Family and organic farming. New apprenticeship through m-learning

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Summary

Recently, family farming has become a central element in the public debate over its fundamental role in rural areas. Family farms ensure agricultural and forestry production, as well as fishing and grazing, managed by a family that mostly depends on unpaid family labour, both women and men.

From the 570 million farms in the world, over 500 million are family farms. There are numerous examples in which, through organic farming, family farming can be lead to new heights of success and innovation, with direct increase in the farm income.

The benefits that may accrue from the adoption of organic farming on family farms in Mediterranean countries such as Portugal, Italy and Spain are analysed, together with its impact and major constraints, as well as the contribution that new forms of teaching and learning can give to its spread and success, including through m-learning, as it is the case of the project ECONewFARMERS - Building a future for new farmers in ecological farming through vocational training.

Background

Recently, family farming, as a way to ensure agricultural and forestry production, managed and run by a family that mostly depends on unpaid family labour, both women and men, has become a central element in the public debate over the fundamental role it plays in rural areas (FAO, 2014). Their economic, environmental, social and cultural importance, led the United Nations to declare 2014 the International Year of Family Farming, with the aim, among others, to strengthen their role in food production as a sustainable system.

Of about 570 million farms in the world, over 500 million are family farms. Most of these farms are small - more than 475 million farms have less than 2 hectares (Lowder *et al.,* 2014). It is estimated that 70% of the world's food is produced by family farmers and that 40% of families in the world depend on the family farm as a way of life (FAO, 2014).

In Europe, according to the FAO concept, about 97% of the holdings are family farms, that have passed from generation to generation, keeping a set of traditions and cultural values (Peters, 2013), which should be preserved and enhanced.

In Mediterranean countries, the agricultural sector is rooted overwhelmingly in family farms. In Portugal, Spain and Italy, more than 90% of the holdings are family farms that use permanent and predominantly labour belonging to the household. These farms occupy above 67% of the utilized agricultural area, which reveals their impact at local and national economies (DGADR, 2014; INE, 2014; INEBase, 2014; Istituto nazionale di statistica, 2014).

There are numerous examples of projects and rural development models dedicated to improve family farming that consider the organic production as a key element for its success, with direct impact on the increase in farm and household income. Successful examples all around the world include: the organic cotton production in West Africa, the essential oils produced in organic mode in Bhutan, the traditional production systems in the Southern Caucasus and the High-Andean zones, the family farmers associated with the Asociacion Nacional de Agricultores Pequeños (ANAP) in Cuba, the integrated organic farming systems of Sub-Saharan countries, tourism systems in organic farming in the Highlands of Montenegro, the organic producer cooperatives in the Austrian Tyrol, the traditional community system 'teikei' in Japan, among many others (Ávila, 2012; Auerbach *et al*., 2013; Batello *et al*., 2010; Diarra, 2012; Jordan and Hisano, 2011; Krug, 2012; von Dach *et al*., 2013).

Through organic farming, based on principles such as securing favourable soil conditions for plant growth, particularly by managing organic matter and enhancing soil activity, optimize nutrient cycling through the management of animals and plants in space and time (through rotations or consociations), or maintain close relationships with the market, to ensure quality, family farms can reach new heights of success and innovation (Auerbach *et al*., 2013).

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Organic farming also contributes for agriculture modernization by improving the sustainability of farming systems, while putting farmers in the driving seat of the innovation process. A wide range of knowledge and technologies may be helpful for farmers, and that's why it is most important to facilitate the access to education, training and knowledge, so that farmers decisions may rely on scientifically based information.

