

## OECD

**Agricultural Knowledge systems (AKS) conference on 15-17 June 2011:**

**Questionnaire on the organisation, objectives and outcomes of AKS**

### **Agricultural Knowledge System in Italy**

#### *1. Organizational issues*

- **What is the organizational structure of AKS (and its components: Higher education, Research, Development and Extension)? What major changes have occurred over the last decade?**
- **Who is responsible at government level for the AKS and its individual components? Please describe and comment on any major changes made during the past decade or currently being proposed.**
- **In what manner is AKS (and its components) financed both from public and private sources? What changes in funding the AKS activities have occurred during the past decade?**

The Italian Agricultural Knowledge System (AKS) is characterized by different organizational models, contents, working methods in all the three segments (or macro-components) recognized by OECD: Higher Education, Research & Development (R&D) and Extension Services.

Higher Education is under the State (national) responsibility, R&D is under the responsibility of both the State and the Italian Regions, Extension falls within the competence of the Regions.

**Higher Education** - This component is represented essentially by the University. It is financed by the Italian Ministry of Education, University and Research (MIUR), which in turn responds to directives defined by the Italian Government.

The Italian University system is organized in Faculties: for the specific agricultural field, there are 24 Agriculture and 14 Veterinary Medicine (Animal health) Faculties, with a staff composed by 927 full professors, 908 associate professors, and 1326 researchers; these Faculties are distributed over the all Italian territory (at least one for each Region). However, also other Faculties may implement agricultural education and training research activities (i.e. the Faculties of Life Sciences, Economic Science, Medicine, Engineering etc.).

Following the 2001 reform, the old 4-5 year degree is under completion, and now University can release two different degrees: a 3 year degree (1<sup>st</sup> level, Bachelor); a 2 years specialistic degree (2<sup>nd</sup> level, Master degree).

The Higher Education activities are implemented in Italy through University courses, post-graduate (i.e. grants, masters, etc.) and Ph.D. courses in different fields related to agriculture and natural resources management. Also the Ministry of Agriculture, Food and Forestry Policies (MIPAAF) contributes to scientific education (and research training) financing fellowships, grants and also PhD grants.

It is worth noting that also a small number of other organizations (agri-food firms, local institutions and associations) promote post-graduate courses regarding specific issues, but it can be considered a marginal activity if compared to the same activities promoted by the Italian Universities, especially in terms of prestige.

**Research and Development** - Both the State and the Italian Regions are in charge of this component.

The principal national funder and manager bodies involved are: the Ministry of Education, University and Research (MIUR) and the Ministry of Agriculture, Food and Forestry Policies (MIPAAF). Anyway, some research activities are funded, managed and carried out also by other national Ministries that support studies on topics related to their core mission, as food safety, human health, labour etc. (i.e. the Ministry of Health, the Ministry for Economic Development - MEF, the Ministry of Environment and Land Protection - MATT).

The national research bodies are grouped in three different structures:

- University, funded and supervised by the Ministry of Education, University and Research (MIUR);
- National Research Council (CNR), funded and supervised by the Ministry of Education, University and Research (<http://www.cnr.it>). The CNR is devoted to carrying out research on all fields of knowledge, included agriculture. It has also a role of research manager<sup>1</sup>: in particular, the planning, coordination and control activities managed by the Agrifood Department of CNR are performed in 20 Institutes, spread over the whole national territory, involving (in 2008) 900 personnel units with a permanent contract, among whom 340 researchers, and 260 personnel unities with a temporary contract;
- Public Research Institutes funded by the Ministry of Agriculture, Food and Forestry policies. The principal structures, with agricultural research as institutional mission, are the following: the National Institute of Agricultural Economics - INEA; the National Research Institute for Food and Nutrition – INRAN; the Council for the Research and Experimentation in Agriculture – CRA (a manager/research body<sup>2</sup>); the Institute of Food Services for the Agricultural Market - ISMEA; the “L. Spallanzani” Institute (animal science).

The 20 Italian Regions and 2 autonomous Provinces (Bolzano and Trento) fund agricultural research either directly or indirectly. Some Regions have their own research structures (i.e. Piemonte, Emilia Romagna, Abruzzo, Sicilia, Sardegna), other have their own research programs implemented through national structures (Universities and other public institutions) situated in their territory. A few examples of Regional or local research centres are:

- CRPA - Research Centre for Animal Production (Emilia Romagna, <http://www.crupa.it>)
- CRPV - Research Centre for Fruit and Vegetable production (Emilia Romagna, <http://www.crpv.it>)
- Experimental research Centre and Safe Crop Centre of S. Michele all’Adige (Trento Province, <http://www.ismaa.it> )
- Laimburg Research Centre for agriculture and forestry (Bolzano Province, <http://www.laimburg.it>)

In Italy, the private agricultural research is estimated to be approximately 25% of the total (65% UK, 10% Germany and Spain).

