

2. “Push” measures

a. Support to organic research and extension

Political justification

The potential for innovation in organic farming systems is considerable. So is the potential impact of organic systems innovation on public goods and services, as well as on markets. However, current spending on agriculture research and innovation around the world does not adequately reflect this potential.

Scientific research, as a source for innovation, is key to:

- Increasing the sustainability, productivity and competitiveness of organic farming systems
- Conversion to organic farming, as the absence of organic solutions to specific local agronomic problems is one of the main obstacles when farmers want to convert.
- Recognition of the benefits of organic agriculture (both by consumers and by policy makers), which requires scientific evidence of the positive externalities associated with its production methods and of its superiority in aspects such as nutritional value and health.

Research and innovation in organic agriculture also benefits the conventional sector, increasing the overall sustainability of agriculture and food production. A classic example is new methods of biological control being used not only in organic systems, but also in integrated pest management. This is also true of the more institutional and social innovations aspects of organic agriculture: one good example is Participatory Guarantee Systems⁵², a social innovation from the organic sector which is being increasingly researched for its potential to expand to other sectors.

Therefore, investing public funds into organic research is primordial for the development of the organic sector, for the design of more sustainable production systems, for the design of new and resilient business models and cooperation among stakeholders across the value chain and for the delivery of public goods and services.

From an organic movement perspective, research is not only important to solve agronomic or technical problems but also to build evidence about the benefits of organic agriculture, and to design more effective institutional frameworks and policies.

⁵² Participatory Guarantee Systems are local alternatives to third party certification whereby the certification is carried out by the stakeholders such as producers and consumers in a participatory manner. Those systems are particularly suitable to and affordable for small producers.

The efficacy of advice on methods and technology is a crucial factor for the development of organic agriculture. Although farmers are often the initiators and testers of innovations, there must be a support structure that collects, transfers and spreads knowledge. In a country where organic agriculture is in its initial stage, farmers often guide advisors and researchers. Farmers are very important in the knowledge transfer process but they should be supported and encouraged by research and extension. The extension service also needs input from research on agronomic, marketing and health issues as well as pedagogical knowledge on how best to deliver the advice.

Research and extension services for organic farming should be strongly linked. This is the reason that the two topics are covered jointly in this section. Extension services should also be capacitated to provide organic advice and disseminate the results of applied research to farmers. A study done in France in 2010⁵³, comparing various regions with very different levels of public spending in organic extension, suggests a strong link between funds invested in organic extension and the number of conversions over the period 2001-2008.

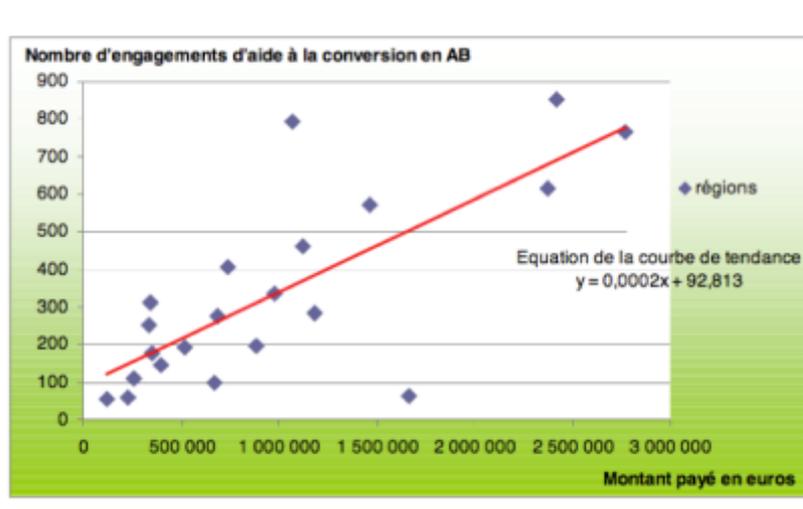


Fig. 4: *Number of conversions to organic farming in relation to the amount of funds invested in organic extension between 2001 and 2008 per region, in France (Data source: ASP, 2009)*

Suitable contexts

Government support to organic research and extension is suitable to all contexts regardless of the stage of development of organic agriculture, the regulatory context, the policy goals and the culture of government intervention: agronomic research and extension exists in most countries. Growth of organic production will be severely hampered if those support sectors only work on conventional agriculture techniques. However, the relative importance of research and extension may vary depending on the stage of development of the sector: one quantitative study⁵⁴ analyzing market and policy factors influencing the share of organic land in a dataset of 61 countries for the

⁵³ QUELIN C., 2010, *Agriculture biologique : La fin du retard français ?*

⁵⁴ WHEELER S., 2006, *The Influence of Market and Agricultural Policy Signals on the Level of Organic Farming.*

years 1990 and 2001, found that the availability of organic advice by publicly funded extension personnel was one of the factors with the largest influence on organic farming adoption at the early stage of sector development, while national organic research activities become the most influential factor at later stages of development.

