



Exploring the economic, social, and environmental dimensions of community-supported agriculture in Italy

Marco Medici^{*}, Maurizio Canavari, Alessandra Castellini

Department of Agricultural and Food Sciences, Alma Mater Studiorum, Università di Bologna, Viale G. Fanin, 50, 40127, Bologna, Italy

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ABSTRACT

The diffusion of community supported agriculture (CSA) in Italy is a very recent phenomenon. The purpose of this paper is to investigate the current status and the evolution of this reality, understanding the social, environmental, and economic benefits for CSA members and the local context. Based on access to CSA data and participant observation during a CSA meeting, a thematic network analysis was adopted to analyse a large piece of information spanning from social, economic, and environmental topics as well as existing relationships between different CSA. Later, we interviewed CSA representatives about CSA production structure and several issues concerning their sustainability, including the role played by CSA members; the economic self-sufficiency; the environmental impact associated with food production. Findings highlighted that in general, the CSA phenomenon in Italy meets sustainability goals, even with different levels of members' involvement, working conditions, economic viability, and environmental impact from a community to one another, with desirable further improvements along all dimensions for most of them. Social transformations in which consumers take the role of producers and consumers at the same time with increased responsibility have been observed. In this context, the members' degree of responsibility contributes to distinguishing CSA in its full sense from CSA initiatives somehow started as ethical purchasing groups, with lower levels of commitment by members, then trying to trigger a higher involvement. The lack of policy support is containing further CSA diffusion and consolidation: new mechanisms are necessary at least to figure out, recognise, and reward the mitigation of environmental impacts characterising local food production and distribution.

1. Background

The term 'Civic agriculture' is broadly used to describe alternative strategies to support small/mid-scale agricultural operations based on local resources and addressed to a local population. The 'local' attribute of food emphasises the connection between a community and the land it occupies, supporting the local food economy and safeguarding biodiversity (Bazzani and Canavari, 2017). The diffusion of civic agriculture has a relevant impact on consumers, with several opportunities regarding the connections that people have with agriculture, the urban context and the environment (Chen et al., 2019; DeLind, 2002; Dunlap et al., 2020; Lyson, 2004; Poças Ribeiro et al., 2021; Rejekiingsih and Muryani, 2017; Saldivar-Tanaka and Krasny, 2004; Trauger et al., 2010; Weidner et al., 2019).

Such localisation of food and agriculture production may take various forms: farmers' markets represent the first direct contact between farmers and consumers; community gardens consist of delimiting

a piece of land, sharing it with a group of people belonging to the same neighbourhood, and providing fresh produce while favouring food production skills; CSA is a cooperative relationship between farmers and consumers, who support farm operations by sharing products, skills, labour and responsibility (Brown and Miller, 2008).

It is well known that civic agriculture is not developed to its full potential in the sense that urban areas can produce significant amounts of food (Kremer and DeLiberty, 2011; Nicholls et al., 2020; Opitz et al., 2016). A first conceptual limit consists of the overarching conceptual framework deriving from neoclassical economics in which market entrepreneurship is primarily driven by high productivity and efficiency, achievable with the manipulation of production factors (DeLind and Bingen, 2008). Instead, local food production is rather associated with a different conceptual framework relying upon, for instance, fair prices and wages, respect of the environment and shared sense of place, with producers and consumers not playing strictly separated roles but cooperating in sharing products, civic engagement,

^{*} Corresponding author.

E-mail address: m.medici@unibo.it (M. Medici).

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environmental-friendly practices and shared production risks (Brown and Miller, 2008; Cox et al., 2008; Hayden and Buck, 2012; Thompson and Coskuner-Balli, 2007). In fact, the close seller-buyer relationship attempts to create holistic, multidimensional relationships, recovering the social and cultural value of food (Flora and Bregendahl, 2012), in contrast with the traditional large-scale distribution, mostly based on the concentration of the offer and depersonalisation of relations (Papaioikonomou and Ginieis, 2017; Rosol and Barbosa, 2021). In addition, local food communities can enhance individual awareness of product origins and food-management capabilities (Birtalan et al., 2021).

