

Agricultural knowledge and systems in Basilicata, southern Italy: key actors and implementation of dialogue

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Abstract: *Research and innovation plays a very important role in rural policy. Many studies have been dedicated to increasing the number of multiple actors who can share knowledge and support innovation, dissemination and the implementation of new products, processes and technologies in the agro-food-forest sectors. The 2007-2013 Basilicata Rural Development Programme (RDP), using Measure 124, began collective, co-operative learning processes ensuring that regional research and innovation actors worked together to develop new products, processes and technologies to contribute to the diffusion and growth of knowledge in Basilicata.*

European Innovation Partnerships (EIP) appointed by the 2014-2020 European Union Programme proposed a new interactive multi-actor approach for rural innovation and research projects, to be implemented by Operational Groups (OGs) on the basis of company knowledge and co-production using the 2014-2020 Basilicata RDP Measure 16.1. On 13 April 2017, a Public call "Support for the establishment and operation of the EIP OGs on productivity and sustainability of agriculture", was published and partnerships established OGs in Basilicata.

New relationships and regeneration produced a "bio-economic Cluster", creating "smart" specialization and a system linking research, innovation and the enterprise world. The Cluster consolidated competence and knowledge in small and medium enterprises, including agriculture and forest farms and encouraged the dissemination and implementation of innovative products and processes. Creating this system was a shared objective in Basilicata through horizontal and vertical collaboration between research organizations and the enterprise world in order to introduce innovations for companies and rural territories.

This paper analyses the relationships between scientists, advisors and small and medium enterprises through interviews with experts from the Cluster in order to establish OGs.

Keywords: *knowledge system, rural actors, research and innovation policies*

1. Introduction

Agricultural knowledge and innovation have become known as strategic elements in the growth and development of organizations and local and regional territorial systems, providing fundamental development leverage in building dynamic competition and generating challenging opportunities in a rapidly changing European and International context (Di Iacovo, 2016). Technological innovation has long represented the basis of modernization and economic development, however, it cannot respond alone to the complex and numerous requests from the market, making it important to underline the necessity of finding new solutions which impact both society and institutions. As a result, organizations, customers, citizens, public and research institutions and their partners need to be innovative. In 2000, the European Union began focussing on political interventions to promote the knowledge system, and, in 2010, reinforced it with the "2020 European Strategy" for "smart" growth based on knowledge and competitiveness, environmental "sustainability" and "inclusiveness" favouring employment and social cohesion (Zanni, 2016). The knowledge system also includes "social innovation" which uses new tools and solutions to help resolve economic crises and global dilemmas such as climate change, scarcity of energy resources, health and social inequality via citizen participation and stimulating public service and institution collaboration with

the intention of contributing to and improving quality of life. Actors must modify their actions individually and collectively to contribute to redefining attitudes, procedures and norms across a community process transforming social and institutional practices (Conger, 1974; Godin, 2012; Moulaert&Nussbaumer, 2005). Economic action enters into communities local social dynamics, usually through bottom up collective practices which evolve vertically and multi-sectorally in both public and private sectors. The knowledge and innovation system in Basilicata, southern Italy is represented by a network of universities, research bodies, advisors, training providers, agricultural schools forestries, farms, unions, etc, who, through experience and competence, activate the rural innovative model (Vagnozzi, 2015).

Interactive innovation was introduced in the 2007-2013 RDP using Measure 124 “Co-operation for the development of new products, processes and technology” a co-evolutionary learning process between diverse actor typologies (Enrd, 2013), encouraging a pre-competitive collective development of new products, processes and technologies in agro-food-forestry organizations. RDP Measure 124, activated at different times, was directed at facilitating the transfer of innovations and increase competitiveness in agro-food sectors. The Partnerships are the beneficiaries of RDP Measure 124 in the form of temporary companies with at least one primary producer and/or other members of the supply chain and research centres in the agricultural field. 73 Partners worked on 39 “Co-operation for the development of new products, processes and technology” projects, 62% were primary producers in the supply chain and 38% were research centres from both the regional and national public and private sectors who have responded positively to the solicitation of the RDP for interactive innovation. The Basilicata University (UNIBAS) played a significant role, over 50% in total of the research organisations who participated. The research world benefitted during this process, a positive experience in terms of innovation and multi-actor interaction, responding to the real needs for the growth of businesses, primary sector and agro-food organisations. RDP Measure 124, at a regional level, contributed to the creation and/or reinforcement of the relationships between different actors in the development of rural areas, in particular, between businesses and the world of both public and private research (Cristiano, 2016). The multi actors, multi disciplinaries (bioenergy, marketing) and the supply chain approach characterise the Basilicata partnership allowing rural productive systems to create important sectorial interconnections.