Support to organic research and extension is a type of policy support that does not require a lot of extra financial resources, but rather a shift of priorities to progressively include organic issues and knowledge into the work of agronomists, researchers and extension agents. Additionally, for developing countries, there is a real opportunity to include activities required for this shift in the scope of a development cooperation project thereby getting foreign resources to support it.

Possible modalities of implementation

Research

In some countries, organic research is integrated and dispersed within many different public research institutes and university departments. This is the case for example in Sweden, the US or Germany. For example, in 2000, the German ministry for food and agriculture established, an Institute of Organic Farming in the Thünen Institute, which is the Federal Research Institute for Rural Areas, Forestry and Fisheries. Organic research in Germany is also integrated in a number of other research institutes and universities.

Other countries have a specialized organic research organization or department that strongly dominates/coordinates organic research (even though other institutions can also conduct organic research). This is the case in Switzerland (with FiBL), in Hungary (with ÖMKi) or in Tunisia (with the CTAB). A somewhat intermediate model is the model of Denmark that has ICROFS, The International Centre for Research in Organic Food Systems. It is an established organization but operates as a "center without walls," where the research is performed in interdisciplinary collaboration between research groups in different institutions and universities. The lead in organic research can be taken on by a public institution or by a non-governmental institution that receives important public financial support.

When organic research is conducted within an established conventional institution, there is a risk that the overall agenda of the institution, values and priorities of the dominant researchers hinders the development of a vibrant organic research environment. This is the case in Sweden, where organic research has taken place since the 1990s, but is still not much accepted in academia. It is likely that a special organic research institute would have been a better solution.

Regardless of the model chosen, it is highly desirable to have a mechanism for national (or even regional, like EU-level) coordination of organic research, favoring partnerships and long-term strategies. This can be in the form of a dedicated organic research program (funded for a multi-year period) such as the German BÖLN, or by assigning this role to a specialized organization (with on-going public financial support) such as

ICROFS in Denmark.

There is a clear benefit⁵⁵ in having long-term programs that address the specific needs of the organic sector (identified through a proper stakeholder involvement process) and that enable coordination with organic research in other countries.

Permanence of the support to organic research is an important aspect of building long-term expertise for the sector. At the EU level, for example, there were successive projects ensuring support for organic research, but there is not yet a permanent fund to guarantee the continuity of such support. In the **USA**, annual funding for organic research has been stable at EUR 13.7 million since 2008 through a funding line included in each Farm Bill.

One beneficial element is also to have or support a dedicated organic research farm that enables long-term trials. For example, in the Canadian province of Quebec, The Platform for Innovation in Organic Agriculture is a 200-hectare research site dedicated to organic research. It provides organically managed land and infrastructure required to allow for research, development, training and public awareness activities related to organic crop production. It was designed by Quebec's Research and Development Institute for the AgriEnvironment (IRDA), and supported by a EUR 9.3 million funding allocation from the federal and provincial governments.

The institutional mechanism to set the national/regional organic research agenda is another key implementation issue. Good examples are those where the organic research agenda is established through a participatory process involving the various stakeholders of the organic movement. National examples of good public consultation processes and stakeholder involvement in the setting of organic research priorities are Denmark (for example for the ICROFS research and development strategy of 2012) and the Dutch research program of WUR/LBI that started in 1993. At the EU level, TP Organics, the European Technology Platform for Organic Food and Farming, is another good example.

Finally, it is important that organic research considers, documents and validates traditional and indigenous knowledge, as it can be highly relevant for organic farming. It is also a way to integrate traditional farmers in research and research agenda setting.

Extension

In terms of organic extension, there are also many different models.

The ideal model would be for extension services to be constructed so that, even conventional farmers learn first about organic solutions, and later, if they do not work, get advice on conventional solutions. Cuba and Bhutan have come closest to implementing such an approach.

⁵⁵ Evaluations (Andreasen, Rasmussen, and Halberg 2015; Rasmussen and Halberg 2014; Vieweger et al. 2014) found that the specialist organic farming programs have had a positive impact on the development of the organic sector and are relevant to meeting specific technical needs.

In some cases the state advisory services offer tailor made provisions for organic farmers, e.g. Bavaria (Germany). Chambers of agriculture are often required to provide advisory services on organic agriculture (e.g. in Austria, France, Turkey), which often means they must have at least one organic adviser per regional/local office. In Denmark, the Danish Agricultural Advisory Service, run by the farmer's union, receives funding from the government to provide organic advice in its 30 agricultural centers across the country.

Training and advice can also be carried out by organic farming associations or private organizations, which are subsidized by public funds (e.g. Switzerland with FiBL, France with FNAB, PRO-BIO in Czech Republic, SEAE in Spain, BioAustria in Austria, Bioland in Germany). Usually a grant is given to eligible expenses for the organization of seminars, field days, training courses and other information actions.

