better targeted research agenda. They should also involve all concerned stakeholders (researchers, farmers, advisors, enterprises, education actors, NGOs, administration, regulatory bodies...).

Organic Opportunities

Given its history of strong collaboration across disciplines and between researchers and producers, the multi-actor approach taken in Horizon 2020 offers great opportunity for the organic sector. Indeed, there is a good record of organic and agroecological oriented projects receiving funding in previous research rounds when they are well constructed and well targeted. Among many examples are SOLIBAM and Cantotogether, both described in chapter 2.

Several multi-actor projects called for in December 2013 make specific reference to organic agriculture, e.g. the calls on "soil quality and function", "genetic resources and agricultural diversity", and "sustainable food chains through public policies". More are expected in 2015.

Organic researchers, farmers and businesses need to organise themselves in order to take part in multi-actor projects or thematic networks. Consortia applying for Horizon 2020 projects should be composed of at least three partners from at least three countries.

3.5. RURAL DEVELOPMENT REGULATION AND EIP-AGRI

Support for innovation is a key priority in the Rural Development regulation for 2014-2020. Innovation is included in the list of priorities, as well as in the list of cross-cutting objectives to which all priorities for Rural Development must contribute. As a result the new Rural Development regulation makes addressing innovation almost fundamental, and the main driver is the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI).

The Rural Development regulation specifies that the EIP-AGRI shall promote an "agricultural sector working towards agroecological production systems". It links up with two other priorities of the Rural Development regulation, namely "restoring and preserving ecosystems" and "promoting resource efficiency and supporting the shift towards a low carbon economy". The regulation lists organic farming and the establishment of agroforestry systems as measures contributing to these two priorities.

What is significant about the EIP-AGRI is that it tries to marry productivity and sustainability: "It contributes to ensuring a steady supply of food, feed and biomaterials, developing its work in harmony with the essential natural resources on which farming depends."³

Strategic Implementation Plan

The EIP-AGRI is guided by the Strategic Implementation Plan⁴, adopted in July 2013 by its High-Level Steering Board. Co-chaired by Commissioners Ciolos (Agriculture & Rural Development) and Geoghegan-Quinn (Research & Innovation), this board is composed of a wide range of stakeholders, including IFOAM EU and ARC 2020.

The Strategic Implementation Plan explicitly mentions that efforts for improving productivity must go hand in hand with sustainable consumption. It calls for innovative solutions for the delivery of public goods, the sustainable use of genetic resources and improvement of soil fertility. It also broadens the concept of innovation from technological to include social.

³ <http://ec.europa.eu/agriculture/eip/>

⁴ http://ec.europa.eu/agriculture/eip/pdf/strategic-implementation-plan_en.pdf

The Plan balances the interests of both conventional agriculture and alternative approaches such as organic farming or agroecology. It is therefore important for organisations favouring the latter to now get active and ensure that authorities, both at EU and national (regional) level, take account of the Strategic Implementation Plan when programming the EIP-AGRI.

Another statement in the Plan is that the diversity of approaches in the food & farming sector means there is no “one size fits all” solution for promoting innovation. A diversity in project size is therefore needed. This means that the Commission should ensure that smaller institutes, companies or associations also have a fair chance of making successful bids in Horizon 2020.

Operational Groups

A key objective of the EIP-AGRI is to build bridges between research and farming practice. It encourages actors from the different parts of the agri-food system – farmers, businesses, researchers and advisers - to share ideas and experiences and so develop innovative solutions or make research results ready for application. To this end it follows “the interactive innovation model which focuses on forming partnerships - using bottom-up approaches and linking farmers, advisors, researchers, businesses, and other actors in Operational Groups”⁵.

This objective is similar to the multi-actor projects in Horizon 2020. However, the difference is that an Operational Group will normally apply to a Rural Development programme region, whereas research projects are cross-border and more EU-level. Therefore, just as EU Member States and regions decide the objectives and the content of their Rural Development programmes, they also play a crucial role in supporting Operational Groups.

