Development Strategies of Agro-Food Sector in Basilicata Region (Italy): Evidence from INNOVAGRO Project

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Abstract. Agricultural production in Basilicata Region is strongly characterized by a high degree of fragmentation, the large percentage of small family businesses and a generalized low propensity to entrepreneurship. Although there are productive realities that are suited to entrepreneurship, going beyond the local market dimensions. The low propensity of agricultural producers to associate in consortium or any other formal collaboration is also a factor to be reinforced in order to improve the competitiveness of the respective supply chains.

The project "Development of an innovative network for the promotion of extroversion of agro-food companies in Adriatic - Ionian Area" (INNOVAGRO) intents to capitalize existing experiences and to adopt innovative solutions in order to develop an intraregional approach combining innovative ICT technologies, the establishment of a Transnational Innovative Agro-food Network and the promotion of environmentally- friendly farming practices.

This work illustrates a detailed context analysis aimed at addressing the general issues promoted by the INNOVAGRO project on specific features characterizing Basilicata Region in supporting new development strategies based on synergic relationships between the tourism sector and agro-food production.

Keywords: INNOVAGRO · Agro-food · Tourism · Sustainability · Basilicata region

1 The Implementation Context

Basilicata is a rural region, whose territory equal to about 10 000 km^2 is almost entirely mountainous or hilly with a few reliefs higher than 2000 m and only 8% lowland areas. Basilicata belongs to the less developed regions (lagging regions) identified by the EU as beneficiaries of ERDF and ESF funds as well as the Cohesion Fund for the period 2014–20.

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The territory is characterized by natural habitats and agricultural landscapes of great value. Agriculture occupies a key position in regional economy, contributing for €771 million in value added to the Basilicata economy in 2014 [1], increasing from 2010 both in absolute value and in percentage terms. The strong agricultural and rural character is also confirmed by the percentage of people employed in agriculture that up to 2010 reached almost 10%, more than double compared to Italian value [2].

The productive structure and territorial organization greatly influence rural development dynamics and agro-food chains growth, as evidenced by the recent emergence of Integrated Projects of Food Chain [3].

Although according to the classification adopted by the 2014–20 Partnership Agreement of September 2014, almost 75% of municipalities belongs "rural areas with development problems", agro-food sector is of strategic importance for the sustainable development thanks [4]. Spatial dislocation of farms and agro-food activities and the presence of food and wine products that constitute potential drivers of rural and natural tourism [5], make agro-economy a crucial issue for sustaining remote rural areas through the generation of income and jobs.

A detailed context analysis highlighted a lack of an entrepreneurial culture, causing rural out-migration, farm fragmentation and land abandonment, with all expected consequences in terms of land degradation [6]. However, some of the realities considered excellent for entrepreneurial skills as well as for sustainability, ability to penetrate trans-regional markets and transversality of services and products offered were identified and deeply analyzed.

The aim of "Development of an innovative network for the promotion of extroversion of agro-food companies in Adriatic - Ionian Area" (INNOVAGRO) project is indeed to take as an example existing virtuous models and develop innovative solutions to create a Transnational Innovative Agro-food Network. Expected result is a platform to combine ICT technologies and environmentally - friendly farming practices and to promote the exchange of positive experiences at a intraregional scale. This platform could support new development strategies based on synergic relationships between the tourism sector and agro-food production.

This work illustrates the main results of a SWOT analysis [7–9] that represent a preliminary context analysis from Basilicata region providing information about the relevance of the agro-food sector with the specific development characteristics.

2 Agro-Food Sector in the Study Area

Basilicata, in the South of Italy, is a sparsely populated region (about 56,7 inhabitants/Km^2 to 2018 [1]) with a constant negative population trend. Of relevance for the socio-economic implications are the presence of numerous small municipalities with less than 2,000 residents and the high fragmentation degree [10, 11] that characterizes the regional settlement environment.

Agricultural productivity accounts for about 49% of regional total amount registering a positive trend due to both an effective modernization and the development of activities related to tertiary sector. The rural development plan (RDP) has in fact promoted the diversification of agricultural sector, focusing on the establishment of

activities related to receptivity (agritourism) and environmental education (educational farms) [12–14].