Family Farming and Organic Farming in Mediterranean Countries

There is no universally agreed definition of family farms, although various stakeholders have established definitions either for purely analytical purposes or for the implementation of government programmes. In this paper, we have adopted the concept defined by FAO for the International Year of the Family Farm:

> *Family Farming (which includes all family-based agricultural activities) is a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production which is managed and operated by a family and predominantly reliant on family labor, including both women's and men's. The family and the farm are linked, co-evolve and combine economic, environmental, social and cultural functions (FAO, 2013b).*

Several difficulties arise when making international comparisons using the agricultural census data, since information is not available for each indicator in every country and for all decades. In this paper we have used estimates from several census rounds and reports and always have chosen the most recent observation we were able to locate for each country. This approach is by no means without fault, since the farm sector is very dynamic and the number of farms in a country changes greatly over time, as stated by Lowder *et al*. (2014).

There are 12 million farms in Europe, which are equivalent to 172 million hectares of agricultural land, with an average size per farm of about 14.3 ha of agricultural land. European agriculture involves 25 million people (European Union, 2012).

In the last decade, the number of farms has fallen by about a third, in Italy, Portugal and Spain (Table 1), where agricultural land still represents respectively 43%, 40% and 47% of the territory. Portugal has the smallest farms (12 ha of utilised agricultural area per farm), followed by Italy, with 14.4 ha per farm in average, and Spain with 30.9 ha per farm (Figure 1).

Table 1: Farm structure - number of farms and utilised agricultural area (Source: European Union, 2012; European Union, 2013b, INE, 2006)

	Number of farms			Utilised agricultural area (ha)	
	1999	2007	2010	2007	2010
Italy	2 590 674	1 679 440	1 620 880	12 744 200	12 856 050
Portugal	415 969	323 154[a]	305 270	3 472 940	3 668 150
Spain	1 764 456	1 043 910	989 800	24 892 520	23 752 690

[a] data from 2005

Average farm sizes are changing all over the world. In low and middle income countries farm sizes are decreasing - average farm sizes are smaller in the 2000s than they were in the 1960s. By contrast, average farm size in the high-income country group, including Italy, Portugal and Spain, has increased between 1960 and 2009 (Figure 1).

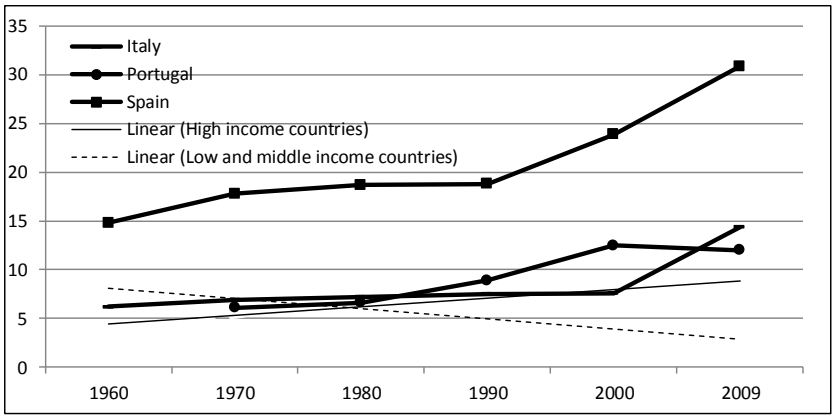


Figure 1. Trends in average farm size by countries and by income grouping (Sources: Lowder et al., 2014; INE, 2014)

In these countries, there is a very unbalanced regional distribution, especially in Italy and Portugal: in Italy the smallest farms are located in the South and in Portugal in the North, with respectively 73% and 75% of farms with less then 5 ha of utilised agricultural area (Table 2).

Table 2: Number of farms by size class in 2010 (Blandford, 2010)

	Number of farms by size class (x 1000) (ha UAA)									
	0-5		5-10		10-20		20-50		>50	
Italy	1182,3	73%	186,2	11%	120,1	7%	87,6	5%	44,7	3%
Portugal	230,9	75%	33,2	11%	19,9	7%	12,2	4%	9,8	3%
Spain	525,6	53%	141,9	14%	111	11%	107,7	11%	103,7	10%
EU-27	8314,2	69%	1307,4	11%	902,7	8%	773,9	6%	716,5	6%

Predominantly rural regions in the European Union represent 52% of the territory and 23% of the population. In 2010, they generated 16% of the total Gross Value Added and 21% of the employment (European Union, 2013b). Predominantly rural regions represent more than 80% of the territory in Portugal, 45.2% in Italy and 29.2% in Spain (Table 3).