In the cases of FiBL in Switzerland, the Organic Research Center at Elm Farm in the UK between 1996 and 2011, CLOA in Egypt, or CTAB in Tunisia, the same organization hosts research and extension. When research organizations have organic demonstration farms, this is well suited for hosting organic extension activities.

Ideally, specific conversion advice provisions are designed for farmers aiming to convert their farms. Such services are provided at the national or regional government level in several European countries. Training and advice is offered in the form of phone or email help-lines, information packages, farm visits or demonstration farms. An innovative conversion program has been launched recently in Germany: conventional farmers interested in conversion may obtain a farm-check and are brought together with potential clients, i.e. processors and retailers before the conversion period starts.

A similar concept has been developed in Denmark: the so-called "Conversion checks", which are a full day of dialogue that give the farmer a total overview of what conversion to organic would mean on their own farm - daily practice and routines, solutions to common challenges, special needs for more land or feed, changes to buildings, where he/she can get a contract for organic sales etc. Conversion checks have proven very motivating for the farmer and hugely successful in Denmark, contributing significantly to a 20% increase in organic land area in 2016. The concept worked so well that it has become financially supported by private companies (such as the supermarket chain Coop) and by the government, as well as already 25 local municipalities/counties, which support the provision of free conversion checks to farmers residing in areas of importance for nature and drinking water supplies.

The organic farmer field school model⁵⁶ can also be very effective way to provide training to organic farmers and is being implemented in several countries (e.g. Tunisia, Swaziland, The Philippines). Another interesting model is the Innovative Farmers Programme⁵⁷ run by the Soil Association in the UK.

A classical model is to offer short training courses for (aspiring) organic farmers,

⁵⁶ See https://en.wikipedia.org/wiki/Farmer_Field_School for more explanation of this model.

⁵⁷ <https://www.innovativefarmers.org/>

supported by public funds. Ministries of Agriculture have financed such courses in order to improve competitiveness of their organic farmers. In the EU some countries have even made short courses in organic agriculture a mandatory requirement for farmers to access other forms of public support to organic agriculture⁵⁸. The rationale for such mandatory requirement is that training on organic agriculture greatly facilitates conversion and limits the risk of farmers reverting to conventional and/or having non-compliances to organic standards.

Training courses for organic farmers can be provided by a variety of institutions, ranging from universities, organic research organizations, NGOs, farmer associations or even consultancies, all of which can be supported by public funds (or by development cooperation money in the case of developing countries). Training courses are usually organized in the low farming season (e.g. winter) to maximize farmers' attendance.

Country examples

Cuba is perhaps the best example of large-scale government support to organic agriculture research and extension. It adopted organic agriculture as part of its official agricultural policy in the nineties due to the trade embargo and agricultural crisis. The Ministry of Agriculture and the Cuban Association of Organic Agriculture took far-reaching steps to promote organic agriculture systems and establish research programs that laid the foundations for food self-sufficiency through organic management. Cuba has since then led a number of sophisticated experiments and innovations in the organic field, such as bio-fertilizers, bio-pesticides and the use of fermentation. The Alejandro de Humboldt Fundamental Tropical Agriculture Research Institute of the Ministry of Agriculture is an active actor of organic research in Cuba. Moreover, the Ministry of Science, Technology and Environment (CITMA) has given priority to organic research themes by approving research projects linked to diversification, agroecology, organic agriculture and related topics. Nearly all agricultural research centers, and agricultural universities in Cuba have been involved in organic research. To date, organic research in Cuba is still a popular destination for exchange visits whereby other countries learn about organic innovations that they can replicate in their (tropical) situations, as well as get inspired by the research and extension linkages in Cuba. Practical results of Cuban research are incorporated into Cuba's Agricultural Knowledge and Information System which is then used for extension. Extension is organized under the Directorate of Science and Technology of the Ministry of Agriculture, which supervises various governmental, academic and NGO actors delivering extension services, and ensures that they use up-to-date, clear and consistent information.

Starting in the 90s, the **EU** has increasingly, even though slowly, raised its contribution available for organic agricultural research. Between 1990 and 2006, the EU Commission funds allocated to research in organic agriculture amounted to EUR 64.2 million⁵⁹.

⁵⁸ In Malta, Andalucía and Cataluña (Spain), Ireland, Austria and Lithuania, attendance of training courses was mandatory for organic farmers participating in agri-environment or organic support payments. In those regions (except Ireland), enough public funds were made available through other CAP measure (e.g. in Measure 111) to support 100% of the training costs.

⁵⁹ Schmid, et al, 2008. Organic Action Plans. Development, Implementation and Evaluation. A Resource

Nowadays, the EU has become an important investor⁶⁰ in and framework for European organic research (even though this still represents a low proportion of total agricultural research).