As regards the age structure of business owners, only 5% of all entrepreneurs are under 35 years and only 10% are younger than 40. This percentage furtherly drops to 3% if only female farmers are considered.

The Utilized Agricultural Area (UAA) is characterized by a prevalent use of arable land which, covering an extension of about 312 000 hectares, represents about 60% of regional UAA; permanent meadows and pastures represent a share of 30%, while agricultural woody cultivations represent only 10% of regional UAA.

Cereal cultivation is the most representative in terms of both UAA and number of farms involved, followed by legumes and vegetable crops.

Woody agricultural crops result classified among fruit trees (about 21% of UAA), citrus fruits (about 12% of UAA) and wine grape (about 11% of the UAA). Olive tree cultivation is the most representative woody cultivation representing more than 54% of regional woody UAA.

The most important cultivation areas are located in Metapontum region, in Ofanto-Bradano Valley and in Agri Valley; smaller but emerging areas are Mercure Valley, Sauro Valley and the periurban horticulture of S. Arcangelo and Senise municipalities. Metapontum area is the heart of fruit and vegetable production, representing three quarters of agricultural area and a recognized Quality Agro-food District [15].

2.1 Structure and Development Characteristics

The analysis of the regional context reveals a strong agricultural attitude of the Region that however suffers limited investments. Employment problems and difficulties in generational renewal induce low competitiveness. Entrepreneurs and workforce' aging and lack of specific skills and knowledge limit the spread of innovation. Difficulties of access to credit appear as a further factor strongly limiting investments.

For these reasons, the productive context of Basilicata region agriculture results strongly characterized by a high degree of fragmentation, by the large percentage of small family businesses and by low propensity to entrepreneurship.

Very low availability of agricultural producers to associate with each other is also a factor on which to influence in order to improve the supply chains' competitiveness [16] and gain larger market shares.

RDP funds and the interception of opportunities made available by the European Community, has allowed some production realities to emerge on larger markets and/or to network mobilizing larger more active partnerships [17].

That's the case, for example, of the Basilicata Regional strategy for research and innovation (also known as "Smart Specialization Strategy" or "S3") that gave innovative territorial leverage to support the emergence of new companies, new relationships and an improved programme from the alignment of and networking of actors.

This multi-actors, multi-disciplinaries approach allowed rural productive systems to create important inter-sectorial interconnections such as in the field of bioenergy (Fig. 1).

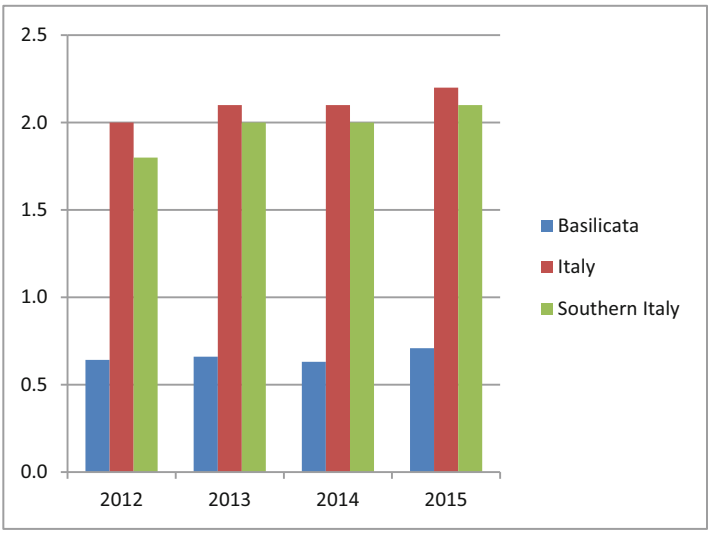

Fig. 1. Export in agro-food sector as percentage of GDP in Basilicata, Southern Italy and Italian contexts

Some companies, on the other hand, have exploited these opportunities to take advantage of a marketing network that has favored their export trend [18]. That's the case of Candonga Strawberry distributed by Club Candonga Consortium and traded at international events such as Fruit Logistica in Berlin (Germany).