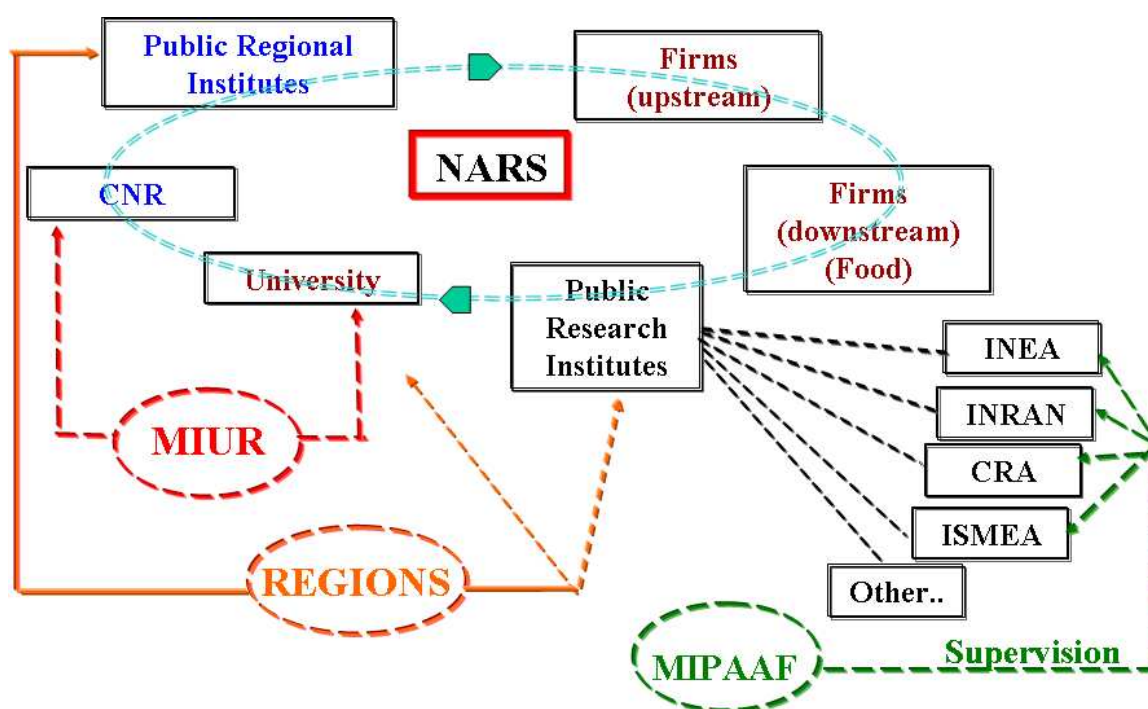
The Italian research system consists of a multiple organization without a central coordinating agency.

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<sup>1</sup> In the past, CNR could act as funding agency supporting agricultural research, but nowadays it uses almost exclusively external funds, from its supervising Ministry or others.

<sup>2</sup> The CRA, that recently aggregated at national level the Italian Experimentation Institutes for agriculture under MIPAAF tutoring, can fund research projects but it is essentially acting as manager and research body dealing with all agricultural and food-non food production chains.

Figure 1 – The Italian National Agricultural Research System (NARS)



**Extension** - The Italian agricultural Extension system consists of two parts, very different from each other in terms of objectives, methods and evolution: the complex organization connected with the firms that produce fertilizers, seeds, chemicals, animal feeds, human food, and the system of public services for farmers connected with regional agricultural institutions.

The first has the principal objective to keep its own share of the market, the second wants to promote the development of agriculture and rural territories. Both try to meet the farmers needs concerning: innovative and more rational productive processes improving agricultural products, decreasing costs and also lowering the impact of agricultural processes on the environment.

These two “sections” of the Italian agricultural development services are separated and, seldom if ever, work together.

In Italy, there is another group of organizations that supplies services to the farms: the farmers’ professional associations (i.e. trade unions or agricultural products associations), that are private bodies but often cooperate with public institutions or receive public funding.

Since 1972, almost everything concerning agriculture has been responsibility of the Regions. Then, the supply of public services for farmers is managed exclusively by the Regions. The first consequence is that there are almost 20 different organizations for the system of extension and adult training.

All the Regions have their own legislation in this field and they allocate funds to the different organizations independently from each other.

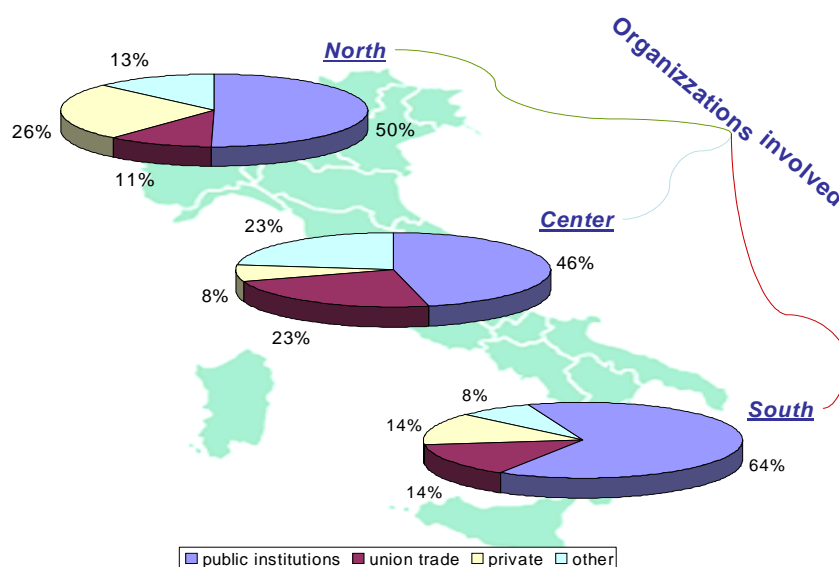
**AKS Funding** – The Italian AKS is supported mainly by public sources; the role of private sources is less relevant and noticeable. The contribution by the private enterprises is also more difficult to assess, because there are not official statistics about.

