

Article

# From needs to policy action: Italian agri-food districts as a case of territorial cooperation

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**Abstract:** In the context of ecological and social challenges in global food systems, this study investigates the potential of agri-food districts to foster balanced territorial development. A multi-step approach to developing sustainable agri-food districts is outlined. How these districts, as integrated systems and meso-level organizational forms, can enhance sustainability through governance is then assessed. This research uses a context-driven analysis pathway involving stakeholder participation and needs identification. The theoretical background, the Italian regulatory framework, and a case study from Lombardy are presented. Needs are identified through participatory approaches and actions are prioritized using desk research and a narrative SWOT analysis combined with key stakeholder discussions (focus group). A total of eighteen needs are identified and categorized into 3 dimensions of sustainability: economic, environmental, and socio-institutional. Findings indicate that agri-food district organization has great potential to help achieve local and regional policy goals in line with the shift to sustainable approaches in the Common Agricultural Policy (CAP). The paper proposes actions to strengthen district capacity-building, focusing on internal governance and sustainable production chains. Additionally, initiatives to attract young people to rural areas and agreements for ecosystem services in agri-food districts are suggested. These actions aim to promote sustainability and competitiveness while addressing challenges related to governance, innovation, branding, demographics, and environment. In conclusion, the study prompts critical inquiry into governance models and system dynamics. The innovative aspects of this study lie in its methodological approach, integration of theory and practice, holistic perspective, policy relevance, and critical inquiry, which collectively contribute to advancing knowledge and understanding in the field of sustainable agriculture and territorial development.

**Keywords:** agri-food districts; territorial cooperation; agriculture; local food systems; Italy

## 1. Introduction

A recent stream of literature reflects the growing interest in territorial approaches to agri-food systems (Felici and Mazzocchi, 2022; Ilieva, 2016; Lamine et al., 2023). This can be seen as a reaction to the ecological and social crises produced by global food systems and unfair mechanisms of value creation and distribution along food supply chains (IPBES, 2019; IPES-Food, 2023). This paper adds to that stream of literature and analyses the capacity of agri-food districts (AFDs) to support a balanced territorial development, where policy and governance tools meet the needs of the local actors and contribute to a sustainable growth.

The European Union (EU) is building policies to curb ongoing environmental degradation. Notwithstanding recent protests held by farmers targeting European environmental policies and their influence on agricultural activities, the Farm to Fork

(F2F) strategy (part of the European Green Deal) seeks to promote the ecological transition of food systems (European Commission, 2020). To reach this goal, the European Commission (EC) has outlined a range of actions, encompassing the promotion of organic farming, reduction of chemical inputs, and an overall revision of production processes throughout the agri-food chain. In addition, it proposes tools for organising and innovating production systems, with the overarching goal of recognizing and compensating all components of the system. This approach contributes to the adoption of innovative and circular practices and processes. The Communication “A Long-Term Vision for Rural Areas” (European Commission, 2021) further underscores the EU’s commitment to collective actions with a distinct territorial approach.

AFDs can be considered as a model for belt governance (*meso*-dimension) due to their distinct capacity to facilitate connections between the micro part of the supply chain (farms) and the macro elements (large processing companies, markets, and institutions) (Enthoven and Van den Broeck, 2021; Toccaceli and Pacciani, 2024).

Aggregation within a district is geared towards promoting collaborative processes through the formation of legal entities that unite the interests of individual members. The establishment of legally recognized partnerships encourages cooperative efforts, fostering the development of a productive and socially cohesive critical mass (social capital). This critical mass becomes capable of self-representation and the defence of shared interests (Rivera et al., 2018).

The present research originates from a feasibility study, financed by the Cariplo Foundation (Italy), on actions for the development of sustainable agri-food districts. As a case study, we developed a multi-step approach for defining a territorial development strategy for AFDs in Lombardy (Italy). The general objective of this work is to assess the extent to which districts, as integrated systems and a *meso* form of organisation of production, can improve sustainability through governance capacity. This is a relevant research question for two main reasons: first, policy tools supporting sustainable forms of production and organisations receive a great deal of attention and financial support in EU policy planning; second, and rather interestingly, they seem to impact regional territories at very different paces. Some have a solid reputation and are very active catalysts of specific economic, social, and environmental interests; others barely survive and have no visibility, and thus are perceived by local actors as just another administrative burden.

With regards to the methodology, we propose a context- and needs-based territorial analysis pathway through participatory modes, based on needs identified by the research team, commented and validated by stakeholders, and confirmed by a textual analysis. These needs are then used to identify specific and targeted lines of action aimed at strengthening districts as an enabling form of territorial organisation in favour of farmers and agri-food supply.

The article is structured as follows: Section 2 provides the background on which agri-food districts lay their foundation; Section 3 presents the research case study; Section 4 introduces the methodology employed in the study; Section 5 presents the primary findings, focusing on the needs identified and their prioritization through multiple techniques; Section 6 comments on the possible actions identified and underscores the policy implications of agri-food district organisation at both the local

and regional levels.

## **2. Background**

### **2.1. Literature review**

The growing interest in the integrated programming of food production from central and local institutions arises from the need to overcome technical and organizational inefficiencies as well as distortions in output and input markets in the agri-food sector (Ericksen, 2008; FAO, 2018). While the evolution of the agri-food system has caused an increase in the segmentation and articulation of agricultural and food production processes, global competition is pressuring single farms to improve efficiency by: better managing production factors; overcoming over-fragmentation of the production process and the agricultural supply; improving their negotiating power with respect to firms operating up- and down-stream in the food chain; concluding economic transactions in reasonable timeframes; strengthening the stages of product conservation and transportation; and making sales and product destinations more stable (Caron et al, 2018; Stefanovic et al., 2020; Swinnen, 2020).

Interest in AFDs has grown in recent years, after a period of relative obscurity, for two main reasons. The first and perhaps more relevant one is the new attention dedicated to agriculture in the discourse on rural development and vitality (Byerlee et al., 2009). After a long period of neglecting agriculture as an engine of balanced development in rural areas, focusing instead on the local industry and small businesses, renewed interest in multifunctionality and the paradigmatic construction of the so-called “European agriculture model” gave new momentum to the primary sector (Cairol et al., 2009; Nowack et al., 2022; Renting et al., 2009). The economic crises of 2009 also rendered evident the need for a new paradigm within which agriculture could once again be able to bring new activities, new entrepreneurship and a new land management to rural and even urban areas (De Janvry, 2010; Zasada, 2010). Awareness of the dynamics of territorial embeddedness of food systems (Felici and Mazzocchi, 2022) has led to the development of important interpretive and normative models. Many of these have deep theoretical roots, linking back to the territorialist studies of the 1970s and their integrated approach to specificities and endogenous contexts in local development processes. In bioregionalist studies (Cevasco et al., 2022) the relationship between food and space includes the relational dimension, based on cultural, social and institutional components (Marino et al., 2018; Lazzeroni et al. 2023; Raffestin, 1984).

The second reason for the current interest in AFDs relates to the need to reorganise the modes and means of agricultural production in response to external and internal elements of crisis. External factors like war, the pandemic, and climate change have crucial effects on the primary sector (Galanakis, 2023; Paudel et al., 2023). Internal factors such as the aging farmers, competing land uses, and environmental pressures on intensive production have also caused attention to shift to alternative modes of production, less productive areas, organic farming, and income diversification (Bonfiglio et al., 2022; Salvioni et al., 2020). The reorganisation of agricultural production, food, and rural areas is seen as a means to achieve social and territorial equity, and also to optimise the use of productive and natural resources

(Cimino et al., 2022; Paudel et al., 2023; Sutherland, 2023).

The resulting new public policies in favour of the primary sector adopt a more sustainable approach, which has led to a whole new set of tools. This is quite evident in the latest reform of the Common Agricultural Policies (CAP). Its strategic goals and operative measures have been designed to target multidimensional sustainability, and sectoral and rural policies finally seem to coexist in some form of balance, included financial balance, and this after decades of domination by distortive sector-based support (OECD, 2023).

The body of literature on industrial districts and other form of production organisation is remarkably broad and, since the 70s, has been growing in many European countries, especially in Italy, where social and economic—and later environmental — conditions were particularly favourable, not only in the industry field but also in agriculture and agri-food (Amin, 2000; Becattini, 2000, 2002; Becattini et al., 2009; Carbone, 1992; CSS, 2005). It is worth noting that the theoretical and analytical construction of the district as a model was based on its capacity for economic, social, and environmental unity, even before the multidimensionality of sustainable development was recognized (Herman, 2024; Zegar and Wrzaszcz, 2017). This capacity makes districts versatile and adaptable to: traditional, more conservative environments as well as innovative high-tech ones; farms both large and small; different categories of specialisation such as food, social goals, and tourism; and both deep rural and peri-urban contexts (CSS, 2005).

The decline of the productivist paradigm in agriculture and the rise of the multifunctional approach to primary activities and farm organisation, supported by the EU common policies, have given new momentum to the so-called European model of agriculture based on small-size family farms and differentiated outcomes (Ilbery and Bowler, 1998; Ortiz-Miranda et al. 2013; Tilzey and Potter, 2008). This model has improved the economic, social, and environmental role of farms with regard to their territories, through the support of a network of external economies, the common sharing of knowledge and experience, and long-lasting personal connections and (sometimes informal) work connections, all of which impact transaction costs (Briamonte et al., 2019; Salvioni et al., 2013).

Integrated food production can offer opportunities to overcome the limitations of a highly fragmented agricultural supply and can facilitate endogenous innovation processes in a territory (Belmin et al., 2018; Shongwe et al., 2019; Toccaceli, 2015). Farms become suppliers of social, recreational, and environmental services, diversifying their activities and products according to the logic of multifunctionality (Cimino et al. 2022; Salvioni et al, 2020; Wilson, 2007). Districts are a part of this context, as a viable alternative to the segmentation of the productive system that encourages integration processes and territorial cooperation. Besides their strictly economic function, districts can also modify the levels of sustainability of production in social, ethical, and environmental terms, specifically throughout the improvement of the multifunctional role of the primary activity and, more in general, by promoting sustainability in the agro-environmental performance of the agricultural sector.