Table 3: Importance of rural areas in 2010 (Source: European Union, 2013b)

	% population			% employment		
	Rural	Intermediate	Urban	Rural	Intermediate	Urban
Italy	20.3	43.1	36.5	19.1	42.8	38.1
Portugal	34.3	17.0	48.7	33.0	16.5	50.4
Spain	7,4	33,5	59,1	7,0	31.9	61.1
EU - 27	22.6	35.1	42.3	20.6	33.9	45.4

In Europe, about 97% of all farm holdings are in the possession of a single person, that continues to own and manage land previously cultivated by their parents and grandparents, and that tries to maintain certain cultural traditions and values. Such farmers and their families typically carry out most of the farm work, derive the majority of their income from farming, and live on or close to the farm itself. Family farms cover around 69% of the EU's agricultural land, and their average size amounts to 10 hectares (ha), as compared to corporate farms, which on average are 15 times larger (152 ha) (Peters, 2013).

In Mediterranean countries, such as Italy, Portugal and Spain, more than 90% of farms are owned by a single individual, a group of individuals or a household (Table 4), which means that the system of management is still strongly based on the family. Only a very small share of farms is owned by a corporation, cooperative, governmental institution, religious institution or an unknown arrangement. In contrast to the share of farms, the share of farmland owned by households or individuals is lower – below 70%.

Table 4: Share of farms owned by an individual farmer in 1999 and 2009 (Sources: Lowder et al., 2014; INE, 2014; INEBase, 2014; Istituto nazionale di statistica, 2014)

	Estimated number of farms			Share of farms owned by an individual farmer (%)		Share of farmland owned by an individual farmer (%)	
	1999	2007	2010	1999	2009	1999	2009
Italy	2 590 674	1 679 440	1 620 880	98	95	69	45
Portugal	415 969	275 080	305 270	98	96	59	56
Spain	1 764 456	1 043 910	989 800	96	80[a]	54	47[a]

[a] data from 2010

In 2009, there were 11.3 million persons working in the agricultural sector in the EU-27 (agriculture, hunting and related service activities), representing 5.0% of total employment. Employees represented 24% of total employment in agriculture (85% in the total economy) and self-employed the other 76% (15% in the total economy) (European Union, 2012).

Farming population continues to be large and agricultural employment remains important in Mediterranean regions. In some countries, like Portugal, rural population is estimated to account for more than 35% of the population in predominantly rural regions, according to OECD definition (Figure 2). In Europe, agricultural employment accounts for almost 25% of total employment in such regions (Blandford, 2010).

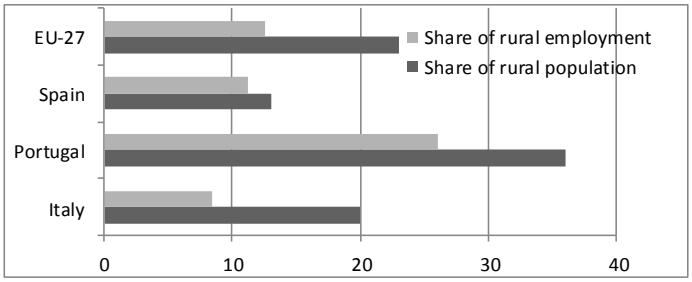


Figure 2. Population share of rural households, in 2005, and share of rural employment in total employment in predominantly rural regions, in 2006 (Sources: ECORYS, 2010; Copus et al., 2006)

Family farm definition also requires the family to supply the majority of the labour. Agricultural labour in the EU-27 is still largely carried out by the farm holder and his/her family members. Within the regular labour force, half of the people involved are farm holders, followed by the holder's spouse and other family members (European Union, 2012).