For what concerns Research and Development, the Italian Ministries (MIUR and MIPAAF) fund almost all the fixed costs of the national structures (staff, instruments, offices etc.) and issue calls to promote specific

research projects. Therefore, these Ministries support R&D directly or through national financial instruments (for example, the National Research Program, PNR, defined by MIUR and including strategic priorities and actions for agriculture and rural development proposed by MIPAAF)<sup>3</sup>. The Regions and Provinces have the same praxis often with regard to specific regional laws. In fact, they also can identify research programmes and autonomously fund research projects tailored to the specific requirements of their local agriculture and agro-industry system (Constitutional Law n. 3, 18/10/2001).

Regarding to Extension, the Regions support services for farms using both European, national and their own funds. Since more than ten years, they have promoted public calls (for public and private bodies) that are specialized in different services to the farms. The Northern and Central Regions involve the same number of private bodies and public institutions<sup>4</sup>, while the Southern Regions involve more public institutions (64%). Compared to the '90s, the situation has changed. In fact, another survey has emphasized a major involvement of the public organization both in the Northern and the Southern Regions. Another aspect to highlight is the type of private bodies involved; in fact, the organizations connected with agricultural trade unions are decreasing, in favour of the agricultural products associations or/and of groups of private advisers.

Figure 2 – Advisory bodies in Italy



Source: National Institute of Agricultural Economics (INEA)

**Major changes over the last decade** – The principal changes occurred in the Italian AKS and regarding the system organization essentially concern:

- the national law (D.L. 204/98) on reorganization of the whole public research system has provided instruments and established rules to program, finance and evaluate research and to reorganize the public research structure;

<sup>3</sup> See the text below for more details about these financial instruments.

<sup>4</sup> The information used in this paragraph is collected in a research (2004 -2006) of the Interregional program “Agricultural development services”, funded by the Ministry of Agricultural, Food, Forestry policies; the results regarding the Northern Regions overestimate the number of public institution because they do not include the situation of Emilia-Romagna, the Italian Region that has chosen to fund only private bodies.

- the reorganization of the public research institutes (D.L. 454/99 – Law n. 137/02) resulted in fusions, new structures and new competences. For example, the Institutes for Research and Experimentation of the Ministry of Agriculture, Food and Forestry policies have been reduced from 23 to 1, named “Council for the research and experimentation in Agriculture” (CRA);
- in 2001 the Italian Constitution was - in part - changed (Constitutional Law n. 3/01) in favour of a more recognized and a more active role of the Regions in the agricultural research field, in order to take account of the diversity of local situation and problems;
- in the 2000-2006 period, the European Commission cut down the funds generally assigned to the development services but many Regions did not replace them with their own funds, only assuring the functioning of the public structures and the basic services; as a consequence, services’ supply was reduced;
- some reforms of the University System regarded the reorganization of the structures and the evaluation of outcomes. These reforms demanded the University a number of changes that are still in place and that actually are creating a sort of confusion among the users of the educational services;

The reorganization of public institutes and the University reform are still on going.

## **2. Objectives, priorities, and outcomes**

- **What is the government policy regarding the nature, scope and role of AKS (and its components)? What major policy developments have occurred during the past decade?**
- **What are the main objectives of AKS (and its components)? How have these changed during the past decade? What are the main instruments to achieve those objectives? How have these been developed during the past decade?**
- **How are priorities set for AKS as a whole (and for its components)? What major changes in priorities have occurred during the past decade?**

**AKS policy** - In Italy it is possible to identify a specific policy for each AKS component, with different roles and objectives.

**Higher Education** – In the last decade the national policy for Higher Education in agriculture has had a twofold objective:

- to provide theoretical and specialized skills,
- to rationalize the expenditure for the University structures and their organization.

While the educational activities continue using the traditional instruments (i.e. University courses, post-graduate courses like grants, masters and Ph.D. courses), the reorganization of the system has been planned through a national law (Law N. 240, December 30, 2010) concerning and determining in particular:

- a new role for decision-making bodies,
- the participation of the society in these bodies,
- a reduction of the number of chairs and specializations.

**Research and Development** – For this component coexist:

- a national policy, aimed at promoting both basic research (carried out mainly by the Ministry of Education, University and Research) and applied research (carried out mainly by the Ministry of Agriculture, Food and Forestry policies), through national programs (often pluri-annual, as in the case of the National Research Programs, PNR) or specific sectoral plans;
- a regional policy, aimed at promoting applied research and testing of innovations at local level through planning and implementation of regional programs.

Agricultural research is funded through:

- public calls, defined through a specific set of rules indicating eligibility criteria for applicants, evaluation criteria for the presented proposals, funding scheme, and issued on the basis of European and national regulations;
- direct assignment, used for relevant research actions of public interest and carried out by specific expertise;
- negotiated procedures, according to the above-mentioned pluri-annual programs.

