

## The Role of Innovation Poles in Agri-food System Development: The Case of Abruzzo's Model

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### ABSTRACT

The Innovation Poles represent a new industrial policy instrument to support the competitiveness of companies that favor the sharing of knowledge between companies and the convergence of investments on trajectories of innovation. This paper provides an in-depth analysis of the case of Abruzzo Innovation Pole "Agire" Consortium, a cluster that includes food companies and joint research, innovation and strategic services. Results showed that requirements of companies to improve their competitiveness are not only devoted to research and innovation in strictly sense (product/process) but also to the exigence of general improvement of services oriented to market development, internationalization / export and support in participation in calls for projects proposal; companies' point out the high cost of innovation as the main limitation; a general strategy improving internal and external policies could overcome or limit this barrier and facilitate the symbiosis process.

**Keywords:** *Innovation Pole; Food Industries; Research and Innovation; Industrial Districts.*

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## 1 Introduction

The development of food industries plays a key role in land development, supported by the interaction with its territory. Many published research studies have analyzed specific factors of territorial variables on innovation behavior in rural areas (Aznar-Sánchez and Galdeano-Gómez, 2011; Fearné et al., 2013), although this aspect plays an important and strategic role. Mattes (2012) highlighted the importance of the notion of proximity in a process of area development. Proximity includes a variety of non-spatial-factors such as: organizational, institutional, social and cognitive parameters; however, the notion of proximity also includes spatial phenomena, therefore, innovation is a complex combination of spatial and non-spatial factors.

Research based on regional innovation systems has shown that the innovative activity is based on localized resources such as a specialized labor force, regional systems, local learning, traditions for co-operation and entrepreneurial culture (Cooke, 2001). The relational resources and skills, in companies and even more in business networks, influence innovation processes. The company's ability to share knowledge resources with other stakeholders is an important element to understand how to manage innovative processes (Di Stefano et al., 2012). However, an oriented partnership-approach is needed without worrying about the barriers to knowledge transfer (Chesbrough, 2003).

Ideas for innovation are largely influenced by the environment where enterprises are located (Kalantaridis and Bika, 2006); to this end, the concentration of companies in industrial districts stimulates the development of unique pools of specialized skills and the promotion or attraction of specialized suppliers (Becattini and Musotti, 2004).

Despite the growing economic and policy importance of clusters, few researches have been conducted to focus on their association with other factors promoting innovation and economic growth (Rodríguez-Pose and Comptour, 2012).

The European Community has identified innovation as an indispensable factor for improving the competitiveness and sustainability of agri-food companies, a role also underlined in the "Europe 2020" strategy through the introduction of the European Innovation Partnerships. The objectives of the European Policy for the 2014-2020 program are to promote partnerships even through research and development, the competitiveness of companies, with obvious repercussions on the social fabric of a community and economic spectrum. In the agricultural sector, rural development policies and the Horizon 2020 program represent an important tool with which the European Union promotes innovation and growth. The European Agricultural Fund for Rural Development (EAFRD) is governed by the rules of the Member States, while the Horizon 2020 program is managed by the European Commission. The projects are focused on critical issues such as the development of a sustainable and competitive agri-food industry, support for the development of a market for biotechnological products and processes, the improvement of production efficiency and the issue of climate change.

The European Commission (2006) has expressed the concept of "intellectual capital" declining on three dimensions:

- Human capital, relates to the skills of each individual in the company's production line.
- Relational capital, relationships organized and integrated with all external stakeholders.
- Organizational capital, relates to the wealth of knowledge of individuals in a company.

Zheng and Shi (2018) stressed the important of the firm's location by characterizing three types of factors: regional attribute (e.g. market conditions, production factor prices, and agglomeration economies), government's intervention (e.g. tax competition and preferential policy), and firm attribute (e.g. ownership, size, and development strategy).

The creation of effective links between heterogeneous groups of actors, with the formation of "coalition" configurations, partnerships between companies and institutions and between the public and private sectors, are often hampered by differences in technology, society, economy and culture (Pant and Odame, 2006).

In recent decades, Regional System of Innovation (RSI) grew due to the consistent interaction of a series of constructs (economy, technology, districts, research, learning, knowledge, governance) related to industrial development at a regional scale (Doloreux, 2002). Perdomo et al. (2017) suggest the need of further research to focus on the management of innovation networks considering the importance of context.

In the recent years, we have assisted to a revival of public debate on industrial policy: this issue has always opposed the supporters of the minimal state to the supporters of a proactive intervention (Chang, 2002; Pack and Saggi, 2006; Peck et al., 2012; Mazzucato, 2013). Italian industrial policies are affected by several changes; all Italian regions have gained a prominent role in the design and the implementation of innovation policies for enterprise, moving from the role of policy-takers to the role of policy-shapers (Caloffi and Mariani, 2018). Although a debate is emerging on how to evaluate innovation intermediaries' performance (Nishimura and Okamoto, 2011; Knockaert et al., 2014), little research exists on how the use of performance indicators affects the intermediaries' behavior (Russo et al., 2016).

## 2 Theoretical background

Given that in the EU small and medium sized enterprises (SME) prevail; understanding how to increase their participation in R&D projects is relevant for the EU agri-food economy in order to face competition in both domestic and international markets (Fritz and Schiefer, 2008). Innovation in small agri-food firms means a wide range of aspects such as introduce new products, develop new processes, make changes in the organizational structure and explore new markets (Adinolfi and Capitano, 2009; Batterink et al., 2010; Perito et al., 2017). According to Inkinen and Suorsa (2010) these innovations become more easily accessible if institutional infrastructures (Universities, Technology Centers, etc.) are located in the same territorial area and they can provide the possibilities for collaboration in research and development (R&D).

Over the past four decades, a wide range of approaches to agricultural sector innovation has emerged (Leeuwis and Aarts, 2011). From the middle of 1980s some approaches attempted to understand innovation in terms of economic development and regional dynamisms within markets that were becoming internationally more open. In particular, in the 1980s, the "national agricultural research system" (NARS) theory focused on the strengthening research supply by providing infrastructure, capacity, management, and policy support at the national level.

Instead in the 1990s the "agricultural knowledge and information system" (AKIS) model recognized that research was not the only means of generating or gaining access to knowledge. The AKIS gave much more attention to ties between researches, education, identifying farmers' constant demand for new technologies. Specifically, as Röling (1990) points out the agricultural knowledge and information system (AKIS) is: "*a set of agricultural organizations and/or persons, and the links and interaction between them engaged in such processes as the generation, transformation, transmission, storage, retrieval, diffusion and utilization of knowledge and information, with the purpose of working in synergy to support decision-making, problem solving and innovation in a given country's agriculture*". Moreover, during the 1990s, the innovative milieu<sup>1</sup>, industrial district (ID)<sup>2</sup> and clusters<sup>3</sup> approaches placed the accent on the rules of competition/cooperation on trust and on relational capital. Clusters, industrial districts and innovative milieu are not synonyms, although they have common aspects (Porter and Ketels, 2009; Becattini and Musotti, 2004). Some of these aspects are common also to the Innovation Pole, though the most significant theoretical basis of Innovation Pole is in the cluster approach, even if for Innovation Pole the territorial development is driven by the action of the State (Harrison, 1992; Saxenian, 1994; Messeghem and Paradis, 2009).

Specifically, IP is a "*government-sponsored consortia, created within EU programs with the objective of stimulating innovation within network of organizations and promote the competitiveness in specific industries or value-chains at a local or regional level*" (Taddeo et al., 2017).