In the referred Mediterranean countries, between 47.9 and 50.9 percent of the farm labor is ensured by the family (Table 5). The number of permanent workers hired to work on the farm is on average very small (far less than 1 per farm). Comparing the number of permanent hired workers on the farm to the number of household members engaged in agriculture, family members outweigh hired permanent labour by more than 3.5 to 1 on average (FAO, 2013a).

Table 5: Employment in agriculture (x 1 000) (Blandford, 2010)

	Total number of persons working in agriculture		Total number of equivalent full-time workers		Average numer of persons working by farm		Volume of family labor in agriculture		Percentage of family labor in agriculture	
	2005	2010	2005	2010	2005	2010	2005	2010	2005	2010
Italy	3279	3393	1232	843	0,38	0,25	1126,4	758,4	43,5	47,9
Portugal	807	708	371	336	0,46	0,47	329,7	294,4	54,4	50,9
Spain	2186	2227	808	721	0,37	0,32	649,5	563,7	45,4	48,9
EU-27	29711	24881	11746	8982	0,4	0,36	10259,8	7547,5	45,9	45,6

Across EU-27, 85% of farmworkers are part-time and 70% work less than 50% of a full-time equivalent. In Portugal, part-time workers account only for 79% of the farmworkers and 51% work less than 50% of a full-time equivalent, which means that a higher number of farmers depend only of agricultural activities (21% of farmers work full time) (Figure 3).

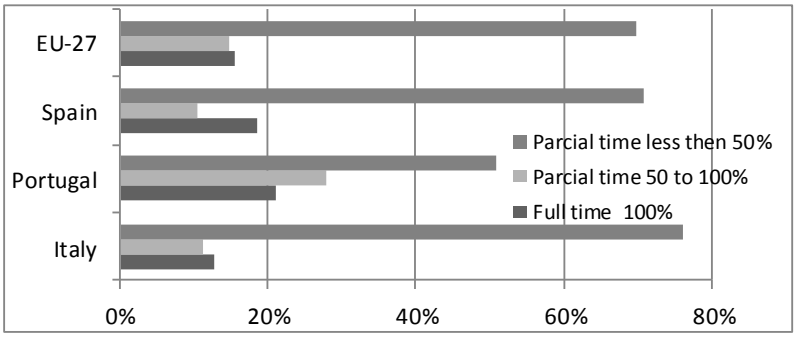


Figure 3. Full and partial time work in agriculture (Blandford, 2010)

In 2012, 15.3% of EU-27 population was younger than 15 years, the working-age population (between 15 and 64 years) represented 66.0% of the total, and elderly people (65 years and above) accounted for 18.6%. (Table 3) (European Union, 2013b). Among rural population the main difference is for the population older than 65 years, that represent 18,6 % in EU-27. In Mediterranean countries such as Italy, Portugal and Spain, this value is higher, with 21.6%, 23.3% and 22.0% of rural people above 65 years, respectively (Table 6).

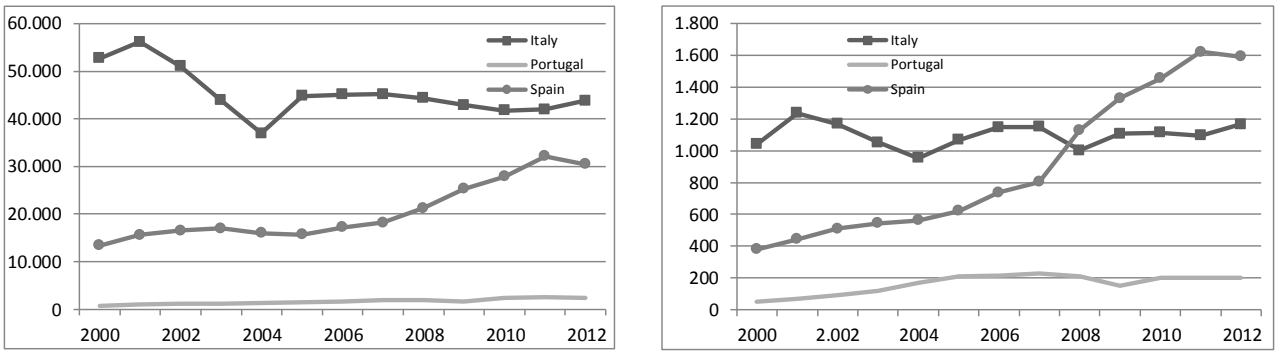
Populations are ageing in most of the European Union's regions, with all the socio-economic consequences that this situation implies. This development is particularly prominent in predominantly rural regions, namely in Italy, Portugal and Spain, which have more than 20% of elderly people working in agriculture. In these countries there are around three persons of working-age for every person aged 65 or over.