However, to date, if on the one hand, civic agriculture is recognised as a strategic tool for promoting sustainable development of cities and rebalancing relations between rural and urban contexts, on the other hand, actions aimed at regulating civic agriculture initiatives are mostly missing in Europe (Artmann and Sartison, 2018; La Rosa et al., 2014). Nevertheless, there is room to enhance civic agriculture with multi-functional ideas deriving from the participation of urban and agricultural stakeholders like citizens, farmers and public bodies at a national and regional level (Ackerman, 2012; Crises, 2011; Sanyé-Mengual et al., 2016). For example, the assignment of public areas to be cultivated for non-commercial purposes, which can be viewed as the starting point toward comprehensive support to civic agriculture experiments, is a very recent phenomenon and a practice today acknowledged just in a few cases in European cities (Mačkiewicz et al., 2018; Maknea and Tzortzi-Georgi, 2019; Palau-Salvador et al., 2019; Pulighe and Lupia, 2016; Rogge and Theesfeld, 2018).

A recent analysis funded by the Ministry of Agricultural, Food and Forestry Policies (MIPAAF) highlighted that civic agriculture experiments are largely not recognised by Italy's institutions. Exceptions are represented by some local administration supporting urban initiatives, mostly located in northern Italy (Giarè and Vanni, 2015). Also, to the best of our knowledge, no studies regarding the evolution of CSA, which can be considered the most representative and paradigm-shift case of civic agriculture and alternative food supply chain, have been conducted in Italy. Italian CSAs have no legal form, being mostly based on informal groups of producers/members. In contrast, the other forms of civic agriculture, e.g. farmers' markets and community gardens, are necessarily recognised and formally authorised by local administrations. In light of this gap, the following research question was derived:

RQ: *In which form the CSA concept is being developed in Italy?*

Thus, we conducted an exploratory study to identify Italian CSA's evolution, aiming to bridge knowledge gaps and identify possible room for public actors' policy actions in supporting the civic agriculture phenomenon with the most appropriate political instruments.

The paper is organised as follows: after briefly describing the CSA phenomenon and outlining the conceptual framework, the information and data collecting process is described in Section 2. Then, the qualitative and quantitative analysis of the interviews is provided (Section 3), and the results are discussed in connection with the research questions and managerial and policy recommendations are outlined (Section 4). The paper concludes with a summary of the main findings (Section 5).

1.1. Origin and evolution of CSA

CSA originated in Japan in the 1960s when producers and consumers began to cooperate directly as a response to the 'Minamata disease' caused by mercury bioaccumulation in the ecosystem (Henderson et al., 2009). People encouraged farmers to produce organic food by signing contracts with them, performing voluntary work, paying in advance and obtaining corresponding product shares. The "Teikei" was the first CSA example. After that, it has been recognised that in the second half of the twentieth century CSA found sap in one of the overarching changes of the opposition movements to environmental pollution and heavy

agricultural mechanisation, particularly the agricultural sustainability/local food systems movement (Buttel, 2005; Lagane, 2013). This movement's efforts have increasingly focused on food systems and their attributes, such as CSA, green/"value-added" labelling and marketing strategies, and community food security. In the last years, the original CSA model, in which members support farming operations by paying for produce in advance, has been adapted with much innovation across countries. Galt et al. (2012) surveyed tens of CSA in California Central Valley, observing diversities among CSA farmers in terms of political orientation, age, and founding farmers better educated and more likely to be women than the general farming population. Farmers use agro-ecological methods, cultivate agrobiodiversity and utilise growing practices that generally meet or exceed organic rules. As argued by Bazzani and Canavari (2013), such alternative food systems can embed social, environmental and health issues while re-locating the production of food close to consumption and strengthening the creation of a "local culture", based on the valuation of food origin, community traditions and food habits. Local food systems like CSA, farmers' markets, and on-farm direct sales provide positive linkages between rural food supply and people living in urban areas, who can become more engaged and informed consumers. The latter, in turn, support ecologically sound food production systems and activities of common interest aimed at promoting local food production (Francis et al., 2005).

From this picture, to understand how CSA was organised and interpreted sustainably, the additional sub-questions were proposed:

1. Which economic, social and environmental issues are prioritised in CSA?
2. How the concept of 'sustainability' is integrated into CSA practice?