The idea is that "*some geographical environments are endowed with a structure as well as a culture which seem to be well suited for dynamic and economically sound development of knowledge, while other*

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<sup>1</sup> In the *milieu innovateur*, the firm is not an isolated innovative agent, but part of a milieu with an innovative capacity. The apprenticeship dynamics and the co-operative organization based on interaction constitute the core of the *milieu innovateur* model (Peyrache-Gadeau and Pecqueur, 2004).

<sup>2</sup> An industrial district is a type of a cluster characterised by the active presence in a specific area on two levels: a community of people, and a population of firms with a dominant industrial activity; a specific location is relatively important to understand the firm' opportunities in terms of social capital, knowledge and innovativeness (Porter and Ketels, 2009).

<sup>3</sup> Porter (1998) defines clusters as "*geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition. They include, for example, suppliers of specialized inputs such as components, machinery, and services, and providers of specialized infrastructure*".

*environments can function as a barrier to entrepreneurship and change*" (Maskell et al., 1998). Especially in these latter geographical environments, the State can play a key role in selecting and evaluating clusters and offering financial incentives through financing and tax exemptions. These incentives could foster the emergence of innovative collaborative projects in a given territory. Firms in Innovation Pole are often located in a single town or region within a nation and attract more efficiently resources away from isolated firms and industries.

Moreover, Innovation Poles goal is to foster local networking, providing high-value services, shared facilities for innovation, as well as addressing the major technological and strategic challenges to be faced by the local industrial community. According to some scholars (Posch et al., 2011; Green and Randles, 2002; Scheel and Vazquez, 2011), networking is recognized as crucial aspects for rural farms development. The presence of companies closely interconnected and co-located in a specific place can explain the capacity of the firms to reach some types of innovations (Bachtelt et al., 2004; Rajalahti et al., 2005). However, some actors or groups of actors could play a determining role in economic and social development: *"some actors are more socially skilful in getting others to cooperate, manoeuvring around more powerful actors, and knowing how to build political coalitions in life"* (Fligstein, 2001). This is particularly true for rural areas, because the socio-economic context is often characterised by a very limited access to resources (physical, human and financial) (Esparcia, 2014).

In rural development, innovations depend on several factors, such as the individual perspective, set of values and attitude of each agent (De Rosa et al., 2014; Perito et al., 2017). Innovations and development occur if actors combine their knowledge with other resources.

According to Simsek et al. (2003), Innovation Pole is designed to encourage the development of entrepreneurial behaviour of incremental and radical innovations. The members of an Innovation Pole are usually production and/or services companies, local authorities, business incubators, laboratories, testing centers and research infrastructures (Universities or R&D centers). In particular, Universities are important source of knowledge (Arbonías and Moso, 2002). The public intervention is justified by the presence of dynamic or systemic failures (Caloffi and Mariani, 2011).

In some EU member states (e.g. Italy and France) the concept of innovation cluster has been easily translated into Innovation Poles (Caloffi and Mariani, 2011). The Italian experience in the field of Innovation Poles has been initiated in 2008; some regional administrations have created regional platforms with the aim to coordinate the Innovation Pole activities, standardizing governance processes and managing the participation in EU schemes in support of research, development and innovation initiatives (Taddeo et al., 2017).

Innovative initiatives in rural areas do not arise in isolation; they are part of territorial dynamic involving different actors. The design and the implementation of Innovation Poles strategies require that regional policy-makers address two main issues. First, in a scenario where public resources are increasingly limited and partly devoted to short-term goals, the scope of innovation policies has to focus on a relatively narrow set of promising long-term objectives and technological-sectorial targets. Second, the identification of promising targets should be based on the recognition and the enhancement of a local base of knowledge and skills (Caloffi and Mariani, 2011).

On this basis, the Innovation Poles have to concentrate the resources, to limit the dispersion of interventions and to help the construction of an innovation system with the combination of three elements: increasing involvement of actors in the socio-economic processes of change; emergence of new economic activities and new strategies; competitiveness in knowledge, innovation and networking.

### **3 Abruzzo's agri-food Innovation Pole: the model and conceptual framework**

Abruzzo is a centrally located region along the east cost of the Adriatic Sea in Italy; Innovation Poles has assumed a significant leadership in the Abruzzo Region (Italy), involving today approximately 1.000 various entities. The average size of innovation pole, in terms of memberships, is 60 units (Simboli et al., 2018). The list of domains for Innovation Pole in Abruzzo is: advanced services; agri-food; artistic craftsmanship; automotive; chemicals-pharmaceuticals; civil economy; energy; fashion; furniture; ICT & electronics; internationalization; logistics and transport; sustainable construction; textile and Resolution footwear; tourism (Taddeo et al., 2017). Abruzzo has created and implemented a specific policy of Innovation Poles in order to identify synergies between actors of the innovative process. The action to support the creation of the Innovation Poles in Abruzzo's Region, promoted with regional funding called *POR FESR Abruzzo 2007-2013 (activity I.1.2)* was born, therefore, with the intent to support Abruzzo businesses, especially the small and medium enterprises, in the experimentation of forms of aggregation with "incentive effect", that is capable of offering them special services and infrastructures that they

could not have used (or to which they could have access only to a limited extent) remaining outside the aggregation.

The regional strategy of Abruzzo identifies innovation hubs, in compliance with what is established by the "Discipline", as synergic coordination structures between the different actors of the innovative process characteristic of a specific technological and application domain and the provision of services to high added value and infrastructure for innovation. Agire (Agri-industry, Research, Eco-sustainability) is the denomination of the consortium selected to represent the dominium of agri-food Innovation Pole in Abruzzo; Abruzzo Innovation Pole "Agire" Consortium (*A.I.P.A.C.*) comprehends over 100 members that represents about 60% of the regional agricultural and agri-food production; its companies members employ approximately 6.000 employees and generate a turnover of over 2.4 billion euros; with these numbers *A.I.P.A.C.* is the largest consortium active in the Agribusiness sector in the Abruzzo region.

Despite having a common origin and similar structure, each Innovation Pole has different characteristics and dynamics; in fact, every territory or region has a specific potential for the absorption of the results from the Innovation Pole activities, deriving from different historical traditions, specific needs and local economy (Taddeo et al., 2017); obviously, the core business of these structure is the innovation; some authors, like Goldsmith and Foxall (2013), reserve this term exclusively for "new to the world" products such as modifications or line extensions, for other new products: the majority of Cluster for Innovation follow this principle and the research and innovation activities are devote in particular to new product or process innovation; the consequence is that various models of hub for innovation showed an orientation to research and innovation in strictly sense, as emerges from the literature analysis (e.g. Fundeanu and Badele, 2014; Geissdoerfer et al., 2018). But some other authors emphasize the multi-dimensionality of innovations; for example, Cooper (1998) proposes a model of innovation that has three-dimension: product-process, incremental- radical and administrative-technical. These factors can materialise in the form of innovative projects as novel forms of knowledge and/or different types of innovation: new products, technological innovations, innovative processes, organisational innovations and attitudinal innovations (e.g. promotion of cooperation, development of more resilient models to face new challenges, etc.), as are presently analysed in this study.