Table 6: Rural population age structure in 2012 (Source: European Union, 2013b)

	0-14 years old	15-64 years old	65 years old
Italy	13.1	65.3	21.6
Portugal	13.6	63.2	23.3
Spain	13.0	65.0	22.0
EU - 27	15.3	66.0	18.6

Family farming success is closely related to the adoption of organic production, in several countries. In Europe, the area under organic agriculture has increased significantly in the last years. In the last decade, the total area (fully converted and in-conversion organic area) has increased more than 6% per year in the EU-27: from 5.7 million ha to 9.6 million ha (European Union, 2013a).

In absolute terms, Spain has the largest areas and number of farms (1.6 million ha and 30 thousand farms, with an increasing trend), followed by Italy (about 1.1 million ha and 43 thousand farms, with a declining trend) (Figure 4, Table 6). These two countries accounted for about a third (30.1%) of the total organic area in the EU-27 in 2010: Spain (18%) and Italy (12.1%) (European Union, 2013a).



(a) (b)

Figure 4. Evolution of organic farming in Italy, Portugal and Spain: (a) number of organic and conversion farms and (b) area of organic and conversion (x 1000) (Source: FIBL, 2013)

Table 6: Supported organic and conversion area and farms, in 2012 (Sources: European Union, 2012; FIBL, 2013)

	Number of organic farms	Area (ha)	Share of UAA under organic farming (%)	Average annual growth rate of UAA under organic farming (% per year)
Italy	43 852	1 167 362	8.5	-0.9
Portugal	2 434	201 054	6.1	-4.0
Spain	30 462	1 593 197	8.5	14.3
EU - 27	253 707	9 949 268	5.5	6.9

On the other hand, Portugal is among the European countries that registered in absolute terms, between 2005 and 2012, a decrease of the area dedicated to organic farming (Figure 4), with a significant negative trend (-4.0% per year) (European Union, 2012).

Organic farmers are younger than conventional (non-organic) ones: farmers younger than 55 represent 61.3% of the organic sector whereas they represent only 44.2% of the conventional sector (Figure 5).

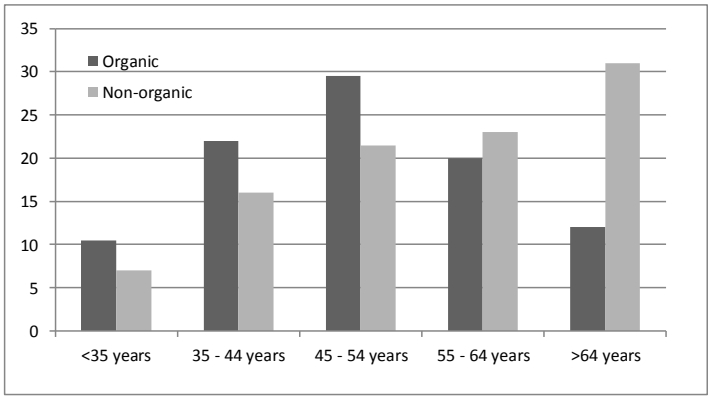


Figure 5. Comparison of age distribution of organic and non organic, in EU-27, in 2010 (Source: European Union, 2013a)

When asked about their training level in 2010 (the latest year for which data are available), 20% of EU-27 farm managers stated that they had followed some kind of agricultural training, but only 8.5% had completed a full cycle of agricultural training. All other farm managers (80%) learned their profession through practical experience only (Table 7).