As an indication, it is estimated that for the period 2016-2017 the EU is making 33 million Euros⁶¹ available to fund organic research projects in the context of Horizon 2020. The legal texts of Horizon 2020 explicitly state that organic agriculture should benefit from the program. This is the first time that legal texts of the EU research policy recognize organic farming. In Horizon 2020, the pillar relevant to agricultural research is implemented through bi-annual Work Programs that describe the actions to be financed (calls). In order to draft Work Programs addressing the needs of the industry, the European Commission extensively consults the European Technology Platforms (ETPs), including TP Organics, which is the technology platform for organic food & farming, aiming at identifying innovation goals for organic and promoting these towards policy makers. The platform was created in 2008 by IFOAM EU, which has built a broad and strong coalition with civil society organizations, researchers, farmers and companies. TP Organic was recognized by the Commission as a European Technology Platform (ETP) in 2013, and granted an official advisory role in the implementation of Horizon 2020. The TP Organics Research Agendas of 2009 and 2014 have played an important role in setting priorities for the subsequent CORE Organic calls and Horizon 2020.

Despite the important investments provided by the European Union, most of the funds earmarked for agricultural research are still managed by EU Member States, but they sometimes do so in the form of transnational cooperation, pooling national budgets together. Since 2004, many EU Member States participate in a transnational partnership called CORE Organic, joining resources within research on organic food and farming⁶². Countries that have a government-funded specialized organic research program are members of the CORE Organic initiative. Most programs also have a clear aim to enhance knowledge exchange in the organic sector and run websites, seminars, conference etc. to highlight the findings of their research. The programs make the findings accessible to a wide range of users through an open access digital publishing archive called organic E-prints as well as through national websites, workshops, conferences, and encouraging coverage of the findings in the (organic) farming press.

Manual for the Organic Food and Farming Sector.

⁶⁰ This is being done in under 2 different frameworks: 1) the EU Research Framework projects, which are the major instruments in supporting research in agriculture (HORIZON 2020 and EIP-AGRI), and 2) the EU trans/international coordination efforts, particularly the successive CORE Organic projects, the FACCE-JPI (Joint Programming Initiative on Agriculture, Food Security and Climate Change) and the COST actions. The EU Research Framework projects are funded by the EU, while the trans/international coordination projects (ERA⁶⁰-Nets) are funded mostly by participating Member States.

⁶¹ This however still represents less than 1% of the total funds made available for agriculture research under Horizon 2020 in the same period.

⁶² This partnership is called ERA-Net CORE Organic "Coordination of European Transnational Research in Organic Food and Farming Systems". After its first phase (CORE Organic I from 2004 to 2007) and second phase (CORE Organic II from 2010 to 2013), the partnership is in its third project phase (CORE Organic Plus, running from 2013 to 2018). Core Organic II had a total budget of EUR 14 million. Core Organic Plus, EUR 12.8 million.

In addition to EU-funding and EU-coordinated research, there are national public funds allocated by EU Member States for organic research. Several EU countries and regions provide research grants for specific projects that address specific national or regional topics relevant to organic farming. Below we list only a few examples.

In the **Netherlands**, a country with a long tradition in research on organic agriculture, research has been an important pillar in national organic farming policies. There was a strong focus on research, training and education in its National Organic Action Plan 2005-2007, in which 63% of the budget was dedicated to those activities. In 2009, the Dutch government allocated 10% of the total agricultural research budget to organic farming (this amounted to a total of 9.6 million for organic research in 2008). Organic research in the Netherlands is highly cooperative and demand-driven: since 2005, the government has delegated the responsibility of setting the organic research agenda to the stakeholders by creating and financing Bioconnect (the knowledge network for the organic sector, now integrated in Bionext). The sector persuaded the Dutch government to delegate responsibility for setting the organic research agenda to Bioconnect on the basis of a pilot project. The support to Bioconnect was thereafter extended until 2011. Participation rate was very high (60% of organic farmers and 50% of actors involved in organic processing). For more information on the organization, methodology and results of organic research in the Netherlands, see the [2009 report *Research on organic agriculture in the Netherlands*](#).

In **Germany**, the [Federal Organic Farming Support Scheme \(BÖLN\)](#), initiated in 2001, aims to provide information to various actors in the whole supply chain and to carrying out research and demonstration activities. The scheme supports research projects by identifying research needs, promoting research projects, checking them for relevance, practicality and cost-effectiveness, and financing and accompanying them until completion. Research projects cover all topics, including the value chain. In addition to research funding, the BÖLN supports and strengthens supply and demand of ecologically or otherwise sustainably produced products with a variety of training, education and information. In these events results from BÖLN-funded research projects are taken up and passed on to the relevant target groups - to actors in agricultural production, acquisition and processing, in trade, to large users, marketers and consumers. Since its launch, the scheme has funded 930 research projects, for a total of 126 Million Euros research spending. It has also organized 3,500 knowledge transfer events since 2005. Its contribution to organic farming development was assessed as being very significant. Additionally to the federal funding, the German Länder (states) also fund organic research. For example, Bavaria alone spent EUR 3.7 million on organic research between 1995 and 2008.