In August 2016, the Basilicata region began the complex process of interactive innovation for agricultural productivity and sustainability.

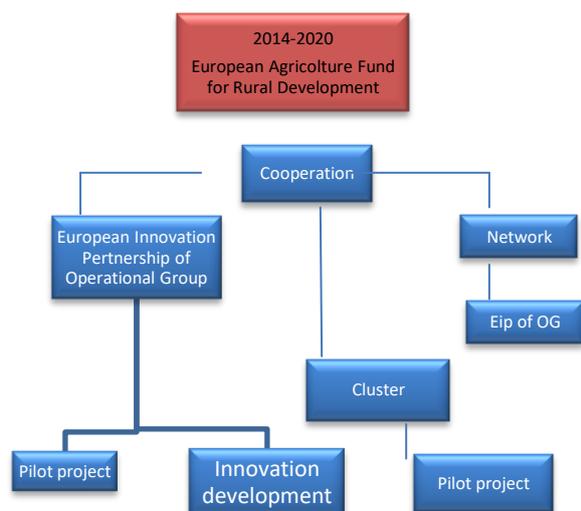


Figure. 2 Innovation paths for agricultural productivity and sustainability
Source CREA's processing

The Basilicata bio-economic Cluster shared its positive partner learning experiences learning from previous programming, involving the territory and valuing its strengths and productive specialisms without impacting in many small innovation projects. This Cluster was created in accordance with European Regional Development Fund (ERDF) 2014-2020 rules to meet diverse territorial needs and understood how to work in other fields identifying development possibilities and carrying out diverse functions activating specific agricultural and forestry organization working methods. The Cluster was also an instrumental in sharing innovations proposed by regulation n.1305 in 2013, studied extensively in literature. The Cluster stimulates innovative economic activity by encouraging intensive interaction the joint use of structures and the exchange of knowledge and experience between productive organisations (Cristiano, 2014).

The principle of co-innovation was adopted at European level with experiences and models relating to those countries impacted by SOLINSA and PURE who had diverse partnerships and participants with very different co-innovation "structural conditions" (Hermans et al., 2015; Neef and Neubert, 2011).

2. Basilicata multi actor experiences

2.1 The Basilicata bio-economic Cluster

Rural Basilicata partnerships are represented by multi-actors and multi-disciplinaries (bio-energy, cosmetics, marketing). Agricultural and regional policy programming carried out by Basilicata University (UNIBAS) and research bodies have had positive experiences regarding innovation. Multi-actors have recognised the opportunity to review their activities and communicate and respond to actual growth needs of a company in an agricultural primary sector. The Basilicata Regional strategy for research and innovation, also known as "Smart Specialization Strategy" or "S3", was introduced via the ERDF 2014-2020 Operational Programme (OP) and added a further

dimension “entrepreneurial discovery” to maximise the participation of the key actors and to share strategy, mobilizing larger more active partnerships. This entrepreneurial discovery gives creative territorial leverage to support the emergence of new companies, new relationships and an improved programme from the alignment of and networking of actors. A relationship and responsibility system needs to be implemented between companies who have different titles, guaranteeing consistency and reinforcing the ability to provide and support strategies involving all stakeholders in the regional research and innovation system and reinforcing monitoring functions, evaluation and networking and qualifying the actions of territories. To overcome criticism of the economic and social system, the Basilicata 2020 vision plans to strengthen the districts using Clusters and existing networks, improving quality, usability and adding value to cultural heritage, the environment innovating and optimizing energy lifecycle, improving quality of life, human resources and training. In 2012, the Region began intense partnership consultation with the aim of co-designing the future mainly based on currently available social capital, in terms of experience, ability and competence. The future path should be based on projects which enhance or share what has already been achieved or is currently under construction. Five trajectories were identified through partnership processes and a specific focus on bio-economics (management of hydrological resources in the agro-industrial supply chain; genomic research for sustainable agriculture, precision and integrated; Health and Nutrition; sustainable chemistry; non technological innovation). The Basilicata Cluster was established in July 2016 to promote bio-economy in the Regional territory, favouring the development and the competitiveness of companies along the bio-economic strategic line, sustaining the construction of stable relationships between companies, research and services for the transfer of innovations. The Cluster represents a virtual model of a network between companies, research and innovation, thanks to the presence of all the actors in the agricultural supply chain willing and able to contribute to Regional economic development, and, above all, offer a permanent reference point to further develop proposals and support research policy and innovation. The Cluster has united all operators in public agricultural research: Basilicata University, CREA, CNR, ENEA and ALSIA with METAPONTUM AGROBIOS. 55 agricultural, food and environmental companies have joined the Cluster, representing the productive Basilicata sector well. The companies which have joined the Cluster, above all the PMI, belong to leading operating organisations in the production sector, harvesting and processing agro-environmental industry.