Practical experience, as the only basis for managing an agricultural holding, is particularly prevalent in In Mediterranean countries, where the number of organic farmers with only practical training is between 84.7% (Spain) to more than 88% (Italy and Portugal).

Table 7: Training and education in agriculture in 2010, in percentage (Source: European Union, 2012; European Union, 2013a)

	Farm managers with agricultural training (%)		Farm managers with only practical training (%)
	Basic training	Full training	
Italy*	8.1	3.1	88.8
Portugal	10.3	1.5	88.2
Spain	13.8	1.5	84.7
EU - 27	11.5	8.5	80.0

*Data from 2005

On the other hand, a very small number of farm managers stated to have completed a full cycle of agricultural training in these countries, especially in Portugal and Spain where the percentage of farm managers with full agricultural training is 1.5%.

It is commonly recognised that life-long learning, i.e. the participation of adults in courses and trainings, enhances competitiveness and employability of the labour force. 24.6 million people aged 25 to 64 years in the EU-27 (9% of the total) participated in education and training in 2012 (European Union, 2013a). In rural areas of the EU-27, this share reached 6.6%, which was below the shares in intermediate (8.4%) and urban areas (11.1%) (Table 7).

The share of people participating in life-long learning activities varies greatly among countries. Less than 10% of the adults in rural areas of Mediterranean countries such as Portugal, Spain and Italy, participated in education and training in 2012.

Table 7: Lifelong learning in rural areas in 2012 (Source: European Union, 2013a)

	Adults participating in education and training (%)			
	Rural	Intermediate	Urban	Total
Italy	5.6	6.1	7.9	6.6
Portugal	7.7	9.7	11.7	10.1
Spain	8.4	10.6	12.1	10.7
EU - 27	6.6	8.4	11.1	9.0

In conclusion, based on the presented agricultural census data, it is possible to say that in Mediterranean countries, such as Italy, Portugal and Spain:

- agricultural land represents more than 40% of the territory; but predominantly rural regions represent more than 80% of the territory in Portugal, 45.2% in Italy and 29.2% in Spain;

- average farm size is 12 ha in Portugal, 14.4 ha in Italy and 30.9 ha in Spain;
- more than 90% of farms are still strongly based on the family;
- in some countries, rural population accounts for more than 35% of the population in predominantly rural regions.
- between 47.9% and 50.9% of the farm labor is ensured by the family;
- a significant number of farmers depend only of agricultural activities (21% in Portugal, 19% in Spain and 13% in Italy;
- in predominantly rural regions, more than 20% people working in agriculture are older than 65 years;
- the area under organic farming is more than 6% of the utilised agricultural area; organic farmers are younger than conventional (non-organic) ones and only 3.1% (Italy) and 1.5% (Portugal and Spain) of organic farmers have completed a full cycle of agricultural training;
- less than 10% of the adults in rural areas participated in education and training in 2012.

What is family farming profiting from Organic?

Organic farming is a way of sustainable and environmentally safe production, giving healthy products of high quality, contributing to food security and ensuring farmers' income through access to a differentiated market, and simultaneously improving working conditions of farmers and the quality of life of their families (Izquierdo et al., 2007).

The benefits of switching to organic farming are multiple and can be evidenced by the results obtained in numerous case studies (Auerbach et al., 2013; FAO, 2014; von Dach et al., 2013, Wijeratna, 2012):

- getting most nutritious, healthier and safer foods,
- improvement of soil quality,
- adoption of local seeds and varieties (reduction of costs with seeds, chemicals and fertilizers),
- preservation of indigenous livestock species well adapted to the local environment,
- cultural diversity,
- reduction of chemical inputs (pesticides and fertilizers),
- reducing accidents and diseases associated with exposure to pesticides,
- job creation,
- adoption of marketing systems based on consumer proximity,
- increasing of consumer confidence.

