

<https://doi.org/10.36128/f2kfng79>

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# Italian Agricultural Cooperatives Between Civil Law and European Regulation: A Development Perspective

## Abstract

Italian agricultural cooperatives represent a distinctive economic and legal model that balances mutualistic principles with entrepreneurial strategies. This paper examines the evolving regulatory framework governing these cooperatives, with a focus on the interplay between Italian civil law and European regulations. The analysis explores key structural and functional aspects, including mutuality, governance, digital transformation, and integration with renewable-energy communities. A central objective is to assess the legal and economic challenges affecting agricultural cooperatives, particularly in relation to their internationalization and financial stability. The study highlights potential reforms aimed at enhancing competitiveness while preserving cooperative identity. By examining judicial interpretations and legislative developments, the paper provides insights into how cooperatives can adapt to emerging market and policy dynamics, ensuring long-term sustainability within the agri-food sector.

**Keywords:** agricultural cooperatives, mutuality principle, Italian agricultural law, renewable energy communities (RECs), blockchain in agri-food supply chains, digitalization in agriculture

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## Introduction

Agricultural cooperatives represent a fundamental pillar of the Italian economic and legal system, playing a strategic role in promoting sustainability, social cohesion, and economic development within the primary sector.<sup>1</sup> Unlike other corporate structures, agricultural cooperatives are distinguished by their mutualistic nature, aimed at meeting the economic and social needs of their members through the collective management of resources and agricultural activities. This business model,<sup>2</sup> governed by Articles 2511–2548 of the Italian Civil Code (“CC”), integrates economic and social objectives, ensuring a balance between the valorization of local agricultural production and the promotion of rural community well-being.<sup>3</sup>

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<sup>1</sup> Verrucoli P. had already emphasized in the entry *Cooperative* in the *Enciclopedia del Diritto*, Vol. X, Milan, 1962, p. 549, that the cooperative society is primarily structured for the benefit of its members, who are natural persons, and that the “individuality of the member” plays a predominant role. He specifies that, as systematically recognized by case law, the legal personality of the cooperative society cannot override the individuality of the member to the extent of preventing the latter from achieving results that inherently require the preservation of such individuality.

<sup>2</sup> For an in-depth analysis of agricultural enterprises, see Casadei E, *L'impresa e azienda agricola*, in Irti N. (ed.), *Manuale di diritto agrario italiano*, Turin, 1978, pp. 55–86; Casadei E., *La nozione di impresa agricola dopo la riforma del 2001*, in *Riv. dir. agr.*, 2009, I; Masi P., *L'impresa agricola tra diritto agrario e diritto commerciale*, in *Riv. dir. civ.*, 1983, II; Masi P., *Impresa agricola*, *ibidem*, 1987, II; Alessi R., Pisciotta G., *L'impresa agricola. Artt. 2135–2140*, Turin, 2010; AA. VV., *Dell'impresa agricola: disposizioni generali artt. 2135–2139*, Galloni G. – Galgano F. (eds.), Bologna, 2003; Germanò A., *L'impresa agricola*, in *Manuale di diritto agrario*, 8th ed., Turin, 2016; Jannarelli A., *L'impresa agricola*, in Buonocore V. (ed.), *Trattato di diritto commerciale*, Turin, 2008.

<sup>3</sup> Giuffrida G., *Le cooperative agricole (natura giuridica)*, Milan, 1981; Parizzi M., *La cooperativa agricola*, Ferrara, 1978; Massart A., entry *Cooperative agricole*, in *Noviss. Dig. It. Appendice*, Turin, 1981, p. 78; Rossi R., *La cooperativa di conduzione agraria (Premessa per una nozione*

In recent decades, agricultural cooperatives have navigated an ever-evolving landscape marked by global challenges such as the ecological transition, digitalization, and international competition.<sup>4</sup> While deeply rooted in a historical tradition of mutuality and solidarity, they must now adapt to the pressing demands for innovation and to new dynamics in the agri-food market. Addressing these challenges requires not only strengthening organizational and managerial capacities but also effectively integrating with European and national policies that promote sustainable development models.

Their legal and economic significance is further reinforced by the Common Agricultural Policy (CAP), which acknowledges their strategic role in improving market-supply concentration and strengthening producers' bargaining power. Through the shared management of resources and the adoption of innovative business models, agricultural cooperatives contribute to the competitiveness of the primary sector and serve as a concrete exemplar of the circular economy.<sup>5</sup>

At a time marked by climate change, geopolitical tensions, and an increasing demand for sustainability, the importance of agricultural cooperatives cannot be underestimated. Their ability to adapt and innovate will be crucial in addressing future challenges while upholding the mutualistic principles that define them and ensuring value creation for both their members and the broader region.

The European regulatory framework and its relationship with national legislation

Agricultural cooperatives hold a key position within European and national policies aimed at promoting sustainability, competitiveness, and the economic integration of the primary sector. Regulation (EU)

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*giuridica autonoma*), Naples, 1979; Goldoni, M. *Commentary on Article 1 of Legislative Decree No. 228 of May 18, 2001*, in *Riv. dir. agr.*, 2001, I, p. 213 ff.

<sup>4</sup> Scholarly literature has highlighted that the definition of "agricultural cooperative" is entirely generic, as there is no legally established model for agricultural cooperatives. See Giuffrida G., *Le società cooperative*, in *Trattato breve di diritto agrario italiano e comunitario*, edited by Costato, 3rd ed., Padua, 2003, p. 284 ff.

<sup>5</sup> Miribung G., *Cooperation and Shared Responsibility*, in *Trattato breve di diritto agrario e dell'Unione Europea*, Milan, 2023, p. 278.

No. 1308/2013,<sup>6</sup> despite being amended by Regulation (EU) 2021/2117,<sup>7</sup> remains a central reference for the regulation of the Common Market Organization (CMO),<sup>8</sup> assigning agricultural cooperatives a strategic role as producer organizations. These organizations not only enhance supply concentration and strengthen producers' bargaining power but also foster the economic and environmental sustainability of agri-food supply chains (Article 152, Regulation (EU) No. 1308/2013, as amended by Regulation (EU) 2021/2117).

A distinctive feature of European law is the balance between supporting agricultural cooperatives and applying competition rules under Articles 101–102 TFEU. This balance results in targeted exemptions for agricultural cooperatives that pursue objectives of collective interest, ensuring that such benefits do not lead to significant market distortions. The European regulatory approach thus recognizes the uniqueness of cooperatives, which combine economic efficiency with mutual solidarity, fostering inclusive and sustainable production models.

In Italy, the transposition of European norms is integrated into Legislative Decree No. 228/2001, which broadened the definition of an agricultural entrepreneur,<sup>9</sup> including cooperatives engaged in the processing, preservation, marketing, and enhancement of products supplied by their

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<sup>6</sup> Regulation (EU) No. 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organization of the markets in agricultural products and repealing Council Regulations (EEC) No. 922/72, (EEC) No. 234/79, (EC) No. 1037/2001, and (EC) No. 1234/2007.

<sup>7</sup> Regulation of the European Parliament and of the Council amending Regulations (EU) No. 1308/2013 establishing a common organization of the markets in agricultural products, (EU) No. 1151/2012 on quality schemes for agricultural and food products, (EU) No. 251/2014 concerning the definition, designation, presentation, labeling, and protection of geographical indications for aromatized wine products, and (EU) No. 228/2013 concerning specific measures in the agricultural sector in favor of the outermost regions of the Union.

<sup>8</sup> Pursuant to Article 40 TFEU, the Common Market Organization (CMO) is the necessary instrument to achieve the objectives of the CAP, as generally defined in Article 39 TFEU and specifically set by the EU for each reference period of the common policy. In 2007, a single Common Market Organization (Single CMO) was created in order to codify the regulatory mechanisms of the twenty-one existing Common Market Organizations (CMOs) (Reg. EC No. 1234/2007).

<sup>9</sup> The concept of agricultural enterprise has thus been expanded, primarily due to the enlargement of the category of connected activities. See Buonocore V., *L'impresa, in Tratt. Buonocore*, 2, I, Turin, 2002, p. 559; Goldoni M., *L'articolo 2135 del Codice civile*, in *Tratt. Costato*, 3rd ed., Padua, 2003, p. 188.

members.<sup>10</sup> The decree also redefined the concept of related activities, placing particular emphasis on the prevalence requirement for products supplied by members. This criterion not only qualifies the cooperative's activity as agricultural but also exempts it from the legal framework governing commercial companies, reinforcing the mutualistic nature of its operations.

The link between European and national regulations is further strengthened through the financial instruments of the 2023–2027 Common Agricultural Policy (CAP), which supports agricultural cooperatives in projects aimed at fostering innovation, sustainability, and economic resilience. The new CAP governance model, introduced by Regulation (EU) 2021/2115,<sup>11</sup> grants Member States greater autonomy in managing funds and defining rural development strategies. Within this framework, agricultural cooperatives can benefit from targeted interventions for infrastructure modernization, digital technology adoption, and ecological transition. These instruments align with the European Green Deal and national climate and energy strategies, which include specific incentives for agricultural-energy communities and the circular economy.

The European and national regulatory framework thus establishes an integrated system designed to enhance the role of agricultural cooperatives as key players in rural development and the ecological transition. This system not only provides economic support through tax incentives and public funds but also ensures legal protection for contributing members. Thanks to this dual safeguard, agricultural cooperatives today stand as pillars of

<sup>10</sup> Article 2135 of the Civil Code (“Agricultural Entrepreneur”) was significantly reformed by Legislative Decree No. 228 of 18 May 2001. The legislative intervention aims at the reorganization and modernization of the agricultural, forestry, fishing, and aquaculture sectors, also promoting their support and economic development. Specifically, the rationale behind the amendments lies in the need to distinguish the regime of the agricultural entrepreneur from the more burdensome regime of the commercial entrepreneur, while also taking into account the changed economic-social framework in which operators act, supporting the “multifunctionality of the agricultural enterprise.” For doctrinal reference, see Sironi M., *Riflessioni civilistiche in materia di attività agricole connesse*, in *Agricoltura*, No. 4, 1 July 2005, p. 227; Franco S. – Senni S., *La funzione sociale delle attività agricole*, Lazio Region – University of Tuscia, *Quaderni d’informazione socio-economica*, 2005, p. 15.