In **Denmark**, organic farming has been supported since 1996 when the Danish Ministry of Food established DARCOF, the Danish Agricultural Research Centre for Organic Farming, which coordinated several research programs in organic farming and foods. In 2008, the so-called 'center without walls' changed into today's ICROFS, the International Centre for Research in Organic Food Systems with an international board. See more information in the Best Practice textbox below.

Most EU Member States now support, in one way or another, the provision of organic advice in the national extension services or through parallel systems, including training programs for organic farmers (e.g. in Flanders, Wallonia (**Belgium**), **Finland, Germany, Ireland, Italy, Luxembourg, Poland, the Netherlands**, some regions in **Spain** and in the **United Kingdom**). Many European countries have set up an organic conversion service dedicated to farmers wanting to convert to organic (Bavaria in **Germany, Italy, Luxembourg** and **England and Wales** - through government funding to the Organic Research Centre and Organic Centre Wales between 1996 and 2010). In **Denmark** the government began paying for the “conversion check” concept invented by the organic association Organic Denmark. **Denmark** allocated € 3.6 million for the period 2015-2018 to support supervision of conversion, preservation and sustainability on organic farms, and to subsidize experimental organic projects. Organic farming associations in Europe (e.g. FNAB in **France**, PRO-BIO in **Czech Republic**, SEAE in **Spain**, BioAustria in **Austria**, various “Ökoringe” – producer association umbrella organizations at the Länder (state) level - in **Germany**) also receive public funding to carry out training and advice to farmers. In the case of PRO-BIO, the organic farmers association in the Czech Republic, the short courses it organizes for organic farmers are paid 70% by government subsidies and 30% by the PRO-BIO Association’s own resources⁶³. A significant proportion of public support to organic extension in the EU is coming from Rural Development Programs financed under the CAP. Organic advisory services can be funded under the new CAP 2014-2020 Measure 2 of the Rural Development measures (“Advisory services, farm management and farm relief”).

In **Norway** all conventional farmers wanting to convert to organic have access to free advice from the Norwegian Advisory Service (NLR).

Switzerland is one of the world leaders in organic agriculture research, thanks to its organic research institute FiBL, which was established in 1974. FiBL is a private research institute, but operating with about half of its budget from public funds, which represented around 8 million Euros of public funding support for the year 2014. Additionally, 3 federal research centers have been involved in organic farming for many years. One of them, Agroscope, has 3 centers, under the federal agriculture office and has an organic research focus. Around 16% of Agroscope’s annual budget goes to organic research, which represents around 30 million Euros for organic research annually. In 2014 the Swiss Federal Council requested the Swiss parliament increase the amounts going to organic research by a few more million annually. Some public universities (ETHZ Zürich, HAFL Zollikofen, ZHAW Wädensil) also carry out some organic research. Advisory services are tightly linked to research: the advisory service of FiBL has coordinated organic extension provision at a national level since 1977, but receives financial support from the regional government. Additionally, federal government funds specialized organic advisers within the general agricultural advisory service.

FiBL also has chapters in **Germany** and **Austria**, and the FiBL model of private non-profit specialized organic research and extension center has been replicated in

⁶³ Data from 1999.

Hungary where FiBL founded ÖMKi in 2011. In 2013, ÖMKi was awarded the title of external Department of Agrobiodiversity and Organic Agriculture of the University of Debrecen. FiBL has also advised several other countries on the development of their national organic research and extension capacity.

Tunisia is an example of a country that proactively invested considerable public funds into organic research and extension at a very early stage of sector development, resulting in great success in terms of sector growth. For more information, see Best Practice Example textbox.

In **Morocco**, in 2011 the government signed a joint public-private contract with the organic industry (represented by AMABIO, the Moroccan association of organic agriculture) within which the government commits to allocate EUR 3.6 million of public money to support organic research, and EUR 1.8 million for extension (capacity building for farmers). The contract covers the period 2011-2020.

In **Egypt**, the Government supports agricultural research through the Agricultural Research Center (ARC) and in universities. A department of the ARC, the Central Laboratory for Organic Agriculture (CLOA) was established to focus on organic research. CLOA researches and promotes organic production of various crops, especially vegetables and fruits. It also has extension services.

In **Saudi Arabia**, the Minister of Agriculture decided in 2009 to convert the Qassim Agriculture Research Center into the Organic Agriculture Research Center. The center has a double mission of research and capacity building (providing farm-based consultancy, offering workshops, seminars and training courses).

The **USA** has historically dedicated a very low percentage of its public research funds to organic research (in 1997, less than 0,1% at the Federal level). The first research funding to include organic projects was the Sustainable Agriculture Research and Extension Program – SARE which began with the 1985 Farm Bill. The funds were small at the time, but nevertheless unleashed interest in doing organic research and in starting organic activities in academic institutions. In recent years, as a result of strong advocacy from the organic sector, the situation has improved and support to organic farming research is now roughly proportional to the sector's size. The US has invested nearly EUR 228.5 million over the period 2009-2015 in organic research⁶⁴. The main US Federal program for organic research now is the Organic Research and Extension Initiative (OREI). EUR 14.8 million is available annually for targeted organic agriculture research and extension program (per 2014 Farm Bill.) This includes agronomic/economic/markets research and development of guidance tools for organic operators. Organic research is conducted primarily by the so-called "Land Grant" agricultural Universities (they receive 90% of the OA research funding). In the US, extension is provided in the USDA Cooperative Extension Program, administered by the USDA National Institute of Food and Agriculture in cooperation with Land Grant universities in individual states. The money is allocated through a competitive grants process. The

⁶⁴ May 19, 2016 Statement from the US Agriculture Secretary Tom Vilsack.