Operational Groups should tackle practical problems – they are not discussion groups – so should be geared to developing new products, practices, processes or technologies. This could involve pilot projects and may relate to specific geographical or environmental contexts. They may also be combined with other rural development measures, such as knowledge transfer and information activities, advisory services, farm/business development or producer groups.

⁵ http://ec.europa.eu/agriculture/eip/documents/eip-opportunities_en.htm

The Rural Development regulation makes provision to support brokerage activities needed for setting up Operational Groups and preparing project proposals, as well as for the project itself and costs of cooperation. Investments in physical assets for an Operational Group will also benefit from increased support.

The EIP-AGRI Service Point

The Commission has established a Service Point for the EIP-AGRI to act as a mediator to enhance communication and cooperation between all innovation actors involved, especially between different projects and across borders. One of its main tasks is providing support for focus groups. The focus groups involve experts (researchers and practitioners) willing to share their knowledge and promote the practical application of innovative solutions within a specific area. The EIP-AGRI website can be found at <http://ec.europa.eu/agriculture/eip/>.

Focus Group on Organic Farming (optimising arable yields)

The Focus Group on optimising arable yields in organic farming was one of the first three to be formed. The Focus Group brought together 20 experts with different backgrounds and experiences (scientists, farmers, advisors...) to provide solutions for reducing the “yield gap” (the gap between the best and least performing organic farms and the gap between conventional and organic farming for particular crops). The aim is to raise the performance of less productive organic farms to the level of “best organic practices”. Five main causes for yield gaps were identified:

- poor soil fertility management;
- inadequate nutrients supply;
- insufficient weed management;
- pest and disease pressure insufficiently managed;
- and variety of choice.

The focus group collected practical solutions already in place and made proposals for topics for research projects and Operational Groups. It also made recommendations for setting-up Operational Groups in terms of methodology. It concluded there is no standard solution for this. On the contrary, the activities of Operational Groups should always be adapted to the agronomic, social and environmental context. The role of the facilitator is highly significant in this. The Focus Group also found it important for Operational Groups to give rapid answers to the farmers.

This allows to receive feedback and plan next steps, but more importantly it builds trust and commitment. Finally, the Operational Group recommended to establish an EU-wide network of knowledge centres that collects and facilitates the use of scientific and practical knowledge that is now so dispersed.

Organic Opportunities

The Rural Development regulation promotes innovation and investments contributing to environment or climate change objectives, including organic farming. As a result, the EIP-AGRI is a key instrument for the organic sector. A good example of a current Rural Development-funded project is Flourishing Farm, described in chapter 2.

Other projects, like the Duchy Originals Future Farm Programme and Slow Food's Presidium for Brânză de Burduf would seem to be suitable for Rural Development funding, e.g. as Operational Groups. However, it is the responsibility of member states to set their own Rural Development programmes, so organic associations and allies need to convince their national or regional authorities to support Operational Groups that foster organic and agroecological solutions.

3.6.

TRANSNATIONAL COOPERATION

Notwithstanding the EU's big investments in research, the majority of research funds are still managed by Member States. The EU aims at creating more coherence between EU and national research policies by supporting Member States that pool national budgets.

The European Research Area (ERA) is the EU's "single market" equivalent for research and innovation, with the aim of enabling free circulation of researchers, scientific knowledge and technology. Started in 2000, its research programmes integrate the scientific resources of the EU through multinational cooperation. This increases the competitiveness of European research institutions and encourages a more inclusive way of working.

Two relevant instruments within the ERA are:

- ERA-Nets – cooperation and coordination of national/regional research activities; and

- Joint Programming – agreement between a number of member states for a strategic research agenda to address a major societal challenge.

Below are a number of examples of such co-operation with significance for organic and agroecological approaches.