<sup>11</sup> Regulation (EU) No. 2021/2115 of the European Parliament and of the Council of 2 December 2021 laying down rules on support for the strategic plans that Member States must draw up under the common agricultural policy (CAP strategic plans), financed by the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD), and repealing Regulations (EU) No. 1305/2013 and (EU) No. 1307/2013, in OJ L 435 of 6 December 2021.

regional development, capable of promoting sustainable, competitive, and inclusive production models.

## **Mutualistic structure and objectives of agricultural cooperatives**

Agricultural cooperatives constitute a distinctive corporate model founded on the principle of mutuality,<sup>12</sup> which represents the cornerstone of both their legal framework and internal organization. Unlike capital-based companies, whose primary objective is profit maximization, agricultural cooperatives pursue the satisfaction of their members' economic, social, and professional needs through the collective management of productive resources and the provision of goods and services under more favorable conditions than those available on the market. Moreover, agricultural cooperatives facilitate the valorization of local production and promotes a sustainable model of regional development.<sup>13</sup> However, the mutualistic nature of cooperatives does not preclude their entrepreneurial dimension, as they must operate according to criteria of economic efficiency to ensure the sustainability of their organizational structure.

A central element of this system is the mutualistic relationship, which entails reciprocal obligations between the members and the cooperative.<sup>14</sup> One of the most significant of these obligations is the mandatory conferment of agricultural products by members, a requirement that does not constitute an ancillary obligation within the meaning of Article 2345 CC, but rather a fundamental obligation essential to the cooperative's functioning.<sup>15</sup> This synallagmatic relationship<sup>16</sup> is structured as a contract with reciprocal obligations: members undertake to provide their agricultural products in

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<sup>12</sup> Prevalent mutuality implies that economic activities are carried out primarily with and for the members, ensuring that the benefits generated are distributed equitably.

<sup>13</sup> Genco R., Iengo M., Morara P.L., *Mutualità: un approccio giuridico*, in *Quaderni della Fondazione Ivano Barberini*, 2023, p. 2.

<sup>14</sup> As emphasized by the doctrine, this model is distinguished by the absence of a clear separation between the individual interest of the members and the collective interest of the entity, as both converge in the enhancement of the agricultural product. See Bonfante G., *La natura agricola delle cooperative di trasformazione e il requisito dell'attività prevalente con i soci*, in *Giur. Comm.*, 2020, p. 146.

<sup>15</sup> Court of Cassation, 9 August 2023, No. 24242, in *Le società*, 2024, p. 22, with a note by Bonfante G., *La "morte" del contratto di scambio nelle cooperative secondo una sentenza del Supremo Collegio*, *ibid.*, p. 24 et seq., which is highly critical of this ruling.

<sup>16</sup> Cf. Garilli, C., *Natura sinallagmatica dei rapporti mutualistici e rimedi contrattuali*, in *Le società*, 2024, p. 169.

accordance with the procedures established by the cooperative's bylaws, while the cooperative assumes the duty to process, enhance, and market the conferred products, distributing the resulting economic benefits in proportion to the contributions.<sup>17</sup>

This contractual framework carries significant legal implications. The cooperative is subject to the general principles of contractual obligations, allowing members to invoke the defense of non-performance (Article 1460 CC) or to request termination of the contractual relationship should the cooperative fail to fulfill its statutory obligations.<sup>18</sup> At the same time, the close interrelation between the mutualistic bond and the productive organization strengthens the legal position of members, ensuring a balanced interplay between obligations and rights within their relationship with the cooperative.

At the heart of the mutualistic model lies the principle of prevalent mutuality,<sup>19</sup> enshrined in Article 2513 CC. This principle requires that the cooperative's activities be carried out predominantly with and for its members, both in terms of supply and revenue. This is not merely a formal requisite but an essential criterion for preserving the cooperative's mutualistic identity.<sup>20</sup> Jurisprudence has clarified that compliance with prevalent mutuality cannot be assessed solely through a quantitative analysis; rather, it necessitates a qualitative evaluation aimed at ensuring that the benefits primarily accrue to the members.<sup>21</sup> Non-compliance with this principle may result in the loss of the cooperative's status as a mutualistic entity, triggering fiscal and regulatory repercussions.

<sup>17</sup> Court of Cassation, 16 January 2018, No. 831.

<sup>18</sup> Court of Cassation, 2 August 2023, No. 23606.

<sup>19</sup> On cooperatives with prevalent mutuality, without claiming exhaustiveness, see Bassi A., *Scopo mutualistico*, in *Società cooperative*, edited by Presti, *Commentario Marchetti-Bianchi-Ghezzi-Notari*, Milan, 2000, p. 1368 et seq.; Belviso U., *Scopo mutualistico e capitale variabile nelle società cooperative*, Milan, 2012, p. 124 et seq.; Id., *Le cooperative a mutualità prevalente*, in *Il nuovo diritto delle società*, *Liber amicorum Gian Franco Campobasso*, edited by Abbadessa-Portale, 4, Turin, 2007, p. 651 et seq.; Marasà G., *L'odierno significato della mutualità prevalente nelle cooperative*, in *Società, banche e crisi di impresa*, *Liber amicorum Pietro Abbadessa*, 2, 2014, p. 2001 et seq.; Rocchi E., *Cooperativa a mutualità prevalente. Criteri per la definizione della prevalenza. Requisiti delle Cooperative a mutualità prevalente*, in *Società cooperative*, edited by Presti, *Commentario Marchetti-Bianchi-Ghezzi-Notari*, Milan, 2006, p. 27 et seq.

<sup>20</sup> This principle, in addition to defining the nature of the cooperative, conditions access to the fiscal and regulatory benefits reserved for agricultural enterprises.

<sup>21</sup> Court of Appeal of Bologna, Section III, 7 June 2022; Court of Cassation, 10 July 2019, No. 18245.

Another distinguishing feature of agricultural cooperatives is the sharing of entrepreneurial risk among members. Unlike capital-based companies, where the risk is limited to the invested capital, cooperative members actively participate in the entity's economic risks. Specifically, the remuneration of confrers is not automatically guaranteed but is contingent upon the cooperative's economic performance and market conditions. This system reinforces the mutualistic bond and promotes economically responsible, and sustainability-oriented management.

From a regulatory standpoint, agricultural cooperatives benefit from favorable legal and fiscal treatment due to their social function and strategic importance in rural development. Italian legislation, in conjunction with European Union regulations, encourages the adoption of sustainable agricultural practices, technological innovation, and the advancement of circular-economic models. In particular, Regulation (EU) No. 1308/2013 acknowledges the role of agricultural cooperatives in improving supply concentration, enhancing producers' bargaining power, and fostering greater economic and environmental sustainability within agri-food supply chains. Furthermore, economic support mechanisms derived from rural development policies, including structural funds and preferential tax regimes, further consolidate the role of cooperatives as key actors within the productive and regional fabric.

## **The relationship between agricultural cooperatives and related activities**

The link between agricultural cooperatives and related activities is essential for understanding their legal nature and strategic role within the economic system. Pursuant to Article 2135 CC, agricultural activities include not only cultivation, livestock farming, and forestry but also related activities such as the processing, preservation, marketing, and enhancement of agricultural products, provided that these products originate predominantly from the members' farms. This legal framework enables cooperatives to operate across the entire agri-food supply chain, fostering an integrated model that combines economic development with regional sustainability.

Related activities are closely linked to the biological cycle of the land, as stipulated in Article 2135(3) CC. The requirement of prevalence should not be interpreted solely in quantitative terms but must reflect a functional and substantive connection with the agricultural production cycle. In

in this context, agricultural cooperatives serve as intermediaries between members' labor and the market, transforming the supplied products and enhancing their value through commercialization.

Jurisprudence has clarified that agricultural transformation cooperatives retain their status as agricultural entrepreneurs when the related activity is predominantly directed toward products supplied by their members. In this regard, the principle of predominant mutuality, enshrined in Article 2513 CC, plays a crucial role, requiring that at least 50% of the cooperative's economic transactions be conducted with its members, whether in the form of contributions or member-generated revenue.<sup>22</sup> Not only does this principle preserve the connection between related activities and the agricultural production cycle, but it also ensures that the cooperative remains faithful to its mutualistic purpose, preventing its transformation into a purely commercial enterprise.

However, the Italian Supreme Court has specified that not every processing and marketing activity can automatically be considered agricultural.<sup>23</sup> This principle highlights the necessity for a concrete and substantive link between related activities and the biological cycle, thereby preventing agricultural cooperatives from becoming mere commercial intermediaries.

Related activities also play a strategic role in enhancing the value of products supplied by members. The ability to process and market agricultural products on a large scale strengthens producers' bargaining power, improving their competitiveness in the market.<sup>24</sup> Moreover, this model supports the creation of more sustainable and resilient agri-food supply chains, in line with the objectives of the Common Agricultural Policy (CAP).

A further distinctive aspect of agricultural cooperatives is that related activities do not constitute independent commercial operations but rather an expression of the mutualistic relationship between members and the cooperative. On this point, case law has clarified that the contribution of agricultural products by members does not constitute an exchange-based

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<sup>22</sup> This requirement is, in fact, essential to distinguish agricultural cooperatives from commercial enterprises and to access the fiscal and regulatory benefits provided for the agricultural sector. See Court of Cassation, 9 August 2023, No. 24242, cited.