USDA can prioritize grants for certain types of extension. They have prioritized extension for organic transition for EUR 2.9 million so far, and grants for developing organic educational tools and training for extension personnel on organic farming.

In **Canada**, The Organic Agriculture Centre of Canada (OACC) at Dalhousie University, founded in 2001, plays a leading role in organic research and education. In 2009, OACC, in collaboration with the Organic Federation of Canada, received groundbreaking federal government funding, supported by over 30 industry partners, to develop the Organic Science Cluster, which channeled over EUR 7 million in research funding into Canada's organic industry. With over 80 scientists at 36 research institutions participating in organic research projects, the Organic Science Cluster spans the country and engages all major agricultural universities in Canada as well as federal scientists. This was followed by the Organic Science Cluster II project, which received a budget of another EUR 7 million for the period 2013-18, covering around 50 organic research projects.

The province of Quebec in **Canada** is also supporting organic research and extension quite intensively. Quebec has a 200 ha research site called Platform for Innovation in Organic Agriculture, dedicated to organic research, created in 2012 and supported by a EUR 10 million government funding. In the province of Quebec there is a public support program to facilitate access for organic farmers to technical advice. The program reimburses up to 85% of the costs of technical advice services.

In **South Korea**, the Division of Environmentally Friendly Agriculture in the Korean Ministry of Agriculture, Food and Rural Affairs currently has a project establishing environmentally friendly agricultural research centers throughout Korea. The project has a 3-year plan and its budget is about EUR 6.4 million. The expected roles of these research centers are to develop organic agriculture field technology, to train and educate producers and consumers, to analyze the safety of environmentally friendly agricultural products and raw materials, and to operate demonstration farms.

In the **Philippines**, the Bureau of Agricultural Research (BAR) is the main government agency that administers and awards research grants for organic agriculture. It funds basic and applied research, as well as the development and commercialization of viable and innovative organic agriculture technologies. It establishes Research, Development and Extension Centers (RDE) in strategic locations in the countryside usually located near Centers of Excellence. The first RDE Center established is the Cordilera Organic Agriculture Development Center (COARDC) at Benguet State University, launched in 2010. COARDC aspires to be the premier Center for Organic Agriculture in Asia. The National Organic Agricultural Program (NOAP), which was established by Republic Act No 10068 (2010), has since its inception supported more than 2,000 trainings for farmers and established and maintained more than 1,000 demonstration farms. The Agricultural Training Institute organizes training sessions specifically on organic agriculture, funded by the government. An organic conference is also organized every year, and the government sponsors the attendance of farmers and extensionists.

In **Argentina**, several agricultural research stations conduct research and extension

activities on organic agriculture, with various specializations (organic horticulture, organic livestock production, etc.). The Ministry of Agroindustry has been sponsoring organic research as part of the Organic Agriculture Development Program (PRODAO) since 2011.

In **Brazil**, there are several research institutions working on organic agriculture or agroecology research, both at the federal and state level. The 2013-2015 National Plan for Agroecology and Organic Production (PLANAPO) allocated around EUR 18 Million for research and technology development and another EUR 215 million for extension services. A national program for technical assistance and rural extension is dedicated to family and traditional agriculture and puts a strong focus on ecological agriculture. The management of this program includes non-governmental actors.

In **Colombia** a number of public universities host research teams specialized in organic agriculture and agroecology.

In **Sri Lanka**, the national program for a toxin-free nation launched in 2016 foresees the establishment of full facilities required to conduct research into indigenous natural (organic) agriculture systems.

In **India**, the Indian Council of Agricultural Research, ICAR, started in 2004 a network project on organic farming at 13 centers in different agro-ecological regions of the country. Since then, the research centers have been working on the development of a package of practices for different crops and cropping systems under organic farming. In 2016, the government of India set up the National Organic Farming Research Institute in Sikkim. Further, the government of Gujarat is setting up India's first university that focus exclusively on organic farming and research.

In **China**, CNCA, the Certification and Accreditation Administration, launched a program of organic demonstration counties. In 2015, seven counties were accepted and there are 30 more applicants. Additionally, the ministry of Environmental Protection has a "National Organic Production Base" of organic demonstration farms, which includes 150 farms, and is growing. By 2013 in Taiwan the Council of Agriculture had also established 8 "organic agriculture research teams" and "organic technique service groups" to conduct research and extension.