ERA-Net Core Organic

Core Organic⁶ (Coordination of European Transnational Research in Organic Food and Farming Systems) is a consortium of 24 partners from 20 countries. Now in its third iteration (CORE Organic I, II and now Plus), it is the only transnational funding structure dealing 100% with organic research. Its aim is to gather into a critical mass the often small and scattered organic research community, to deliver better research more efficiently.

The most recent call has been launched in the first week of December 2013. It features four themes:

1. plant/soil interaction,
2. functional biodiversity to improve management of pests, diseases and weed,
3. livestock health management systems including breeding, and
4. ensuring quality and safety of organic food along the processing chain.

As an "ERA-Net Plus" call, the European Commission provides co-funding. Together with the national funds, the total budget of the call amounts to €10 million.

ERA-Net SUSFOOD

ERA-Net SUSFOOD⁷ consists of 25 partners from 16 countries. It deals with sustainability of the food chain beyond the farm gate. The first SUSFOOD call was launched in February 2013 and had a value of € 10 million. The second SUSFOOD call was launched in February 2014 and had a value of almost € 7.4 million.

It is important that the organic sector engages with SUSFOOD, for example to advocate for the maintenance of the "natural" quality in food processing or to stress the importance of adopting sustainable food habits.

⁶ www.coreorganic.org

⁷ www.susfood-era.net

Other related ERA-Nets that may have relevance

- **ARIMNet (Network for Agricultural Research In the Mediterranean Area)** promotes a shared vision of the priorities for agricultural research in the Mediterranean and the convergence of national programmes. ARIMNet2 started in January 2014 and runs for four years.⁸
- **ICT-AGRI (Information and Communication Technologies and Robotics for Sustainable Agriculture)** developing a common European research agenda concerning ICT and robotics in agriculture. ICT-AGRI-2 started in January 2014 and runs for four years.⁹
- **ANIHWA (Animal Health and Welfare)** started in 2012 and aims to increase the cooperation and coordination of national research programmes on animal health and welfare of farm animals, including fish and bees.¹⁰
- **C-IPM (Coordinated Integrated Pest Management in Europe)** – addressing the challenge of responding to the mandatory implementation of the principles of Integrated Pest Management as called for by Directive 2009/128/EC on the sustainable use of pesticides.¹¹

FACCE-JPI

The Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI)¹² started in 2010 and brings together 34 partners from 21 countries. Its aim is to address the interconnected challenges of sustainable agriculture, food security and impacts of climate change. Its actions are structured around five major themes:

1. sustainable food security in the context of climate change,
2. environmentally sustainable growth and intensification of agriculture,
3. assessing and reducing trade-offs between food production, biodiversity and ecosystem services,
4. adaptation to climate change, and
5. mitigation of climate change.

In October 2013, a research call on the adaptation of European agriculture to climate change (“climate-smart agriculture”) was launched with a budget of almost € 20 million. A new call on achieving a sustainable bio-economy is under preparation.

⁸ <http://www.arimnet.net>

⁹ <http://ict-agri.eu>

¹⁰ <http://www.anihwa.eu>

¹¹ <http://c-ipm.org>

¹² www.facejpi.com

Organic Opportunities

The ambition of FACCE-JPI goes beyond just pooling national research resources. It has become a significant voice in the setting of the EU research agenda for agriculture, food security and climate change. Therefore it is very important that the organic sector engages with FACCE-JPI.

3.7. RESEARCH-INDUSTRY COLLABORATIONS

Moving closer to the market, the EU promotes two structures to bring together research institutions, companies, education and extension establishments.

European Technology Platforms – industry-led stakeholder forums that develop short to long-term research and innovation agendas and roadmaps for action at EU and national level. There are no official support measures for ETPs but they can receive both private and public funding.

Knowledge and Innovation Communities (KIC) – integrating the three sides of the “knowledge triangle” (higher education, research and business) to reinforce the journey from research to market. Launched under FP7, KICs continue to be an official instrument within Horizon 2020.