<sup>23</sup> Court of Cassation, 10 November 2016, No. 22978 excluded the qualification of agricultural entrepreneur for a cooperative engaged in slaughtering, processing, and selling livestock products, noting that such operations were not aimed at the care and development of the biological cycle, but were instead classified as typically industrial and commercial activities.

<sup>24</sup> Miribung G., *Trattato breve di diritto agrario e dell'Unione Europea*, cited, 2023, Milan, p. 225.

contract but rather an obligation deriving from the social contract, intrinsically linked to the mutualistic purpose of the cooperative.<sup>25</sup> This legal framework allows cooperatives to maintain their mutualistic identity, ensuring a balance between statutory obligations and economic benefits.

This arrangement strengthens the role of cooperatives as instruments of economic and social integration, where members are not mere suppliers but actively participate in the management of activities and the distribution of benefits.

Related activities acquire particular importance at the European level, especially in relation to the objectives of ecological transition. Agricultural cooperatives are encouraged to integrate innovative activities into their production processes, such as the generation of alternative energy<sup>26</sup> or participation in renewable-energy communities.<sup>27</sup> These initiatives, supported by European and national programs, offer new opportunities to combine environmental sustainability with the economic valorization of member-supplied agricultural products.

## **Democratic governance in agricultural cooperatives**

Democratic governance is a fundamental principle distinguishing agricultural cooperatives from other corporate structures, as it is based on the “one member, one vote” mechanism established by Article 2538 CC. Unlike capital-based companies, where decision-making power is proportional to the shares held, agricultural cooperatives ensure that each member has equal voting rights, regardless of their economic capacity or the volume of their contributions. This model reflects the mutualistic nature of cooperatives, aiming to guarantee equal participation among members and preserve collective interests.

The principle of equal decision-making translates into a governance system that fosters active participation and meaningful member engagement in the cooperative’s management. Judicial rulings have consistently

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<sup>25</sup> Court of Cassation, 9 August 2023, No. 24242.

<sup>26</sup> Cf. Tedioli F., *Agriovoltaico avanzato: innovazione, sostenibilità e regolamentazione per il futuro dell’energia rurale*, in *Riv. per la consulenza in agr.*, n. 100/2025, p. 12; Tedioli F., *La produzione di energia da fonti rinnovabili quale attività connessa a quella agricola*, ibidem, n. 53/2020.

<sup>27</sup> See infra paragraph 10. Agricultural Cooperatives and Renewable Energy Communities (RECs).

emphasized that any attempt to deviate from this rule, even through statutory agreements, would contravene the cooperative's mutualistic purpose and compromise its identity.<sup>28</sup> Consequently, democratic governance not only safeguards internal democracy but also ensures that control remains equitably distributed, preventing the undue concentration of power.

The organizational structure of agricultural cooperatives comprises three main governing bodies. The general assembly, recognized as the cooperative's supreme body, is responsible for strategic decisions such as approving financial statements, appointing directors, and amending the bylaws. Operating under the majority principle, in accordance with Article 2538 CC,<sup>29</sup> the assembly ensures a balance between participation and decision-making efficiency.

The board of directors, elected by the assembly, oversees both ordinary and extraordinary management, representing the collective interests of the members. It is tasked with ensuring transparent and responsible governance, upholding mutualistic principles, and promoting participatory management.<sup>30</sup>

Where applicable, the board of statutory auditors performs supervisory functions, ensuring compliance with administrative regulations and statutory provisions.

Beyond formal equality, democratic governance fosters informed participation in the cooperative's activities. Article 2545-quater CC mandates that members contribute to the cooperative's mutualistic purpose not only through financial contributions but also by actively participating in assembly decisions. Non-participation or failure to fulfill social obligations may lead to the exclusion of a member.<sup>31</sup>

However, the democratic model of agricultural cooperatives is not without challenges. Collective decision-making processes can slow down operations, particularly in competitive markets that require rapid action. Additionally, balancing individual and collective interests may lead to internal conflicts, potentially affecting organizational cohesion. Furthermore,

<sup>28</sup> Court of Cassation, 28 May 2024, No. 14850.

<sup>29</sup> Bassi A., *Le società cooperative*, in Bassi, Buonocore, Pescatore, *Commento ai D.Lgs. n. 5-6 del 17 gennaio 2003*, Torino, 2003, p. 264; Bonfante G., *La società cooperativa*, in *Trattato di Diritto Commerciale*, Bologna, 2014; Id., sub art. 2538, in Comm. Cottino, Bonfante, Cagnasso, Montalenti, Bologna, 2004, p. 2560.

<sup>30</sup> Chiusoli R., *La riforma del diritto societario per le cooperative*, Milano, 2003, p. 42; Tata-rano M.C., *La nuova impresa cooperativa*, Milano, 2011, p. 538.

<sup>31</sup> Trib. Firenze, 8 maggio 2019; in dottrina, Casale F., *Scambio e mutualità nella società cooperativa*, Milano, 2005, p. 18.

the increasing complexity of regulatory frameworks necessitates specialized administrative expertise.

To address these challenges, cooperatives are adopting innovative solutions, integrating democratic principles with technological tools and more adaptable governance models to enhance operational efficiency while preserving their mutualistic identity.

## **Agricultural cooperatives and the protection of the contributing member's position**

Digitalization is transforming the internal governance of agricultural cooperatives, making decision-making processes both more efficient and more inclusive. Tools such as digital platforms for managing general meetings, electronic voting systems, and applications for information sharing promote greater transparency and member participation while simultaneously reducing administrative complexity.

One of the main benefits of digitalization concerns the management of meetings and decision-making processes. Agricultural cooperatives, often characterized by a large and geographically dispersed membership base, can benefit from online meeting management platforms and electronic voting systems, allowing members to participate actively without the need for physical presence. The adoption of software for managing meeting minutes and the integration of digital signature tools streamline bureaucratic procedures while ensuring greater security and traceability in decision-making.

Another key aspect is the use of cloud-based document management systems, which allow essential documents such as financial statements, regulations, contracts, and production-activity reports to be stored, updated, and shared in real time.<sup>32</sup> This eliminates issues related to information dispersion and significantly reduces costs associated with paper-based management. Additionally, immediate access to data enables governing bodies to operate with greater timeliness, avoiding delays in resolutions and improving the cooperative's strategic planning.

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<sup>32</sup> For example, digital platforms such as Hubfarm, developed by Confagricoltura in collaboration with xFarm Technologies, allow agricultural cooperatives to centralize the management of activities, improve operational efficiency, and promote sustainable practices (<https://www.hubfarm.eu>).

### Digitalization as a tool for internal governance

The role of the contributing member plays a central role in the system of agricultural cooperatives, as it is through contributions that these entities fulfill their mutualistic purpose and ensure their economic sustainability. The contribution represents not only the key element of the mutualistic relationship but also the cornerstone of the cooperative's internal regulation, which is based on a dynamic balance between reciprocal rights and obligations.

As previously mentioned, under Article 2135 CC, the contribution does not constitute an ancillary service pursuant to Article 2345 CC but rather a fundamental obligation arising from the social contract, closely linked to the mutualistic purpose. The Court of Cassation has clarified that this obligation cannot be equated with an autonomous exchange contract,<sup>33</sup> but instead reflects the peculiar nature of the associative bond between members and the cooperative.<sup>34</sup> This interpretation confirms that the relationship between the member and the cooperative is aimed not only at enhancing the value of the member-contributed products but also at promoting a collective and solidarity-based management of resources.

The contribution generates a synallagmatic relationship between the member and the cooperative. On the one hand, the member undertakes to contribute their agricultural products according to the terms established by the statute; on the other, the cooperative is obligated to process, store, and market these products, distributing the economic benefits derived from the mutualistic activity to its members. However, remuneration does not constitute an immediate and guaranteed right but rather a mere expectation, subject to the cooperative's economic performance and financial results.<sup>35</sup>

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<sup>33</sup> Regarding the configuration of mutualistic relationships as exchange contracts distinct from the social bond, see Buonocore V., *Rapporto mutualistico e parità di trattamento*, in *Il nuovo diritto delle società*, Liber amicorum Gianfranco Campobasso, edited by Abbadessa - Portale, 4, Turin, 2007, p. 579 et seq.; Casale F., *Scambio e mutualità nella società cooperativa*, op. cit., passim; Bonfante G., *La società cooperativa, Itinerari di giurisprudenza*, in *Le Società*, 2023, p. 102 et seq.; Bassi A., *Scopo mutualistico - Società cooperative, Profili tipologici e causal*, in *Trattato delle società*, edited by Donativi V., Milan, IV, p. 1361; Petrelli G., *I profili della mutualità nella riforma delle società cooperative*, CNN Studio n. 5308/I, 2004, <https://notariato.it/wp-content/uploads/5308.pdf>; Piras A., *Profili mutualistici della governance delle società cooperative*, in *Società, banche e crisi di impresa*, Liber amicorum Pietro Abbadessa, 2, 2014, p. 2023 et seq. In the case law of the Court of Cassation, see, among others, Cass. 12 January 2023, no. 770, Cass. 13 May 2021, no. 12949.

<sup>34</sup> Court of Cassation, 9 August 2023, no. 24242.

<sup>35</sup> Court of Cassation, 2 August 2023, no. 23606.

This structure reflects the principle of mutuality, whereby members not only share the benefits arising from the entity's management but also participate in the economic risks associated with its activities. Such a balance is essential to preserving the cooperative's mutualistic nature and ensuring an equitable distribution of resources.