## **2.2. The regulatory framework in Italy**

The territorial nature of AFDs enhances the pursuit of sustainable goals through support for economic, social, and environmental actors at the local level, who are also the main beneficiaries of the effects of collective action on sustainability (Donati et al., 2012). The territorial dimension, through a decentralized setting of the decision-making process, represents one of the main qualifying elements of districts. A collective consultation among institutional and local actors is important to adjust the goals of using financial resources according to the diversity of local situations. Given that it is an integrated strategy, local public institutions, together with local economic and social actors, are called upon to adopt intervention modalities able to respond effectively to the specific questions that arise, including those regarding sustainable development.

Districts enhance the organization of production and territorial systems (structuring), encouraging collaboration between players who usually compete (Bouncken et al., 2015; Nijkamp, 2003) and networking for actors who share a common goal (Becattini, 2001; Hannachi and Moléno, 2012). It is a tool that triggers governance mechanisms where they are lacking or reorganizes them where they already exist (Cisilino et al., 2023; Cremaschi, 2001; Tarangioli, 2013).

Empirical evidence and the need to find forms of organisation that are more responsive to the requirements of enterprises and market needs have induced Italian legislators to legally recognise and define 2 types of agricultural district (legislative decree No. 228/2001):

- “quality AFD”: a productive area with a meaningful economic presence, characterized by interrelation and productive interdependence between agricultural and agri-food enterprises, and which generates one or more products certified and protected by EU or national regulations or by traditional or typical productions;
- “rural district”: a productive system characterized by a homogeneous historical and territorial identity and by the integration of agricultural activities and other local activities, as well as by the production of goods or services, coherent with the traditions and the natural and territorial vocations.

Subsequently, Law No. 205/2017 introduced the concept of “food district”. Food districts are agricultural and rural territories that have the capacity to establish cooperation paths between actors in the production chain, thus providing a guarantee for the end consumer that the work of all those involved is recognised and the production process is traceable. The 2017 law intends firstly to standardise the concept of district, bringing under a single definition the various forms of agri-food districts recognised by the regions (rural and agri-food districts, production systems located in urban and peri-urban areas with a significant presence of agricultural activities with the aim of environmental and social regeneration, local systems linked to direct sales and short supply chains, organic districts) (Berti, 2024; Toccaceli and Pacciani, 2024). It also establishes specific objectives for districts: to promote territorial development, cohesion and social inclusion; the integration of activities characterised by territorial proximity; food safety and reduced environmental impact of production and food waste; the preservation of the territory and the rural landscape.

### 3. The Lombardy case study

Lombardy is a region in northern Italy where, despite the prominence of industry and services, traditional agriculture has managed to maintain its vitality and agriculture is deeply integrated into the agri-food value chain. Simultaneously, the primary sector plays a crucial role in the preservation, revitalization, and enhancement of the territory. It is primarily in the more marginal territories of the region where agriculture faces challenges in maintaining viability.

These contrasting facets of the regional agri-food system have encouraged the proliferation of AFDs across the region (Carillo et al., 2023): in 2019, a total of 17 districts were officially recognized as AFDs. Among these, 8 were classified as rural, 4 as quality agri-food, and 5 as supply chain districts (**Table 1**). The Lombardy regional law acknowledges AFDs as adaptable tools, enabling the accommodation of local specificities and the needs of territorial actors. They enhance efficiency in coordinating the various actors within the local (and national) development supply chain. Moreover, they provide an institutional framework within which farmers can organize their activities and market relations (Carillo et al., 2023; Toccaceli, 2015).

**Table 1.** Food districts in Lombardy.

No.	Agri-food district	Typology
1	Distretto Agricolo della Bassa Bergamasca	Rural
2	Distretto Agricolo della Valle del Fiume Olona (DAVO)	Rural
3	Distretto Agricolo delle Risaie Lomelline	Rural
4	Distretto Agricolo Milanese	Rural
5	Distretto del Vino di Qualità dell’Oltrepò Pavese	Quality agri-food
6	Distretto della Filiera Avicola Lombarda	Food chain
7	Distretto della Filiera Cerealicola Lombarda	Food chain
8	Distretto Latte Lombardo (DLL)	Food chain
9	Distretto Neorurale delle Tre Acque di Milano (DINAMO)	Rural
10	Distretto Plantaregina	Food chain
11	Distretto Riso e Rane	Rural
12	Distretto Rurale Valle dell’Adda	Rural
13	Distretto Florovivaistico Alto Lombardo	Food chain
14	Po di Lombardia	Quality agri-food
15	Valtellina Che Gusto!	Quality agri-food
16	Distretto Agricolo Adda Martesana	Rural
17	Distretto Agricolo Biologico Casalasco Viadanese	Quality agri-food

Source: Elaboration by authors on Lombardy Region data.

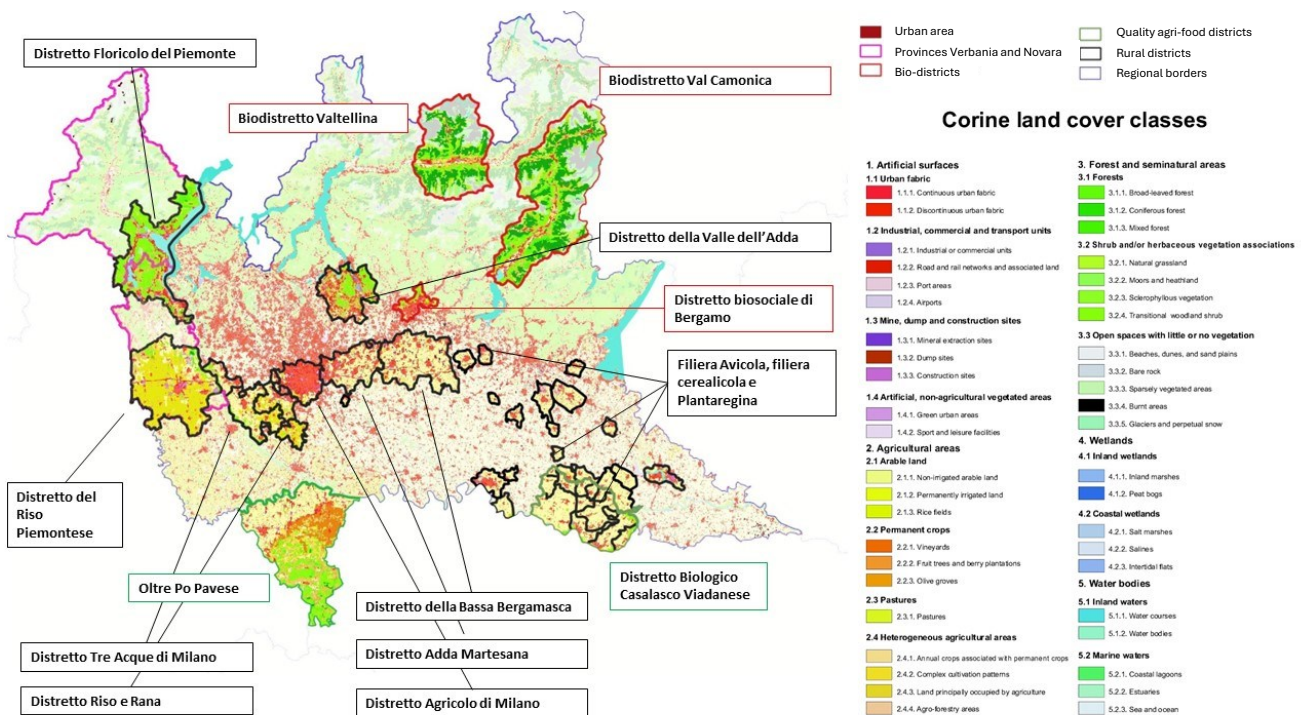
The Lombardy regional law recognizes three types of AFDs: rural, food chain, and quality AFDs. The general objectives and models of development and operation are very different among the different types of districts.

In particular, the rural districts aim to promote and enhance the area, focusing on certain aspects of what they produce, the environment and natural resources, and historical culture. The quality AFDs allow the creation of a networking system among

the businesses in different areas and the development of relationships with local institutions. In some cases, this is intended to restrict the marginalization of agriculture in areas where there is considerable pressure from urbanization. The four quality AFDs are in equal parts concentrated either over several provinces or a single territorial area, and mainly aim to enhance typical local productions, supporting aggregations and interactions among the various economic operators in the district, and promoting synergistic actions to share production and market needs and problems.

The supply chain districts, on the other hand, are mainly located over several provinces, and the strategy behind the establishment of the company is to enhance the value of products and sectors by promoting their productive economic improvement.

In addition to the AFDs, some bio-districts (bio-AFD) have been established in the regional territory (**Figure 1**), with the aim of prioritising organic production and sustainable practices as the focal points of their activities (Lamine et al., 2023; Sturla et al., 2019).



**Figure 1.** Distribution of the AFDs focused on by the present study.

Source: Elaboration by authors on Lombardy Region data.

Note: For Territorial continuity, the Distretto Floricolo del Piemonte and the Distretto del Riso Piemontese are also shown but not investigated.

## 4. Methodology

The methodology, based on a combination of instruments and supported by a concerted and organised dialogue with the stakeholders and on the available literature, is represented in **Figure 2**.

