Knowledge system driving multifunctionality: a challenge for the Italian agricultural sector

Laura Aguglia, Ines Di Paolo, National Institute of Agricultural Economics (INEA), Italy

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Introduction

Changes that are involving the Italian agricultural sector in the last period are creating new expectations on the role of the agricultural entrepreneurs. Markets, agro-food industry, civil society are asking to farmers a new competitive approach, to enhance the environmental and social sustainability of the productive process and create a stronger relationship between local resources and actors. Therefore, main actors within the agricultural sector are trying to meet these requirements, focusing on diversification and multifunctional strategies, as, for example, organic and integrated farming, green energy trough biofuels, eco-agri-tourism, farming education, direct sale.

In terms of motivation underneath entrepreneurial choices, multifunctionality and diversification represent, first of all, an opportunity to guarantee or increase the income derived from primary production, at the same time satisfying the demand of sustainability coming from consumers and institutions. To apply these strategies new skills and expertise are often required to farmers. Investments in research and innovation, training and extension services become more and more important in supporting farmers in taking into account economic, social, environmental aspects in their management.

The aim of this paper is to analyze the role of the Agricultural Knowledge System (AKS) in providing Italian farmers instruments to manage the adjustment process towards a more multifunctional agriculture. First, the analysis will provide a description of the characteristics of the Italian agricultural sector in terms of multifunctionality, through the FADN survey in 2007. Then the work will analyze the resources of the AKS, using both financial and physical indicators, invested in supporting farmers in conciliating the productive function of agriculture with the others, the environmental, social, cultural ones. Finally, after evaluating the potential impact of AKS on the degree of multifunctionality of agriculture, some conclusions will be drawn with policy indications and suggestions to facilitate the transition towards a multifunctional agricultural system.

1.Multifunctionality and diversification in the Italian agriculture in 2007

A wide literature exists on diversification, multifunctionality, and pluriactivity in agriculture, and on the differences among the approaches, allowing us to construct a valuable theoretical frame. Among the main authors and aspects, the paradigm of broadening, deepening and regrounding by Van der Ploeg and Roep (2003) helped us in identifying the main trends of the process involving agriculture. A wider concept of agricultural function compared with the conventional one is suggested: deepening refers to enlarging productive activity within the supply chain (organic farming, short chain, quality and regional production); broadening relates to activation of new functions in the rural area in which farms are located (diversification, landscape management, new on-farm activities); regrounding means using some farm internal resources to activities outside the farm (off-farm incomes).

Wilson (2007) suggested us that there are various level of multifunctionality, from weaker to stronger, depending on the ñconsciousnessò of the process of enlarging agricultural function to other services and on different categories of farms. The OECD (2009) and European

Commission (2008) provide some useful more practical instruments to classify diversification activities, respectively based on the type of farm (individual or other types), and on the combination of localization of the activities (on-farm and off-farm) and production factors. The different definitions and approaches create a very rich but conflicting frame, sometimes difficult to be applied to a specific context.

With reference to the Italian agricultural sector, some authors describe it as characterized by complex multifunctional systems (Aguglia *et al* 2009, Henke *et al*, 2010), referring to the simultaneous activation of more diversification activities within the same farm and to the different motivations underneath diversification choices.

In this work we focus on on-farm activities as indicators of multifunctionality in the Italian agricultural sector, referring to the use of production factors for activities inside the farm (so excluding ñregroundingò), for which data is available in the FADN. At farm level we have information on organic and other sustainable productions, direct sale, agritourism, quality systems and certifications (ISO, Haccp, etc), traditional and typical products, on-farm processing, rentals. The FADN data for 2007 includes a sample of 8,207 farms, statistically representing 749,712 farms. Approximately 95% of the total farms are individual.

As first results, 57% of total farms is involved in at least one of the several kind of multifunctional activities. The most representative are on-farm processing (39% on total), direct sale (23%) and origin and traditional certification (13%)(Tab. 1). The UAA in average per farm is higher for organic and agritourism activities; the same happens for the number of total work units per farm, but the range is however concentrated between 1,2 and 2,5 units. In terms of value added, the higher value is connected with agritourism, followed by certification and organic. The specialization is represented by permanent crops for all the farms of the sample and the economic size is the one from 8 to 16 esu for most of them. About the characteristics of farmers, they are mainly male, between 40 and 60 years for organic or sustainable production, agritourism and rentals and over 60 years for the other activities.