Moreover, to have a clear idea of what to define as environmental impact and depict the relationship between CSA and the environment, an additional sub-question has looked like:

3. Which kind of methods do the CSA foresee to favour environmental sustainability?

1.2. Current CSA examples across countries

Founded in Switzerland in 1978, 'Les Jardins de Cocagne' can be considered the first European CSA example (CSA Switzerland). It grows organic vegetables and delivers the produce to around 40 drop-off points, covering about 400 members who participate in field or delivery work for a few half-days per year.

Since then, the CSA approach has grown in number and variety across countries.

CSA began appearing in North America in the 1980s. In the US, the CSA phenomenon has rapidly grown, with both State and civil society actors have invested in supporting CSAs through help with startup funding, networking opportunities, even publications sharing ideas on how to build a CSA (Flora and Bregendahl, 2012). More than 12,600 CSA examples were documented in the US in 2012 (USDA, 2012). Successful examples of running a CSA model on a university campus have been reported in the US (Wharton and Harmon, 2009) and France (Lagane, 2015). About 500 CSAs were identified across Canada in 2002 (Hiranandani, 2010). The Family Farmers Network, which connects local producers to consumers with the organic basket, represents a significant case of how CSA has been implemented in Canada. Today, the association brings together more than 100 organic farms, providing food for more than 20,000 families every year (CSA Canada). This type of CSA does not foresee a direct member involvement in fieldwork since it is similar to an ethical purchasing group.

German CSA movement is called 'Solidarische Landwirtschaft' and was born after the Chernobyl nuclear disaster alongside the interest in organic food (Stranz, 2009). The solidarity included in the title refers to the mutual support and trust between farmers and the so-called

'co-farmers' or 'co-producers' (an emphasised alternative term to 'consumers'). Solidarity also refers to the financial arrangement within the CSA, with higher-income people paying more than lower-income people. In 2017, the existence of 127 CSA was reported (Wellner and Theuvsen, 2017). In Denmark, the Aarstiderne CSA project delivers organic food, meat and dairy products to 50,000 subscribers in Denmark and 10,000 in Sweden, providing recipes for everyday meals to re-establish a close connection between organic farming and healthy cuisine (CSA Denmark). This experiment too recalls the ethical purchasing group attitude.

In France, AMAP (*Association de Maintien de l'Agriculture Paysannes*) promotes small-scale farming and direct links between farmers and consumers. Members prepay the farmer for the crops and are encouraged to visit the farm and support the farmer actively in climate hazards (Lagane, 2015). This case, too, represents a trade-off between the strict CSA definition and the so-called 'subscribing farming'.

In the last years, CSA has developed rapidly in China, where communities are characterised by cooperative networks with food safety as the primary development goal and trust as the basis (Tang et al., 2019; Zhang et al., 2016), with promising examples of low environmental impacts and the good economic profitability (Zhen et al., 2020).

CSA phenomenon appeared in Oceania too. In Australia and New Zealand, the first communities started their activities in the second half of the 1990s and 2010s, respectively. Today 35 CSAs operate in Australia and 2 in New Zealand (Savarese et al., 2020).

In Italy, very few examples of CSA are available. Instead, there is a strong tradition of Solidarity Purchasing Groups (Gruppi di Acquisto Solidale - GAS), and often this alternative agri-food network model is confused with that of CSA. GAS is a system of purchasing goods collectively that first appeared in Italy in the 1990s. These purchasing groups take the form of a non-profit organisation and are usually set up by several consumers who cooperate to buy goods directly from producers at a price that both parties consider fair. At least two important differences exist between a CSA and GAS and concern consumers' role and the geographical distinction. First, while members play a role in farm management decisions in a CSA, sharing risks with farmers, GAS subscriptions are based on lower engagement and commitment since members can withdraw at any moment. Second, producers and consumers may be remarkably distant within a GAS, which drops the locality requirement. For these reasons, in a food context, CSA can be viewed as an advancement of the GAS experience, which constitutes a consumer-driven phenomenon, aimed in the first instance to form a critical mass to obtain scale economies, without claiming any 'co-production approach' (European CSA Research Group, 2016). Considering this phenomenon, to address possible underlying CSA organisational problems, one last sub-question was proposed:

4. What are the barriers and challenges that CSA have to cope with?

2. Methodological approach

The approach selected for identifying the evolution of Italian CSAs included contact with farmers representing the community founders. Although CSA and civic agriculture are largely regarded as more sustainable than conventional food systems, no frameworks based on quantitative or qualitative metrics have been used to assess the related sustainability (Michel-Villarreal et al., 2019). For this reason, special effort was placed in establishing direct contact with CSA farmers in order to develop a transparent and comparable framework.