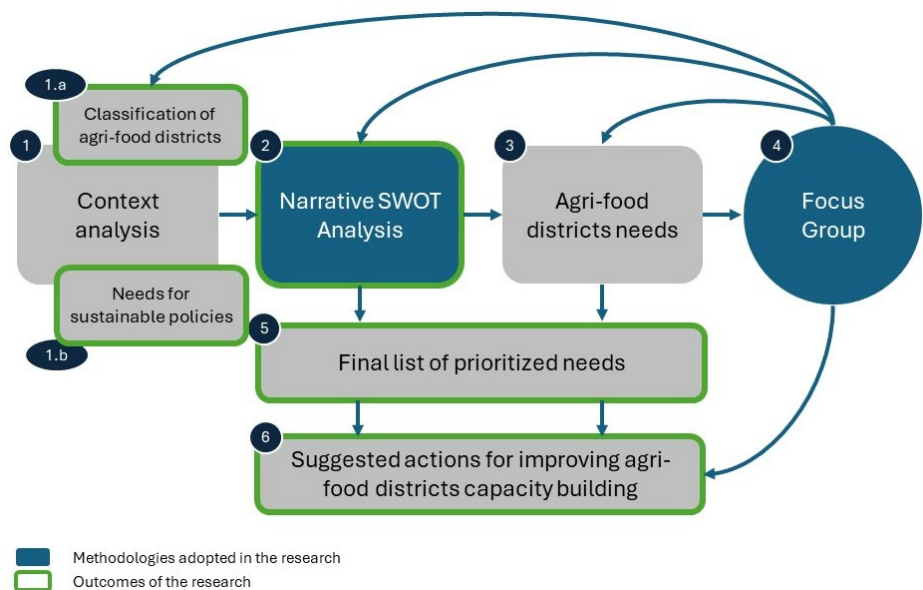
During the first step—the context analysis (step 1 in **Figure 2**)—AFDs have been classified according to their missions and relationships in the territory (step 1.a). This analysis was based on official statistical data, supplemented by administrative statistics (Italian Agricultural Payments Agency—AGEA), the livestock registry



database, regional data, etc.). On this basis, we analysed their main needs in terms of sustainable policies (step 1.b). The reference context was analysed by means of a narrative SWOT analysis with the direct involvement of territorial actors (step 2). Despite certain criticisms of the method (Bezzi, 2005; Bezzi, 2013; Marradi, 1996), the SWOT analysis can prove effective if appropriately structured to provide a concise yet comprehensive representation of the main characteristics of the regional territory, thereby aiding in the identification of potential development trajectories (Zanon and Martignano, 2007). In complex contexts, such as the regional one, it can assist in pinpointing the most suitable strategy and priority actions to enhance the competitiveness of the agricultural and agri-food sector from a district perspective. In this regard, the SWOT analysis can be regarded as part of a decision-support knowledge process.

The needs were defined and prioritised (step 3) after a discussion with key stakeholders through an organised focus group (step 4) (Krueger and Casey, 2015; Morgan, 1996). This participatory technique allows collective and in-depth reasoning on a theme, topic, product, or service. Opinions are freely expressed based on the moderator’s stimuli. Each participant has equal importance (influence power). Moreover, the individuals involved not only answer questions but also interact and discuss among themselves. This technique gathers opinions through significant elements useful for the empirical evaluation of research hypotheses (Cisilino and Monteleone, 2020). During the focus group, which was held on 16 June 2022, the discussion was geared towards the identification of the most appropriate solutions to the most urgent problems raised by the stakeholders.

Based on the minutes and recordings of the focus group, the preliminary list of needs identified by the research group was fine-tuned (step 5). The work was then developed to formulate a set of operational actions which might have an impact on the self-sustainability and capacity-building of the districts, coherently with the identified needs (step 6).



**Figure 2.** Graphical representation of the methodology.

Source: Elaboration by authors.



It should be noted that the methodology followed a participatory approach. In this sense, the analysis process was developed dynamically by presenting the results of the territorial audit—based on the context analysis—to a group of key stakeholders during the focus group. With a view to stakeholder involvement (Beierle, 2002), this approach can be effective in formulating strategies that align with the needs of the individuals directly and indirectly involved in the initiatives, as well as in fostering a sense of ownership of the policies and their outcomes by the stakeholders involved. This serves the dual purpose of meeting the demands arising from the territory and fostering consensus and support for the promoted initiatives, thereby ensuring their effectiveness and sustainability over time (Licciardo et al., 2018). Furthermore, it is noteworthy to recognize how the stakeholder discussion generated information loops (see arrows in **Figure 2**) which have refined both the inputs on which the stakeholders were asked to respond (SWOT narrative analysis and needs) and the context analysis and classification of AFDs.

## **5. Results**

### **5.1. Classification of AFDs**

Based on the context and the literature analyses, AFDs have been classified into five types, described below. For each type of AFDs, a brief assessment of the activation capacity of the sustainability dimension was provided, along with a comparative assessment against the implicit importance of that dimension for the area in which the district is located.

- Rural AFDs exhibit a significant interchange between agricultural and other local activities, including specific goods and services, often with externalities linked to the traditions and physical and cultural specificities of the territories. Interestingly, both statistics and focus group have revealed a specific focus on public support, which is necessary to convey certain functions and activities, requiring public remuneration for their characteristics of public goods and services. In fact, this link to policies recurs in almost all the district types identified, underscoring the importance of public action in enhancing district functions and also in enhancing sustainability.
- Rural-urban and peri-urban AFDs differ from rural AFDs due to their peri-urban character, linked to their proximity to major urban centres. This position strongly influences their relationship with sustainability. In particular, compared to rural districts, the economic dimension of sustainability assumes greater importance here, particularly the connection with markets, precisely because they aim to capitalise on their proximity to significant markets such as the Milan metropolitan area and other regional urban hubs. In this case, much emphasis is placed on public support tailored to specific forms of peri-urbanity. In terms of other dimensions, the social one does not appear to emerge prominently, as does the environmental one, although obviously there is a potentially relevant role for urban districts as a “buffer zone” between congested urban areas and more properly rural ones.
- High-quality agri-food AFDs are characterized by a significant economic activity,

often integrated into agri-food supply chains, with a significant presence of one or more products with Geographic Indications. The economic dimension of sustainability, therefore, should be somehow integrated with the social and environmental dimension. However, once again, the economic aspect predominates, and beyond a perceptible focus on food quality, there is limited awareness regarding other social and environmental dimensions. Nonetheless, the district could potentially serve as a synergistic element for sustainability goals in this area, and this factor could itself become a branding for local productions.

- In specialised agri-food chain AFDs, the element of territorial homogeneity loosens in favour of a more strictly sectoral dimension that acts as a link. Another characteristic of these districts is the dependence of the local population and the entire agribusiness labour pool. In this typology, once again, the economic dimension of sustainability is central in the perception of the actors involved, while both the social and environmental dimensions are less perceived. Conversely, the latter is of crucial interest for the area of location of districts under study, both due to problems related to forms of pollution resulting from agribusiness activities, and because of the potential interest in forms of circular economy and bioeconomy that could contribute positively and with less impact on production, social and territorial systems.
- In bio-AFDs sustainability priorities lean towards the environmental dimension and, to a lesser extent, the social one. This is largely due to the process of converting production to the organic method, which brings greater attention to issues such as biodiversity and various forms of pollution. However, it is also partly related to the territorial characteristics of the districts concerned, which fall in mountainous and relatively more remote areas compared to other districts. Attention to sustainability issues relates to energy sources and the possibility of bioenergy production and enhancing the circular economy seems to be rather limited, despite representing a viable alternative form of sustainable production.

## **5.2. The SWOT analysis**

The SWOT analysis highlighted the strengths and weaknesses of a system, which internal factors can be altered by proposed interventions, and the opportunities and threats posed by external aspects of the context, which may not be readily modifiable in the short term. A summary of the SWOT analysis is given below (**Table 2**), however a longer, narrative form was also prepared for each item that articulates and deepens the content.

**Table 2.** SWOT analysis.

<b>Strengths</b>	<b>Weaknesses</b>
<p>S1. Regulatory recognition of districts in agriculture</p> <p>S2. Classification of Lombardy’s agri-food districts (rural districts, quality agribusiness districts, supply chain districts) promoting territorial specificities</p> <p>S3. Widespread territorial coverage of the food districts</p> <p>S4. Strong connection between agricultural production and other economic activities</p> <p>S5. Presence of bio-districts (AIAB) and organic agri-food districts in Lombardy</p> <p>S6. Landscape diversity favoured by the presence of an important river system</p> <p>S7. The agri-food districts’ role in protecting and safeguarding the environment and enhancing the territory</p> <p>S8. Variety of mountain agricultural production</p> <p>S9. Prevalent agricultural identity in some districts and diversity of territorial agricultural supply chains</p> <p>S10. Location in areas of high natural value</p> <p>S11. Significant weight of the agri-food sector on manufacturing</p> <p>S12. Capacity to aggregate different players and a greater critical mass of AFDs</p> <p>S13. District as a catalyst for territorial initiatives and intermediate body with local institutions</p>	<p>W1. Territories with high indices of soil sealing and land consumption</p> <p>W2. Low presence of natural areas</p> <p>W3. Existence of high land conflicts, including those regarding investments made by farms in the metropolitan area</p> <p>W4. Gradual abandonment of agricultural activities and fragmentation of land ownership</p> <p>W5. Strong presence of intensive agricultural systems</p> <p>W6. Low investment in technology as a tool for environmental sustainability in the management of production processes</p> <p>W7. Still a small number of organic farms</p> <p>W8. Lack of financial resources for district policies and absence of guiding proposals for different regional realities</p> <p>W9. Lack of elasticity of administrative tools and limits in dialogue with public institutions, local authorities in particular</p> <p>W10. Low participation of farms in the districts and difficulties in the commercial transfer of products</p>
<b>Opportunities</b>	<b>Threats</b>
<p>O1. Governance and financial resources pertaining to regional economic planning</p> <p>O2. Variety of development and operational models</p> <p>O3. Public backing for organic farming</p> <p>O4. Intimate connection between urban and rural areas</p> <p>O5. Agricultural activity employed as a means to combat environmental degradation</p> <p>O6. Indications of a resurgence in agricultural activity for tourism purposes</p> <p>O7. Inclination toward internationalization and innovation</p> <p>O8. Agri-food district serving as a crucible for new ideas.</p> <p>O9. Collaboration with civil society to enact initiatives aimed at promoting awareness of the role farms play</p>	<p>T1. Densely populated territorial context with significant land use conflicts</p> <p>T2. Depopulation phenomena due to attraction from other areas or economic sectors</p> <p>T3. Abandonment of agricultural and forestry activities in certain medium and high mountain areas</p> <p>T4. Climate change and resource crises (e.g. water, plant diseases, pandemics, etc.)</p> <p>T5. Potential competition for the districts’ products</p>

Source: elaboration by authors.

### 5.3. From SWOT analysis to expressed needs

From the SWOT and the discussion with stakeholders that took place during the focus group held on 16 May 2022 in Milan, it was possible to fine-tune the list of needs expressed by the AFDs under study.

To achieve the objective, a structured method was used: some previously prepared questions were proposed, around which the moderator directed the participants’ attention by activating (and re-activating) their discussion. Participants

were told that the goal was not to find correct answers, but rather to collect their opinions, their points of view. It was also explained that the discussion sought not to reach an agreement on the issues, but to foster lively debate.

The SWOT analysis was briefly described as a useful framework for reflecting on and examining issues related to a specific territory: analysing strengths and weaknesses (internal), as well as identifying opportunities and threats (external) are indeed fundamental premises for defining needs. Looking at the context as a unified scenario makes it possible to define the potential areas of intervention. Based on the SWOT and contextual analysis, needs were illustrated during the meeting.