The statute of *A.I.P.A.C.* highlighted that the objective of this consortium are finalize to understand and interpret the technological needs of companies, with the aim of directing regional research and innovation support actions on specific relevant technological problems; this is an institutional and strategic role that pose *A.I.P.A.C.* as an intermediary organism with Regional Political Institution. Other goals highlighted are (not exhaustive):

- sharing of knowledge and the convergence of investments on new trajectories of development of innovative products or services, as well as contributing to the intersectoral transfer of technological knowledge;
- strengthen and consolidate the chain of companies operating in the sectors of industry, commerce, craftsmanship and services distributed throughout the Abruzzo region and other Italian or foreign regions;
- definition, implementation and management of projects, including those aimed at strengthening and / or completing business networks, including through public contributions.
- assistance and advice for improvement and quality control and performance related guarantees;
- the development of commercial activity, participation in trade fairs, the carrying out promotional actions, the study and market research experiment, the preparation of catalogs and the preparation of any other promotional means deemed suitable and marketing actions.

The model of *A.I.P.A.C.* comprehends the research and innovation as the core business and completes its strategy of food companies' development through a list of services offered to support the competitiveness of its member, as following: accompaniment to quality certification, assistance in the pursuit of business efficiency, internationalization, development laboratory, monitoring of regulatory, fiscal and financial opportunities and implementation of technological audits.

It's evident that *A.I.P.A.C.* represents a way of organizing innovation system at territorial level through the approach of private-public partnership; quantitative and qualitative surveys about the innovations carried out by the companies through the use of the structures and services of the poles or through the inter-organizational relationships are lacking (Evangelista, 2015).

This paper aimed at presenting a systematic analysis of regional innovation systems focusing on *A.I.P.A.C.* model, a concrete case of agri-food innovation Pole devotes to research, innovation and strategic services in Abruzzo; in this direction, three main issues were analyzed:

- State of art of food company's investment in the recent three years and R&D activities;
- Food company's obstacles factor;
- Food company's requirements and opportunities.

The monitoring of this cluster model can be a useful tool for improving competitiveness of territorial agri-food system.

## **4 Materials and methods**

### **4.1 Survey construction**

Data was gathered through a formal questionnaire directed to agri-food companies and developed through the following steps:

-Conceptualization: the main output of this stage was to list the target variables to investigate. It was performed after a careful bibliographic research focus on different thematic area related to Innovation Pole, districts, cluster for Innovation (see previous paragraphs). A qualitative analysis of the scientific literature was achieved in the Scopus database defining a set of key-words (Innovation Poles; innovation network; innovation clusters; regional system of innovation). Others general information has been obtained consulting technical reports and official websites. In this stage a map of services offered by *A.I.P.A.C.* has been analyzed.

-Questionnaire design and pre-test: after the conceptual basis, a first draft of the questionnaire with the sequence of the thematic sections has been designed, elaborating the topic emerged in the previous stage. The comprehensibility of the questions was reviewed through a pre-test administered to a group of 10 respondents associated to food industries to find and fix possible errors of interpretation, superfluous or confusing questions. At this stage respondents were encouraged to provide feedback.

-Revision: a final questionnaire based on the pre-test findings was performed and the final version of the survey prepared.

The final version was structured following 4 sections: section 1 - sample composition; section 2 - state of art of company's investment and obstacles factor; section 3 - investments in research and development; section 4 - requirements and opportunities.

Data was processed through SPSS 21.0 program, Statistical Package for Social Science.

### **4.2 Data collecting**

The food industries member of *A.I.P.A.C.* have been invited to participate in an online-survey and telephone interviews in a period between 1<sup>st</sup> October 2017 and 15<sup>th</sup> March 2018; all Food companies' member of *A.I.P.A.C.* (51 in total) have been contacted to take part in the survey. The questionnaire was organized according to topics such as: company's investment, obstacles factor, investments in research and development, needed and opportunities.

*A.I.P.A.C.* is composed by 115 members, divided in different categories, as indicate in Fig. 1; Food industries represent the main portion with 46% of the total member, following by services companies (27%) and agricultural companies (13%). The food industries are the most involved in research and development activities.

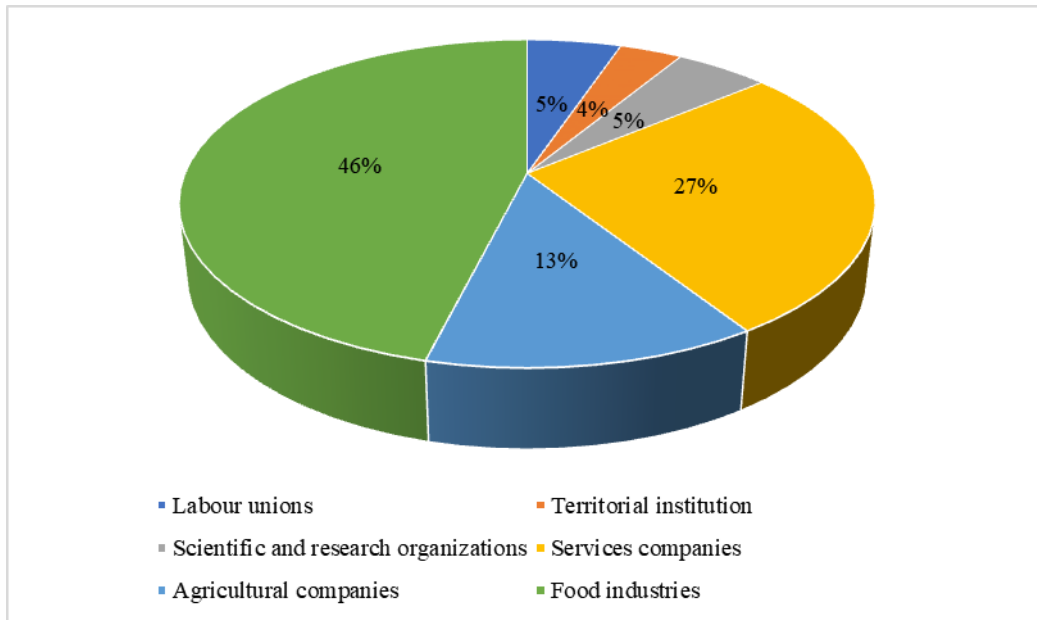


Figure 1. A.I.P.A.C. members profile (update to 13/07/2017).

The sample composition is reported in Fig. 2. The sector most represented is the wine sector (25%), very developed in Abruzzo, followed by confectionery (14%), oil (10%) and pasta and bakery sectors (8%). The main Italian agri-food sector, although with different proportions, are all included.