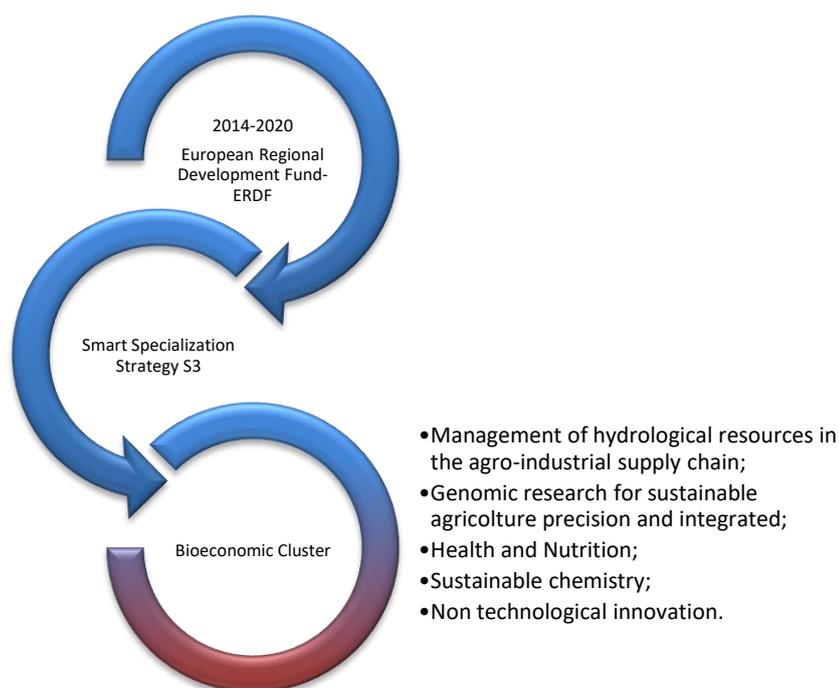


Figure. 2 Relationships between 2014-2020 innovation regional policies
Source: CREA's processing

The productive sectors which best represent the Basilicata agricultural economy (vegetable, olive-growing, wine and cereal production) are mostly organized in collective forms such as co-operatives, consortiums and associations of producers who have different needs in terms of innovation. In addition, by joining the Cluster, they have consolidated existing and newly established networks, representing new production specializations such as medicinal plants. The Research Table was established by Basilicata University who has played a technical-scientific coordination role in supporting the Cluster since the founding phase and in the various operational and planning routes. This Research Table was established in April 2014 and is still operational today. The research actors decided to work together for the first time to create common projects for the Basilicata regional territory. However, the construction of the Research Table required intense animation activity, necessary for a climate of trust and collaboration. In August 2016, the Research Table steered the Basilicata bio-economy Cluster to test its multidisciplinary aggregation capacity via project proposals in response to the Regional Public Notice for expressions of interest in establishing EIP's and OGs. The aim of the Public Notice was to gather project ideas for innovation, research and testing (S3 Basilicata) at regional and inter-regional levels for the agro-forest-environmental sector. Procedural constraints were not introduced by regional administration at this stage, e.g. list of eligible expenses, financial resources. However, free reign was given in the presentation of needs and innovations in partnership form regarding research subjects, dissemination, advice and business. The paper analysed dialogue from the Basilicata bio-economic Cluster and the role of the regional territorial facilitator for innovation and new and broader partnerships were conceived. This activity was conducted over a period of nine months in two successive stages: the expression of interest and the promotion of support for the establishment and management of OGs. This lengthy period is linked to three extensions to the deadlines for the delivery of the documents requested by the exploratory notice and in the support for the establishment and management of the EIP's and OGs. The requests for extensions are closely linked to the implementation of a quality program set by the Region. This study is the result of desk surveys (guidelines, calls, etc.) and qualitative analyses. Interviews were conducted with facilitators who participated in the analysis of innovation needs and the proposal for the establishment and management of OGs in the final phase. The results of interviews are reported in 2.2. The analyses shows active involvement and exceptional relationships skills from the operators in the fields of knowledge and innovation. Basilicata is slightly behind in the implementation of RDP Measure 16.1, however, it is in line with most other Italian regions. The 139 OG's (Trento, Bolzano, Veneto, Emilia Romagna, Umbria and Basilicata) commenced in December 2017; 196 projects are under establishment in the Marche, Tuscany and Puglia regions (National Rural Network, 2018).