The position of the contributing member is protected both by the provisions of the CC and by the cooperative's statute, which plays a crucial role in regulating relationships between members and the entity. The statute, in fact, governs fundamental aspects such as the criteria for remuneration, the redistribution of benefits, and risk management. In this context, proportional rebate mechanisms<sup>36</sup> based on contributions serve as an essential tool to ensure fairness in the redistribution of economic advantages. Similarly, the statute may establish procedural safeguards for the potential exclusion of a member, such as the obligation to provide reasons for decisions and the right to challenge them, in accordance with Article 2533 CC. Moreover, democratic participation of members is encouraged through mechanisms that allow them to directly influence decisions concerning the management of contributions and the cooperative's strategic planning.

Despite the legal protections available, the position of the contributing member is not without significant issues. A significant concern is information asymmetry, which can limit the member's ability to access complete and transparent information regarding the cooperative's management, thereby compromising their ability to assess the adequacy of remuneration. In addition, the economic risk inherent in the mutualistic structure means that remuneration for contributions depends on the cooperative's economic performance and is therefore not always guaranteed. This issue becomes particularly problematic in times of crisis within the agricultural sector. Furthermore, the collective management of resources and the redistribution of benefits may generate internal conflicts between contributing members and administrators, particularly in cases of disagreement over operational strategies or methods of distributing economic outcomes.

To address these challenges, it is essential to promote member training, enhancing their skills and fostering greater awareness of the cooperative's operational mechanisms. At the same time, the adoption of independent monitoring tools is necessary to ensure transparent management in line

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<sup>36</sup> The refund is the mutual advantage granted to the cooperative member on a deferred and contingent basis, following the identification of a surplus in the annual financial statement.

with mutualistic principles, reducing the risk of internal tensions and information asymmetries. These measures would not only strengthen the protection of the contributing member but also contribute to consolidating the economic and social sustainability of the cooperative model.

The protection of the contributing member is not limited to statutory provisions or regulations governing the redistribution of benefits but also extends to legal remedies in cases of nonperformance by the cooperative. If the cooperative fails to fulfill its obligations regarding the processing and valorization of contributed products, the member may avail themselves of protective instruments such as the defense of nonperformance under Article 1460 CC or, in more severe cases, seek the termination of the mutualistic relationship. Case law has repeatedly emphasized the importance of these remedies, underscoring their fundamental role in ensuring compliance with the cooperative's obligations toward contributing members.<sup>37</sup>

At the same time, the cooperative has self-protective mechanisms to manage potential breaches by members, such as the application of sanctions provided for in the statute or, in extreme cases, exclusion from the social contract, always in compliance with statutory and regulatory provisions. This balance of rights and obligations helps preserve the sustainability of the mutualistic relationship, ensuring a system that protects both the individual interests of members and the overall effective functioning of the entity.

## **The right of pre-emption and agricultural cooperatives**

The right of agricultural pre-emption represents one of the cornerstones of agricultural law, aimed at safeguarding the continuity of land cultivation and promoting the stability of rural enterprises. Its original legislative framework, outlined by Law No. 590/1965 and Law No. 817/1971, initially granted this right exclusively to direct farmers, in accordance with the principle of favor for the active farmer, designed to strengthen agricultural ownership in the hands of those who actually cultivate the land.<sup>38</sup> However, the legislation has undergone significant evolution, culminating

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<sup>37</sup> See Court of Cassation, August 2, 2023, No. 23606, cit.

<sup>38</sup> Casarotto G., *Profili sistematici della prelazione agraria*, in *Uno studio e due note in tema di prelazione agraria*, in *Riv. dir. civ.*, 1976, II, p. 400.

in the extension of pre-emption rights to other collective entities, including agricultural cooperatives, subject to specific legal requirements.

The first recognition of agricultural pre-emption rights for agricultural cooperatives came with Article 16(5) of Law No. 817/1971, which allowed agricultural cooperatives formed by farmers to exercise pre-emption in their capacity as tenants of the land. Subsequent case law consolidated this approach, affirming that the mutualistic function of agricultural cooperatives, based on collective land management and the aggregation of small producers, aligns with the protective purposes of the pre-emption system.<sup>39</sup>

A further step forward was made with the enactment of Legislative Decree No. 228/2001 and Legislative Decree No. 99/2004, which expanded the range of subjects entitled to exercise pre-emption, including agricultural partnerships, provided that at least half of their members qualify as direct farmers and are duly registered in the special section of the business registry.<sup>40</sup> The rationale behind this extension lies in the legislator's intention to adapt pre-emption regulations to the evolving reality of collective agricultural enterprises, recognizing that agricultural cooperatives, when operating in line with the direct farming model, pursue the objective of ensuring the continuity of agricultural activities.

However, for an agricultural cooperative to exercise the right of agricultural pre-emption, it must meet strict legal requirements, both substantively and procedurally. The first criterion concerns the agricultural nature of the cooperative, which must be established in compliance with Articles 2511 et seq. CC, with an exclusively agricultural corporate purpose and activities directly related to cultivation, livestock farming, or forestry. Additionally, at least half of the cooperative's members must hold the status of direct farmers, as evidenced by their registration in the special section of the business registry. Case law has interpreted this requirement strictly, emphasizing that the registration must be valid and up to date at the time of the land sale.<sup>41</sup>

Despite the legislator's clear intention to grant pre-emption rights to agricultural cooperatives under specific conditions, the practical application of this right has raised several interpretive issues. One of the main concerns is the legal significance of business-registry entries in determining

<sup>39</sup> Cf. Court of Cassation, 18 June 1996, No. 5577; Court of Cassation, 13 January 1986, No. 151.

<sup>40</sup> See Article 2(3), Legislative Decree No. 99/2004; Court of Cassation, 7 August 2023, No. 23989.

<sup>41</sup> Court of Cassation, 5 March 2019, No. 6302.

whether a cooperative's members qualify as direct farmers. Courts have ruled that such registration is not constitutive but merely declaratory, meaning that the pre-empting cooperative may be required to provide additional documentary evidence of its effective agricultural activity.<sup>42</sup> This has led to considerable litigation, as in some cases sellers have challenged the validity of pre-emption exercised by agricultural cooperatives, arguing that they lacked effective direct cultivation.

Another critical issue concerns the exercise of pre-emption by farm-management cooperatives, which cultivate land belonging to their members through lease or loan agreements. According to prevailing case law, pre-emption can only be exercised by cooperatives that own adjacent land, excluding those managing land under contractual arrangements.<sup>43</sup> This restrictive interpretation has been criticized by scholars, who argue that it risks undermining the objective of agricultural continuity and hindering the consolidation of agricultural cooperatives as instruments of collective land management.<sup>44</sup>

Thus, while the extension of agricultural pre-emption rights to cooperatives represents an important recognition of their role in the sector, it remains characterized by application limits and a complex regulatory framework. In conclusion, the excessive rigidity of formal requirements and restrictive judicial interpretations call for a reconsideration of the legal framework to ensure that the institution effectively contributes to strengthening agricultural cooperatives and preserving the continuity of land cultivation.<sup>45</sup>

## **The insolvency of agricultural cooperatives: legal nature and applicability limits**

The issue of the insolvency of agricultural cooperatives is a highly relevant legal matter situated at the intersection of agricultural and commercial law. The complexity arises from the dual legal status of these entities: while they operate as agricultural enterprises under Article 2135 CC, they are incorporated as cooperatives, thereby subject to the regulations applicable

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<sup>42</sup> Court of Cassation, 7 August 2023, No. 23989.

<sup>43</sup> Court of Cassation, 25 March 2016, No. 5952; Court of Cassation, 16 June 2016, No. 20642.

<sup>44</sup> Tonalini P., *Prelazione agraria e società agricole* in *Riv. Notariato*, 2022, p. 637.

<sup>45</sup> Cf. Di Cerbo L., *Il diritto di prelazione agraria in favore delle società agricole* in *Riv. Notariato*, 2024, p. 88.

to corporations.<sup>46</sup> This legal framework has significant implications for their subjection to insolvency proceedings, particularly judicial liquidation (formerly bankruptcy).

Article 33 of the Italian Business Crisis and Insolvency Code (“CCII”), introduced by Legislative Decree No. 14 of January 12, 2019, reaffirmed<sup>47</sup> the exclusion of agricultural entrepreneurs from insolvency proceedings, recognizing the unique characteristics of agricultural activities, which are marked by irregular production cycles and heightened exposure to market and environmental risks. However, this exemption does not automatically extend to agricultural cooperatives, which may be classified as commercial enterprises and thus subject to judicial liquidation. Their exclusion from insolvency proceedings depends on demonstrating that they effectively fall within the category of agricultural entrepreneurs, in accordance with the requirements set out in Article 2135 CC.

Case law has consistently emphasized that the agricultural nature of a cooperative cannot be assessed merely on a formal basis but must be determined in concrete terms, taking into account the actual activities carried out.<sup>48</sup> In particular, the Italian Supreme Court has clarified that, to benefit from exclusion from judicial liquidation, a cooperative must demonstrate that its agricultural activity is predominant over its commercial activity and that its production cycle aligns more closely with an agricultural rather than an industrial model.<sup>49</sup>

Specifically, the criterion of agricultural predominance, as outlined in Article 2135 CC, requires that activities connected to agricultural production (such as processing, preservation, and marketing) be functionally linked to the biological cycle and that the majority of raw materials used originate from members' contributions. Failure to meet this requirement may

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<sup>46</sup> De Gaetano D., *Non è esclusa dal fallimento l'impresa agricola che svolga anche attività di carattere commerciale*, in *IUS, Crisi d'impresa*, 29 aprile 2022.

<sup>47</sup> Article 1 of the Bankruptcy Law (Royal Decree of March 16, 1942, No. 267) explicitly provides that agricultural entrepreneurs are excluded from the application of bankruptcy procedures.

<sup>48</sup> The case law has reiterated that the judge, when evaluating the agricultural nature of a cooperative, must examine not only the statutory clauses but also the actual activity carried out, verifying the presence of the requirements set forth in Article 2135 CC and Legislative Decree No. 228/2001. The requirement for agricultural predominance must be assessed on a case-by-case basis, based on an analysis of the accounting documentation, the operational methods of the entity, and the destination of the processed products. See Trib. Gela, July 7, 2023; Court of Appeal of Palermo, Section III, July 22, 2021.