In **Bhutan** a capacity development program for farmers is implemented directly by the National Organic Program operated by the Ministry of Agriculture. Since 2008, the NOP program has trained 3306 farmers directly and 259 staff members of the Ministry of Agriculture (training of trainers). After the training of trainers, the MoA staff (including NOP staff and agricultural extension officers) carries out further training of farmers.

In **Cook Islands, Niue & Republic of the Marshall Islands**, the Pacific Organic & Ethical Trade Community, hosted by the Secretariat of the Pacific Community, manages a project funded by the EU and IFAD, which provides capacity building and technical support to around 600 farmers. In **Fiji**, the University of the South Pacific (supported by 12 island nations) specifically its Institute for Research, Extension and Training in Agriculture (IRETA) offers training and extension in organic agriculture.

In **Swaziland** the government supports a project (funded by the EU) aiming at training 1,200 smallholders on organic agriculture techniques and setting-up 6 organic farmer field schools with 12 trained organic extension workers.

In **Kenya**, Busia County partnered with local organic NGOs to train its extension officers on organic agriculture. 18 extension workers attended the one-week training. The funds to organize the training came from a donor-funded project, but the county agriculture office allocated the time for their extension staff to participate in the training.

Best practice example(s)

Best Practice Example 1: Support to organic research and extension in Tunisia

Since enacting its organic law in 1999, the Tunisian government has taken a very proactive role in supporting organic sector development with outstanding results. Key support measures were the establishment of several institutions with budgetary autonomy and permanent allocation of public funds.

The Regional Center of Research in Horticulture and Organic Agriculture (CRRHAB) was established in 1999. It houses the Tunisian national Organic Agriculture Research Laboratory, which is responsible for conducting and disseminating research on all aspects of organic horticultural production systems for Tunisia's Eastern region, where most of the organic operations are located.

The Technical Centre of Organic Agriculture (CTAB) was also established in 1999 by Ministerial decree. It conducts applied organic research and provides training and extension services for organic operators and staff of other support organizations. CTAB adapts the results of CRRHAB's research for practical application by organic operators in their local conditions. CTAB also oversees trials for the endorsement and registration of different organic inputs and maintains a list of approved inputs on its website.

Other governmental bodies are also involved in organic research, such as the Institution of Research and Higher Agricultural Education (IRESA), which created the National Commission for Planning and Evaluation of Organic Agriculture Research. This body's activities include working with stakeholders involved in the organic sector with a view to addressing their operational problems through research. Several professional groups receive government funds to collaborate with research institutions on activities such as organic input development.

The National Program for Organic Agriculture has also established organic extension services in various districts of the country. Since 2003, thanks to a collaborative project between FAO and the various aforementioned Tunisian public institutions, the concept of farmer field schools has been extensively used in Tunisian organic extension.

The various government bodies active on organic research and extension (and more broadly on organic agriculture) work in tight collaboration, ensured through their respective institutional linkages, which includes membership on one another's boards and committees.

The establishment of organic research and extension institutions with budget autonomy and sufficient funding, as well as their interlinking, are factors that explain the success of the Tunisian government's policy on organic research and extension.

Best Practice Example 2: Organic Research in Denmark: A long history of institutional development

Research for organic agriculture was already on the agenda of Danish organic farmers in 1981, when their newly established National Association for Organic Farming (now Organic Denmark) put it on their agenda of priorities. The development of a strong research agenda in Denmark has been characterized by a collaborative dialogue between the organic sector and government institutions, as well as governmental commitment to supporting organic research, particularly by the Ministry of Food, Agriculture and Fisheries. Originally this enabled a faculty position in organic farming to be established in 1987 at the Danish Agricultural University and a commitment to fostering organic research in the government's national strategy for agricultural research.

The first institutional phase: DARCOF

The 1995 Action plan for the promotion of organic food production in Denmark recommended that higher priority should be given to research in organic farming, in order to facilitate conversion and increase organic food production to match consumer demand. This plan also suggested that a dedicated organic research station should be set up. Against this background, the Ministry of Food, Agriculture and Fisheries took the initiative to establish the Danish Research Centre for Organic Farming (DARCOF) in September 1995, and it set aside about EUR 13 million for research and development during the 1996 - 1999 period. Furthermore, the Ministry decided to establish an organic research station and several organic workshop sites. DARCOF was a "center without walls" where scientists remained in their own locations while working across institutions. The organic farming movement was skeptical, favoring an organic institution where capacities could be brought together, and do research in an environment shaped by organic principles. But the model proved to be a strong model that the movement battles to maintain and grow. DARCOF's activities were coordinated by a secretariat at the Research Centre Foulum, Aarhus University. From 1995 to 2008 three major organic research programs were launched - DARCOF I, II and III. After intensive lobbying activity from Organic Denmark, the Ministry increased research funding for DARCOF II (2000-2005) to EUR 22 million. About 100 researchers across 20 institutions were engaged in the DARCOF programs.