2.2 Organisation Group: key actors and implementation of dialogue

Following suggestions from the Scientific Table, the Cluster (UNIBAS, CREA, CNR, ENEA, ALSIA and private companies) identified the following themes: cereal-growing, animal husbandry (meat and milk), viticulture, olive-growing, fruit and vegetables, wood forests, water management, sustainable and integrated precision agriculture, medicinal plants and sustainable chemistry. The IEP was a challenge for the Cluster in terms of improving specialised and sustainable agriculture and avoiding reduced company income. The exploratory public notice only reported a list of projects financed under the 2007-2013 RDP. As a result, the "Research Table" worked hard to organize those activities identified by the Commission in "Guidelines on programming for innovation and implementation of the EIP for agricultural productivity and sustainability" (December 2014) as well as the Strategic Plan for innovation and research in the MIPAAF agricultural, food and forestry sector (2014/2020). The Research Table then prioritized community interventions with actual regional productivity (supply chains, etc.) and the results were shared with companies from the Cluster. To identify innovative needs, the Cluster organized territorial meetings, co-ordinated by "facilitators", selected for their skills and experience (Measure 124 "Cooperation for the development of new products, processes and technologies" of the RDP 2007/2013, Horizon 2020, etc.). Three facilitators were chosen for each theme to identify company innovation needs and organized at least three meetings in the regional territory, all the meetings were carried out in line with the principles of inclusion. The facilitators, the Cluster and the Research Table were informed of these meetings using various communication channels (websites, etc.) which could reach a

larger number of companies and support the dissemination of RDP Measure 16.1. The first meeting focused on the needs of farms and companies and facilitators allowed the freedom to explore innovation needs, although, not always clear in an agricultural environment. A comparison of company typologies in Basilicata highlighted actual production requirements and the beginning of new relationships between entrepreneurs. During the second meeting, facilitators presented innovations provided by the Cluster, who had responded to priority needs. A list of innovations and common projects for future OGs was compiled from the results of an intense investigation, more than two months, and from testimonies from the second meeting. Research Table departments, centres, laboratories, etc. completed project surveys and identified national and international projects which could respond appropriately to the companies needs. The list identified pilot projects, new product development projects, practices, processes and technologies which could satisfy measure 16.2 of the Basilicata RDP. The facilitators stressed the importance of the Research Table and the Cluster and a multi-disciplinary approach which could be translated into the availability of a variety of common projects integrated into various actions, more adaptable to company needs. Analyses and planning timelines were lengthy with effort focused on meetings, discussions and co-design. Specific skills scientific, economic and sociological skills were drawn upon and technological aspects including innovations were also included in the development of organizational models, etc. This list also contained some research projects for the Basilicata S3 strategy. The project idea was developed during the third territorial meeting as specified by the public notice, with participants working on the project together. The partners who took part in the design process demonstrated their interest in participating in future activities and were also asked about the implications of the project, declining the role if necessary, depending on competence and availability in terms of execution, completion dates and financing. Facilitators highlighted that an active interest in collaboration in the development of innovations is necessary to respond to the market. The Bio-economy Cluster nominated nine project ideas for OGs in November 2016 and in April 2017, the Region issued a call for support for the establishment and management of the EIP Operational Groups, which included the setting up phase and the establishment of OGs. As a result, the Cluster was able to reinforce its initial ideas by aligning them with regional requirements (eligible expenses, procedures, etc.). In addition to the nine Cluster “themes” the Region introduced “transversal themes” and “minor supply chain” themes to respond to priority Community interventions and to the other requests from the territory. The Cluster informed previous partnerships of the Regional guidelines via the public announcement, requesting approval to implement the design idea. Based on this mandate, the Cluster tried to create, themes and project synergies with other interested public and/or private parties. This activity led to the creation, modification and expansion of the initial design idea in terms of activities and outputs. The Cluster was presented with fourteen OGs at the end of the activity. The interviews highlighted a great deal of enthusiasm regarding the strong relationship partnerships. The Cluster candidated twelve EIPs and OGs out of a total of twenty eight. The Basilicata administration approved twenty one projects and however only eleven were eligible and ten were from the Cluster. Corilus OG does not belong to the Cluster.