The tools used for collecting information and opinions from the focus group participants were the Metaplan populated with post-its. A summary of the emerged elements was reported on each note.

The issues that most drove the discussion, considering the elements identified in the SWOT analysis, were as follows:

- AFDs role as a catalyst for ideas (the district can enhance the capacity of enterprises and local authorities to generate innovation and develop new business models by fostering the valorisation of endogenous resources and becoming a catalyst for change. Situations where public-private stakeholders and districts had coinciding interests, leading to various collaborations, were highlighted (O8; S12; S13);
- Opportunities related to agroecology vary depending on an AFD's vocation (in this sense, the new development frontier for agri-food clusters can be guided by a twofold approach. Firstly, the transformation and/or strengthening of production systems with a focus on sustainability, employing methods from agroecology to circular production processes, can be central. Secondly, fostering cooperation and supply chain integration may also be essential (S9; O2);
- Environmental problems (conflict) were identified in metropolitan areas (proximity to large urban centres creates competition for land and, more broadly, for natural and environmental resources. This competition diminishes the capacity to preserve agricultural areas, which are not sufficiently acknowledged for their strategic role in regional planning (T1; W1; W3);
- In Bio-AFDs, one of the most evident limitations is property fragmentation (the decline in agricultural production has been ongoing for several decades, particularly in mountainous and foothill districts. In some instances, the primary objective of these districts is to counteract the marginalisation of agriculture amidst significant urbanisation pressure (S4; S5; S7; O5);
- The role of agricultural activity in environmental preservation is still at the centre of AFDs' activities (districts operate in territories where land use conflicts are highly significant. Many districts primarily aim to prevent the marginalisation of agricultural activity, which can combat environmental degradation and serve both cultural and productive roles, integrating seamlessly with urban activities (S7; O2; O5));
- AFDs are considered a privileged partner in metropolitan areas (a distinctive feature of many districts in Lombardy is the close relationship between the cities and the countryside, which offers significant development opportunities for local

production. These include short supply chains, Ethical Purchasing Group, integration with other supply chains, Horeca sector, local crafts, secondary processing, and the provision of ecosystem services (S4; O4);

- Bio-AFDs are characterized by territorial significance. Variety of productions in mountain areas (the bio-district is typically defined as a territorial area where certified organic farms operate. However, it also serves as a model of sustainable development, engaging all local communities committed to acting with respect for the environment and resources (S5; W7; O3);
- Challenge: overcoming the intergenerational gap. Sensitization and education are needed (regulatory and bureaucratic rigidity hampers the development of clusters in these territories. Nonetheless, despite depopulation and the abandonment of agricultural activities, there is evidence of a "return to the land" driven by tourism (W9; T2; O6).

The definition of needs is the intermediate step between the analysis of the situation, as expressed by the context analysis and the SWOT, and the identification of possible interventions. In fact, as evidenced by the main output of this phase (**Table 3**), each identified need is linked to the elements of the SWOT that ensure logical sequencing. After definition, needs were prioritized. The degree of priority was assigned by cross-referencing the data that emerged from the context analysis with the opinions and evaluations expressed by the stakeholders during the focus group. The priority level does not in itself define a greater or lesser relevance of each need with respect to the challenges identified in the SWOT (Cagliero et al., 2021; Mazzocchi et al., 2021). Rather, it means they are strategic and cross-cutting. In a nutshell, all needs are interdependent and require corresponding resources for their achievement. The needs have been grouped by three levels:

- Strategic: these are the heart of planning and should involve both specific actions and comprehensive approaches that also affect other needs in a mutually reinforcing way;
- Qualifying: refers to areas of intervention that are enabling to make the response to other needs effective, particularly strategic needs;
- Complementary: refers to areas of intervention that synergistically complement strategic needs; not technically a less relevant rank, just more specific, enabling in nature.

The list of needs, the link with the elements of the SWOT and their relative degree of priority are shown in **Table 3**. A total of 18 needs were identified, of which:

- 6 relate to the economic dimension of sustainability (E1–E6)
- 5 relate to the environmental dimension of sustainability (A1–A5)
- 7 relate to the socio-institutional dimension of sustainability (S1–S7)

Furthermore, the priority level was strategic for 5, qualifying for 8, complementary for 5.

**Table 3.** Needs, level of priority and links with the SWOT.

Code	Need	Level of priority	Link to SWOT
Economic needs			
E1	Strengthening connections with commercial channels for those districts operating in more remote rural areas.	Qualifying	O4; S3; S5; W3; T1
E2	Improving connections between districts and local manufacturing fabric and the local community food service system.	Strategic	S4; S7; O7; W6
E3	Supporting a high level of technological innovation to strengthen the district's level of competitiveness.	Complementary	W6; O8
E4	Promoting the quality marks as a source of competitive advantage and supporting actions for marketing district's quality productions, strengthening the economies of scale and scope.	Qualifying	S9; S10; S12; W10; T5
E5	Improving the position of the actors in the supply chains and recognising the value-added of agri-food productions.	Strategic	S2; S9; S12; O2; T5
E6	Fostering and supporting signs of return to agricultural activity, considering diversification and multifunctionality approaches at farm level.	Qualifying	O6; T3
Environmental needs			
A1	Enhancing the capacity of agricultural activity as a tool to face environmental degradation (loss of biodiversity) and land consumption.	Qualifying	S1; W2; W6; O5; T1; T2; S10
A2	Promoting strategies for adaptation to climate change by fostering the adoption of environmental innovations.	Strategic	T4; S10; W2
A3	Strengthening the capacity of districts to contribute to landscape complexity.	Complementary	S6; W2; S10
A4	Efficient use of resources, especially water, through better coordination between rural areas and urban centres and between sectors and by recognizing the benefits of metropolitan agriculture.	Qualifying	W3; W5; O4; T1; T2
A5	Supporting a concept of sustainability 3.0, which supports organic agriculture and is also able to represent an ethical and environmental investment for the future.	Qualifying	O3; W7
Socio-institutional needs			
S1	Facilitating integration with other tools to support supply chain cooperation and provide reward systems that recognize the role of districts.	Strategic	S1; W8; O1
S2	Encouraging organizational arrangements that go beyond the local dimension (long supply chains, business networks, supply chain contracts, etc.).	Complementary	S12; W9
S3	Facilitating the dissemination and exchange of innovation among district actors. Designing and supporting communication activities for sustainability aimed at a wide audience involving civil society.	Complementary	S8; O8; O9; W10
S4	Involving the social, productive and environmental communities of the territories through open and collaborative forms of governance	Qualifying	S4; S8; O3; O9
S5	Countering the loss of agricultural identity and culture, slowing down and, where possible, halting the loss of cultivated agricultural areas	Complementary	W1; W3; W4; S9; T3
S6	Supporting access to land (especially in mountainous areas) and the organization of supply chains through regulatory interventions and joint planning.	Qualifying	W4; W8
S7	Organizing intermediary structures that can foster communication between institutions and districts: providing a figure who can act as a facilitator/tutor with local actors and develop greater dialogue between entities.	Strategic	W9; W10

Source: elaboration by authors.

(\*) E = Economic needs; A = environmental needs; S = socio-institutional needs.

**Table 4** shows how individual needs have greater or lesser relevance to the classification of districts reported in the context analysis section. Rural districts express the greatest number of needs for intervention in response to the problems arising from the enterprises (especially small ones) and the target territory (mountainous and marginal areas). Bio-districts present a greater awareness of their role both in environmental terms and in terms of production potential. However, they express a need to intensify relations with the rest of the territorial economy (actors) and to have greater recognition from institutions as well. One problem is that, in urban-rural contexts, the latter felt a need to enhance and preserve primary and natural resources threatened by the territorial context.

**Table 4**, on the other hand, associates the 18 identified needs with the five district categories identified in section 5.1: rural-urban and peri-urban districts, rural districts, specialized agri-food chain districts, high-quality agri-food districts, and bio-AFDs. Three levels of correlation were identified:

- = Direct correlation
- = Indirect correlation
- = Low correlation

**Table 4.** Correlation of needs with identified AFDs types.

Code*	Need	Correlation with agri-food district types				
		Rural-urban and peri-urban	Rural	Specialized agri-food chain	High-quality agri-food	Bio-AFDs
E1	Strengthening connections with commercial channels for districts operating in remote rural areas.	●	●●●	●	●	●●●
E2	Improving the districts' connection with the local manufacturing fabric and the community and local food service systems.	●●●	●●●	●●●	●●	●●●
E3	Supporting a high rate of technological innovation to strengthen the district's level of competitiveness	●●●	●	●●●	●●●	●
E4	Promoting the quality marks as a source of competitive advantage and supporting actions for marketing district's quality productions, strengthening the economies of scale and scope.	●●●	●●●	●●●	●●●	●●●
E5	Improving the position of the actors in the supply chains and recognising the value-added of agri-food productions.	●●●	●●●	●●	●●●	●●●
E6	Fostering and supporting signs of return to agricultural activity, considering diversification and multifunctionality approaches at farm level.	●●	●●●	●	●	●●●
A1	Strengthening the capacity of agricultural activity as a tool to prevent environmental degradation (loss of biodiversity) and land consumption.	●●●	●●●	●●	●●	●●●
A2	Promoting strategies for adaptation to climate change by fostering the adoption of environmental innovations.	●●●	●●	●●	●●	●●●
A3	Strengthening the capacity of districts to contribute to landscape complexity.	●●●	●●●	●	●●	●●●