Tab.1 Multifunctionality in Italy in 2007 (average values for UAA, TWU, value added)

	n° of farms	% of total	UAA	TWU	value added	crop specialization	ESU	farmer's age
organic	9,755	1.3	27.82	1.92	57,939	permanent	8 to 16	40 to 60
environmental issues	46,447	6.2	15.07	1.48	53,376	permanent	8 to 16	40 to 60
certifications (ISO, Haccp)	30,356	4.1	11.24	1.41	62,699	permanent	up to 8	over 60
traditional and typical products	97,439	13.0	10.45	1.49	38,320	permanent	16 to 40	over 60
diversification: direct sale	171,336	22.9	11.73	1.26	24,901	permanent	8 to 16	over 60
agritourism	9,847	1.3	26.69	2.49	79,978	permanent	16 to 40	40 to 60
processing	289,290	38.6	11.82	1.22	23,875	permanent	8 to 16	over 60
rentals	25,203	3.4	15.00	1.33	30,269	permanent	8 to 16	40 to 60

Source: INEA processing of FADN 2007 data.

In farmersô choices, therefore, in terms of number of farms it seems to be a preference towards multifunctional practices allowing them to keep more value added in their hands, as for processing, direct sale and traditional and typical certified products, maybe because these activities require competences and resources that are already inside the farm. Direct sale often is organized using family work in period in which it is unemployed; traditional and typical products certification emphasize the sense of belonging of a farm to its territory and rural culture, and the farmer play the role of the keeper of production process know-how.

In terms of economic results the most profitable activities seems to be agritourism and certification systems.

2.How the Knowledge System encourages multifunctionality in agriculture

The Italian AKS is characterized by three main segments: Higher Education, Research & Development (R&D) and Extension Services. Higher Education is under the State (national) responsibility and it is represented essentially by the University. R&D is under the responsibility of both the State and the Italian Regions. The national research bodies are grouped in three different structures: University, National Research Council (CNR) and Public Research Institutes funded by MIPAAF. The 20 Italian Regions and 2 autonomous Provinces fund agricultural research either directly or indirectly: some Regions have their own research structures (i.e. Piedmont, Emilia Romagna, Abruzzo, Sicily, Sardinia), others have their own research programs implemented through national structures (Universities and other public institutions) situated in their territory.
The Extension system falls within the competence of the Regions and two actors play a key role: the private system (advisors of firms producing fertilizers, seeds, chemicals, animal feeds, human food) and the system of public services for farmers, connected with regional agricultural institutions. These two sections are very different one from each other in terms of objectives, methods and evolution and, seldom if ever, work together. In addition, farmersô professional associations (i.e. trade unions or agricultural products associations) are supplying services to the farms. They are private bodies, but often cooperate with public institutions or receive public funding.
In this work the two components of AKS, R&D and Extension are taken into account. The analysis is developed at regional level because regions are the most significant actor in charge. For R&D, data comes from the Regional Agricultural Research Data Bank, managed by Inea, collecting regional research projects, of which we take the period 1999-2004. For Extension, data is available from a survey developed by Inea and Regions on all the activities from 2001 to 2004. The period we take into account for research is wider compared to the one for extension assuming that research takes time to obtain results and to transfer them; for the same reason the potential impact on the agricultural sector is analyzed some years later, on 2007 data. Not all regions are represented, but the ones for which data on both components, R&D and extension, has been collected.

Tab. 2 Multifunctionality by regions: farms, investments in R&D and in Extension

	multifunctional farms (2007)		R&D (1999-2004)			Extension (2001-2004)		
	n. of farms	% on tot agric. farms	n. of projects	euro	% of tot	n. of activities	euro	% of tot
Basilicata	13,129	3.07	8	547,472	14.00	5	1,011,127	60.86
Campania	28,280	6.61	10	870,324	14.95	53	26,664,146	65.02
Friuli V.G.	6,535	1.53	8	1,914,460	34.33	15	16,668,205	3.40
Lombardy	18,044	4.22	21	3,643,967	23.70	275	9,871,277	59.71
Piedmont	22,820	5.34	24	492,940	8.55	28	41,485,588	9.30
Puglia	91,116	21.31	10	2,465,959	18.39	44	28,053,598	51.32
Sicily	34,436	8.05	37	5,786,361	14.21	6	9,642,022	77.61
Tuscany	29,514	6.9	18	3,460,204	26.91	54	29,365,873	77.58
Veneto	20,164	4.72	5	1,351,232	20.72	5	782,900	3.35