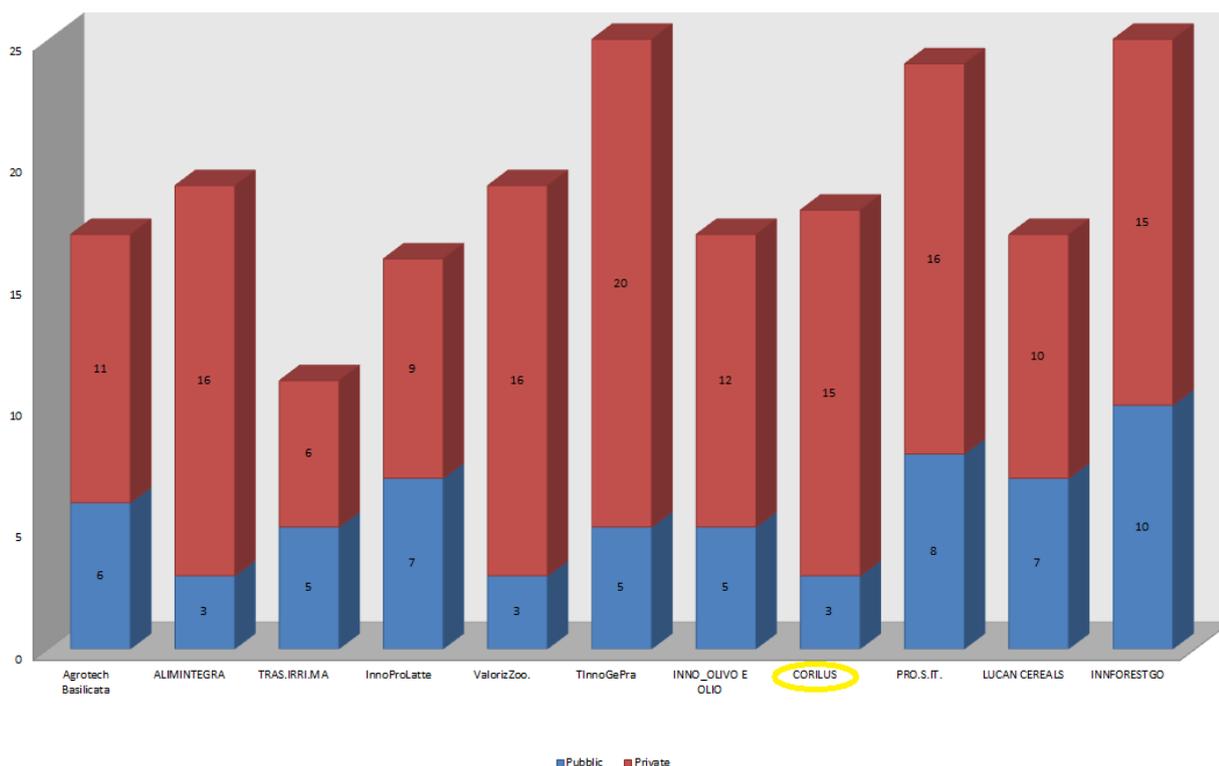


Figure 3 Public and private OGs.
Source: CREA’s processing on Basilicata Region data

190 partners engaged with the Cluster Partnership to establish OGs, 31% public and 69% private sectors. The public partners were exclusively represented by universities and research institutions and by farms and single and associate companies in the private sector accounting for 84%. A large number of partners were engaged with the OGs in the fruit and vegetable, viticulture and forest sectors. The first two sector percentage involvement is justified as they are well organized at a regional level, however, the forest sector required more commitment from the OGs as it was not well organized. An increase in the participation of agricultural, forestry, food companies, advisors and other enterprises (marketing and agro-environmental sectors) was noted for Partnership EIPs compared with the 2007-2013 RDP Measure 124.