**Table 4.** (Continued).

Code*	Need	Correlation with agri-food district types				
		Rural-urban and peri-urban	Rural	Specialized agri-food chain	High-quality agri-food	Bio-AFDs
A4	Efficient use of resources, especially water, through better coordination between rural areas and urban centres and between sectors and by recognizing the benefits of metropolitan agriculture.	●●●	●	●●	●●	●●
A5	Supporting a concept of sustainability 3.0, which supports organic agriculture and is also able to represent an ethical and environmental investment for the future.	●	●●	●●	●●●	●●●
S1	Facilitating integration with other tools to support supply chain cooperation and provide reward systems that recognize the role of districts.	●●	●●●	●●●	●●	●●●
S2	Encouraging organizational arrangements that go beyond the local dimension (long supply chains, business networks, supply chain contracts, etc.).	●	●●●	●●●	●●●	●●
S3	Facilitating the dissemination and exchange of innovation among district actors. Designing and supporting communication activities for sustainability aimed at a wide audience involving civil society.	●●●	●	●●	●●	●●●
S4	Involving the social, productive and environmental communities of the territories through open and collaborative forms of governance	●●●	●●●	●	●	●●●
S5	Countering the loss of agricultural identity and culture, slowing down and, where possible, halting the loss of cultivated agricultural areas	●●	●●●	●●	●●●	●●
S6	Supporting access to land (especially in mountainous areas) and the organization of supply chains through regulatory interventions and joint planning.	●●●	●●●	●●●	●	●●
S7	Organizing intermediary structures that can foster communication between institutions and districts: providing a figure who can act as a facilitator/tutor with local actors and develop greater dialogue between entities.	●●●	●●●	●●	●●	●●●

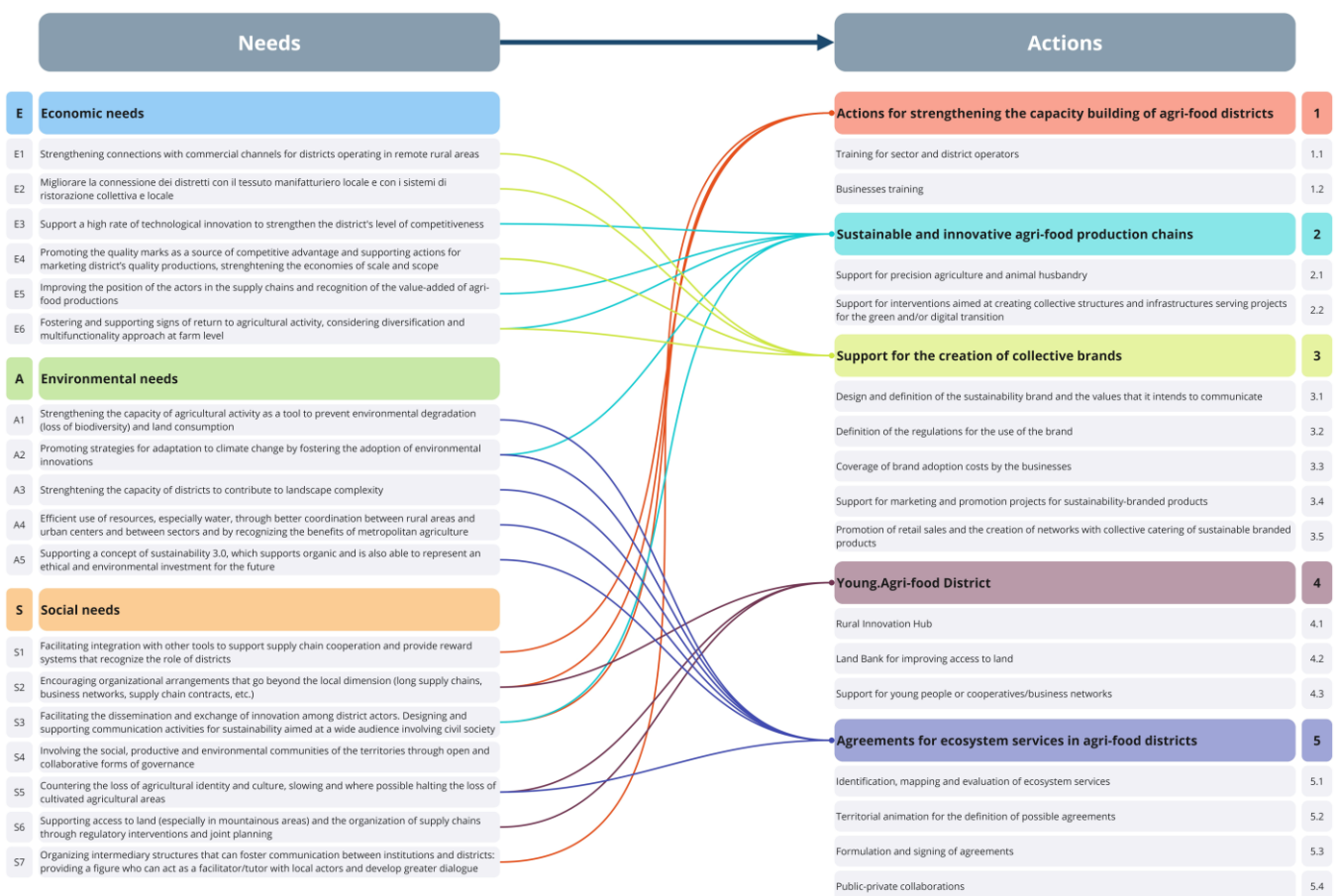
Source: Elaboration by authors.

(\*) E = Economic needs; A = environmental needs; S = socio-institutional needs.

## 6. Policy implications and discussions

This study has sought to define a set of tools to accompany the proper development of agri-food districts. The combination of inputs received during all stages of the methodological construction of the research identified five groups of actions to strengthen district capacity-building and improve the ability to generate positive impacts for farmers and the target area (**Figure 3**). Starting from the needs and considering the purposes that Lombardy Region attributed to the recognition of districts, some lines of intervention were hypothesized that could accompany the growth of districts in a sustainable way and in line with the main national and European agricultural development strategies. Indeed, the priorities highlighted by the two regions in their respective Regional Development Complements with respect to the Strategic Plan of the CAP 2023-27 (the main national agricultural policy instrument) have been considered in defining the main policy directions. The actions are articulated below with a focus on correlation with needs and policy implications.

In **Table 5**, the suggested actions and measures are listed, as well as their links with needs as listed in **Table 3**. For completeness, estimated impacts and indicators have also been included, but since their identification was based only on the authors' experience with the CAP Strategic Plan, they have not been commented in the following sections and will require further research on the matter. Considering the focus of our research, aimed at identifying policy implication for the capacity-building of the AFDs, we deemed to incorporate the discussion with the policy implications. Accordingly, in the following sub-sections, the discussion of the five lines of intervention is presented not as a mere illustration/presentation but is compared with the relevant literature. In particular, since the specific literature on AFDs is not extensive, for each of the five lines of action, we identified the literature that was best suited from a thematic point of view to validate/comment on our considerations.



**Figure 3.** Needs and actions.

Source: Elaboration by authors.

### 6.1. Actions for strengthening the capacity-building of AFDs

The goal is to improve internal district governance and foster planning to ensure greater economic, environmental, and social sustainability of district production and marketing activities. The aforementioned analysis has highlighted the low visibility of the agri-food districts with respect to the reference context both in terms of the representation of member farms and companies and the ability to be recognized as a representative entity by other actors in the area. The management of governance inside

and outside the district is crucial to foster change and innovation. In this sense, capacity-building can foster systemic planning of the activities of the district and its members in a way that ensures the strategy is clearly recognizable even for external socio-institutional and economic actors with whom the district interacts (Den Boer et al., 2021; Sonnino, 2013). The European Commission, in the Communication “A long term vision for rural areas” (European Commission, 2021), stresses the need for rural areas to be involved in multi-level, place-based governance that develops integrated strategies using collaborative and participatory approaches, benefiting from tailored policy mixes and interdependencies between urban and rural areas. Therefore, interventions should focus on training activities for district members to improve their skills for the overall management of activities. Training and information activities should be initiated for district enterprises to develop innovative skills in line with collective planning. Training should be accompanied by Technical Assistance activities to facilitate interaction with district partners and plan an overall action and information strategy on district activities aimed at the territorial and socio-economic context.

## **6.2. Sustainable and innovative production chains**

The goal is to increase innovation and the use of new technologies among actors throughout the agri-food supply chain to create transparent networks and supply chains, improve product traceability and quality, develop new promotion strategies, optimize production and processing within the circular economy model, and encourage the use of sustainable packaging. Digitalization is perceived by the local actors as an opportunity to improve the integration of local production systems, enable product traceability, increase enterprise productivity and competitiveness, improve risk management, predict market trends, and enhance the decision-making and strategic capabilities of enterprises (Brunori, 2022). An in-depth discussion and a critical assessment of the impacts of the introduction of innovation in agriculture and specifically in AFDs goes beyond the scope of this paper, but it is worth mentioning that a system of, decision support to innovation and its applications is currently available to help farmers optimize production processes, reduce input costs, improve productivity and process yields, and increase profitability (Zhai et al., 2020). Precision farming technologies are also considered proper for a more rational use of production inputs and natural resources (such as water and soil), thereby reducing pollution and ensuring more sustainable use of resources (Finger et al., 2019). Several studies on the determinants of digital technology adoption in agriculture and its impact on production management point to difficulties farmers have in understanding the advantages of adopting these technologies and the knowledge required for their effective use (Silva et al., 2023). A specific advisory figure that combines technological knowledge with the specific needs of various farms and territories is currently lacking but could help farmers choose between different systems and use them properly, so that the potential of digitization can be translated into a real advantage for the farmer.

### **6.3. Support for the creation of collective brands**

This measure is considered relevant by the local actors in order to strengthen the sustainability and competitiveness of enterprises within a AFD. In some AFDs, territorial marketing initiatives based on local branding have contributed to the positioning of products (both in niche markets like Alternative Food Networks and farmers' markets, and in large-scale organized distribution), consumer loyalty, and to the strengthening of supply chain integration (Rossi et al., 2019). Introducing brands is also seen as an opportunity to define and follow production standards (especially in terms of environmental sustainability), to introduce certification paths for quality, healthy, and ethical products, and to raise awareness of the production context and restore competitiveness to businesses and the territories (Henke et al., 2023; Vaquero-Piñeiro, 2021). The nature, objectives, and needs of a given district can all help define a trademark to promote the growth of the AFD, helping to affirm the role of the territory. Furthermore, collective branding may be a more effective means of incentivizing firms to invest in quality than individual branding (Fishman et al., 2018), while developing identity, representation, and commercial value of rural communities through their productive and commercial orientation (Ortiz-Esaine and Gutierrez, 2022).