To answer research questions, one of the authors attended a CSA national meeting and conducted in-depth interviews with the farmers who founded the communities. The focus on CSA groups in Italy allows dealing with a still not thoroughly analysed and understood phenomenon. Thus, the study of Italian CSA relied on 1) participant observation during a CSA national meeting and 2) interviews with CSA farmers, conducted at a later stage.

A thematic network analysis (Attride-Stirling, 2001) was performed to analyse qualitative data from the CSA meeting held in December 2019 and joined by farmers and members of 9 CSAs and other stakeholders (farmers, scholars, a lawyer). In line with (Attride-Stirling, 2001), this approach systematised the extraction of underlying themes, constituting the lowest-order premises evident from the meeting, and organising themes, which are categories of underlying themes, grouped to summarise sustainability issues within the CSA. These themes constitute the tenets for the setting up of semi-structured interviews with each CSA farmer.

The attended meeting also constituted the basis for extending the contact base. Additional CSA farmers were found through a process involving (a) the word of mouth of the already contacted subjects and (b) a list of CSA initiatives provided by the CSA representative who set up the first CSA meeting in 2018. This list included twenty CSA, of which six have proven to be not active, or they did not consider themselves CSA, having been active in other contexts and just interested in the CSA approach in the past. A final search on the Web and social networks did not provide additional contacts.¹

Semi-structured in-depth interviews were conducted with a total of nineteen CSA representatives between December 2020 and February 2021. The interviews began with an initial question about the CSA main activity. Afterwards, we asked them questions about the CSA structure (number of members, products, soil ownership, farm extension, number of workers), CSA economics (main cost and revenue items), CSA social issues (member involvement and voluntary work, social events) and the CSA approach to the respect of the environment.

Relevant pieces of information have been extracted from interview transcripts and compared among others to formulate an overview of Italian CSA reality concerning sustainability's various dimensions.

3. Findings

This section explains the key findings in response to the questions posed by this research. All data in tables, graphics and figures represent aggregated inputs derived from the performed interviews.

The identified CSA are not equally distributed in the country; most (14) are located in Northern Italy, 4 in the Centre and 1 in the South. Table 1 shows the main CSA characteristics.

3.1. CSA organisation and food distribution

CSA in Italy is a recent phenomenon that started in 2013 with one leading large CSA, with other realities emerged in the last years (Fig. 1). Most CSA are based on informal relationships. Thus, although the concept of CSA can embrace several legal forms, including NGO, cooperative or association, CSAs operate as informal groups, even with no constitutive document. It was observed that less than half of CSAs (31.6%) could be considered autonomous entities, while in the other cases, CSAs are supported by already operating farms (57.9%) and/or no-profit associations (10.5%). According to CSA representatives, the coexistence of CSA and a profit-oriented farm represents a driving force for agricultural production and support for farm investments.

CSA realities are often small, with limited cultivated land and a relatively low number of associated members playing consumers' role. Most CSA span between a small vegetable garden (0.1 ha) and a small agricultural plot (9 ha), with only two exceptions of medium-sized farms (23 ha and 47 ha) (Fig. 2). Horticulture is preeminent, with vegetables cultivated in almost all cases, as outlined in Fig. 3.

About one-fourth of CSA also cultivate cereals processed in flour for bread and pasta, while only a few produce fruit, legumes, olives, and

¹ The search was based on the general patterns "CSA", and "community-supported agriculture", and the Italian terms "comunità", "rete", "supporto", "agricoltura" plus the locality at regional/city level (e.g., Piemonte, Turin, etc.).

Table 1
Overview of Italian CSAs (C=Cereals, L = Legumes, V=Vegetables, E = Eggs, O=Olives, A = Apiculture, F=Fruit).