Below are two examples of relevance to the organic community.

TP Organics

As this chapter has made clear, the EU and Member States are big investors in agricultural research. Also, not only are research and innovation crucial for the further development of the organic sector, but also research in organic and agroecological approaches can help to transform the rest of agriculture. Therefore, they must receive high priority in the research and innovation agendas.

To address this challenge, TP Organics¹³, the technology platform for organic food and farming was established in 2008. It is a broad and strong coalition of civil society organisations, researchers, farmers and companies. The aims are to leverage the organic sector’s environmental and societal benefits including by contributing to sustainable approaches in the wider agricultural sector, and to identify

¹³ <http://www.tporganics.eu>

innovation goals for organic and low-input agriculture and promote these towards policy makers.

In July 2013, TP Organics achieved its goal of being recognised by the Commission as a European Technology Platform (ETP). This means it now has an official advisory role in the implementation of Horizon 2020.

KIC Food4Future – Sustainable Supply Chain from Resources to Consumers

The European Institute of Innovation and Technology (EIT) is responsible for creating Knowledge and Innovation Communities (KICs) based on the need to enhance Europe's ability to innovate, by "adapting quickly to the fast pace of development, being one step ahead in providing solutions to rapidly emerging societal problems and developing products that meet the demands and desires of consumers".¹⁴

With the convergence of problems facing agriculture and the food industry (increasing and more affluent population, climate change etc.), the EIT has identified this area as a suitable candidate for a KIC. Accordingly, a call for the KIC Food4Future is being prepared for launching in 2016.

Foodbest, a European consortium with the support of many large food companies and research and advisory institutions, is working on a bid for this proposed KIC. The aim is to "promote innovation and entrepreneurship in food across Europe to address societal food challenges" and to "develop healthy, safe and appealing foods for a growing world population in a competitive and sustainable way".¹⁵

Organic Opportunities

As ever, the buzzwords "healthy", "safe" and "sustainable" are at the core of this initiative. Organic companies and institutes need to get involved to ensure its core is indeed healthy, safe and sustainable.

programmes and is intended to be easier to access than its predecessor.

Erasmus+ will provide opportunities for over four million Europeans to study, train, gain work experience and volunteer abroad. It will also support transnational partnerships among education, training, and youth organisations to foster cooperation and bridge the worlds of Education and work.

The European Commission's Education, Audiovisual and Culture Executive Agency is responsible for implementing the centralised Actions of the Programme. At local, regional and national level, national agencies are responsible, and act as the link between the European Commission and participating organisations.

Erasmus+ contains three Key Actions: (1) Learning mobility of individuals, (2) Cooperation for innovation and the exchange of good practices and (3) Support for policy reform. Whilst not being specifically targeted at any one sector, Key Action 2 offers opportunities for agroecological innovation and developing new modes of learning in (organic) farming.

Key Action 2 – Cooperation for innovation and the exchange of good practices

Within it, the most relevant actions are **Strategic Partnerships, Knowledge Alliances and Sector Skill Alliances**. Key Action 2 is allocated at least 28% of the overall budget and calls for proposals are made annually. The expectation is to facilitate:

- 25,000 Strategic Partnerships involving 125,000 institutions/organisations in joint initiatives promoting exchange of experience and know-how and links with the world of work;
- Nearly 300 Knowledge Alliances and Sector Skills Alliances, involving 3,500 education institutions and enterprises working together.

Strategic Partnerships

Strategic Partnerships aim to support the development, transfer and/or implementation of innovative practices at organisational right up to European levels. They have to be transnational, involving at least three organisations from three different countries. They can range from simple cooperation between small organisations to sophisticated and large-scale projects and can be in all fields of education, training and youth.

3.8.