<sup>49</sup> Court of Cassation, May 20, 2024, No. 13997; Court of Cassation, Civil Section III, March 22, 2022, No. 9351

result in the reclassification of the cooperative as a commercial enterprise, leading to its subjection to insolvency proceedings.<sup>50</sup>

Another key aspect is registration in the special section of the business registry reserved for agricultural entrepreneurs, which serves as an indication of the agricultural nature of the activity. However, case law has repeatedly held that such registration is merely declaratory and not constitutive.<sup>51</sup> Therefore, even when such registration is present, courts retain authority to verify in concrete terms whether agricultural activities prevail over commercial ones. This interpretation aims to prevent abuses intended to shield the cooperative from insolvency proceedings through a purely formal claim of agricultural entrepreneur status.

A particular case concerns agricultural cooperatives that qualify as social enterprises<sup>52</sup> under Legislative Decree No. 112/2017. According to lower court jurisprudence,<sup>53</sup> these cooperatives are not subject to judicial liquidation applicable to commercial companies but rather to compulsory administrative liquidation. This legal framework distinguishes them both from individual agricultural enterprises, which are inherently excluded from insolvency proceedings, and from ordinary agricultural cooperatives, whose insolvency status depends on meeting the criterion of agricultural predominance.

In light of these considerations, it is clear that the current legal framework creates a disparity between individual agricultural enterprises, which are automatically excluded from judicial liquidation, and agricultural cooperatives, which must provide detailed evidence of meeting the agricultural predominance requirements. This regulatory uncertainty not only leads to a high level of litigation but also creates operational challenges for cooperatives, which risk being reclassified as commercial enterprises.

A legislative intervention clarifying the boundaries between agricultural and commercial activities for agricultural cooperatives could help reduce uncertainty and ensure a more consistent application of insolvency rules. In the meantime, the negotiated crisis-settlement tools,<sup>54</sup> introduced by the

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<sup>50</sup> Court of Cassation, March 22, 2022, No. 9351.

<sup>51</sup> Court of Cassation, June 25, 2020, No. 12859.

<sup>52</sup> Cf Tedioli F. *Agricoltura sociale e l'impresa agricola multifunzionale*, in *Cons. Agr.*, No. 11/2021, pp. 7-12.

<sup>53</sup> Court of Siracusa, Bankruptcy Section, May 5, 2021.

<sup>54</sup> The negotiated composition for the resolution of business crises is a new institution regulated by Title II of Legislative Decree 14/2019 (Code of Business Crisis). For further insights, see D'Alonzo R., *La composizione negoziata nell'era del D.Lgs. 136 del 2024*, in *Diritto-dellacrisi.it*, September 30, 2024; Bonfatti S., *La procedura di Composizione Negoziata per la*

CCII, provide agricultural cooperatives with an opportunity to prevent judicial liquidation through restructuring and business-continuity strategies.

This mechanism allows struggling agricultural cooperatives to initiate a debt-restructuring process and preserve business continuity without resorting to insolvency proceedings. Its effectiveness depends on the cooperative's ability to develop a sustainable recovery plan and demonstrate the predominance of agricultural activities. In particular, case law has clarified that the qualification of a cooperative as agricultural, and the consequent exemption from insolvency proceedings, must be assessed based on objective criteria, evaluating the predominance of agricultural activities over commercial ones and their strict connection to the primary production cycle.<sup>55</sup>

The uncertainty regarding the legal classification of agricultural cooperatives, arising from the interplay between agricultural and commercial activities, remains a significant issue. The need to distinguish between these two categories has been repeatedly emphasized by both legal scholars and case law to ensure a consistent application of the rules and avoid conflicting judicial interpretations.<sup>56</sup>

The insolvency of agricultural cooperatives, therefore, remains a highly relevant issue that requires a balance between safeguarding the specificities of the agricultural sector and ensuring transparency and equitable treatment in the market. Once again, a legislative intervention aimed at further clarifying the criteria for qualifying agricultural activities and assessing their predominance could help reduce litigation in this area and provide greater legal certainty for sector operators.

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*soluzione della Crisi d'Impresa: funzione, natura, presupposti ed incentivi*, Diritto dell'acrisi.it, September 20, 2023; Ghedini A. and Russotto M.L., *L'istituto della composizione negoziata della crisi*, in Diritto dell'acrisi.it, October 19, 2021; Iorio A., *Alcune riflessioni sulle misure urgenti: un forte vento di maestrale soffia sulla riforma!*, in Diritto dell'acrisi.it, October 1, 2021; Leuzzi S., *Allerta e composizione negoziata nel sistema concorsuale ridisegnato dal D.L. n.118 del 2021*, in Diritto dell'acrisi.it, September 27, 2021; Santangeli F., *Il D.L. 118/2021. Spunti per la conversione*, in Diritto dell'acrisi.it, September 21, 2021; Liccardo P., *Neoliberismo concorsuale e le svalutazioni competitive: il mercato delle regole*, in Il fallimentarista.it, 2021; Farolfi A., *Le novità del D.L. 118/2021: considerazioni sparse "a prima lettura"*, in Diritto dell'acrisi.it, September 6, 2021; Panzani L., *Il D.L. "Pagni" ovvero la lezione (positiva) del covid*, in Diritto dell'acrisi.it, August 25, 2021; Santangeli F., *Le finalità della composizione negoziata per le soluzioni della crisi d'impresa*, in Diritto dell'acrisi.it, January 4, 2022.

<sup>55</sup> Court of Cassation, May 20, 2024, No. 13997.

<sup>56</sup> Court of Cassation, March 22, 2022, No. 9351.

## Agricultural cooperatives and Renewable Energy Communities (RECs)

Renewable Energy Communities (RECs) represent an innovative model that integrates effectively with the nature and objectives of agricultural cooperatives. Introduced by Directive (EU) 2018/2001 (RED II)<sup>57</sup> and transposed into the Italian legal system through Legislative Decree No. 199/2021, the RECs aim to promote the production, consumption, and sharing of renewable energy, strengthening energy self-sufficiency and fostering the sustainable development of local communities.<sup>58</sup> The ability of agricultural cooperatives to aggregate resources, coordinate members, and manage shared projects makes them key instruments for the success of the RECs, especially in rural areas.<sup>59</sup>

The involvement of agricultural cooperatives in the RECs is based on a close synergy between the enhancement of territorial resources and the pursuit of environmental sustainability objectives. In particular, these entities offer agricultural producers the opportunity to fully capitalize on the economic and social benefits associated with renewable energy production. Unused or marginal lands, warehouses, and other agricultural structures become ideal spaces for the installation of photovoltaic systems or for the production of biogas and biomass, thereby transforming energy into a shared and sustainable resource.

However, the RECs do not merely address energy needs; their regulatory and organizational structure aligns perfectly with the mutualistic principles characterizing agricultural cooperatives. As highlighted by the RED II, the RECs must be autonomous legal entities based on voluntary participation and oriented not towards profit but towards achieving social, economic,

<sup>57</sup> This directive was initially transposed at the national level through Law No. 8/2020, which tested its potential, and later through Legislative Decree No. 199 of November 8, 2021, which consolidated the regulatory framework by introducing substantial innovations. In particular, Article 31 of Legislative Decree No. 199/2021 outlines the characteristics that Renewable Energy Communities (RECs) must possess: they self-produce renewable energy intended for sharing among their members, and, within the limits of the underlying purpose, are allowed to sell the self-produced and stored energy to third parties external to the RECs.

<sup>58</sup> In this regard, see Romeo M., *Produzione di agroenergie, autoconsumo collettivo e comunità energetiche*, in *Dir. giur. agr. alim. amb.*, no. 4/2021.

<sup>59</sup> See Cappelli V., *Appunti per un inquadramento privatistico dell'autoconsumo di energia rinnovabile nel mercato elettrico: il caso delle comunità energetiche*, in *Nuova giur. civ. com.*, 2023, p. 381; ead., *Profili privatistici delle nuove discipline in materia di promozione dell'energia rinnovabile e regolazione del mercato elettrico*, in *Nuova giur. civ. com.*, 2022, p. 1202.

and environmental benefits. In this context, agricultural cooperatives are ideally positioned to assume a leading role, as their primary purpose, governed by Articles 2511 et seq. CC, is closely linked to the creation of shared value for members and the territory.

Article 30 of Legislative Decree No. 199/2021 stipulates that the RECs must be autonomous legal entities, non-profit in nature, and oriented toward generating economic, social, and environmental benefits for the local community.<sup>60</sup> Although the regulation does not mandate a specific legal form, the cooperative structure proves particularly suitable for combining energy production with a participatory resource management, in line with the mutualistic and democratic principles typical of the RECs.<sup>61</sup> This type of organization allows for the integration of agricultural activities with energy projects, with a particular focus on economic and environmental sustainability. In many cases, the energy produced is primarily allocated for self-consumption within the cooperatives themselves, thereby reducing operational costs and strengthening the competitiveness of agri-food supply chains.

A striking example of the effectiveness of this synergy is provided by advanced agrivoltaic systems, which combine energy production with agricultural land use. This solution involves the installation of elevated or crop-integrated structures, allowing for reduced land consumption while preserving agricultural productivity and generating renewable energy. The REC model can become the cornerstone for the collective management of such systems, ensuring that the energy produced remains within the communities and is used to enhance agricultural activities.