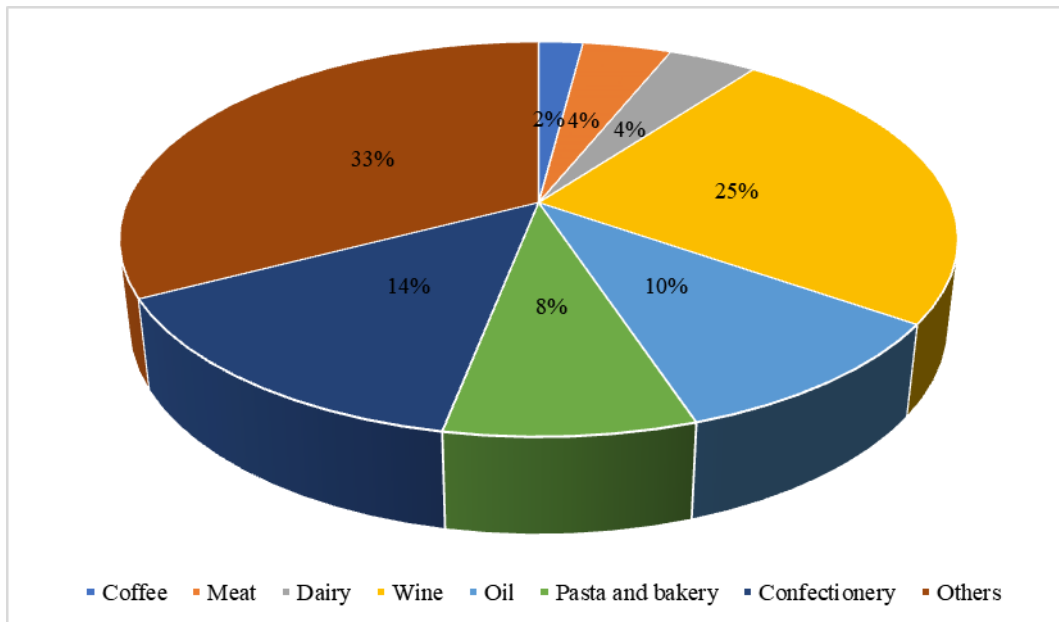


Figure 2. Sample composition.

The response rate is 82.3% (42 companies). The small-medium companies represent the major of the sample (88%), as showed in Fig. 3. It represents a real picture of the Italian country, dominated by small-medium size companies; the sample dimensions is an important aspect to take into consideration: a correlation between firm size and innovation efforts was pointed out by various authors (Capitanio et al., 2010; Bayona-Sáez et al., 2013; Malorgio et al., 2016).

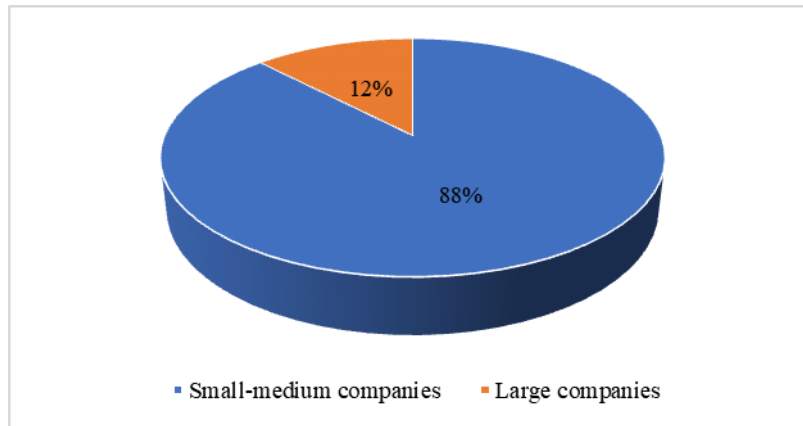


Figure 3. Size of companies interviewed.

## 5 Results and discussion

### 5.1 State of art of company’s investment and R&D

Company’s investments in the last 3 years (Fig. 4) has been primarily focused on equipment (59.4%). Madeira et al. (2017) highlighted the important role of qualified personnel to support innovation. The certification and quality (40.6%) represents the second investments in the last three years; the concepts behind the quality certification ISO 9001 and ISO 14001 are strongly focused on the concept of continuous improvement, respectively in quality management and environmental performance (Murmura et al., 2018a; Murmura et al., 2018b); these concepts are linked to innovation in a broad sense: an implementation of these aspects as a service offered by Innovation Pole could improve the offers in particular in organization innovation, but also in products innovation, as point out by Manders et al. (2016) relating to standard ISO 9001.

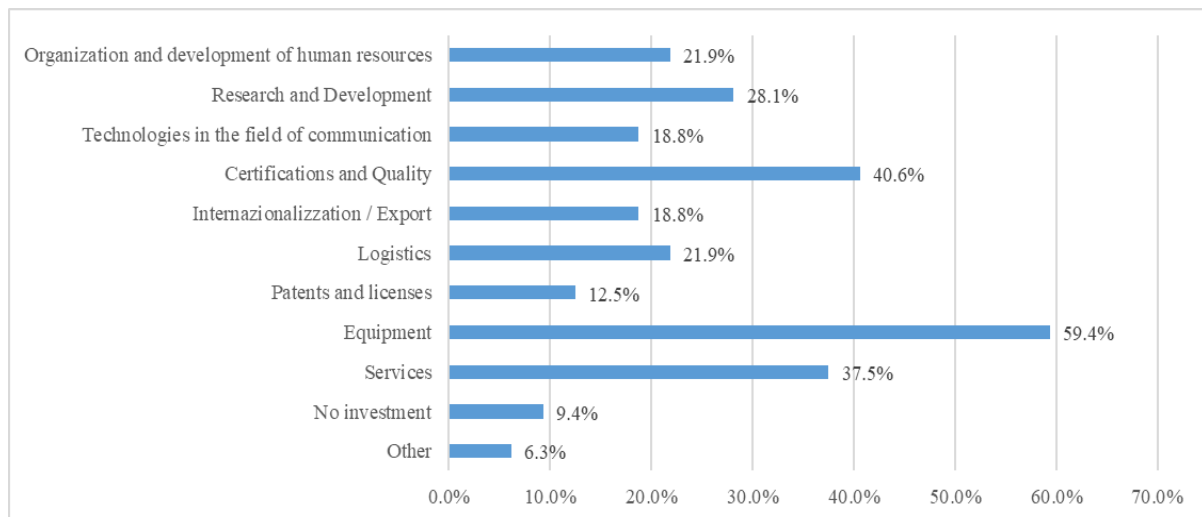
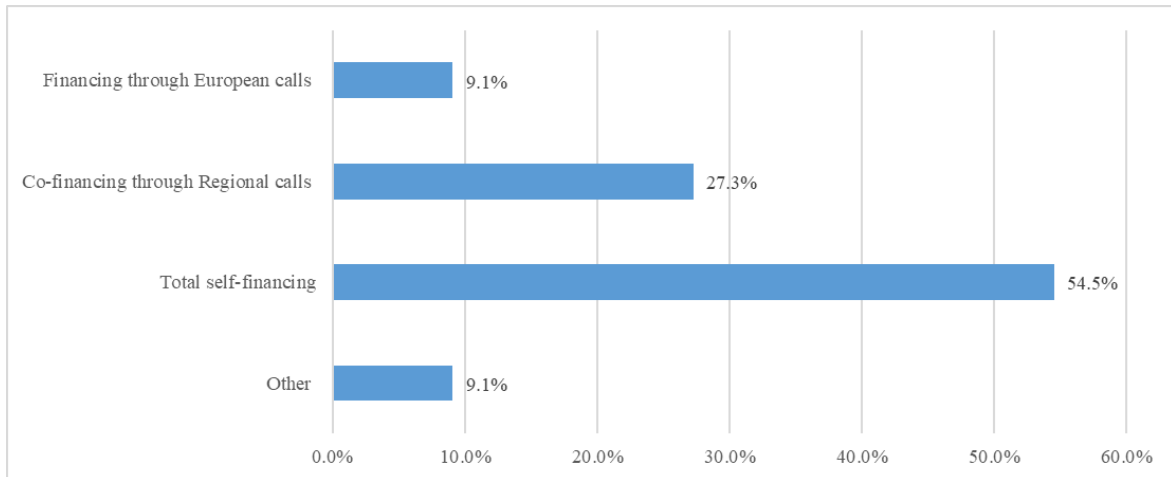


Figure 4. Company’s investments in the last 3 years (possible multiple choice).