EDUCATION AND TRAINING – ERASMUS+ PROGRAMME

The Lifelong Learning Programme has now ceased but its activities in 2014-2020 continue under the Erasmus+ Programme¹⁶, with a 40% increase in budget (almost € 15 billion over the seven years). It brings together seven existing

¹⁴ <http://eit.europa.eu/about-us/>

¹⁵ <http://www.foodbest.eu>

¹⁶ <http://ec.europa.eu/programmes/erasmus-plus/>

Chapter 2 contains descriptions of two partnerships (funded by the Lifelong Learning Programme, the predecessor of the Erasmus Programme+): Multifunctional Agriculture in Europe and Sustainable Training for Organic Advisors.

Knowledge Alliances

Knowledge Alliances aim at strengthening Europe's innovation capacity and at fostering innovation in higher education, business and the broader socio-economic environment. They should achieve one or more of the following objectives:

- develop new, innovative and multidisciplinary approaches to teaching and learning, e.g. educational activities with and within companies, real problem-based teaching and learning;
- developing entrepreneurship mind-set and skills;
- facilitate the flow and exchange of knowledge between higher education and enterprises.

The Eberswalde University for Sustainable Development and the Norwegian University of Life Sciences (described in chapter 2) are two examples of universities offering their students problem-based education. They aim to close the gap between food and farming businesses, advisory services, agricultural research and university studies.

Sector Skills Alliances

Sector Skills Alliances aim to tackle skills gaps and enhance the responsiveness of vocational education to the changing needs of the labour market. They are transnational projects that work to design and deliver joint vocational training programmes and develop innovative methodologies. They should normally focus on work-based learning.

The sectors targeted under this Action change year by year. The 2014 call included Environmental technologies (Eco-Innovation) as one of the sectors.

Organic Opportunities

Erasmus+ contains a large range of possible programmes, including exchanges with other European countries, strategic partnerships in education, alliances between education and business, funding for attending courses and placements. Most are geared towards the education

and youth fields and there are plenty of opportunities for organic organisations to help improve organic-related skills, training and experience of young people and others. The four examples mentioned above and described in chapter 2 illustrate very well the range of possibilities that this broad programme can support.

3.9. ORGANIC ACTION PLAN

Ten years after the first EU Organic Action Plan, the Commission adopted a new Organic Action Plan in March 2014¹⁷. It accompanied the Commission's legislative proposal for a new regulation on organic production. The Organic Action Plan recognises the need for more research to help the sector overcome regulatory changes (e.g. phasing out of exceptions to the use of organic seeds and organic animal feed). It also acknowledges that the organic sector requires "specific professional education, knowledge and technologies". The Commission will therefore help in the identification of research and innovation priorities of organic producers. The Commission also promises to take account of the relevant Horizon 2020 instruments, including a new ERA-Net, to support organic research and foster uptake of research results. Finally, the Action Plan states that "participation of the organic farming sector in the EIP-AGRI will be essential for boosting innovation".

Organic Opportunities

The Action Plan has made a good assessment of the research needs of the organic food and farming sector, but clear commitments are lacking. For example it does not contain concrete timeframes nor dedicated budgets. Nevertheless, with the Action Plan the Commission has committed itself to take action and support the growth of the sector, including by funding research and innovation.

¹⁷ http://ec.europa.eu/agriculture/organic/documents/eu-policy/european-action-plan/act_en.pdf

THE KEYS TO FACILITATING INNOVATION

The wide range of examples presented in this Action Plan show that innovation works at its best when divisions between knowledge producers, users and brokers, and indeed decision-makers are broken down. Direct stakeholder participation, like in the Participatory Guarantee System of Nature & Progrès or in the Flourishing Farm project, provides a means of achieving a much more multi-faceted, holistic approach to addressing problems. It ensures the link with day-to-day life. All actors need to be able to contribute their perspectives and needs, their experience and expertise, their knowledge and ideas.

Thus the learning process should not be a one-way action, from the active technician with scientific knowledge to the passive farmers lacking (valuable) knowledge. Instead, a reciprocal exchange between scientific, empirical and social knowledge should be pursued where each participant is both teaching and taught at the same time.