The regulatory flexibility characterizing the RECs represents an additional strength for agricultural cooperatives. By transposing European provisions, the legislator has granted the RECs a broad margin of statutory autonomy, allowing them to adapt to the needs of their territories and members. This approach is particularly evident in the regulation of relationships between the RECs and their members, governed by private-law contracts that enable the structuring of management and energy-distribution

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<sup>60</sup> The Implementing Decree provided for by Article 8 of Legislative Decree 199/2021 outlines the criteria for accessing incentives, specifying both the methods for granting premium tariffs and the requirements for grants. Together, these measures encourage the creation of robust and Renewable Energy Communities (RECs), integrating advanced renewable technologies and actively engaging local communities.

<sup>61</sup> Cf. Tedioli, F., *Advanced Agrivoltaics: Innovation, Sustainability, and Regulation for the Future of Rural Energy*, in *Rivista per la consulenza in agricoltura*, n. 100/2025, p. 12.

mechanisms based on the specificities of local communities. Such flexibility strengthens the RECs' ability to provide tangible benefits to rural areas while simultaneously contributing to the ecological transition and the fight against climate change.

Despite the significant opportunities offered by the RECs, agricultural cooperatives must address several notable challenges. These include the bureaucratic complexity associated with accessing incentives, the need to coordinate the diverse requirements of members, and the importance of ensuring transparent and efficient management of energy resources. However, the incentive framework introduced by the National Recovery and Resilience Plan (“NRRP”) and Ministerial Decree No. 414/2023 provides concrete tools to overcome these difficulties, making the creation of renewable-energy systems more accessible and promoting widespread energy self-consumption.

In conclusion, agricultural cooperatives and the RECs represent a powerful combination for integrating rural development, environmental sustainability, and innovation. Thanks to their ability to merge agricultural activities with energy projects, cooperatives can not only reduce their energy dependence but also become key players in a more inclusive development model rooted in the region. To fully realize this potential, it will be essential to continue supporting agricultural cooperatives through targeted incentive policies, dedicated training for members, and a clear and stable regulatory framework.

## **The impact of Agriculture 4.0 on agricultural cooperatives**

In the context of the digital evolution of the primary sector, Agriculture 4.0 has emerged as a revolutionary paradigm based on the integration of advanced technologies such as the Internet of Things (IoT), artificial intelligence (AI), blockchain, and satellite-monitoring systems.<sup>62</sup> According to the 2023 Smart AgriFood Report, by the Politecnico of Milan Observatory,<sup>63</sup>

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<sup>62</sup> Cf. Casa, R., *Agricoltura di precisione*, Bologna, 2017; European Commission, *Agricultural Knowledge and Innovation Systems Towards the Future – A Foresight Paper*, Directorate-General for Research and Innovation, Luxembourg, 2016; Schrijver, R., *Precision Agriculture and The Future of Farming in Europe*, Scientific Foresight Study, EPoS (European Parliamentary Research Service), Scientific Foresight Unit (STOA), Brussels, 2016.

<sup>63</sup> The Smart AgriFood Observatory of the Politecnico di Milano and the University of Brescia analyzes digital innovations in the agricultural and agri-food supply chain, from

the Agriculture 4.0 market in Italy reached a value of approximately EUR 2.1 billion in 2022, with an annual growth rate of 31%, driven by crop-monitoring systems, connected machinery, and data-analysis platforms. The digitalization of agriculture is also one of the central objectives of the new Common Agricultural Policy (CAP) 2023–2027,<sup>64</sup> within the framework of the Farm to Fork<sup>65</sup> strategy and Regulation (EU) No. 2021/2115, which recognize the role of technology in environmental sustainability and in the optimization of productive resources.

Agricultural cooperatives, by their very nature as collective and mutualistic entities, are strategically positioned to leverage the potential of new technologies. The IoT, for instance, enables real-time data collection on essential parameters such as soil moisture, climatic conditions, crop status, and animal health.<sup>66</sup> Connected sensors also provide the opportunity to

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#### Agriculture 4.0 to digital food traceability.

<sup>64</sup> According to Recital 23, “A smarter, more modern, and sustainable CAP must encompass research and innovation in order to fulfill the multifunctional role of agriculture, forestry, and food systems in the Union, investing in technological development and digitalization, as well as improving the dissemination and effective use of technologies, particularly digital technologies, and access to impartial, solid, relevant, and new knowledge, intensifying their sharing.”

<sup>65</sup> 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,” Brussels, 20 May 2020 COM(2020) 381 final. The Farm to Fork strategy includes significant references to digitalization, emphasizing the need for investments both in human and financial resources to support farmers in improving environmental and climate performance, as well as optimizing the use of production factors. In this perspective, digitalization and technological innovation play a central role in facilitating the transition to a more sustainable, efficient, and resilient agricultural model, contributing to the achievement of the objectives set out by the European Green Deal. See Rolandi S., *The Role of Digitalization in the EU Farm to Fork Strategy: Between Explicit and Implicit References. What Legislative Actions in Four Years?* in *Riv. dir. agr.*, 2024, 1, p. 636–658.

<sup>66</sup> Recent studies show that precision irrigation based on IoT data can reduce water consumption by up to 25%, with a 10–15% increase in productivity. The EPRS – European Parliamentary Research Service, *Precision Agriculture in Europe: Legal, Social and Ethical Considerations*, European Union, Brussels, 2017, p. 4, defines precision agriculture as a management approach based on the use of data, characterized by the collection and processing of specific information about individual plots. These data allow for the adjustment of the use of production factors according to the characteristics of the cultivated areas, with the goal of optimizing resource consumption and reducing waste, thereby limiting environmental impact. This model relies on technological transfers from other sectors and makes use of various infrastructures and technologies, including data collection and management systems, geographic information systems (GIS), global positioning systems (GPS), microelectronics, wireless sensor networks (WSNs), and radio frequency identification (RFID) technologies. The primary aim of precision agriculture is, therefore, to optimize the use of production

certify events automatically and without human intervention. Through these insights, cooperatives can optimize resource usage, reduce waste, and improve production profitability.<sup>67</sup> Digitalization extends beyond business management to the development of the entire rural ecosystem, enhancing connections between producers and strengthening the agri-food supply chain.<sup>68</sup> The IoT can also have a significant impact on food safety management during transportation, through the advanced use of interconnected – even biodegradable – sensors that, via the internet, facilitate timely data exchange and collection, as well as the monitoring of essential parameters such as storage temperature and product location.<sup>69</sup>

Additionally, cloud computing can facilitate coordinated collaboration among food producers, retailers, testing laboratories, and regulatory authorities. It is also worth noting that cloud technology is highly scalable, meaning it can adapt to evolving organizational needs, which makes it particularly beneficial for businesses operating in markets characterized by seasonal demand peaks or cyclical production.

However, the use of these technologies also raises legal and organizational concerns, particularly regarding the management and ownership of data collected by sensors and connected equipment. Data regulation in agriculture is indeed a crucial issue, as data not only enhances operational efficiency but also influences market dynamics and relationships among cooperative members.<sup>70</sup>

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factors, such as fertilizers, pesticides, and irrigation water. On the topic, see, among others, Lattanzi P., *L'agricoltura di fronte alla sfida della digitalizzazione. Opportunità e rischi di una nuova rivoluzione*, in *Riv. dir. agr.*, 2017, 4, p. 555, and M. Ferrari, *Fattori di produzione, innovazione e distribuzione di valore nella filiera agroalimentare*, Milan, 2023.

<sup>67</sup> The use of digital platforms for monitoring agricultural practices, as demonstrated by the SOS QualiTec system developed by a wine cooperative, provides a concrete example of how digitalization can support quality and production efficiency. In this regard, the Innovarurale portal (<https://www.innovarurale.it/>), developed by the CREA Center for Policies and Bioeconomy in collaboration with ISMEA as part of the National Rural Network (RRN) program 2014–2020, offers numerous examples of innovation and digitalization in agriculture, promoted by individual enterprises, agricultural cooperatives, or consortia.

<sup>68</sup> See Regulation (EU) No. 2115 of December 2, 2021, Article 6(2), Article 6(2).

<sup>69</sup> Schiaehli S., *Biodegradable microsensors for food monitoring*, 2017, in <https://phys.org/news/2017-09-biodegradable-microsensors-food.html>

<sup>70</sup> Cf. Versaci G., *La regolazione dei dati per l'agricoltura di precisione tra questioni generali ed esigenze settoriali*, in *Dir. Agrol.* 2024, p. 619; Leone L., *Big data e intelligenza artificiale nell'agricoltura europea 4.0: una lettura etico-giuridica*, *ibid.*, 2024, p. 505.

Artificial intelligence and machine learning<sup>71</sup> offer additional tools for optimizing agricultural production. Cooperatives can leverage predictive algorithms to anticipate adverse weather events, monitor the spread of plant diseases, and optimize distribution logistics.<sup>72</sup> These tools are especially valuable for large cooperatives, which must coordinate production across multiple associated farms and respond swiftly to market-demand fluctuations. However, the value of these technologies depends on the quality and management of the data collected: the distinction between input data (directly generated by agricultural machinery) and output data (processed by algorithms and AI systems) highlights how digitalization is redefining decision-making roles within cooperatives, posing new challenges in terms of governance and information control.

Blockchain technology is emerging as a transformative tool in the agri-food sector, offering advanced solutions for traceability, transparency, and efficiency throughout the entire production chain.<sup>73</sup> This technology functions as an open, shared, decentralized, and distributed digital ledger in which data is recorded and integrated chronologically to ensure the creation of immutable and tamper-resistant records.<sup>74</sup> Its operation is based on four fundamental principles: (a) decentralization; (b) security; (c) verifiability; and (d) automation through the execution of smart contracts.<sup>75</sup>

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<sup>71</sup> For a general analysis of the relationship between law and digital technologies, see Faini F., Pietropaoli S., *Scienza giuridica e tecnologie informatiche. Temi e problemi*, Torino, 2021.