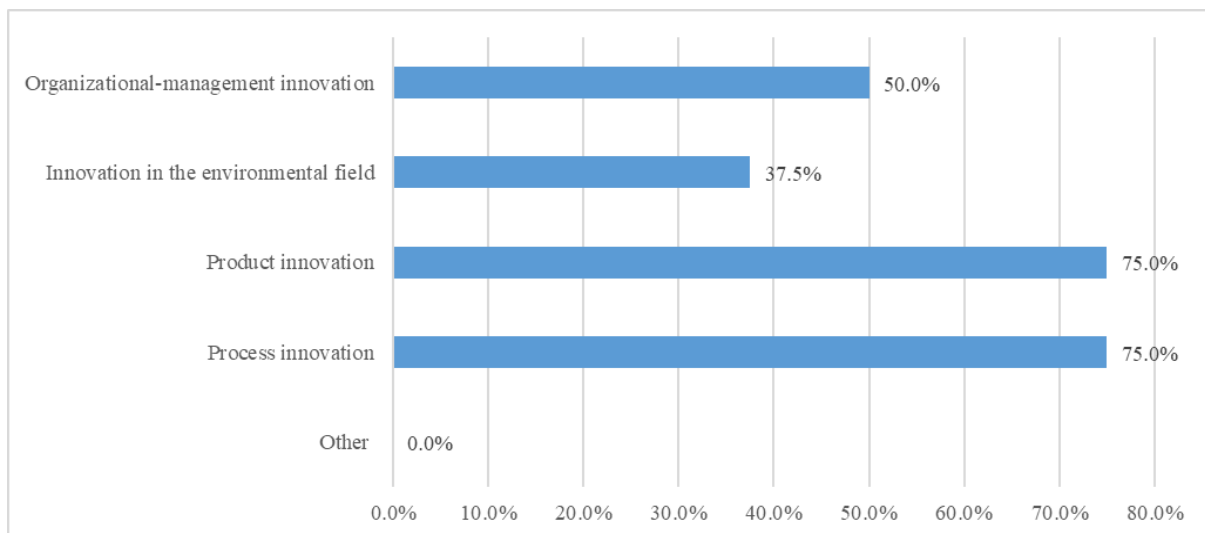
Investments in research and development represent the core business of Innovation Pole. The total self-financing is the type of financing investments most diffused (54.5%), while the public funding, European and Regional, represents respectively the 9.1% and the 27.3% (Fig. 5).





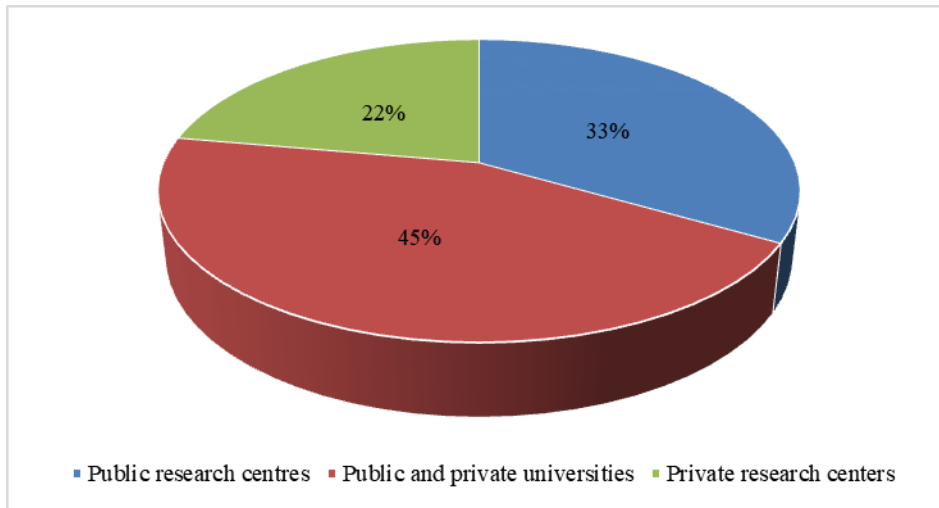
**Figure 5.** Financing investments in research and development carried out in the last 3 years by companies (multiple choice option).

Product and process innovation represent the 75% of the last 3 years investments in research and development (Fig. 6). In the modern world, process innovation has been joined by a product innovation aimed at producing new foods with the aim of satisfying the needs of the consumer; the product differentiation makes possible to differentiate the product on the market and acquire, consequently, an added value. The innovative processes observable in the local innovation systems are the result of accumulation, combination and stratification of knowledge among the actors. The product of these processes becomes the heritage of the entire territory, highly contest specific, difficult to transmit and reproduce.



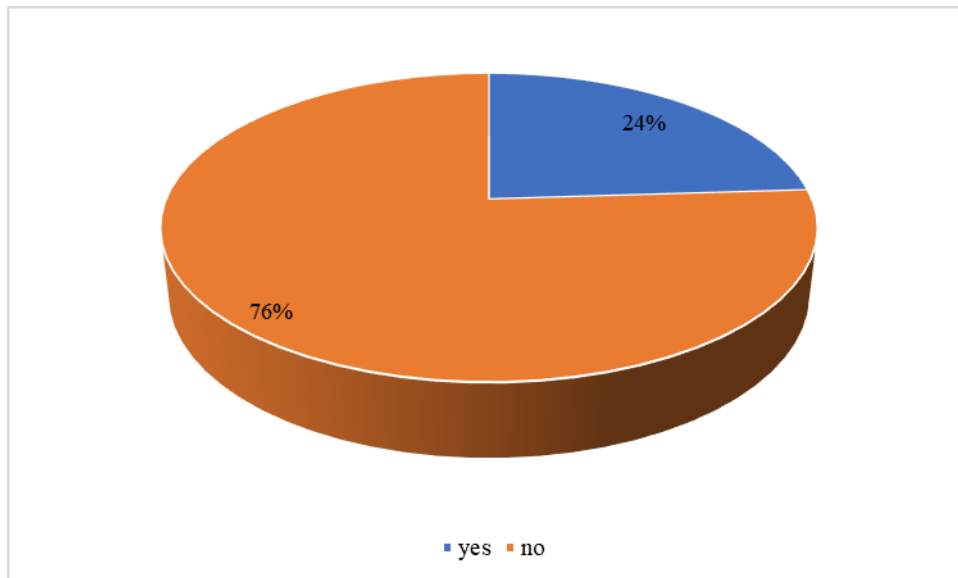
**Figure 6.** Focus on the typology of the last 3 years investments in innovation (multiple choice option).

The Universities (45%) represent the type of scientific organism more used for the realization of research projects (Fig. 7). Ciliberti et al. (2015), highlighted the important role of cooperation between food companies and research institutions for successful innovation activities. There is increasing awareness that collaboration between universities and industries provides an important knowledge transfer channel and consequently play an incisive role in the process of innovation and in regional economic development (Muscio et al., 2012). However, this type of collaboration may be very specific depending on whether the companies' partner is engaged in mature or emergent activities (Freitas et al., 2013).



**Figure 7.** Typology of scientific organism that collaborate for the realization of companies' research projects.

With regards to collaboration between companies, 76% of the companies have never collaborated with other/s in the recent years (Fig. 8), but 87% would like to create a form of collaboration for the future (Fig. 9). According to Deiters and Schiefer (2012), the view on networking has indicated a suitable tool for innovation support. These results indicate the need of new policies more oriented to the facilitation of the symbiosis process in research and innovation project, for example promoting common space for research and development between companies.