The role of European policy and its instruments and funds for the 2007 – 2013 period is also particularly relevant.

The Ministry of Education, University and Research (MIUR) is responsible for the National Operative Program (PON) about “Research and competitiveness”, consisting in research and technology transfer activities including also agri-food issues. This Program is aimed at supporting the Convergence Regions (i.e. territories with a lower level of development). The Program has a budget of approximately 6 billion and 200 million euro, half of which will be established by the European Regional Development Fund (FESR).

The Regions are responsible for Rural Development Programs (RDPs) including a specific measure aimed at improving the innovation diffusion (Measure 124 “Cooperation for development of new products, processes and technologies in the agriculture and food sector and in the forestry sector”).

The total amount of the resources of the measure is more than 175 million € for all the Italian Regions.

**Extension.** – Every Region has a specific Extension policy, which is regulated by regional laws, regarding also applied research in agriculture (according to an integrated approach generally developed and introduced in the regional legislation since 2000).

The main objectives of the regional Extension policy are:

- technological transfer,
- farm competitiveness,
- cross-compliance,
- rural animation,
- diversification,
- food safety,
- environmental impact.

In more recent years, the Extension policy has become more connected with the objectives of the Common Agricultural Policy (CAP), in particular regarding the last three points above- mentioned.

For the 2007 – 2013 period, again the Extension policy is provided by the European Union (EU) that has instituted the Farm Advisory System (FAS) with the Reg. EC n. 1782/2003. In particular the European Agricultural Fund for Rural Development( EAFRD) has financed some measures of the regional RDPs above mentioned regarding:

- vocational training and information actions including diffusion of scientific knowledge and innovative practices (111),
  - use of advisory services by farmers and forest holders (114);
  - setting up of farm management, farm relief and farm advisory services, as well as of forestry advisory services (115);
  - a training and information measure for economic actors operating (331);
  - a skills-acquisition and animation measure with a view to preparing and implementing a local development strategy (332).
- **What major changes have occurred in programs, staff numbers and funding levels of AKS and its components during the past decade?**

- **What changes have occurred in student intake by area of study within AKS and level of degree/diploma? How do these changes relate to existing or expected future employment opportunities?**

**Higher Education** - The most important initiatives implemented by the University system regard the organization, the governance and its instruments.

The system of Higher Education, especially in the last two years, has undergone further changes aimed at reducing public spending and - in part - at rationalizing the system as a whole.

The more recent reform of the “Education system” (Law N. 240, December 30, 2010) affects also the organization of the Faculties of agricultural sciences. In fact, reductions in the number of degree courses, of departments and also of Faculties are still ongoing.

Students subscribed to the Faculty of Agriculture in the academic year 2009/2010 were 27.672 (in the academic year 2005-2006 they were more than 40.000), while students registered were 8.277. Almost 6.000 of them were registered to a University course for the first time.

With respect to the previous academic year, there has been seen a slight decrease on the total enrollment (-1.2%), reflecting the general decline of students enrolled in the Italian universities occurred in the more recent years.

However, it is worth emphasizing an increase (+5.2%) of students registered. In 2009, in the Faculties of Agriculture, 3.921 students graduated (1.3% of the total number of graduates), showing a decline from the previous year of about one percentage point.

**Research and Development** – This component has had an important general reform derived from a national law (D.L. 204/98) that introduced a more structural process for the research governance. It provided the research system with planning, coordination and evaluation instruments.

In particular, the evolution of the Italian public research system has focused on two objectives:

- the evaluation of research in terms of scientific output (as well as organization and management)
- the promotion of a functional and more effective link between research activities and policy guidelines.

As a result of this new approach:

- three National Research Plans (2001-2003, 2005- 2007, 2010-2012) have been issued,
- some official committees have been constituted (Experts committee for research policy, science and technology council etc.),
- a research evaluation committee has been founded and the first evaluation exercise carried out (in 2004), while another has been started.
- some official committees are constitute (Experts committee for research policy, science and technology council etc.),
- new ways of funding research activities have been promoted, increasingly linked both to:
  - the possible forms of cooperation: partnerships aimed at the submission of projects; permanent consultation groups to define the research question;
  - the thematic priorities identified by the policy.

The agricultural research system is involved in all the initiatives above mentioned.

The involved Ministries (MIUR and MIPAAF) have promoted several initiatives to stimulate the research institutes to work on specific topics.

In detail, the Ministry of Education, University and Research (MIUR) has financed research through:

- Projects of Relevant National Interest (PRIN), that involve only the university structures on free research topics,
- Investment Fund for Basic Research (FIRB), that involves all the Italian research structures on general research topics promoted by specific public calls,

- Additional Special Fund for Strategic Research (FISR, D.L. 204/98), that involves all the Italian research structures on applied research promoted by specific calls,
- Fund to Facilitate Research (FAR, D.L. 297/99), that involves enterprises on applied research promoted by specific calls.

The Ministry of Agriculture, Food and Forestry policies (MIPAAF) has financed essentially specific initiatives dedicated to applied research.