### **6.4. Young Agri-food districts**

The goal is to increase the attractiveness of rural areas for young people. For various reasons, all districts have a dearth of young people interested in living and working in rural areas (Coopmans et al., 2020). In more marginal areas, agricultural activities are sometimes abandoned due to difficulties in business management, land access problems, and a lack of essential services (Zagata and Sutherland, 2015). Conversely, in neo-rural districts or those located in more competitive areas, the challenges for young people are the access to land and capital, and the attractiveness of other economic sectors that offer professional opportunities and often also better pay (Terres et al., 2015). The EC communication "The long-term vision of rural areas" points out that negative demographic trends in rural areas combined with productivity challenges and limited connectivity, infrastructure, public services, including education and care, all reduce the attractiveness of rural areas as places to live and work. Agri-food districts could help encourage young people to stay in rural areas, by addressing the issues that cause young people to leave rural areas and agricultural activities. Together with local institutions, agri-food districts can promote initiatives to improve quality of life, they can accompany individual and collective neo-entrepreneurship, support youth initiatives with collective services or system actions whose costs can be unaffordable for start-ups or new businesses.

### **6.5. Agreements for ecosystem services in AFDs**

The goal is to strengthen the ecosystem service delivery capacity of AFD areas. Many AFD areas in Lombardy and Piedmont badly need to enhance and conserve the natural environment. Agroforestry areas provide very important ecosystem services, but the ability to regenerate their underlying natural resources (natural capital) is subject to increasing risks and pressures (e.g., water resource scarcity, land

consumption, impactful agricultural practices, and high use of chemical inputs). Among the market instruments for the conservation and enhancement of services provided by natural ecosystems, Payment for Ecosystem Services (PES) systems are market mechanisms in which beneficiaries of an environmental service pay service providers (e.g., farmers or forest owners) to ensure the continuity of the service provided or an enhancement of the service in the long run (Greiber, 2009; Salzman et al., 2018). In other words, PES systems are voluntary agreements between at least one seller and one buyer in the context of one or more well-defined ecosystem services or land uses that produce that service. The districts have, in some cases, promoted activities for the sustainable management of natural resources by involving member companies and local institutions in public-private agreements. The context analysis revealed intensive and competitive land use, especially in areas closest to cities, the need to limit and optimize water use, and the need to defend biodiversity and natural resources from widespread anthropization. The adoption of sustainable environmental management schemes promotes behaviours capable of preserving the delivery of ecosystem services (Wegner, 2016). In addition, districts, given their nature as a collective entity, can incentivize the adoption of sustainable processes by helping their partners adhere to the adopted scheme. At the same time, where the district or a group of firms carry out active land, natural resource or environmental protection actions that have a positive impact, these should be recognized by the community and rewarded through agreements and schemes which reward and incentivize virtuous practices.

**Table 5.** Actions, measures, links with needs, estimated impacts, and indicators suggested for supporting agri-food district development.

Action	Measures	Links with needs	Estimated impacts	Indicators
1. Actions for strengthening the capacity-building of AFDs	1.1. Training for sector and district operators	S1, S2, S3, S7	<ul style="list-style-type: none"> <li>• Strengthening the partnership structure</li> <li>• Strengthening the core competencies of practitioners regarding innovation issues</li> <li>• Consolidation of the district’s role both with respect to members and outside the district</li> <li>• Definition of an innovative and sustainable action strategy that can improve the competitiveness of those involved in the district’s activities</li> </ul>	<ul style="list-style-type: none"> <li>• Number of operators who completed the training course</li> <li>• Number of days of training</li> <li>• Number of training courses activated</li> </ul>
	1.2. Training businesses			<ul style="list-style-type: none"> <li>• Number of entrepreneurs involved in training activities</li> <li>• Number of training activities carried out</li> </ul>
2. Sustainable and innovative agri-food production chains	2.1. Support for precision agriculture and animal husbandry	E3, E5, E6, A2, S3	<ul style="list-style-type: none"> <li>• Direct: Rational management of production resources and production processes; Reduction of business management costs; Reduction of waste and production waste</li> <li>• Indirect: Strengthening partnership processes; Improving enterprise management skills; New entrepreneurship.</li> </ul>	<ul style="list-style-type: none"> <li>• Number of investments made in precision agriculture and animal husbandry</li> <li>• Number of operators assisted through the back-office service</li> </ul>
	2.2. Support for interventions aimed at creating collective structures and infrastructures serving projects for the green and/or digital transition			<ul style="list-style-type: none"> <li>• Number of farms benefiting from collective infrastructure</li> <li>• Number of "sustainable innovation vouchers" used</li> </ul>
3. Support for the creation of collective brands	3.1. Design and definition of the sustainability brand and the values that it intends to communicate	E1, E2, E4, E6	<ul style="list-style-type: none"> <li>• Increased recognition of the district</li> <li>• Adoption of sustainable management behaviours of enterprises</li> <li>• Increased competitiveness of district enterprises</li> </ul>	<ul style="list-style-type: none"> <li>• Share of agri-food production falling under the brand specification (%)</li> </ul>
	3.2. Definition of the regulations for the use of the brand			<ul style="list-style-type: none"> <li>• Quantity of agri-food products retailed through the brand (tons)</li> </ul>
	3.3. Coverage of brand adoption costs by the businesses			<ul style="list-style-type: none"> <li>• Value of agri-food products retailed through the brand (€)</li> </ul>
	3.4. Support for marketing and promotion projects for sustainability-branded products			<ul style="list-style-type: none"> <li>• Quantity of agri-food products sold in mass catering channels (ton)</li> </ul>
	3.5. Promotion of retail sales and the creation of networks with collective catering of sustainable branded products			<ul style="list-style-type: none"> <li>• Value of agri-food products sold in mass catering channels (€)</li> </ul>

**Table 5. (Continued).**

Action	Measures	Links with needs	Estimated impacts	Indicators
4. Young AFDs	4.1. Rural Innovation Hub			<ul style="list-style-type: none"> <li>• Number of projects initiated</li> <li>• Population involved in the project</li> <li>• Number of agribusinesses involved in the projects</li> </ul>
	4.2. Land Bank for improving access to land			<ul style="list-style-type: none"> <li>• Number of hectares managed through the land bank</li> <li>• Number of hectares allocated through the land bank</li> <li>• Number of agricultural enterprises allotted land through the land bank</li> </ul>
	4.3. Support for young people or cooperatives/business networks	S2, S6, S5	<ul style="list-style-type: none"> <li>• Increased youth employment and entrepreneurship</li> <li>• Improved quality of life</li> <li>• Increased number of new and young farmers</li> </ul>	<ul style="list-style-type: none"> <li>• Number of young farmers (&lt;40 years old) already active involved in the project</li> <li>• Number of new young farmers (&lt;40 years old) involved in the project</li> <li>• Number of projects activated (cooperatives and/or business networks)</li> <li>• Number of new activities started as a result of the project (cooperatives/business networks)</li> </ul>
5. Agreements for ecosystem services in AFDs	5.1. Identification, mapping and evaluation of ecosystem services			<ul style="list-style-type: none"> <li>• Number of agreements signed</li> <li>• Number of agribusinesses involved in the agreements</li> </ul>
	5.2. Territorial animation for the definition of possible agreements			
	5.3. Formulation and signing of agreements	A1, A2, A3, A4, A5, S4, S5	<ul style="list-style-type: none"> <li>• Improved sustainable management of natural resources</li> <li>• Recognition of the farmer's eco-system services</li> <li>• Diversification of farm income</li> <li>• Improvement of land environmental performance and strengthening of ecosystem service delivery</li> </ul>	<ul style="list-style-type: none"> <li>• Population benefiting from agri-environmental actions</li> <li>• Citizens involved in territorial animation actions</li> </ul>
	5.4. Public-private collaborations			<ul style="list-style-type: none"> <li>• Number of agribusinesses involved in territorial animation actions</li> </ul>

Source: Elaboration by authors.



## 7. Conclusions

There is currently strong momentum for AFDs in Italy. The present research offers three types of contribution that are relevant in this respect: (1) The methodology, which involved a mix of desk and participatory techniques and which, from the context analysis to the definition of the lines of action, was centred on the real needs of the AFDs. (2) The modelling of AFDs, through the identification of five typologies based on a profound territorial, economic, environmental, and social analysis (see Section 5.1). (3) The link between the needs and the possible public support policies as commented in Section 6.

The study opens interesting research perspectives, particularly with regard to the evaluation of the implementation of actions planned or that can be activated by the AFDs and, in general, by integrated actors involved into local development programs. Furthermore, it opens rooms for a new and more robust conceptualization of AFDs, and of a new policy framework as well (Toccaceli and Pacciani, 2024). Regarding the effectiveness of co-construction of public policies, the definition of the AFDs action programmes is the result of a long-term shared effort of the actors involved, which allows the collection of needs, the definition of objectives and of intervention instruments. These processes need time and resources and can easily fail due to loss of interest or discouragement of actors involved. The working methodology made it possible to test an alternative way of defining an intervention programme for the districts with very limited costs, human resources, and time. This methodology can be further tested in order to define a specific approach to concerted planning activities at a territorial and sectoral level, especially in terms of stakeholder involvement and identification and analysis of needs.

However, it is useful to understand whether and to what extent AFDs represent a real tool to foster supply chain integration or whether it is a more symbolic initiative to promote, even at the level of political culture, local governance of food systems. This intersection of policy, narrative, and economic strategy is a common thread in numerous contexts that extend beyond agriculture, such as urban development or environmental issues. Understanding how narratives influence policy implementation and public perception is crucial for crafting effective strategies in any domain (Mazzocchi et al., 2023). The paper prompts broader questions about governance models and systems dynamics, applicable beyond the specific context of food districts. Exploring whether certain governance structures really facilitate collaboration and integration, or if they primarily serve symbolic purposes, is relevant in understanding power dynamics and decision-making processes. It provides a framework for critical analysis and inquiry that can be applied across different contexts, emphasizing the importance of evaluating policies, narratives, and governance structures to foster sustainable development and effective organizational models.