Source: INEA (for extension data processing we thank Alessandro Possagno)

Besides resuming the weight of multifunctional farms by region, in Table 2 are described the investments in R&D and Extension devoted to enhance the degree of multifunctionality of agriculture. In several regions, both in the North as in the South of Italy, a percentage between 14 and 27 of total research funds in agriculture are dedicated to multifunctionality, along with a relevant percentage, between 60 and 80%, of total extension investments; despite that, in 2007 farms engaged in these activities are still less than 10% of total. Friuli and Veneto, being equal the low share of multifunctional farms, show an high investment in research, but very limited in services. Puglia shows the more sane relationship between research and services and a more advanced step in the process of multifunctionality.
Analyzing the subjects within multifunctionality on which research and extension investments focus on, for both of them resources are concentrated on the environmental function (Tab. 3), in which measures for sustainable production processes are mainly included, along with landscape, biodiversity, animal health, traceability and environmental certifications. For extension, another important share of investments refers to territorial resource, dealing with the safeguard of rural habits and communities, the valorization of local heritage and resources.

Tab. 3 Investments in R&D and in Extension by typology

	R&D			Extension			
	n.	investment (euro)	% of total	n.	investment (euro)	% of total	work units
organic sector	50	5,542,502	5.04	72	5,344,128	0.48	105
environmental issues	205	28,213,030	25.66	207	70,535,129	6.28	881
certifcation	20	3,726,498	3.39	89	23,334,681	2.08	442
traditional and typical products	68	5,871,546	5.34	48	15,165,337	1.35	110
territorial resources	9	402,838	0.37	24	44,332,047	3.95	47
diversification (agritourism, educational farms, short chain)	15	1,979,949	1.80	46	4,833,415	0.43	162

Source: INEA, Regional agricultural research databank and Interregional Project.

Going more in deep with the analysis of these projects and activities, comes out that research resources are mostly devoted to provide to farmers innovative instruments and methods to make the agricultural system more sustainable, for the reason that farmers with their activity play a key role in protecting the natural resources, biodiversity and the landscape, and this is also what institutions and policies are trying to achieve. Extension services, supporting farmers with a more practical approach, are mainly devoted to help farmers to comply with regulations and to apply to public payment scheme.

Conclusions

This work represent an attempt of evaluating the impact of research and extension services in the adjustment process towards a more multifunctional agriculture. The Italian agricultural sector in 2007 seems not to have faced a deep and complete change towards a multifunctional concept of agriculture yet. Despite of more than 50% of farms being involved in some multifunctional aspects, the analysis suggests us that some more work is still to be made. Farmers have carried out more diversification activities (direct sale, agritourism, processing) rather than proper multifunctional activities, showing a preference towards practices that directly contribute to increase their income or to assure a market to their production. A less

interest covers activities in which agriculture is linked to wider objectives, as environmental protection, rural communities survival, and more in general connected with public goods. Except for the organic sector, that simultaneously allow an income to farmers and sustainability of productions, the other environmental issues are still considered more as a constrain than as an opportunity. Environmental care activities are probably driven by the law binds and the public payments rules, that is however an integration to farm income, rather than by a long term farm strategy.
On the opposite, the higher share of research and extension initiatives and investments focus on the environmental issues.
Few considerations to help managing the process towards a more multifunctional sector can be proposed:

- the agricultural sector and the AKS are still perceiving different objectives and trends, emphasizing the distance between private and public interest. There is a wide debate on the role of public goods in agriculture, on how it is possible assessing them from the economic point of view, on who is in charge of them. A stronger effort is needed by public actors to communicate multifunctionality as a strategic instrument to increase income, to reduce management risks, to gain consumers trust, to benefit from the rural context;
- to answer to a longer development strategy and to produce a positive impact on rural areas as well, the AKS actors should support farmers in the adoption of more than one multifunctional action in the same farm (especially for big farms, with a more competitive and industrial scale production) and plan multifunctional strategies at territorial level (especially for small, marginal, individual farms, more sustainable, but with limited multifunctional possibilities);
- multifunctionality therefore represents a complex process and an ambitious target, requiring a multidisciplinary approach in the AKS, with specific different expertise and professionals working together (economists, agronomists, technicians, engineers, landscapers);
- the distance between agricultural sector and AKS trends suggest us to widen the analysis of methods and instruments employed by extension services to verify their coherence with multifunctional objectives.

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