In recent years there have been issued calls on specific topics such as: organic farming (18 projects for 24 million €), nursery (30 projects for 5.5 million €), bio-energies (31 projects for 10 million €), or on topic different at the technical level but with a very specific target such as the calls open to the small and medium enterprises (SMEs) conducted by young entrepreneurs (53 projects for € 4 million).

Table 1. Agricultural research public funding (thousand of euro) per Ministries

	MIUR			TOTAL (a)	MIPAAF		TOTAL (b)	TOTAL (a+b)
	PRIN	FIRB	FISR*		DG policies	DG fishery		
2001	7.225	16.060	-	<b>23.285</b>	16.338	4.264	<b>20.602</b>	<b>43.887</b>
2002	8.567	-	24.031	<b>32.598</b>	28.308	4.264	<b>32.572</b>	<b>65.170</b>
2003	9.423	5.490	-	<b>14.913</b>	26.603	4.264	<b>30.867</b>	<b>45.780</b>
2004	9.534	-	-	<b>9.534</b>	30.465	4.264	<b>34.729</b>	<b>44.263</b>
2005	8.625	...	-	<b>8.625</b>	54.739	2.400	<b>57.139</b>	<b>65.764</b>
2006	5.471	7.686	-	<b>13.157</b>	13.478	2.031	<b>15.509</b>	<b>28.666</b>
2007	1.127	-	-	<b>1.127</b>	29.581	...	<b>29.581</b>	<b>30.708</b>
2008	...	-	-	<b>0</b>	58.206	...	<b>58.206</b>	<b>58.206</b>
<b>TOTAL</b>	<b>49.972</b>	<b>29.236</b>	<b>24.031</b>	<b>103.239</b>	<b>257.718</b>	<b>21.487</b>	<b>279.205</b>	<b>382.444</b>

Source: INEA (several years)

\* The FISR funding for projects was also supported by MIPAF, that in the period 2001-2004 has contributed with more than 15.000 €.

With regard to the data in the previous table, it is important to specify that they do not coincide with the total cost of the Italian system of public agricultural research, because they do not include the ordinary financing, covering the fixed costs of management and the research activities of public institutes (so called “institutional research”).

The MIPAAF had a relevant role also regarding to the Interregional Programs funded by a national law (L. 499/1999). Through these funds it was possible to support the cooperation between Regions having the same type of agriculture.

In the period 2003-2009, 11 Interregional research projects were realized covering 11 topics: vegetable proteins, seeds, fruit farming, organic animal husbandry, olive growing, horticulture, flower growing, grassland and animal husbandry, cereal farming, no food productions, wine growing.

These complex projects were co-financed and coordinated by the Ministry of Agriculture, Food and Forestry policies and directly managed and implemented by the Regions. The overall cost was more than 9 million euro.

The Regions finance research especially through regional laws: their role has increased to reach a funding level comparable to the national amount of financial resources (in terms of average expenditure per year and per Region). In fact, in 2004-2008 the expenditure for agricultural research projects of 12 Regions<sup>5</sup> was about 140 million € (with a regional average of 2,3million € per year).

Since 2002, a relevant interregional initiative has been implemented, funded exclusively by the Regions involved: the creation of an “Information system on the agricultural regional research”.

<sup>5</sup> Data are available only for 12 Regions for the entire period 2004-2008. The sources are: a specific survey on regional research system carried out by the National Institute for Agricultural Economics (INEA) in 2009; the database of the same Institute on agricultural regional researches.

It consists of a network system – a database which can be consulted and updated directly on-line - for collecting and spreading information on regional research activities in agri-food and agri-environmental sectors, created and managed by the National Institute for Agricultural Economics (INEA), on behalf of the Regional Referents Network of agricultural research, which is an interregional coordinating organization recognized by the Conference of Presidents of the Regions and the Autonomous Provinces.

The initiative started thanks to the Italian Regions’ interest to coordinate their efforts in achieving a wide dissemination of knowledge and experience in the above mentioned fields<sup>6</sup>.

The overall aim of the project is to provide the regional policy makers with a multimedia information system (an on-line database) on the main aspects of agricultural research financed and promoted by the Regions (institutions involved, projects, objectives, main contents, financial resources), in order to start up a coordinating process aimed at the appropriate allocation of the financial resources available.

Over time, other operational objectives have been added, such as:

- to promote an active participation of research institutes;
- to find a more efficient meeting point between agricultural research supply and demand.

At present the on line-database contains the synthetic information on more than 1600 regional researches (financed by the majority of Regions involved starting from the year 2000) and produces statistics and analysis which are useful - to policy makers, researchers, etc. - for verifying the evolution of regional agricultural research in terms of funds, objectives and contents.

**Extension-** The main fields of Extension service funded by public institution are: specialized technical supports (33%), basic extension services (32%), specialized extension services (14%), information services (6%).

The first two fields represent the most traditional extension services in Italy. “Technical supports” are those activities collecting and processing data useful to the agricultural processes by means of advanced level technical instruments (for example, the meteorological networks and chemical laboratories). They are usually funded by public institutions because they involve high investment costs and the extension organizations can not afford them. Actually, these services are expensive also for the public, but their funding is not put in discussion since these technical supports are extremely useful for surveys and investigations on the environmental impact or the food quality.

The “Basic extension” is a kind of all-purpose assistance given to farmers, but nowadays its use has been reduced since the farms are often specialized and so they need rather expert advice.