Because there is a multitude of realities, research must not be expected to provide one single answer to a global problem. Rather, it needs to propose solutions related to the specific circumstances where the problem arises. This is well enshrined in the teaching methods used by Eberswalde University for Sustainable Development and the Norwegian University of Life Sciences.

The new EU policy instruments for innovation and learning, in particular the EIP-AGRI, have adopted a more systems approach of interactive innovation. It is a welcome shift away from the linear model ("technology transfer"). The success of this new thinking will depend on the political will and the services' capacity to implement it. By learning from experiences with agroecology and organic farming, policy makers and public servants can make Horizon 2020 and the EIP-AGRI a success.

CONTRIBUTION OF ORGANIC AND AGROECOLOGY TO RESEARCH

And there is another argument in favour of giving greater prominence to organic and agroecological research. It is true that, at least in our European climate, organic yields tend to be somewhat lower than conventional farming, but most other factors, such as quality, biodiversity, carbon sequestration, energy use, pollution and employment all tend to be superior. How much more could it deliver, how much more could it contribute to developing productive, sustainable and resource-efficient primary production systems (the objective of Horizon 2020's Societal Challenge 2) if its research and development activities were better resourced!

Organic and agroecological approaches are at the cutting edge of sustainable production - there is nothing more comprehensive, more scrutinised or, arguably, more effective. The specific intention is to design and manage farming systems in ways that close nutrient cycles, encourage

positive health of stock and crops, minimise external inputs, build soil organic matter (and therefore carbon) and create biodiversity.

Every review of the Common Agricultural Policy (CAP) sees its objectives become more and more closely aligned to those of organic farming and agroecology. The corollary of this is that every review of the CAP sees its objectives looking more and more at odds with the problems and consequences of conventional agriculture. How is this situation going to be addressed, how, in addition to the welcome new emphasis on innovation, can the enormous research budget be better targeted towards the objectives of CAP, EIP-AGRI and Horizon 2020, how can all this deliver what EU citizens expect?

Logic alone would suggest that vastly more research investment should be directed at the cutting edge of sustainable production, both to advance that effectively and also for the multiplier effect as it trickles down and helps raise the bar for the rest of agriculture.

GENERAL RECOMMENDATIONS

Whilst the multi-actor projects funded by Horizon 2020 demand genuine involvement of various actors and "end-users" (farmers and farmers' associations, advisors, enterprises), the strict rules regarding subcontracting and third party agreements actually make it rather complicated to achieve this. The examples presented in this publication show that often already at national level various organisations and networks need to work together to make innovation happen. How will this work out if all these organisations are to join a transnational consortium as direct beneficiaries? More flexibility in funding rules is needed that allows practitioners to be remunerated for the value they add and the knowledge they develop without them being formal partner in the consortium.

The current set-up of the Horizon 2020 work programmes does not take account of the fact that for multi-actor projects to be successful a preparatory phase is needed. To build a solid basis of trust among the various participants takes more time compared to purely academic research where the researchers are more familiar with each other's worldview. This aspect of the work must be recognised and budgeted for accordingly. This can for example be done by providing seed money giving multi-actor consortia financial breathing space to prepare a full project proposal.

Policy makers should provide long-term support to innovation projects. Following the close of a successful project, further financial support and follow-up promotion is often necessary to help disseminate the new ideas and change farming practices. In this regard, the EIP-AGRI should not only link Horizon 2020 and Rural Development, but also create synergies with Erasmus+. Indeed strategic partnerships under Erasmus+ could be used to promote implementation of innovative practices developed in Horizon 2020 projects or facilitate transfer of innovations developed by Operational Groups in one Member State to other Member States.