The second institutional phase: ICROFS

In 2008 the Ministry decided that its premier organic research institute should become an international research center with an international mandate. On the basis of DARCOF it founded the International Center for Research in Organic Food Systems (ICROFS), and committed to provide it with annual institutional funding. ICROFS is headed by an international board of directors with directors coming from Danish universities and organizations, IFOAM – Organics International, Asia, Europe, Africa, and North America. Within ICROFS is a Danish Program Committee, which oversees domestic research programs including DARCOF III (which continues under the "center without walls" concept) and another program, Organic RDD, consisting of 11 projects with a budget of EUR 12 million for 2014-2018.

ICROFS also participates in EU and global research platforms and it engages in targeted international research projects such as Productivity and Growth in Organic Value- chains (GroV) which assists with organic value chain development in East Africa. ICROFS is also engaged in information dissemination at national and international levels. At an international level it administers organic eprints, www.orgprints.org, the largest repository of organic research papers, which are publicly available in a web-based, open-access format. The archive contains more than 13,000 publications from global sources and has more than 23,500 registered users.

In Denmark, organic extension services are provided almost fully by the private sector through the Danish Agricultural Advisory Service and Organic Denmark. However, ICROFS disseminates its knowledge nationally by organizing farmer field days, thematic workshops, and a major domestic organic congress.

Pitfalls and challenges

The main challenge in terms of public support to organic research and extension remains the amount and continuity of support. Overall a much larger share of the agricultural research public funds still goes to areas incompatible with organic agriculture, such as genetic engineering. However, some organic associations have been increasingly successful at putting organic farming on the policy research agenda. One example is the IFOAM-EU group. Following the publication in 2014 of a Strategic Research and Innovation Agenda for Organic Food and Farming by TP Organics, the technology platform for organic food & farming in the EU, the EU budget allocated to organic research was increased and organic agriculture is now explicitly mentioned in research policy documents as a valuable approach.

An important challenge when setting up publicly funded organic research programs is getting the right level of stakeholder involvement in the identification of research priorities. In terms of farmer involvement, experience in European Innovation Partnership projects on organic research has been very positive because farmers' needs are put at the center. End-user (farmers) involvement is crucial, but one should be aware that other stakeholders might also have legitimate (and not always overlapping) interests. For example, researchers and technicians have their own legitimate concerns and ideas when it comes to research priorities, and consumers and environmental NGOs as well. Some might, for example, be more interested in an optimization of measures to conserve resources and the environment. Farmers on the other hand will be more concerned about solutions for pests and diseases, farm profitability and reduction of labor input. Advocacy organizations like organic associations will also have their specific needs, such as more studies proving the benefits of organic agriculture. Politicians might push for an increase in farm productivity or farm employment issues. The example of Bioconnect in the Netherlands (now integrated in Bionext) is an interesting one that addressed the challenge of stakeholder involvement.

There is a risk that general public research programs do not factor in the time needed to bring stakeholders together in a more participatory research approach. For multi-actor projects to be successful, a preparatory phase is needed. To build a solid basis of trust among 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 recognized and budgeted for accordingly. This can be done, for example, by providing seed money thus 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 practices⁶⁵.

Aside from the level and continuity of public support to organic research, and having the right level of stakeholder involvement, a bottleneck remains. In many countries, this is the ability of the research community to innovate while switching to a different agronomic paradigm.

Additionally, international cooperation in research remains a challenge, even though not specific to organic research.

Although agronomic research is the chunk of what is needed in organic research, it is also important not to forget organic processing issues (an area that is still largely under-funded) and the more social and economic aspects of organic agriculture (including markets and policies).

There are often calls for comparative research, where organic and conventional production systems are compared. This has some obvious value for informing advocacy and policy making, but it is of little value for organic farmers. It is also very difficult to design such comparative research until there is substantial knowledge of organic agriculture in the country, both among farmers and researchers, as comparisons only makes sense if they are based on realistic crop rotations and organic practices used by farmers. Moreover, as organic farming builds soil fertility over many years, such research requires a long time frame, often exceeding the time frames of typical research calls. A badly designed comparative research will consume a lot of resources and have no value for any stakeholder.

In terms of organizing the integration of organic agriculture into public extension services, the main challenge remains the state of mind of extensionists in the public system. Some may have the status of public servants (employed by the Ministry of Agriculture) and have life-long positions. If they have been advising on conventional methods for the past 20-30 years, they may be unlikely to welcome a change towards more organic advice (and also are unlikely to be competent in providing this advice). Therefore, inclusion of organic advice in public extension services often means the recruitment of new additional staff, and therefore an increase in budget (and not a simple re-allocation of resources to different priorities), at least in the short-medium term until some of the advisors retire. Another challenge is that the farmer training provided by extension services in their classical form (more academic-like training) are sometimes not so well suited to the needs of organic farmers, where farmer-to-farmer knowledge exchange is more important.

⁶⁵ Moeskops B et al. (2014), *Action Plan for Innovation & Learning*, TP Organics, Brussels,