However, taking account of all the Regions, the field of interest for the public supported Extension is very broad and varied and, as the following pattern shows, they have needed a complex system of classification to include everything.

#### EXTENSION SERVICES CLASSIFICATION

##### *First level services (target: farms and local territories)*

<p>a. Information</p> <p style="padding-left: 20px;">a1. Technical magazines</p> <p style="padding-left: 20px;">a2. Fairs and exhibitions</p>	<p>b. Basic and local services</p> <p style="padding-left: 20px;">b1. Cultural activities</p> <p style="padding-left: 20px;">b2. Basic farm advises</p>
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<sup>6</sup> Up to now, 15 Italian Regions (Piemonte, Lombardia, Veneto, Friuli Venezia Giulia, Liguria, Emilia Romagna, Toscana, Umbria, Abruzzo, Lazio, Campania, Puglia, Basilicata, Sicilia e Sardegna) have taken part to this project. At present, over 1.600 regional researches, financed by the majority of these regions starting from the year 2000, have been registered in the above-mentioned database, which can be consulted and updated directly on-line. For further information, go to the database site (<http://www.bancadati regioni.inea.it:5454/index.html>).

a3. Conferences and seminars a4. Other		b3. Technical advices b4. Marketing advices b5. Customer advices b6. Other
c. Advanced level support services c.1 Network of environmental monitoring c.2 Specialized supports c.3 Marketing promotion c.4 Networks, data base and multimedia c.5 Other	d. Product specialized services d1. Test d2. Technical advices d3. Marketing advices d4. Farm advises d5. Other	e. Managerial services e1. Accounting e2. Managerial and financial advices e3. Support to implement policy e4. Other

*Second level services (target: technical organizations)*

f. Planning and management advices g. Analysis of innovation demand h. Other
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*Source: National Institute of Agricultural Economics*

In 2004-2007 the same national law above mentioned (L. 499/1999) funded another Interregional Program regarding the agricultural development services aimed at:

- providing training for the agricultural extension technicians on the main topics dealing with the rural development policy;
- testing new models, methodologies and instruments for agricultural Extension (information, training and advisory in rural areas) with a multiregional approach for the respective activities.

The overall cost of these activities was five million € and involved directly all the Regions.

Currently, the Regions have a great involvement in the implementation of the RDPs measures above mentioned: the total amount of the resources for the three measures on Extension services (111, 114 and 115) is more than 460 million €.

In particular, the public expenditure planned for the measure 114 (use of advisory services by farmers and forest holders) is almost 210 million € and the expenditure planned for the measure 111 (vocational training and information actions including diffusion of scientific knowledge and innovative practices) is more than 230 million €.

- **What has been the impact of developments in the agricultural sector, markets, and policies, and consumer demand on priorities and functioning of AKS during the past decade?**
- **How has AKS contributed to agricultural and food policy formation, to public understanding of policy issues and to policy implementation during the past decade?**

Every component of the Italian AKS adapts its own strategy and priorities to the changes occurred to the agri-food sector. In the last decade, the main consequences have been:

- the enlargement of the topics towards other areas of expertise, areas considered non-traditional for the agricultural sector like environment, climate, tourism, social subject etc.,
- the increase of interdisciplinary works,

- the need to promote training activities for researchers, technical and administrative staff, advisors etc.,
- the risk to cause a mix-up between the roles of the different organizations and a reduction of the specialization especially for the research institutions,
- the great expansion of the applied research vs basic research,
- the difficulty the advisory bodies have in adapting to the farm needs that change very quickly.

In Italy there is not an institutional procedure that directly links agricultural and food policy with the AKS. For instance, there isn't an institutional committee in which are represented the AKS components (one of these or all) or sharing processes to define the contents of the development projects.

However, when the public institutions have to promote a specific change or to implement the objects of the European policy, they use the outcomes of research and consult the experts in order to promote meeting, white paper, specific committee and so on. Traditionally, Research and Development are the components more involved; the role of Extension and Higher education is less important.

With regard to the Extension, the problem of the services system isolation is much debated in Italy because they often are not able to organize their own structures in order to interact more effectively and efficiently with policy makers.

This difficult situation is caused by the unbalance of the public Italian extension system that does not receive a continuous commitment from the public institutions.

For example, in the period 2000-2006, the European policy neglected the extension field and many Regions did not replace the European funds with their own funds, only assuring the functioning of the public structures and the basic services.

This situation does not allow a structural solidity to the system, especially with regard to the management and the organization of bodies offering specialized services to the farmers.

### *3. Relationships and networking*

- **How does AKS relate to the general scientific/educational community? How does AKS relate to any general science policy? How does AKS relate to the general higher education policy? Are there separate research institutes and higher education institutes dealing with agriculture or do AKS activities occur in general institutions?**
- **What opportunities for co-operation between AKS and other possible partners (e.g., the private sector) have been developed in research, extension and higher education?**
- **How have relationships between AKS and various client groups, (e.g., the public, consumers, food processors, farmers, input suppliers, public agencies) evolved during the past decade? Have new kinds of networks emerged? Have different kinds of networks emerged to address different issues?**

The relationship between AKS and the general science policy is a task of public official institutions (Ministries and Regions) that are joined in committees or/and agreements concerning the general planning (National Research Programs - PNR, Operative National Programs – PON, etc.) and the general strategy or priorities. However, the AKS components relate to the general scientific/educational community through the specific research projects that are carried out.