Finally, the examples of agroecological innovation in this publication showed that a lot of organic and agroecological knowledge is already available. Several initiatives exist at national or regional level that bring the knowledge held by various actors together (e.g. Duchy Originals Future Farming Programme in UK, Flemish Research & Knowledge Network for Organic Food and Farming or the Knowledge and the Innovation Network for Organic Food and Farming run by Eberswalde University in Brandenburg). There is however no platform that brings all this knowledge available in the Member States together at EU level. Such a platform is highly needed especially because the diversity of agroecological and organic practices and knowledge, and the fact that this knowledge and practices are often location-specific, pose additional challenges to their exchange. The platform should be established as part of the EIP-AGRI. It should bring together the organic knowledge centres, advisory services and innovation brokers in an EU-wide network as was also recommended by the final report of the Focus Group on Organic Farming.

SPECIFIC RECOMMENDATIONS: EIP-AGRI

The Strategic Implementation Plan managed fairly successfully to balance the interests of conventional agriculture against alternative approaches, such as organic farming or agroecology. More efforts should be done to promote it. The Commission's desk officers evaluating the Rural Development programmes of the Member States should be more aware of the recommendations of the Plan. The Directorate-Generals for Research & Innovation and for Agriculture & Rural Development should take these into account when drafting the next Work Programmes of Horizon 2020.

The Focus Group on Organic Farming was a welcome initiative. Bringing together experts with different backgrounds (scientists, farmers, advisers...) proved to be a successful approach and has resulted in many useful recommendations. These should be taken account of when planning future Operational Groups and Horizon 2020 calls.

New Focus Groups on themes relevant for organic and agroecological farming should be set up. A possible theme is pest and disease control in organic viticulture and fruit production. These perennial systems depend much on a few essential plant protection agents. The reduction of this dependency would be a very important step towards their long-term viability.

Until now, Focus Groups have not or only very little dealt with social and organisational innovation. New modes of cooperation and changes of behaviour are however necessary to achieve sustainable food & farming systems. Possible themes of social innovation are generational renewal in agriculture (supporting young and new farmers) and the promotion of sustainable, diverse and healthy diets.

SPECIFIC RECOMMENDATIONS: EU ORGANIC ACTION PLAN

The EU Organic Action Plan has made a good assessment of the research needs of the organic food and farming sector, in particular with regard to the possible phasing out of several exceptions and derogations. The Commission should now show ambition in the implementation of the Action Plan. For example, a large-scale research programme should be set up in order to allow the organic sector to adapt to the new rules and live up to the highest sustainability standards. Participation of the organic sector in Horizon 2020 and EIP-AGRI should be promoted and a follow-up of the ERA-Net CORE Organic should be established.

RECOMMENDATION FOR THE ORGANIC AND AGROECOLOGICAL FOOD & FARMING SECTOR:

There are various policy instruments for supporting innovation from regional to EU level: Operational Groups (Rural Development programmes), multi-actor projects or thematic networks (Horizon 2020) and strategic partnerships (Erasmus+). Organic researchers, farmers and businesses need to organise themselves in order to take part in them. The numerous examples of innovation given in this publication can serve as inspiration.

LAST WORD

This publication started by saying the world is changing and everyone involved in agriculture needs to adapt and innovate in order to ensure continued productivity and success. We have seen that organic and agroecological approaches to farming are, by definition, innovative and have much to offer: not only the production systems are innovative and sustainable, but similarly also are the models of development, organisation and research.

We have seen that the European institutions have embraced innovation and it is now at the centre of European policy. Never before has the policy environment for agriculture been so favourably disposed towards agroecological farming, not only innovation, but also the sustainability agenda. If all actors – from farmers and enterprises, through associations, institutions and researchers, right up to policy makers and the authorities – can nurture and exploit these positive conditions with cooperation and mutual respect, then innovation can truly spark and we have a chance to meet the huge challenges that Europe and the World, and all its peoples, face.

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www.ptbioitalia.it



NOBL: Network for Organic Food and Farming Research (BE)

www.nobl.be



Bionext (Netherlands)

www.bionext.nl



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