<sup>72</sup> The European strategy emphasizes the role of digitalization in reducing environmental impact and optimizing the use of production factors, such as water and fertilizers, through advanced monitoring systems. See Canfora I., *Politica Agricola Comune e digitalizzazione del comparto agroalimentare*, in *Riv. dir. alim.*, Quaderno No. 1, 2023, p. 11.

<sup>73</sup> See Tripoli M., Schmidhuber J., *Emerging Opportunities for the Application of Blockchain in the Agri-food Industry*, FAO and ICTSD: Rome and Geneva, 2018, highlighting the growing importance of blockchain technology in the agri-food sector. This technology is not only a tool for ensuring product safety and quality but also a catalyst for greater sustainability.

<sup>74</sup> On the topic, see Matera P. – Benincampi A., voce *Blockchain*, in *Dig. discipl. priv. sez. comm.*, agg. IX, Turin, 2022, p. 24; Gambino A.M. – Bomprezzi C., *Blockchain e criptovalute*, in Finocchiaro G. – Falce V. (ed.), *Fintech: diritti, concorrenza, regole. Le operazioni di finanziamento tecnologico*, Bologna, 2019, p. 276 ff.

<sup>75</sup> Blockchain infrastructures are composed of “nodes” distributed within a network that operates based on shared communication protocols. Each node holds an integral copy of the chain, ensuring its immutability. Each block is cryptographically linked to the previous and next, forming an irreversible sequence of data (hence the term “blockchain”). This system is configured as a distributed server capable of storing a potentially unlimited amount of information without the need for a central memory. See O’Lerary D.E., *Configuring blockchain architectures for transaction information in blockchain consortiums: The case of accounting and supply chain systems*, in *Intelligent Systems in Accounting, Finance and Management*, 24, 2017, p. 138–147.

Blockchain allows for the immutable and verifiable recording of every phase of the production process,<sup>76</sup> from sowing to distribution, providing consumers with detailed information on the origin and quality of products. This level of transparency not only strengthens consumer trust but also protects producers from fraudulent practices and counterfeiting.

For agricultural cooperatives,<sup>77</sup> adopting blockchain represents a significant opportunity to improve internal management and relationships with members.<sup>78</sup> However, it is important to highlight the tension between blockchain technology and data protection regulations under Regulation (EU) 2016/679 (General Data Protection Regulation, GDPR).<sup>79</sup> The former inherently ensures data immutability, processed in a distributed and decentralized manner, whereas the latter imposes, when applicable, the right to data erasure at the request of the data subject. This creates a potential conflict between blockchain's transparency and integrity requirements and the privacy protection principles enshrined in the GDPR.<sup>80</sup>

The implementation of smart contracts can automate and ensure the execution of agreements between parties.<sup>81</sup> These are autonomous systems

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<sup>76</sup> Specifically, every step of a food product is monitored, recording it each time in a new block, which is added to the previous one, thereby creating an immutable and easily verifiable ledger.

<sup>77</sup> In Italy, the Agrichainitalia project stands out as an innovative initiative aimed at implementing blockchain technology in the national agri-food supply chain. Promoted by Legacoop Romagna, this project seeks to ensure product traceability, improve transparency for consumers, and enhance the value of local products, strengthening the competitiveness of Italian agricultural cooperatives in the global market.

<sup>78</sup> A prominent example of blockchain application in the agricultural sector is the collaboration among the four major global agricultural companies - Archer Daniels Midland Co., Bunge Ltd., Cargill Inc., and Louis Dreyfus Co. - which have launched a project to digitalize the trade of grains using blockchain technology. This initiative aims to make transactions more efficient, transparent, and cost-effective, reducing the need for paper documentation and minimizing delays in logistics processes.

<sup>79</sup> Regulation (EU) No. 2016/679, of April 27, 2016, commonly known as the "GDPR," which stands for General Data Protection Regulation.

<sup>80</sup> Battelli, E., *Innovazione tecnologica e gestione della filiera agroalimentare*, in *Dir. Agroalim.*, 2024, p. 473.

<sup>81</sup> Cf. Gallo, P., *DLT, Blockchain e Smart Contract*, in M. Cian - C. Sandei (a cura di), *Diritto del Fintech*, Padova, 2020, p. 137 ss.; Remotti, G., *Blockchain smart contract. Un primo inquadramento*, in *ODCC*, 2020, p. 189 ss.; Maugeri, M., *Smart Contracts e disciplina dei contratti - Smart Contracts and Contract Law*, Bologna, 2021; Id., *Smart contracts e disciplina dei contratti*, in *Oss. dir. civ. e comm.*, 2020, p. 382 ss.; Pellegrini, T., *Gli smart contract*, in E. Battelli (a cura di), *Diritto privato digitale*, p. 261; Barr, E. - Incutti, E.M., *Gli smart contracts nel diritto bancario tra esigenze di tutela e innovativi profili di applicazione*, in *Contr. impr.*, 2019, p. 930 ss.; Campagna, M.F., *Gli scambi attraverso algoritmi e il problema del linguaggio. Appunti minimi*, in *Analisi*

capable of self-managing, as once established, they do not require human intervention for execution. Upon the fulfillment of predetermined conditions, they ensure the automatic execution of economic transactions in accordance with the contractual framework formalized in the operational algorithm. For instance, payments to members can be made automatically when specific predefined conditions are met, reducing settlement times and ensuring a more equitable distribution of revenues. This approach not only enhances operational efficiency but also mitigates the risk of disputes, as contractual terms are encoded and transparent to all parties involved.

However, the adoption of blockchain in the agricultural sector is not without challenges. It is crucial to address legal and contractual issues related to the use of smart contracts, ensuring compliance with existing regulations and ensuring that all parties fully understand the implications of such tools. Additionally, it is essential to guarantee interoperability among different blockchain systems and promote common standards to facilitate widespread adoption.

At the same time, robotics is also profoundly transforming the agricultural sector, offering innovative solutions that enhance operational efficiency and address the growing shortage of skilled labor. For agricultural cooperatives, integrating robotic technologies into production processes represents a strategic opportunity to optimize activities, reduce costs, and improve the sustainability of agricultural practices. The adoption of such technology helps overcome some of the sector's typical challenges, including the high reliance on manual labor and dependence on workforce availability.

The applications of robotics in agriculture are numerous, ranging from sowing to harvesting, including pruning and weeding.<sup>82</sup> Agricultural robots, equipped with artificial intelligence and advanced sensors, can constantly monitor crop conditions and intervene precisely to optimize resource use. Robotic sowing systems ensure uniform seed distribution, improving soil yield and reducing waste. In pruning operations, intelligent machines can accurately identify branches to be cut, contributing to plant health

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giuridica dell'economia, 2019, p. 156 ss.; Travia, N., *Profilo internazionale del diritto degli smart contract*, in R. Battaglini e M.T. Giordano (a cura di), *Blockchain e smart contract*, p. 389 ss.

<sup>82</sup> The interest in agricultural robotics is steadily growing, as evidenced by the numerous international competitions dedicated to the development of advanced solutions for the primary sector. The Agri-food Competition for Robot Evaluation (ACRE), for example, recently showcased robots specialized in precision weeding, highlighting the rapid progress of these technologies. Additionally, Italy hosted one of the main European competitions for agricultural robots in 2023, underscoring the key role that technological innovation is playing in the agro-food landscape of the continent.

and increasing crop productivity. In harvesting, robots equipped with artificial-vision systems and mechanical arms carefully select ripe fruits, minimizing waste and ensuring a higher-quality product.

A particularly relevant aspect for agricultural cooperatives is the positive impact of robotics on environmental sustainability. The use of robots for weeding, for example, significantly reduces the need for chemical herbicides, promoting more eco-friendly farming practices. Similarly, automated irrigation-management machines, through real-time soil-parameter analysis, optimize water consumption, reducing waste and improving resource efficiency.

However, integrating robotics into agricultural cooperatives presents some challenges. One of the main obstacles is the high investment cost, which can be prohibitive for small and medium-sized enterprises. To overcome these difficulties, the NRRP,<sup>83</sup> the Transition 4.0 Plan, and the Horizon Europe<sup>84</sup> program provide specific incentives for the agricultural sector, allocating funds for the purchase of smart machinery, drones, digital platforms, and integrated farm-management systems. Another crucial aspect is the need to adequately train personnel in the use and maintenance of robots, so that cooperatives can fully exploit the potential of new technologies without encountering operational or technical problems.

Due to their collective and mutualistic structure, agricultural cooperatives can greatly benefit from adopting robotics, not only in terms of increased productivity and efficiency but also by strengthening their competitiveness in international markets. The ability to integrate advanced technologies while sharing investment and training costs among members provides a significant advantage over individual agricultural enterprises. In a context where global demand for food products is growing and environmental

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<sup>83</sup> Digitalization is listed as one of the needs in Chapter 2, which addresses the Assessments of Needs and Intervention Strategies (“Improving market orientation and increasing agricultural business competitiveness in the short and long term, also through greater focus on research, technology, and digitalization”, 2.1.SO2).

<sup>84</sup> Horizon Europe is the European Union’s framework program for research and innovation for the period 2021–2027. It is the successor to Horizon 2020. The program has a duration of seven years, corresponding to the EU’s long-term budget, and a total financial allocation of €95.5 billion (at current prices), which includes €5.4 billion allocated to the Next Generation EU recovery plan. It is the largest transnational research and innovation program in the world. Horizon Europe finances research and innovation activities – or activities supporting R&I – mainly through open and competitive calls for proposals. The program is directly managed by the European Commission. The research and innovation activities financed by Horizon Europe must focus exclusively on civilian applications.

challenges require a more rational use of resources, robotics emerges as an essential tool for ensuring more sustainable and innovative agriculture.