As mentioned above, the topics that in the last decade have involved the agricultural sector (i.e. food, environment, climate, tourism, social subject) have also encouraged the research and educational interdisciplinary.

Since the first National Research Program (2001), the Ministries have decided that the Higher education should be connected with Research and that the projects funded at national level should include post-graduate (i.e. grants, masters, etc.) and Ph.D. courses.

Also the Ministry of Agriculture, Food and Forestry Policies allocates financial resources in favor of Higher education through a specific budget chapter used by the CRA that promotes research training, fellowships for graduate students, Ph.D grants in collaboration with the University. This funding amounts approximately to one million euro per year.

Until two – three years ago, the research institutes and higher education institutes dealing with agriculture were separated from general scientific institutes, but recently, as a consequence of the University reorganization, there has been the unification of the research/higher education structures not taking into account the disciplinary boundaries but rather more general topics (for example: economy of product systems , etc.)

The co-operation between AKS and other partners have been developed through the following activities:

- the supply chain committees that have been constituted by the MIPAAF involving private associations, institutional representatives, researchers in order to define the main problems of the different agricultural sectors (cereals, viticulture and wine, oil, agro-energy, sugar beet, tobacco, horticulture, floriculture, animal husbandry, dairy products, nuts),
- Italian Bio-Economy Technology Platforms that result from the European Technology Platforms, having the same objectives of the above committees but more aimed to the technology innovation in industrial processes,
- the public-private laboratories that have been promoted by the MIUR to develop the cooperation between public and private research,
- the orientation (tendency) of the MIPAAF to fund the research projects that have the farm representatives and other private bodies into the project group.

These initiatives regard mainly the Higher Education and the Research components, less the Extension one.

#### ***4. Internal AKS co-operation***

- **How do the components of AKS relate to one another? What developments have occurred during the past decade?**
- **What opportunities for increased cooperation among the components of AKS have been identified and what mechanisms have been developed to encourage AKS cooperation during the past decade?**

The debate on the importance of the relationship between the AKS components has been a distinctive Italian approach for the last twenty years.

If in the '90s the subject matter was the agricultural services system, in the last decade it was the agricultural knowledge network, an approach less constraining that enhances all the components and does not stiffen the roles and the competences.

Unlike the above considerations, the internal AKS co-operation has been a strength of the Extension that has the task to connect the farmers with the research world. Besides the Extension is an expression including many different activities that all contribute to the farm development (information, demonstration, advisory, testing, divulgation etc.) which are the task of different bodies and institutional levels.

Consequently, the regional laws on AKS are system's laws that:

- specify the roles and tasks of the different components,
- try to promote the relationship between them funding the extension projects when they include different extension activities.

In the first years of the last decade the MIPAAF with the Regions implemented some important initiatives to connect the Research and the Extension with regard to technology transfer projects. The advisors and the researchers worked together into 77 innovative projects that spent more than 50 million euro.

However, in the last years the attention on the links between the AKS components has been reduced at all levels, also in connection with the Farm Advisory System and the other Extension initiatives promoted by the European policy for the rural development. In fact, this European action is very fragmented because provides many different measures with extension objectives not connected each other and does not provide the research activities.

Then the deregulation, typical of the network, is getting the upper hand over the coordination. The MIPAAF and the Regions are working together to deal this matter with specific initiatives.

### **5. *Cross-country co-operation***

- **What have been developments in international cooperation among developed countries and emerging economies, and with developing countries?**
- **What were the drivers of recent developments and is there scope for further co-operation?**

In Italy there are two levels of cross-country co-operation: the institutional level and the AKS structures level.

The public institutions more involved are national: MIUR and MIPAAF. In the last 10 years, their presence at international initiatives has been strengthened in two directions:

- actively participating in some programming bodies like the Standing Committee for Agricultural Research (SCAR, MIPAAF is the Italian - IT delegate) and the Joint Programming Group (GPC, MIUR is the IT delegate);
- increasing the direct involvement of research funding bodies in the coordination of research at international level (ERANETs and JPIs).

Since 2005, seventeen Collaborative Working Groups (CWGs) have been set up by the European countries engaging voluntarily and on a variable-geometry basis in the definition, development and implementation of common research agendas in the field of agricultural research. MIPAAF has ensured the participation of IT in most of them, five evolved in ERA-NETs scheme.

Italy has taken part to 80 ERA-NETs: 15% of them directly dealing with agriculture, food and forestry issues while another 11% concerning agri-environment and related issues (biodiversity, water, renewable energy, climate change, biology and biotechnology infrastructures).