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## References

- Amin, A. (2000). Industrial Districts. In: Sheppard, E., Barnes, T. J. (editors). *A Companion to Economic Geography*. Wiley-Blackwell.
- Becattini, G. (2000). Districtality between agriculture and industry. *QA Rivista dell'Associazione Rossi-Doria*, 2, 9–25.
- Becattini, G. (2001). Districts and Rurality: Challenges to Economic Reductionism (Italian). *Una replica. La questione agraria*, 1, 119–127.
- Becattini, G. (2002). Industrial Sectors and Industrial Districts: Tools for Industrial Analysis. *European Planning Studies*, 10(4), 483–493. <https://doi.org/10.1080/09654310220130194>
- Becattini, G., Bellandi, M., De Propriis, L. (2009). *A handbook of industrial districts*. Edward Elgar Cheltenham, UK and Northampton, MA, USA.
- Beierle, T. C. (2002). The Quality of Stakeholder-Based Decisions. *Risk Analysis*, 22(4), 739–749. Portico. <https://doi.org/10.1111/0272-4332.00065>
- Belmin, R., Casabianca, F., & Meynard, J.-M. (2018). Contribution of transition theory to the study of geographical indications. *Environmental Innovation and Societal Transitions*, 27, 32–47. <https://doi.org/10.1016/j.eist.2017.10.002>
- Berti, G. (2024). Territorial food governance: local policies, districts and food communities (Italian). *RRN Magazine, Rivista della Rete Rurale Nazionale*, 20, 28–31.
- Bezzi, C. (2005). The dynamic or relational SWOT, *Italian Evaluation Review*, n. 31/2005 (Italian). FrancoAngeli editore.
- Bezzi, C. (2013). *Researching with Groups: A Guide to Using Focus Groups, Brainstorming, Delphi, and Other Techniques* (Italian), FrancoAngeli editore.
- Bonfiglio, A., Abitabile, C., & Henke, R. (2022). A choice model-based analysis of diversification in organic and conventional farms. *Bio-Based and Applied Economics*, 11(2), 131–146. <https://doi.org/10.36253/bae-12206>
- Bouncken, R. B., Gast, J., Kraus, S., et al. (2015). Coopetition: a systematic review, synthesis, and future research directions. *Review of Managerial Science*, 9(3), 577–601. <https://doi.org/10.1007/s11846-015-0168-6>
- Briamonte, L., Henke, R., Monteleone, A. (2019). Network and networks: The contribution to agri-food and rural areas. *Economia Agro-alimentare/Food Economy*, 21(2), 309–313.
- Brunori, G. (2022). Agriculture and rural areas facing the “twin transition”: principles for a sustainable rural digitalisation. *Rivista Di Economia Agraria*, 77(3), 3–14. <https://doi.org/10.36253/rea-13983>
- Byerlee, D., de Janvry, A., & Sadoulet, E. (2009). Agriculture for Development: Toward a New Paradigm. *Annual Review of Resource Economics*, 1(1), 15–31. <https://doi.org/10.1146/annurev.resource.050708.144239>
- Cagliero, R., Bellini, F., Marcatto, F., Novelli, S., Monteleone, A., & Mazzocchi, G. (2021). Prioritising CAP Intervention Needs: An Improved Cumulative Voting Approach. *Sustainability* 2021, 13, 3997. <https://doi.org/10.3390/su13073997>

- Cairol, D., Coudel, E., Knickel, K., et al. (2009). Multifunctionality of Agriculture and Rural Areas as Reflected in Policies: The Importance and Relevance of the Territorial View. *Journal of Environmental Policy & Planning*, 11(4), 269–289. <https://doi.org/10.1080/15239080903033846>
- Carbone, A. (1992). Productive integration on the territory and formation of local agricultural systems (Italian). *La Questione Agraria*, 46, 137–163.
- Carillo, F., Henke, R., & Sturla, A. (2023). An Assessment of the Effects of Food Districts on Sustainable Management of Land: The Case of Lombardia, Italy. *Systems*, 11(6), 283. <https://doi.org/10.3390/systems11060283>
- Caron, P., Ferrero y de Loma-Osorio, G., Nabarro, D., et al. (2018). Food systems for sustainable development: proposals for a profound four-part transformation. *Agronomy for Sustainable Development*, 38(4). <https://doi.org/10.1007/s13593-018-0519-1>
- Cevasco, R., Fanfani, D., Ziparo, A. (2022). Eco-territorialism. In: *The bioregional perspective*. *Scienze del Territorio*, 10, 2.
- Cimino, O., Henke, R., Vanni, F. (2022). The role of diversification in the revenue composition of Italian farms. *REA- Italian Review of Agricultural Economics*, 77(1), 25–38.
- Cisilino, F., & Monteleone, A. (2020). Designing Rural Policies for Sustainable Innovations through a Participatory Approach. *Sustainability*, 12(21), 9100. <https://doi.org/10.3390/su12219100>
- Cisilino, F., Giampaolo, A., Licciardo, F., et al. (2023). The Tuscany Integrated Supply Chain Projects 2014–2022: A New Path to Support the Agri-Food Industry. *Land*, 12(6), 1230. <https://doi.org/10.3390/land12061230>
- Consiglio Italiano per le Scienze Sociali (CSS). (2005). *Local development trends and policies in Italy (White paper)* (Italian). Politecnico di Torino.
- Coopmans, I., Dessein, J., Accatino, F., et al. (2020). Policy directions to support generational renewal in European farming systems. *EuroChoices*, 19(2), 30–36. Portico. <https://doi.org/10.1111/1746-692x.12282>
- Cremaschi, M. (2001). *Integrated programs: opportunities and constraints* (Italian). Formez/Donzelli editore, Roma, Italy.
- De Janvry, A. (2010). Agriculture for development: new paradigm and options for success. *Agricultural Economics*, 41(s1), 17–36. Portico. <https://doi.org/10.1111/j.1574-0862.2010.00485.x>
- Den Boer, A. C., Broerse, J. E., & Regeer, B. J. (2021). The need for capacity building to accelerate food system transformation. *Current Opinion in Food Science*, 42, 119–126. <https://doi.org/10.1016/j.cofs.2021.05.009>
- Donati, M., Mancini, M. C., Menozzi, D. (2012). The Parma Ham District between typicality and sustainability (Italian). *Economia & Diritto Agroalimentare*, 17, 133–159.
- Edelmann, H., Quiñones-Ruiz, X. F., Penker, M., et al. (2020). Social Learning in Food Quality Governance—Evidences from Geographical Indications Amendments. *International Journal of the Commons*, 14(1), 108–122. <https://doi.org/10.5334/ijc.968>
- Enthoven, L., & Van den Broeck, G. (2021). Local food systems: Reviewing two decades of research. *Agricultural Systems*, 193, 103226. <https://doi.org/10.1016/j.agsy.2021.103226>
- Ericksen, P. J. (2008). Conceptualizing food systems for global environmental change research. *Global Environmental Change*, 18(1), 234–245. <https://doi.org/10.1016/j.gloenvcha.2007.09.002>
- European Commission. (2020). European Commission Communication COM/2020/381—Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Farm to Fork Strategy for a Fair, Healthy and Environmentally-Friendly food System. Available online: [https://eur-lex.europa.eu/resource.html?uri=cellar:ea0f9f73-9ab2-11ea-9d2d-01aa75ed71a1.0001.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:ea0f9f73-9ab2-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF) (accessed on 15 December 2023).
- European Commission. (2021). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions—A long-term Vision for the EU’s Rural Areas Towards Stronger, Connected, Resilient and Prosperous Rural Areas by 2040. COM(2021)345. Available online: <https://eur-lex.europa.eu/legalcontent/PL/TXT/?uri=CELEX%3A52020SC0345&qid=16290618986> (accessed on 15 December 2023).
- FAO. (2018). *Sustainable Food Systems: Concept and Framework*. Food and Agriculture Organization of the United Nations.
- Felici, F. B., & Mazzocchi, G. (2022). Territory Matters: A Methodology for Understanding the Role of Territorial Factors in Transforming Local Food Systems. *Land*, 11(7), 1046. <https://doi.org/10.3390/land11071046>
- Finger, R., Swinton, S. M., El Benni, N., et al. (2019). Precision Farming at the Nexus of Agricultural Production and the Environment. *Annual Review of Resource Economics*, 11(1), 313–335. <https://doi.org/10.1146/annurev-resource-100518-093929>