Digitalization<sup>85</sup> also enhances the economic and financial management of cooperatives.<sup>86</sup> Automated accounting software enables real-time monitoring of revenues, expenses, and member contributions, reducing the risk of accounting errors and improving financial forecasting. The integration of business-intelligence tools allows for the analysis of economic and production data, identifying market trends, optimizing pricing strategies, and planning targeted investments.<sup>87</sup> This approach, known as the Agricultural Knowledge and Innovation System (“AKIS”), not only enhances the cooperative’s reputation but also facilitates access to markets requiring specific certifications, such as organic products or protected-designation-of-origin (PDO) products.

Despite the advantages offered by digitalization, the digital transition of agricultural cooperatives presents significant challenges. Key obstacles include the high initial costs of technology implementation, which are often prohibitive for small and medium-sized cooperatives, and the resistance to change among some members. Additionally, the low level of digital literacy among many agricultural operators necessitates investment in training programs, so that members and employees can fully leverage the potential of Agriculture 4.0 and digital cooperative management.<sup>88</sup>

Agriculture 4.0 represents a major opportunity for agricultural cooperatives, allowing them to use new technologies to improve operational efficiency, reduce costs, and make their activities more sustainable. However,

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<sup>85</sup> In this regard, see Gernone C., *Digitalizzazione dell’agricoltura e cooperative agricole*, in *Dir. giur. agr. alim amb.*, no. 2025; Albisini F., *Agricoltura e digitalizzazione: l’impresa agricola nel tempo presente*, in *Quaderni della Riv. dir. alim.*, 2023, 1, pp. 92–106.

<sup>86</sup> Brunori G., *Agriculture and rural areas facing the “twin transition”: principles for a sustainable rural digitalization*, in *Italian Review of Agricultural Economics*, 77(3): 3–14. DOI: 10.36253/rea-13983; Rijswijk K. – Bulten W. – Klerkx L.W.A. – Dessein J. – Debruyne L. – Brunori G., *Digitalisation: Economic and Social Impacts in Rural Areas: Digital Transformation of Agriculture, Forestry and Rural Areas*, Wageningen, 2020, p. 6.

<sup>87</sup> Cf. D’Avanzo W., *Smart Farming. La quarta rivoluzione industriale e la digitalizzazione del settore agricolo*, in *Dir. Agroalim.*, 2022, 2, p. 279–299; Scandola S., *La “piattaformizzazione” dell’agricoltura tra rischi e benefici: prime riflessioni*, in *Quaderni della Riv. dir. alim.*, 2023, 1, p. 72–91; Soto I. et al., *The Contribution of Precision Agriculture Technologies to Farm Productivity and The Mitigation of Greenhouse Gas Emissions in the EU*, EUR 29320 EN, Luxembourg, 2019.

<sup>88</sup> Digitalization is, in fact, recognized as a key tool for strengthening the bargaining power of farmers within the agri-food supply chain, particularly through producer organizations. Cf. Barabanova Y. – Krzysztofowicz M., *Digital Transition: Long-term Implications for EU Farmers and Rural Communities*, Publications Office of the European Union, Luxembourg, 2023, doi:10.2760/093463, JRC134571.

the success of the digital transition will depend on the cooperatives' ability to overcome economic and cultural barriers, adopting innovation strategies that promote collaboration among members and ensure balanced growth in the agricultural sector.

## The internationalization of agricultural cooperatives and access to global markets

Internationalization represents one of the main challenges and opportunities for Italian agricultural cooperatives. Participation in global markets allows for risk diversification, increased competitiveness, and the enhancement of Italian agri-food excellence. However, agricultural cooperatives, on average, export only 8% of their production, compared to 10% in traditional agriculture and 13% in the food industry as a whole.<sup>89</sup> This limited export propensity results from a series of structural and organizational factors that hinder the international expansion of Italian cooperatives.

One of the primary constraints is the fragmentation of the cooperative system, which is predominantly composed of small and medium-sized enterprises that, unlike large agri-industrial groups, do not benefit from economies of scale or from adequate logistical and commercial structures to compete globally. The small size and territorial dispersion of cooperatives complicate the coordination of export strategies and make it more difficult to access foreign markets characterized by intense competition. Additionally, limited familiarity with financial instruments for exports and challenges in managing international commercial relations constitute further obstacles to the international projection of cooperatives.<sup>90</sup>

Despite these challenges, the Italian cooperative system has enormous competitive potential, driven by the quality and reputation of the Made in Italy agri-food sector.<sup>91</sup> To strengthen their presence in international mar-

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<sup>89</sup> Observatory of Italian Agricultural Cooperation, Report 2023

<sup>90</sup> According to the study commissioned by the European Commission: Directorate General for Agriculture and Rural Development, 50% of producer organizations or associations of producer organizations are recognized in the European Union as cooperatives, in accordance with the rules established by individual Member States. On this topic, see Montanari F., Chlebicka A., Szalbo G., Amat L. et al., *Study of the Best Ways for Producer Organisations to Be Formed, Carry Out Their Activities and Be Supported, Final Report*, <https://data.europa.eu/doi/10.2762/034412>.

<sup>91</sup> Italy's agri-food heritage is closely linked to the certified quality of products with Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI), which

kets, it is essential to adopt more structured internationalization strategies. A first step is the creation of alliances among cooperatives, through consortia or business networks, to overcome size limitations and access facilitated financial instruments. This model, already successfully adopted in the Netherlands and Denmark, allows cooperatives to share resources, infrastructure, and expertise, improving logistical and distribution efficiency.

At the same time, digitalization offers innovative tools to facilitate access to global markets. The use of e-commerce platforms and international marketplaces reduces geographical barriers and expands commercialization opportunities. Tools such as Access2Markets,<sup>92</sup> provided by the European Commission, offer detailed information on regulations, tariffs, and export conditions in major global markets, facilitating the strategic planning of cooperatives. Additionally, blockchain technology can be used to improve product traceability, ensuring transparency throughout the supply chain and meeting international consumers' sustainability demands.

Another key factor for successful internationalization is strengthening managerial competencies within cooperatives. Knowledge of international trade dynamics, the management of certification requirements in different markets, and adaptation to the cultural and regulatory specificities of each country are essential elements for successfully navigating global competition. In this context, training programs, institutional support, and technical-assistance networks can bridge existing gaps and provide concrete tools for managing export operations.

However, access to global markets is not without obstacles. In addition to regulatory barriers and the costs of complying with international standards, cooperatives must compete with multinational agri-food corporations, which possess significantly greater financial and logistical resources. To overcome these challenges, cooperatives must adopt positioning strategies that highlight the distinctive strengths of Made in Italy,

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form the cornerstone of the success of the national production system. Italy boasts the highest number of agri-food products recognized in Europe, with a sector that combines tradition, innovation, and sustainability. Italian food, wine, and spirits supply chains with Geographical Indications stand out for their high economic value and strategic role in promoting the Made in Italy brand on international markets.

<sup>92</sup> Access2Markets is a platform that provides essential information for conducting trade with countries outside the European Union. It offers details on tariffs, taxes, procedures, formalities, rules of origin, export support measures, statistics, and trade barriers. Additionally, it provides crucial data for trade in services, investments, and procurement in third countries. This tool also helps businesses understand and take advantage of the EU's trade agreements, offering testimonials and success stories from other companies.

such as environmental sustainability, product authenticity, and quality certifications.

In this scenario, the role of institutions and public support mechanisms becomes essential. Programs such as the *Fondo per la Promozione Integrata*<sup>93</sup> and the measures provided under the (CAP) and the NRRP offer specific financial instruments to support the internationalization of agricultural cooperatives. Access to these incentives, combined with aggregation strategies, digitalization, and skills development, can transform internationalization from a challenge into a concrete opportunity for the growth and consolidation of the Italian cooperative system.

## Conclusions

Agricultural cooperatives represent a fundamental economic and organizational model for the Italian agri-food sector, offering a synthesis of mutualism and entrepreneurship. Their ability to respond to the challenges of global competitiveness, digitalization, and the ecological transition depends on their capacity to adapt to a constantly evolving regulatory and economic framework.

A crucial element for the future of cooperatives is the strengthening of internal governance through digitalization, which can enhance managerial transparency and the democratic participation of members. However, the success of this process depends on the ability to integrate new technologies without distorting the mutualistic model and without creating barriers to information access for less digitally skilled members.

Internationalization is another critical challenge for the sector. Although agricultural cooperatives have traditionally faced difficulties in exporting due to organizational fragmentation and a lack of managerial skills, tools such as business networks and institutional support can help them overcome these limitations. The promotion of the Made in Italy agri-food sector, combined with the adoption of digital strategies and access to European funds, can strengthen the presence of cooperatives in global markets.

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<sup>93</sup> The Integrated Promotion Fund (*Fondo Promozione Integrata*), managed by Simest, is a financial tool designed to support Italian businesses in their internationalization efforts. This fund provides non-repayable grants to compensate for the material damages incurred by exporting companies located in areas affected by natural disasters, such as floods.

The ecological and energy transition presents new opportunities, particularly concerning Renewable Energy Communities (RECs) and advanced agrivoltaic models. The integration of agricultural activities with energy production represents a strategic lever for reducing costs, increasing energy self-sufficiency, and contributing to national and European climate objectives.

From a legal perspective, the distinction between agricultural and commercial activities continues to impact the economic stability of cooperatives and the protections they can benefit from. The current regulatory framework generates uncertainty, with case law requiring a concrete assessment of the predominance of agricultural activities to exclude cooperatives from judicial liquidation. A legislative intervention to clarify these aspects could help reduce litigation and provide greater security to industry operators.

In summary, agricultural cooperatives have the tools and opportunities to successfully tackle future challenges. Technological innovation, international market growth, environmental sustainability, and a clearer regulatory framework are key factors in ensuring the sector's competitiveness and resilience. A coordinated effort among institutions, cooperatives, and trade associations will be essential to support a business model capable of adapting to global changes while preserving mutualistic principles and maintaining a strong connection to local communities.

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