The Ministry of Agriculture, Food and Forestry Policies (MIPAAF) is the main participant in the agricultural related ERA-NETs (75%), being present in:

- CORE Organic (I and II) on organic food and farming; two calls have already been launched with a total budget of 2.4 million euro (virtual common pot) available for the Italian research community to participate in transnational research consortia;
- EUPHRESKO (I and II) on plant health; one call has been issued with a mixed financial mechanism (virtual and real common pots, depending on topics) and a budget of 290.000 euro available for IT researchers participating in transnational projects;

- EMIDA on animal health; MIPAAF jointly participates in this ERA-NET with the Ministry of Health and they have made available a budget of 3 million euro for the participation of IT researchers to the transnational call launched in 2009;
- ARIMNeT on Mediterranean agriculture; the first joint transnational call will be launched in summer 2011;
- WoodWisdom-Net2 on forest based materials; two calls have already been launched and in the second one MIPAAF has made available to the researchers involved in transnational projects a budget of 300.000 euro;
- ICT-AGRI on ICT & Robotics in agriculture; a joint call has been issued in 2010 and a budget of 650.000 euro has been made available by MIPAAF for the participation of IT researchers to transnational research projects;
- RURAGRI on rural development; the set up of a common strategic research agenda on the basis of which to start joint activities is ongoing.

Under the 7<sup>th</sup> Framework Program (FP7), another instrument has been launched at the end of 2008: it is the “Joint Programming”, a voluntary partnership between Member States (and associated countries). Two of the 3 JPIs ("first wave"), adopted by the Council in 2010 deal with agriculture and food:

- Agriculture, Food security & Climate Change (FACCE), jointly coordinated by France and United Kingdom (FR & UK);
- Health, Food and prevention of Diet related diseases, coordinated by Netherland (NL).

The MIPAAF Research Office is participating in both initiatives, jointly with MIUR in the first one and with MIUR and the Ministry of Health in the second one.

The AKS structures having more international relationships are the research institutions. In fact, many Italian research groups have continuous connections with the colleagues of the other countries regarding the specific topics of their studies. This habit has been increased by European initiatives to finance research, especially the Framework Programs.

A good experience of cross – country cooperation in Extension Services regards the involvement of the Italian Regions in the debate on the reform of the Farm Advisory System (FAS) after 2013. The Regions prepared a proposal that was submitted to the European Commission and to the other countries in occasion of some official meetings (organized by JRC), and that was very appreciated.

## ***6. Toward the future***

- **Please describe the outcome of any self assessments or evaluations of changes which have occurred in AKS and its components during the past decade? What lessons have been learned in order to guide the activities of AKS in the coming decade?**
- **What major challenge is your AKS expected to face during the coming decade?**
- **Please give a general overview of experience/proposals for greater cooperation/coordination/integration among research/higher education/extension and suggest any conclusions from your country experiences, which you would wish to bring to the attention of the Joint Conference.**

The Italian AKS consists of a great number of decisional levels, structures, initiatives and human resources.

The main objectives of the last decade were:

- connecting Research and Higher Education to the development policy with the instrument of planning, evaluation and coordination,
- connecting Research to Extension with experiences of common projects,

- promoting the competition between public, public and private, private bodies by means of public announcements and other procedures,
- promoting a coordination between the Regions,
- implementing the European policy especially with regard to the new agricultural functions and the environmental impact,
- taking part in international initiatives,
- reorganizing the Higher Education.

These activities have incremented the products and the actors of the system, have improved the relationships between the components but have reduced the level of general coordination and the interest to the effectiveness of the same activities.

Then the major challenge regards three issues:

- the implementation of an institutional coordination that commits both the public institutions and the research structures,
- a major commitment in the demand analysis and evaluation impact,
- a strong investment on the expertise and skills of human resources involved.

In reference to the first point, the institutional coordination can be useful to define some common priorities, approaching them with a great number of initiatives. It is necessary especially in the current period of financial crisis.

In reference to the second and third points, it is important that the public initiatives become more connected to the more structured system of monitoring and evaluation, and that the researchers and technicians can use a more efficient system of “on going training” especially for the choice of the correct work methods.

These conclusions are also sustained by two studies that were promoted by two Italian Regions in the last decade. The first had the objective to check the diffusion (to the farms) of the research results and was financed by the Piemonte Region. The second had the objective to evaluate the efficiency and the effectiveness (in terms of impact on the territory) of the regional spending on agricultural research; it was financed by the Emilia-Romagna Region.

According to the experimental results of the Piemonte’s study, the innovations had a major diffusion when some essential requirements were present at the same time :

- a lively and dynamic production background,
- a rigorous scientific activity,
- a local agricultural knowledge network connected with the farm system and the other rural bodies,
- a regional governance of research/extension activities supporting processes and monitoring results.

The task of the policy would be taking away the causes that obstruct this positive coincidence of situations also applying to actions not peculiar to the AKS policy, but in any case connected with the development policy. The AKS policy and structures should coordinate using these actions and the best methods in every situation.

The need of coordination within the AKS system and between the supply side and the demand side of research emerges also from the study conducted for the Emilia-Romagna Region. The study focused on the analysis of the agricultural R&D co financing carried by the Region between 2001 and 2006 according to the pluri-annual programme established by regional law LR 28/98.

The principal messages derived from the analysis can be summarize as follows:

- it is necessary to create and improve a “unique control room” as the only national leader of inter-regional task force (it is already existing but needs to be more recognized)

- a stronger collaboration and more effective coordination between the regions are desirable for the purposes of the definition of common practices:
  - a common methodology for assessing the impacts of research
  - experimenting new forms of innovative financing and cooperation methods between research structures.

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