**Figure 8.** Percentage of companies that declare to have developed research project collaboration with other companies.

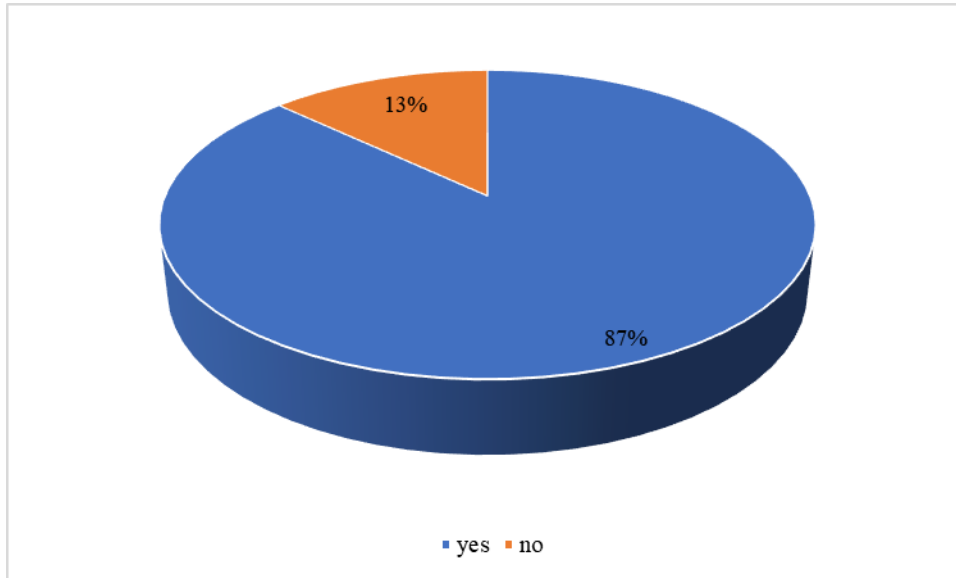


Figure 9. Percentage of companies that declare the willingness to collaborate with other companies.

5.2 Company’s obstacles factor

The identification of barriers to innovation is essential to understanding companies’ innovation processes and overcoming these barriers (D’Este et al., 2012). The level of importance associated to companies’ obstacle factors (scale 1 to 4) in the last three years are, equally, costs of innovation too high (2.8), lack of sources of funding (2.8) and lack of financial resources (2.8); furthermore, markets dominated by consolidated companies represent the fourth obstacle in order of importance (Table 1). Similarly, Madeira et al. (2017) found high innovation costs as a limiting factor of product and process innovation performance. These results showed a clear picture of the volunteer of A.I.P.A.C. companies to potentiate their innovation.

Table 1. Level of importance associated with the companies’ obstacle factors in the last three years (1=unimportant; 2=not very important; 3=important; 4=very important).

	Mean	st. dev.
Costs of innovation too high	2.8	0.90
Lack of sources of funding	2.8	1.05
Lack of internal financial resources	2.8	1.02
Markets dominated by consolidated companies	2.6	0.97
Difficulty in identifying partners	2.6	1.07
Lack of a fast internet connection	2.4	1.07
Insufficient demand for innovative products / services	2.4	0.79
Lack of connecting infrastructure (roads, railways, etc.)	2.3	1.18
Lack of information on the markets	2.3	0.98
Lack of qualified workers	2.2	0.86
Innovations already introduced previously	2.1	0.63
It is not considered necessary to innovate to meet the demand	2.0	0.93
Lack of information on technologies	1.9	0.78

### 5.3 Company's requirements and opportunities

Table 2 report the level of importance of the company's requirements (scale 1-4); the main are: access to new markets (3.5), support for participation in regional, national and international calls (3.5) and internationalization / export (3.5). The fifth in order of importance is the promotion (3.3), another aspect directly linked to the market; innovation also includes new approaches to marketing and new forms of distribution (Porter, 1990). Agricultural and food markets have changed drastically, shifting from production to market orientation; companies have to produce goods and services which match the needs of consumers; in this context the co-ordination of company decisions in the food channel has become extremely important; in conjunction with this development, agri-food systems changed from production-driven to consumer-driven and innovation has become a continuous process (Jongen and Meulenberg, 2005).

Companies looking also for technical services, such as quality certification (3.4), that also includes aspects related to food safety in agri-food sector (Casolani et al., 2018; Di Fonzo et al., 2012).

**Table 2.**

Indicate the level of importance of the companies' requirements in relation to their business (1=unimportant; 2=not very important; 3= important: 4=very important).

	Mean	st. dev.
Access to new markets	3.5	1.03
Support for participation in calls for projects proposal (regional, national and international)	3.5	0.95
Internationalization / Export	3.5	0.86
Quality certification	3.4	0.84
Promotion	3.3	0.87
Communication and website	3.2	0.79
Training	3.1	0.78
Internal organization and management control	3.1	0.71
Research and development	3.1	0.80
Logistics	3.0	1.09
e-commerce (development or implementation)	2.9	0.84
Manage the generational transfer of employees / collaborators	2.8	1.15
Technological adaptation linked to new services / products	2.7	1.00
Change in the organization and management of human resources	2.5	0.89
Assumptions	2.5	0.70
Meetings and thematic tables	2.4	0.80
Patents and licenses	2.3	1.01
Relocation of production units	1.6	0.56

The main objectives in the short-medium term (scale 1 to 10) are market development (8.3) and process improvement (8.2) represent the most important objective in the short-medium terms of companies (Table 3). Coherently, the access to market represents both a need and an objective for food companies. The innovation and research plan could be oriented to facilitate the access to new market. Another characteristic element of this Innovation Pole ecosystem is the degree of openness to the external market of innovation overcoming the limitation linked to small company dimension. In fact, every food firm adopts a specific strategic behavior that in terms of innovativeness could mean investments in R&D and technology and/or in market-oriented product development activities, aimed to improve the customer satisfaction: the innovative process of the firm is generated from the interaction of these activities (Omta and Folstar, 2005).

**Table 3.**

Score assigned to importance of company's objectives in the short-medium term (give a score of 1 to 10 with 10 = max importance and 0= not at all important).

	Mean	dev. St.
Market development	8.3	2.16
Process improvement	8.2	1.77
Product improvement	8.0	2.09
Improvement of internal organization	7.9	1.63
Improvement of the financial structure (fiscal management and access to credit)	7.3	2.31
Other	6.5	4.95

## 6 Conclusions

This paper discusses the case of *A.I.P.A.C.*, an innovation hub devoted to agri-food sector in Abruzzo's Region, with the aim to contribute to a broader comprehensive analysis focused on the Innovation Pole.

*A.I.P.A.C.* shows a case of model of development based on joint research, innovation and strategic services and comprehends a combination of typical aspects of Industrial Districts, Industrial Associations and Cluster for Innovation through the involvement of the different actors (farmers, agri-food companies, rural communities, businesses, universities, research centers, etc.) to the co-production and sharing of knowledge; the importance of multi-dimensionality of innovations is emphasize in this study through several dimensions that belong to *A.I.P.A.C.*: product-process, organisational innovations, promotion of cooperation and implementation of market, product and process development are strategies that could be organize in an optic of symbiosis typical of a consortium.