- Fishman, A., Finkelstein, I., Simhon, A., Yacouel, N. (2018). Collective brands. *International Journal of Industrial Organization*, 59, 316–339. <https://doi.org/10.1016/j.ijindorg.2018.03.00>
- Galanakis, C. M. (2023). The “Vertigo” of the Food Sector within the Triangle of Climate Change, the Post-Pandemic World, and the Russian-Ukrainian War. *Foods*, 12(4), 721. <https://doi.org/10.3390/foods12040721>
- Greiber, T. (2009). Payments for ecosystem services: Legal and institutional frameworks. IUCN.
- Hannachi, M., & Coléno, F. (2012). How to adequately balance between competition and cooperation? A typology of horizontal coopetition. *International Journal of Entrepreneurship and Small Business*, 17(3), 273. <https://doi.org/10.1504/ijesb.2012.049577>
- Henke, R., De Leo, S., Longhitano, D., and Sardone, R. (2023). New CAP and the challenge of sustainability: a synthetic indicator for the Italian wine sector. *Wine Economics and Policy*. <https://doi.org/10.36253/wep-13468>
- Herman, E. (2024). Sustainable Agriculture and Its Impact on the Rural Development in EU Countries: A Multivariate Analysis. *Land*, 13(7), 947. <https://doi.org/10.3390/land13070947>
- Ilbery, B., and Bowler, I. (1998). From agricultural productivism to post.productivism. In Ilbery, B. (editor). *The geography of rural change*. Routledge. <https://doi.org/10.4324/9781315842608>
- Ilieva, R. T. (2016). *Urban Food Planning, Seeds of Transition in the Global North*. Routledge: Oxfordshire, UK.
- IPBES. (2019). Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. IPBES Secretariat.
- IPES-Food. (2023). From plate to planet: How local governments are driving action on climate change through food. IPES-Food.
- Krueger, R. A., & Casey, M. A. (2015). Focus Group Interviewing. In *Handbook of Practical Program Evaluation: Fourth Edition*. John Wiley & Sons. 10.1002/9781119171386.ch20
- Lamine, C., Garçon, L., & Brunori, G. (2019). Territorial agrifood systems: A Franco-Italian contribution to the debates over alternative food networks in rural areas. *Journal of Rural Studies*, 68, 159–170. <https://doi.org/10.1016/j.jrurstud.2018.11.007>
- Lamine, C., Pugliese, P., Barataud, F., et al. (2023). Italian biodistricts and French territorial food projects: how science-policy-experience interplays shape the framings of transitions towards sustainable territorial food systems. *Frontiers in Sustainable Food Systems*, 7. <https://doi.org/10.3389/fsufs.2023.1223270>
- Lazzeroni, M., Berti, G., Bruno, R., et al. (2023). Le regioni del cibo: processi, politiche, narrazioni. *RIVISTA GEOGRAFICA ITALIANA*, 4, 152–172. <https://doi.org/10.3280/rgioa4-2023oa16857>
- Licciardo, F., Legnini, M., & Buscemi, V. (2018). Il coinvolgimento del partenariato nella costruzione del PSR 2014-2020 della Regione Liguria. *RIV Rassegna Italiana Di Valutazione*, 67, 7–23. <https://doi.org/10.3280/riv2017-067002>
- Marino, D., Mastronardi, L., Giannelli, A., et al. (2018). Territorialisation dynamics for Italian farms adhering to Alternative Food Networks. *Bulletin of Geography; Socio-economic Series*, 40(40), 113–131. <http://doi.org/10.2478/bog-2018-0018>.
- Marradi, A. (1996). Metodo come Arte. *Quaderni Di Sociologia*, 10, 71–92. <https://doi.org/10.4000/qds.6358>
- Mazzocchi, G., Cagliero, R., Monteleone, A., Angeli, S., Monteleone, A., & Tarangioli, S. (2021). La prioritizzazione delle esigenze nel Piano Strategico Nazionale PAC 2023-2027. Rete Rurale Nazionale 2014-2020, Mipaaf, Roma.
- Mazzocchi, G., Giarè, F., Sardone, R., et al. (2023). Food (di)lemmas: disentangling the Italian Local Food Policy narratives. *Rivista Di Economia Agraria*, 78(3), 19–34. <https://doi.org/10.36253/rea-14511>
- Morgan, D. L. (1996). Focus Groups. *Annual Review of Sociology*, 22(1), 129–152. <https://doi.org/10.1146/annurev.soc.22.1.129>
- Nijkamp, P. (2003). Entrepreneurship in a Modern Network Economy. *Regional Studies*, 37(4), 395–405. <https://doi.org/10.1080/0034340032000074424>
- Nowack, W., Schmid, J.C., & Grethe H. (2022). Social dimensions of multifunctional agriculture in Europe - towards an interdisciplinary framework, *International Journal of Agricultural Sustainability*, 20:5, 758–773. <https://doi.org/10.1080/14735903.2021.1977520>
- OECD. (2023). Policies for the Future of Farming and Food in the European Union, OECD Agriculture and Food Policy Reviews. OECD Publishing. <https://doi.org/10.1787/32810cf6-en>
- Ortiz-Esaine, N., Gutierrez, D. D. (2022). Collective Rural Brands and Consumption of Agroecological Products. In: Abreu, A., Liberato, D., Garcia Ojeda, J. C. (editors). *Advances in Tourism, Technology and Systems—Smart Innovation, Systems and Technologies*. Springer Nature Singapore. <https://doi.org/10.1007/978-981-19-1040-1>
- Ortiz-Miranda, D., Moragues-Faus, A., and Arnalte-Alegre, E. (2013). Agriculture in Mediterranean Europe: Between old and new paradigms. *Research in Rural Sociology and Development*.

- Paudel, D., Neupane, R. C., Sigdel, S., et al. (2023). COVID-19 Pandemic, Climate Change, and Conflicts on Agriculture: A Trio of Challenges to Global Food Security. *Sustainability*, 15(10), 8280. <https://doi.org/10.3390/su15108280>
- Raffestin, C. (1984). Territorialization, deterritorialization, reterritorialization and information (Italian). In: Turco, A. (editor). *Regione e regionalizzazione*. FrancoAngeli.
- Renting, H., Rossing, W. A. H., Groot, J. C. J., et al. (2009). Exploring multifunctional agriculture. A review of conceptual approaches and prospects for an integrative transitional framework. *Journal of Environmental Management*, 90, S112–S123. <https://doi.org/10.1016/j.jenvman.2008.11.014>
- Rivera, M., Knickel, K., Diaz-Puente, J. M. and Afonso, A. (2018). The Role of Social Capital in Agricultural and Rural Development: Lessons Learnt from Case Studies in Seven Countries. *Sociologia Ruralis*, 59(1), 66–91. Portico. <https://doi.org/10.1111/soru.12218>
- Rossi, A., Bui, S., & Marsden, T. (2019). Redefining power relations in agrifood systems. *Journal of Rural Studies*, 68, 147–158. <https://doi.org/10.1016/j.jrurstud.2019.01.002>
- Salvioni, C., Henke, R. and Ascione, E. (2013). The emergence of new development trajectories in Italian farms. In: Ortiz-Miranda, D., Moragues-Faus, A., and Arnalte-Alegre, E. (editors). *Agriculture in Mediterranean Europe: Between Old and New Paradigms*. Research in Rural Sociology and Development.
- Salvioni, C., Henke, R., & Vanni, F. (2020). The Impact of Non-Agricultural Diversification on Financial Performance: Evidence from Family Farms in Italy. *Sustainability*, 12(2), 486. <https://doi.org/10.3390/su12020486>
- Salzman, J., Bennett, G., Carroll, N., et al. (2018). The global status and trends of Payments for Ecosystem Services. *Nature Sustainability*, 1(3), 136–144. <https://doi.org/10.1038/s41893-018-0033-0>
- Shongwe, M. I., Bezuidenhout, C. N., Sibomana, M. S., et al. (2019). Developing a Systematic Diagnostic Model for Integrated Agricultural Supply and Processing Systems. *Systems*, 7(1), 15. <https://doi.org/10.3390/systems7010015>
- Sonnino, R. (2013). Local foodscapes: place and power in the agri-food system. *Acta Agriculturae Scandinavica, Section B - Soil & Plant Science*, 63(sup1), 2–7. <https://doi.org/10.1080/09064710.2013.800130>
- Stefanovic, L., Freytag-Leyer, B., & Kahl, J. (2020). Food System Outcomes: An Overview and the Contribution to Food Systems Transformation. *Frontiers in Sustainable Food Systems*, 4. <https://doi.org/10.3389/fsufs.2020.546167>
- Sturla, A., Viganò, E., & Viganò, L. (2019). The Organic Districts in Italy. An Interpretative Hypothesis in the Light of the Common Pool Resources Theory. *ECONOMIA AGRO-ALIMENTARE*, 2, 429–458. <https://doi.org/10.3280/ecag2019-002013>
- Sutherland, L.-A. (2023). Who do we want our ‘new generation’ of farmers to be? The need for demographic reform in European agriculture. *Agricultural and Food Economics*, 11(1). <https://doi.org/10.1186/s40100-023-00244-z>
- Swinnen, J. (2020). Competition, market power, surplus creation and rent distribution in agri-food value chains—Background paper for The State of Agricultural Commodity Markets (SOCO) 2020. FAO. <https://doi.org/10.4060/cb0893en>.
- Tarangioli, S. (2013). The integrated approach in RDP 2007–2013. Available online: [https://www.researchgate.net/publication/257251606\\_The\\_integrated\\_approach\\_in\\_RDP\\_20072013](https://www.researchgate.net/publication/257251606_The_integrated_approach_in_RDP_20072013) (accessed on 15 December 2023).
- Tardelli de Silva, F., Baierle, I. C., Goncalves de Faria Correa, R., et al. (2023). Open Innovation in Agribusiness: Barriers and Challenges in the Transition to Agriculture 4.0. *Sustainability*, 15(11), 8562. <https://doi.org/10.3390/su15118562>
- Terres, J.-M., Scacciafichi, L. N., Wania, A., et al. (2015). Farmland abandonment in Europe: Identification of drivers and indicators, and development of a composite indicator of risk. *Land Use Policy*, 49, 20–34. <https://doi.org/10.1016/j.landusepol.2015.06.009>
- Tilzey, M. and Potter, C. (2008). Productivism versus Post-Productivism? Modes of Agri-Environmental Governance in Post-Fordist Agricultural Transitions. In: Robinson, G. (editor). *Sustainable Rural Systems*. Routledge. <https://doi.org/10.4324/9781315611556>.
- Toccaceli, D. (2015). Agricultural districts in the Italian regions: looking toward 2020. *Agricultural and Food Economics*, 3(1). <https://doi.org/10.1186/s40100-014-0019-9>
- Toccaceli, D., & Pacciani, A. (2024). Dear old (and misunderstood) districts, let’s look ahead. *Rivista di Economia Agraria*, 78(3), 3–15. <https://doi.org/10.36253/rea-15062>
- Vaquero-Piñeiro, C. (2021). The long-term fortunes of territories as a route for agri-food policies: evidence from Geographical Indications. *Bio-Based and Applied Economics*, 10(2), 89–108. <https://doi.org/10.36253/bae-9429>

- Wegner, G. I. (2016). Payments for ecosystem services (PES): a flexible, participatory, and integrated approach for improved conservation and equity outcomes. *Environment, Development and Sustainability*, 18(3), 617–644. <https://doi.org/10.1007/s10668-015-9673-7>
- Wilson, G. A. (2007). *Multifunctional agriculture: A transition theory perspective*. CABI Publishing, Cambridge MA (USA) and Wellington (UK).
- Zagata, L., & Sutherland, L.-A. (2015). Deconstructing the ‘young farmer problem in Europe’: Towards a research agenda. *Journal of Rural Studies*, 38, 39–51. <https://doi.org/10.1016/j.jrurstud.2015.01.003>
- Zanon, D, Martignano, A. (2007). The value of a participatory SWOT in local development programs: the case of the 2007-2013 “Competitiveness” program of the PA of Bolzano (Italian). In: *Conferenza scientifica annuale dell’Associazione Italiana di Scienze Regionali*; 26–28 September 2007; Bolzano.
- Zasada, I. (2010). Multifunctional peri-urban agriculture—A review of societal demands and the provision of goods and services by farming. *Land Use Policy*, 28(4), 639–648. <https://doi.org/10.1016/j.landusepol.2011.01.008>
- Zegar, J. S., and Wrzaszcz, W. (2017). The Holism Principle in Agriculture Sustainable Development. *Economic and Environmental Studies*, 17(44), 1051–1069. <https://doi.org/10.25167/ees.2017.44.26>
- Zhai, Z., Martínez, J. F., Beltran, V., et al. (2020). Decision support systems for agriculture 4.0: Survey and challenges. *Computers and Electronics in Agriculture*, 170, 105256. <https://doi.org/10.1016/j.compag.2020.105256>