Organic farming becomes therefore important because of the potential to sustain and enhance the productivity by improving soil fertility, biodiversity and other ecosystem services. It is a mode of production particularly suited to small farms, which become less dependent on external resources, and make use of the traditional knowledge and techniques. Farmers easily fit the requirements of organic farming, may resort to certification and thus achieve higher prices for their products.

Family farms often display greater resilience than conventional farms, by demonstrating willingness and flexibility to adapt their traditional businesses to prevailing external conditions, for example by focusing on high-quality food production, participating in short food supply chains and/or engaging in 'pluriactivity' (mixed and off-farm activities) and on-farm diversification.

The prices obtained in organic farming and the cost reduction in pesticides and other inputs are motivating factors that have led to the conversion of many family farms (FAO, 2013c). It is estimated that the sustainable adoption of these practices increases the productivity of small farms in about 79%, which together with the reduction of fertilizer and pesticide costs markedly contributes to the increase in economic performance (Pretty et al., 2006; Wijeratna, A. 2012).

The adoption of organic farming involves a set of practices that require an effort of knowledge and learning of new technologies, essential so that the farms may become competitive and to enable job creation both through on-farm and off-farm activities. Simultaneously, with the improving of farmers life quality, organic farming contributes to a range of ecosystem services that enable the reduction of the ecological footprint of farms, to mitigate climate change and to ensure food security (Willer and Lukas, 2012; IFAD, 2013).

Organic farming helps to maintain and enhance many ecosystem services that are supporting agricultural production: improve soil organic matter, reduce soil erosion and increase biodiversity, namely natural enemies and pollinators, reduce dependence on fossil fuels and can be an important part of mitigate climate change by contributing to carbon sequestration and reduction of energy consumption (Altieri and Kohafkan, 2008; Oxfam International, 2014; Wijeratna, 2012).

Although organic farming makes use of local and traditional knowledge, it requires a vast knowledge of ecology and of the various innovative technologies that make the best use of natural resources and ecosystem services, reducing the

negative effects of farming, such as integrated protection or minimum tillage (Pretty et al., 2006), which should be accessible to farmers.

The Contribution of the project ECONewFARMERS

Facing different challenges, family farms and organic production have specific needs, both in technologies and knowledge. Hence, the evolution of these farms to organic should be linked to major drivers such as vocational training. M-learning and inovation networking might play a fundamental role in promoting these innovative practices.

The knowledge and technical training are essential for the adoption of organic farming, whereby project ECONewFARMERS - Building the future with new farmers in organic production through vocational training aims to contribute to the technical training and provide tools to improve the capacity of intervention and innovation for farmers wishing to convert or start a farm in organic farming, in contexts of m-learning (learning in contexts of mobility).

The project will use a set of learning tools already provided by other international projects that will be adapted to the reality and needs of each country and the target audience, being further supplemented with new materials. A specific training curriculum will be created that can be made available at distance, in a format providing large autonomy to the learners.

It is also intended, by providing multiple tools such as a digital platform that will provide a permanent e-book on organic farming, a discussion forum, a digital library and a database of trainers, that farmers interested can go over time renewing their knowledge and share their experiences and success stories.

The project aims to contribute to the development of organic agriculture, a method of agricultural production aiming to produce nutritious and high quality foods, without the use of synthetic chemicals or genetically modified organisms, and which aims to minimize the negative environmental impacts in nature. Organic farming, by contributing to the health and welfare of man with respect for the environment and its balance, based on principles of justice that allow improving the quality of life of all stakeholders, can be an opportunity and a challenge for family and organic farming, which will ensure the creation of value and facilitate access to markets and, simultaneously, ensure food safety and environmental quality.

Being the most common operational farming model, family farming has ensured the growth of Europe's agricultural sector for centuries. The adoption of organic farming family farms will contribute to strengthen the sector and to overcome the challenges that rural areas are facing by improving the competitiveness of agriculture, protecting the environment and enhancing the quality of life in rural areas.

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