The improvement of Food Companies opportunities to access to new markets and market development are respectively the main companies' requirements and objectives in the short-medium term; these issues are not disjoint by the general concept of innovation: the innovation in organize commercial activity is a form of innovation; perhaps, the results of products and process innovation could improve the access to new market through a product/s differentiation and improvement of industrial production. In this sense, innovation could be declined to the market orientation of the firm and its marketing activities.

Excessive costs of innovation and lack of funding are the main limitation perceived by companies; from this point of view, a strategy could suggest a policy orientation that improves the collaboration between member (perhaps a necessity declared by companies interviewed) in order to develop common project and decrease the cost of innovation; furthermore, the improvement of collaborations between companies could facilitate the exchange of experiences and contaminations both for research, commercial and industrial development strategies.

The general strategy of *A.I.P.A.C.* tell us something: the Innovation Pole could became a dynamic model for developing several strategies for Food Industries development and could influence the territorial policy, both internal (improve services offered to member), both external, through feed-back with policy makers and institutions; for these reasons, this study demonstrates that Innovation Pole could refer to as "system-based" policies model. At present, Italian industrial and innovation policy is largely based on the use of EU regional funds declined at Regional level.

In a modern economy, with an increasing importance of knowledge and innovation, a strategic analysis of innovation activities is an essential element to transfer to businesses.

Robust levels of networking for innovation and development pass through an optimization of benefits and limitation of critical issues.

Further studies are needed in order to collect more information about point of force, weakness and requests of agri-food Innovation Pole in other geographical contexts.

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## 8 References

- Adinolfi, F., Capitanio, F. (2009). Innovation vs. oppositions: the role of women in the family farms regeneration process. An Italian experience. *New Medit*, **8**(2): 23-30.
- Arbonías, A.L., Moso, M. (2002). Basque Country: the knowledge cluster. *Journal of Knowledge Management*, **6**(4): 347-355.
- Aznar-Sánchez, J.A., Galdeano-Gómez, E. (2011). Territory, cluster and competitiveness of the intensive horticulture in Almería (Spain). *The Open Geography Journal*, **4**: 103-114.
- Bachtelt, H., Malmberg, A., and Maskell, P. (2004). Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress of Human Geography*, **28**(1): 31-56.
- Batterink, M.H., Wubben, E.F.M., Klerkx, L, and Omta, S.W.F. (2010). Orchestrating innovation networks: The case of innovation brokers in the agri-food. Sector. *Entrepreneurship & Regional Development: An International Journal*, **22** (1): 47-76.
- Bayona-Sáez, C., García-Marco, T., Sanchez-García, M., and Cruz-Càzares, C. (2013). The impact of open innovation on innovation performance: The case of Spanish agri-food firms. In: *Open innovation in the food and beverage industry*. Woodhead Publishing Series in Food Science, Technology and Nutrition, pp 74-94.
- Becattini, G., Musotti, F. (2004). Measuring the “district effect”: reflections on the literature. In: Becattini G. (ed.) *Industrial districts: A new approach to industrial change*. Cheltenham: Edward Elgar, pp 88-111.
- Caloffi, A., Mariani, M. (2011). Shaping regional policy responses: The design of innovation poles. *Policy Studies*, **32**: 413-428.
- Caloffi, A., Mariani, M. (2018). Regional policy mixes for enterprise and innovation: A fuzzy-set clustering approach. *Environment and Planning C: Politics and Space*, **36**(1): 28-46.
- Capitanio, F., Coppola, A., and Pascucci, S. (2010). Product and process innovation in the Italian food industry. *Agribusiness*, **26** (4): 503-518.
- Casolani, N., Liberatore, L., and Psomas, E. (2018). Implementation of quality management system with ISO 22000 in food Italian companies. *Quality - Access to Success*, **19**(165): 125-131.
- Chang H.J. (2002). Breaking the mould: An institutionalist political economy alternative to the neoliberal theory of the market and the state. *Cambridge Journal of Economics*, **26**(5): 539-559.
- Chesbrough, H.W. (2003). *Open innovation: The new imperative for creating and profiting from technology*, Harvard Business Press, Boston.
- Ciliberti, S., Bröring, S., and Martino, G. (2015). Drivers of innovation in the European food industry: evidences from the Community Innovation Survey. *International Journal on Food System Dynamics*, **6**(3): 175-190.
- Cooke, P. (2001). Regional Innovation Systems, Clusters, and the Knowledge Economy. *Industrial and Corporate Change*, **10**(4): 945-974.
- Cooper, R.G. (1998). Benchmarking new product performance: results of the best practices study. *European Management Journal*, **16**(1):1-17.
- D’Este, P., Iammarino, S., Savona, M., and von Tunzelmann, N. (2012). What hampers innovation? Revealed barriers versus deterring barriers. *Research Policy*, **41**(2): 482-488.
- De Rosa, M., Bartoli, L., and La Rocca, G. (2014). Testing Extension Services through AKAP Models. *The Journal of Agricultural Education and Extension*, **20**(5): 513-535.
- Deiters, J., Schiefer, G. (2012). Network Learning and Innovation in SME Formal Networks. *International Journal on Food System Dynamics*, **3**(3): 201-213.
- Di Fonzo, A., Perito, M.A., and Russo, C. (2012). Private standards on food safety: A contract theory model to analyze organizational and promotional aspects. *Economia agro-alimentare*, **14**(2): 85-105.