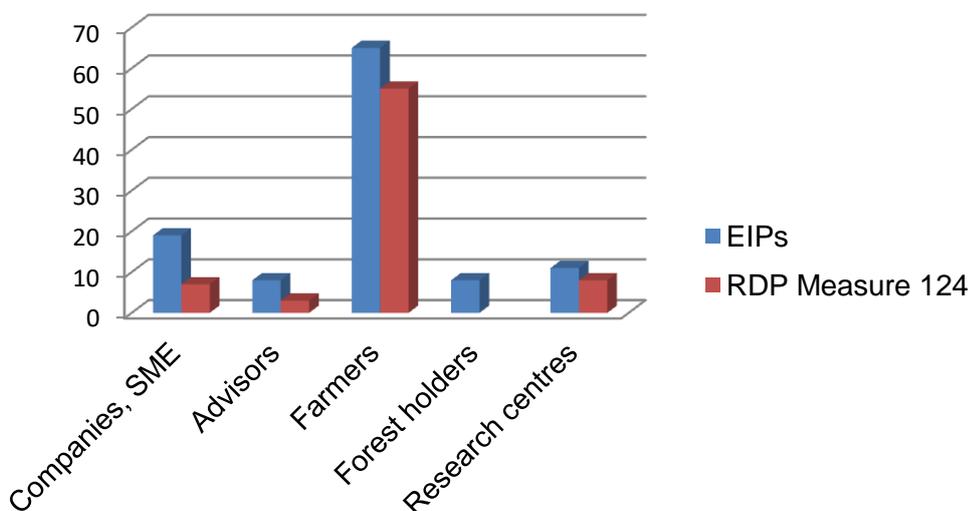


Figure. 4 Partnership EIPs and Measure 124 (RDP 2007-2013)
Source CREA’s processing on Basilicata Region data

3. Conclusions

The Cluster, originally set up to intercept regional development policy funding, has made positive changes to the agricultural sector through nine eligible OGs.

and has mobilized the regional research and innovation system to support companies and farms, concentrating resources and skills on issues of entrepreneurial interest, relevant for local and sector development. The partnership network shared knowledge and for the first time, all the regional public research actors have created common and shared projects based on actual sustainable agriculture. The positive Cluster results highlight:

- an involvement of all research centres operating in Basilicata;
- an interactive approach adopted by all participants of the knowledge system;
- a need to continue innovative processes from previous programming;
- partnerships with projects of sustainable agriculture an understanding of how to find partnership solutions independently.

The Cluster was set up to respond to the funding of regional development policies and has brought about positive changes in the agricultural sector showing how organized partnerships can support and manage financial resources. The Cluster shows the capacity of organized groups to support and manage financial resources and change processes. It managed an intense preliminary activity phase to set up OGs, focusing on the investment of time, effort and expertise to produce a high quality project. During this phase, the Cluster allowed agricultural and forestry companies to participate in the establishment of OGs ensuring territorial inclusiveness. This element was necessary as the CLUSTER was not a beneficiary of the OGs. The Cluster therefore showed innovation in terms of work methods and solutions provided to meet the needs of the companies, in fact it obtained 91% of financial resources and number of approved OGs.

A multi actor as a Cluster with specific skills is required to create a sustainable innovation project. The Cluster co-ordinated actions to implement innovation in Basilicata meeting the needs of the actors and Community policies and initiating co-innovation. The Basilicata Cluster is a model which could be used in Europe where both OGs and Clusters are beneficiaries of 2014-2020 EU policies.

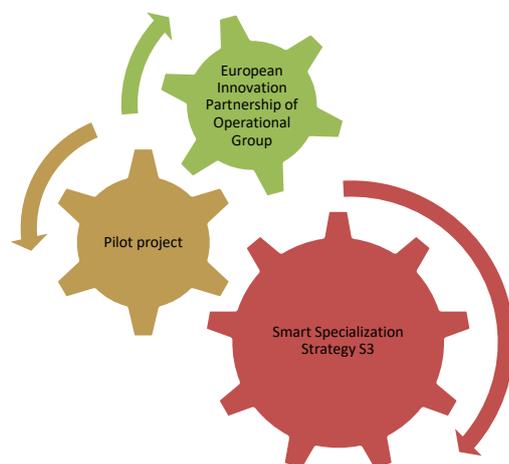


Figure. 5 Regional Innovation governance

Source CREA's processing on Basilicata Region data

The hope is that this action does continues after this first phase of facilitation and animation and continues to operate in the longer term reinforcing this innovative collaboration and guaranteeing continuity for Cluster actions through the S3 Strategy, improving a model which encourages the structuring of relationships and collaboration between farmers, companies, research institutions and universities.

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