3 Prospects and Trends of the Agro-Food Sector

In the last decade, the agricultural sector has been subject to structural changes in the productive systems of the farm, linked to different motivations, from adverse climatic conditions to frequent crises in the sector (inadequate market prices, high production costs, disaggregated supply). Recent calls for tenders for the establishment of new businesses have, on the one hand, favored the growth of the number of businesses managed by competent young people, but, on the other hand, favored the fragmentation of large farms into a number of businesses of a smaller size.

The growing trend of organic farming or the adoption of schemes aimed at greater sustainability of the sector, if it is to prove effective in the long term, must necessarily include training and integration within the context of specialized figures who support individual initiatives and know how to fully grasp the potential in terms of profitability and development of virtuous supply chains.

A positive trend is growing in relation to the corporatist approach that is becoming increasingly important, especially in production contexts related to the province of Matera. The establishment of Productive Organizations solves in part the problem of poor preparation of business leaders and, if well organized, contributes to the reduction

of production costs and the implementation of marketing techniques that are inaccessible to individual producers and effective in penetrating some segments of the market.

A further perspective that suggests wide margins for growth is that of the integration between sustainable tourism and high quality products.

Since 2006, there has been an upward trend in the number of farms authorized to carry out agri-tourism activities, which account for almost all of the accommodation facilities in the entire region, and a greater territorial spread of activities connected with agriculture. Positive effects can in general be found in tourism sector, as shown by the increase in the number of both attendance and arrivals (see Fig. 2) that correspond to an increase in available bed supply all over the region.

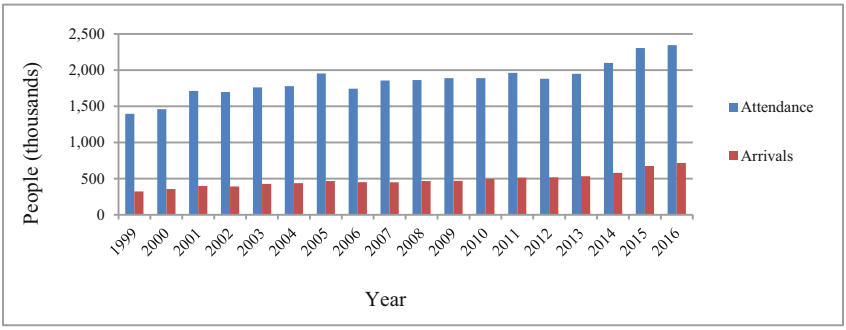

Fig. 2. Tourism flows in Basilicata region

The development of diversification activities, in addition to offering income opportunities in rural areas where agricultural production are less remunerative, meet the growing demand for goods and services of collective interest.

3.1 Sustainable Development Challenges

In addition to some intrinsic characteristics of the agricultural sector in Basilicata that over the years have become factors limiting the development of the entire sector (depopulation, lack of or delayed generational change, inadequate preparation of employees in the sector), a challenge for the development of the agricultural sector is certainly aimed at resolving the numerous environmental conflicts in the region.

The greatest of these is certainly the one relating to the Val d'Agri [19–21] where the emergence of excellent agricultural products and the penetration of markets on a larger scale must clash with the needs of conservation and protection related to the management of the National Park of the Apennines and, above all, with the coexisting oil industry and refining of extracted crude oil.

Another case of serious environmental conflict also occurs near the Ionian coast, where significant production in terms of economic weight as well as for the areas concerned, coexist with the Fuel Elements Treatment and Refabrication Plant (ITREC), a nuclear plant located in the Enea-Trisaia research center in Rotondella (MT) and used

for the conservation and testing of the reprocessing of nuclear fuel derived from a thorium-uranium cycle.

In addition to the specific problems of the agricultural field, there are some that, although generalized, have important effects on the primary sector. Hydrogeological instability is for example a historical problem certainly inherent to its territory and its particular geological, geomorphological, hydrogeological and seismic characteristics, but worsened in the nineteenth century due to extensive deforestation, economic marginalization, depopulation, reduction of the garrison of the territory, adoption of inadequate cultivation practices, and cementification, this phenomenon also seems destined to a predictable, further exacerbation following the rapid evolution of climate change. Rainfall, whether short and intense or exceptional and prolonged, is one of the most important factors for triggering slope instability phenomena; the first for rapid and superficial phenomena, the second for landslides with a greater depth of the sliding surface or involving predominantly clayey lithotypes. The tropicalisation of rainy events (heavy rains in a short time) as a result of the global change would contribute to accentuating the instability of the slopes as well as the hydraulic risk [22].