- Di Stefano, G., Gambardella, A., and Verona, G. (2012). Technology push and demand pull perspectives in innovation studies: Current findings and future research directions. *Research Policy*, **41**(8): 1283-1295.
- Doloreux, D. (2002). What we should know about regional systems of innovation. *Technology in society*, **24**: 243-263.
- Esparcia, J. (2014). Innovation and networks in rural areas. An analysis from European innovative projects. *Journal of rural studies*, **34**: 1-14.
- European Commission (2006). Directorate-General for Research, Reporting Intellectual Capital to Augment Research, Development and Innovation in SMEs. [www.ec.europa.eu](http://www.ec.europa.eu).
- Evangelista, V. (2015). I poli d'innovazione nel sistema d'innovazione abruzzese. *Rivista geografica italiana*: **122**(3): 323-338.
- Fearne, A., García Álvarez-Coque, J.M., López-García Usach, T., and Sánchez García, M. (2013). Innovative firms and the urban/rural divide: the case of agro-food system in the Valencia region. *Management Decision*, **51**(6): 1293-1310.
- Fligstein, N. (2001). Social Skill and the Theory of Fields. *Sociological Theory*, **19**: 105-25.
- Freitas, I.M.B., Marques, R.A., and Silva, E.M.D.P. (2013). University–industry collaboration and innovation in emergent and mature industries in new industrialized countries. *Research Policy*, **42**(2): 443-453.
- Fritz, M., Schiefer, G. (2008). Food Chain Management for Sustainable Food System development: a European research agenda. *Agribusiness*, **24**: 440-452.
- Fundeanu, D. D., Badele, C. S. (2014). The impact of regional innovative clusters on competitiveness. *Procedia-Social and Behavioral Sciences*, **124**: 405-414.
- Geissdoerfer, M., Vladimirova, D., and Evans, S. (2018). Sustainable business model innovation: A review. *Journal of cleaner production*, **198**: 401-416.
- Goldsmith, R.E., Foxall, G.R. (2003). The measurement of innovativeness, in Shavinina, L.V. (ed.), 2003, I.c.: 321-330.
- Green, K., Randles, S. (2002). At the interface of innovation studies and industrial ecology. In Green, K., Randles, S., (Ed.), *Industrial Ecology and Spaces of Innovation*, Edward Elgar: Cheltenham, UK.
- Harrison, B. (1992). Industrial districts: old wine in new bottles. *Regional studies*, **26**(5): 469-483.
- Inkinen, T., Suorsa, K. (2010), Intermediaries in Regional Innovation Systems: High-Technology Enterprise Survey from Northern Finland. *European Planning Studies*, **18**(2): 169-187.
- Jongen, W. M., Meulenber, M. (2005). Innovation in agri-food systems. Wageningen Academic Pub.
- Kalantaridis, C., Bika, Z. (2006). Local embeddedness and rural entrepreneurship: case-study evidence from Cumbria, England. *Environment and Planning*, **38**: 1561-1579.
- Knockaert, M., Spithoven, A., and Clarysse, B. (2014). The impact of technology intermediaries on firm cognitive capacity additionality. *Technological Forecasting and Social Change*, **81**: 376-387.
- Leeuwis, C., Aarts, N. (2011). Rethinking communication in innovation processes: Creating space for change in complex systems. *The Journal of Agricultural Education and Extension*, **17**: 21–36.
- Madeira, M. J., Carvalho, J., Moreira, J. R. M., Duarte, F. A., and de São Pedro Filho, F. (2017). Barriers to Innovation and the Innovative Performance of Portuguese Firms. *Journal of Business, Universidad del Pacífico (Lima, Perú)*, **9**(1): 2-22.
- Malorgio, G., Biondi, B., and Perito, M.A. (2016). Strategic behaviour of Italian fruit and vegetables importers from South Mediterranean Countries faced with food safety standards. *New Medit*, **15**(3): 29-36.
- Manders, B., de Vries, H. J., and Blind, K. (2016). ISO 9001 and product innovation: A literature review and research framework. *Technovation*, **48**: 41-55.
- Maskell, P., Eskelinen, H., Hannibalsson, I., Malmberg, A., and Vatne, E. (1998). Competitiveness, Localised Learning and Regional Development. Specialisation and Prosperity in Small Open Economies. London: Routledge.
- Mattes, J. (2012). Dimensions of proximity and knowledge bases: innovation between spatial and non-spatial factors. *Regional Studies*, **46**(8): 1085-1099.
- Mazzucato, M. (2013). The Entrepreneurial State: Debunking Public vs. Private Sector Myths. London: Anthem Press.

- Messeghem, K., Paradas, A. (2009). L'émergence d'un pôle de compétitivité agroalimentaire: de l'encastrement à l'ambidextrie. *Management Avenir*, **25**(5): 164-183.
- Murmura, F., Casolani, N., Liberatore, L., and Vicentini, A. (2018a). An empirical analysis of ISO 9001:2008 application in Italian services and manufacturing companies. *Total Quality Management & Business Excellence*, **29**(7-8): 786-797.
- Murmura, F., Liberatore, L., Bravi, L., and Casolani, N. (2018b). Evaluation of Italian Companies' Perception about ISO 14001 and Eco Management and Audit Scheme III: Motivations, Benefits and Barriers. *Journal of Cleaner Production*, **174**: 691-700.
- Muscio, A., Quaglione, D., and Scarpinato, M. (2012). The effects of universities' proximity to industrial districts on university–industry collaboration. *China Economic Review*, **23**(3): 639-650.
- Nishimura, J., Okamuro, H. (2011). Subsidy and networking: The effects of direct and indirect support programs of the cluster policy. *Research Policy*, **40**(5): 714-727.
- Omta, S. W. F., Folstar, P. (2005). Innovation in agri-food systems. Wageningen Academic Publishers.
- Pack, H., Saggi, K. (2006) Is there a case for industrial policy? A critical survey. *The World Bank Research Observer*, **21**(2): 267-297.
- Pant, L.P., Odame, H.H. (2006). Multi-stakeholder deliberation on dialectical divides: an operational principle of the systems of innovation. *Management for Development Journal*, **2**: 60-74.
- Peck, J., Theodore N., and Brenner, N. (2012) Neoliberalism resurgent? Market rule after the great recession. *South Atlantic Quarterly*, **111**(2): 265–288.
- Perdomo, S. A. P., Farrow, A., Trienekens, J. H., Omta, O. S., and van der Velde, G. (2017). Testing the effectiveness of network governance mechanisms to foster ambidexterity of agricultural innovation networks in east and central Africa. *International Journal on Food System Dynamics*, **8**(2): 81-95.
- Perito, M.A., De Rosa, M., Bartoli, L., Chiodo, E., and Martino, G. (2017). Heterogeneous organizational arrangements in agrifood chains: A governance value analysis perspective on the sheep and goat meat sector of Italy. *Agriculture*, **7**: 47.
- Peyrache-Gadeau, V., Pecqueur, B. (2004). Les ressources patrimoniales: une modalité de valorisation par les milieux innovateurs. In Camagni R., Maillat D., Matteaccoli A. (Ed.): *Ressources naturelles et culturelles, milieu et développement local*. Neuchâtel, EDES.
- Porter, M.E. (1990). The competitive advantage of nations. London: Macmillan Press Ltd.
- Porter, M.E. (1998). Clusters and the new economics of competition. *Harvard Business Review*, **76**(6): 77–90.
- Porter, M. E., Ketels, C. (2009). Clusters and industrial districts: common roots, different perspectives. A handbook of industrial districts.
- Posch, A., Agarwal, A., and Strachan, P. (2011). Editorial: Managing Industrial Symbiosis (IS) Networks. *Business Strategy and the Environment*, **20**(7): 421-427.
- Rajalahti, R., Woelcke, J., and Pehu, E. (2005). Developing research systems to support the changing agricultural sector (Vol. 14). *Agriculture & Rural Development Department, World Bank*.
- Rodríguez-Pose, A., Comptour, F. (2012). Do clusters generate greater innovation and growth? An analysis of European regions. *The Professional Geographer*, **64**(2): 211-231.
- Röling, N. (1990). The agricultural research-technology transfer interface: a knowledge systems perspective. Westview Press, with International Service for National Agricultural Research.
- Russo, M., Caloffi, A., Rossi, F., and Righi, R. (2016). Designing performance-based incentives for innovation intermediaries: Evidence from regional innovation poles. *Geography, Open Innovation, Diversity and Entrepreneurship*.
- Saxenian, A.L. (1994). Regional advantage: Culture and Competition in Silicon Valley and Route 128, Cambridge: Harvard University Press.
- Scheel, C., Vazquez, M. (2011). The role of innovation and technology in industrial ecology systems for the sustainable development of emerging regions. *Journal of sustainable development*, **4**(6): 197-210.
- Simboli, A., Taddeo, R., and Morgante, A. (2018). Poli d'innovazione come potenziali contesti di simbiosi industriale. Il caso della regione Abruzzo. *XXVIII Congresso Nazionale di Scienze Merceologiche*: 168-173.
- Simsek, Z., Lubatkin, M.H., and Floyd, S.W. (2003). Inter-Firm Networks and Entrepreneurial Behavior: A Structural Embeddedness Perspective. *Journal of Management*, **29** (3): 427-442.



- Taddeo, R., Simboli, A., Ioppolo, G., and Morgante, A. (2017). Industrial symbiosis, networking and innovation: The potential role of innovation poles. *Sustainability*, **9**(2): 169.
- Zheng, D., Shi, M. (2018). Industrial land policy, firm heterogeneity and firm location choice: Evidence from China. *Land Use Policy*, **76**: 58-67.