Basilicata is one of the Italian regions most exposed to landslide risk. Over the last hundred years, 19 of the 131 towns and cities have been totally or partially relocated. The Hydrogeological Plan shows that 5.2% of the regional territory is at risk of landslides and it is also affected by erosive problems [23]: 34.19% of the UAA and 36.67% of arable and permanent crops are exposed to erosive phenomena. These values, well above the national and European average (Italy: 27.84%; Europe: 6.0%), indicate the existence of a real regional problem.

Although they affect a large part of the regional territory, the erosive phenomena are more widespread in the environment of the plio-pleistocene hills [24]. They have an average erosion value not tolerable by 61 municipalities, about 70% of the total, 31 of them are located in mountain area and 30 in hilly area.

The goal of protecting and promoting regional biodiversity is undoubtedly part of a sustainable development strategy that is effective in the long term but which immediately has an impact. There are several specific objectives to be pursued for its achievement: the reduction of the polluting impact of agricultural practices; the permanence of farms in mountainous and disadvantaged areas, the adoption of agricultural and forestry practices capable of reversing the phenomena of land degradation but also measures for the prevention of fires and the enhancement of forest resources.

Both the programming period ending in 2013 and the current programming period have provided for a number of measures (PDR 2007–2013: Measures 1, 2, 8, 10, 11 and 16) for the conservation of soil resources, such as reforestation, maintenance and implementation of agroforestry systems, as well as increasing the resilience and mitigation capacity of forest ecosystems.

4 Final Remarks and Perspectives of Project Implementation

The agricultural sector of Basilicata boasts products of excellence that could be further enhanced through appropriate interventions. The limited percentage of suitable agricultural area compared to a type of agriculture aimed at large distribution, does not

allow Basilicata agricultural production to be competitive in large-scale retail trade. Nevertheless, our region is one of the most dynamic realities of the entire national sector, both in terms of numbers and specific production since fruit and vegetable chains are distinguished by quality and excellence. This happens for some horticultural and fruit species (brassica, fennel, apricot, strawberry, clementine), while for typical products, although the markets concerned are niche, both demand and sales prices are positive.

The sector, like other regions, is however affected by negative trend in consumption and a greater pressure of foreign competition, in addition to the low concentration of supply, the limited bargaining power of producers and the fragmentation of this sector. One solution to these problems is represented by NGOs that in Metapontum area, in particular, is represented by Producer Organizations that have been able to direct production and provide answers in terms of training and research.

The Integrated Supply Chain Design, synthesis of the effectiveness of the recent rural development policies, has allowed to plan investments in innovations to anticipate the competition on the markets and to extend its presence on them, to rationalize the production costs and improve their marketing. In order to further increase the potential of fruit and vegetable production, it is necessary to favor the diversification of supply, guarantee greater food safety, reduce production costs [25, 26] and achieve higher levels of efficiency in logistics systems.

Finally, a further evidence suggests that extra-agricultural activities and multi-functionality represent a possible strategy of income diversification both for farms and, in the future, for forestry companies. This could provide an incentive for small farms located in inland areas to overcome the lack of sufficient income from primary production and more extensive improvement of rural quality of life [27].

Former EU funded transnational cooperation projects allowed our research group to implement sectorial applications in sustainable development practices [28–32]. In the specific case of INNOVAGRO project, as comprehensive and long term expectations of project implementation, the contribution for the development of a rational and effective framework for territorial planning is expected [33, 34]. It goes in the direction of developing an integrated platform based on local specializations on which the operative programs are coherently organized in providing funding for public and private projects [35]. A critical component of such process is represented by monitoring systems (specialized on sustainability assessment [36, 37] that should reinforce decision making and citizens awareness on on-going processes and trends.

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