CSA	Location	Surface (ha)	Products	Full/part-time farmers	Member shares	Drop-off points
1	Bologna	47	C, L, V	7/1	202	8
2	Rome	2.5	V	1/0	60	6
3	Padua	1.3	V	2/0	30	3
4	Siena	1.5	V	1/1	45	2
5	Mestre	1.2	V	1/0	40	5
6	Bergamo	1.5	C, V	0/3	20	1
7	Fermo	8.0	V, E	0/2	30	–
8	Trento	0.2	V, E	1/0	20	1
9	Lecce	23	C, V, O, L	3/0	14	–
10	Florence	0.5	V	1/1	80	14
11	Bologna	7.5	C, V	3/1	110	7
12	Belluno	0.2	V	2/0	55	3
13	Trento	0.9	C, V, F	0/3	26	1
14	Reggio Emilia	0.5	V	1/0	40	–
15	Vicenza	0.6	V, F	1/1	15	–
16	Brescia	1.0	A	1/1	40	–
17	Milan	9.0	V	5/0	40	5
18	Vicenza	2.0	V	1/3	20	3
19	Brescia	6.0	V, O, F	3/0	50	5

Source: data from our survey

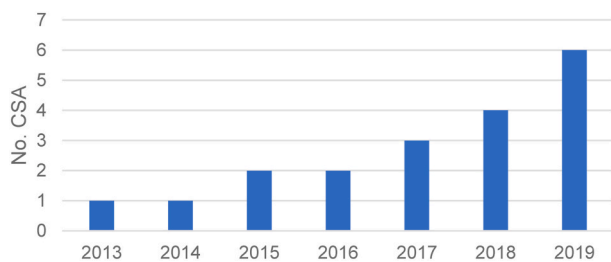


Fig. 1. Starting year of CSAs. Source: data from our survey.

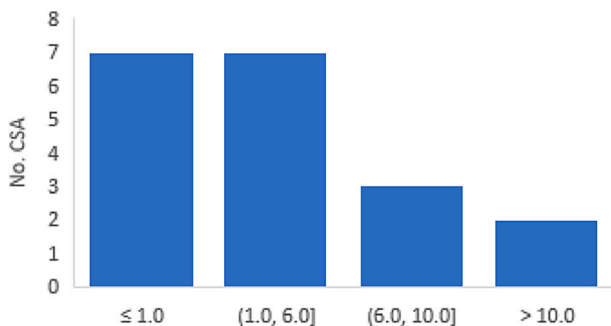


Fig. 2. Cultivated land (ha). Source: data from our survey.



Fig. 3. Type of produce. Source: data from our survey.

eggs; one CSA specialises in honey production only (Fig. 4). Food processing is foreseen in 8 cases (42.1%) and is performed by third parties (milling plants, bakeries and other local food processors), except for the CSA producing honey, which constitutes a unique case. Almost all processed food is sold externally to the public (bread, pasta and cooking oil), while vegetable sauces and fruit juices are distributed to CSA members.

CSA distribution relies on several collection points in the urban and peri-urban area, in addition to the CSA farm itself (Table 1), with members collecting the food at the closest collection point weekly. Twelve CSA can rely on a company van used for distribution (63.2%), in 4 cases only own private cars are used (21.1%), while in the remaining 3 cases, food is autonomously sourced from each member to CSA place (15.8%). The distance between families and the farm and the possible existence of rough roads to reach the farm were identified as barriers to CSA subscription, at least in the last mile.

3.2. CSA economics: shares, revenues, and costs

Since most CSA operates as informal groups, not referring to a formalised legal structure, they do not report in conformity with civil law. Due to this limitation, we limited ourselves to the qualitative detection of direct CSA revenues and direct CSA costs in the form of living expenses.

Member shares constitute the first and foremost economic support for agricultural activities in every CSA community. However, some alternative financial sources have been observed (Fig. 5). A large part of the CSA with high production surplus gains from sale's revenues a relevant economic source (57.9%). Other funding sources consist of training courses or consulting activities performed by CSA farmers to the public (26.3%), funding from public bodies at the local or national level, and financial support from the already existing farm, which was less relevant but somehow significant (21.1%).

Production surplus constitutes the most frequent alternative financial source during the year. Its extent varies substantially among the communities: no production surplus was detected in 42.1% of cases, either because the production level is sized on member demand only, or because selling food to the public is not seen as proper CSA practice; the remaining cases (57.9%) generate surpluses within 20–90% with respect to the total member shares (Fig. 6). When present, the production surplus is generally sold in farmers' markets or, to a lesser extent, supplied to restaurants or agri-tourisms. The produce intended for sale is not branded, while processed food has the CSA own brand or that of the eventual supporting farm. Besides selling production surplus, two forms

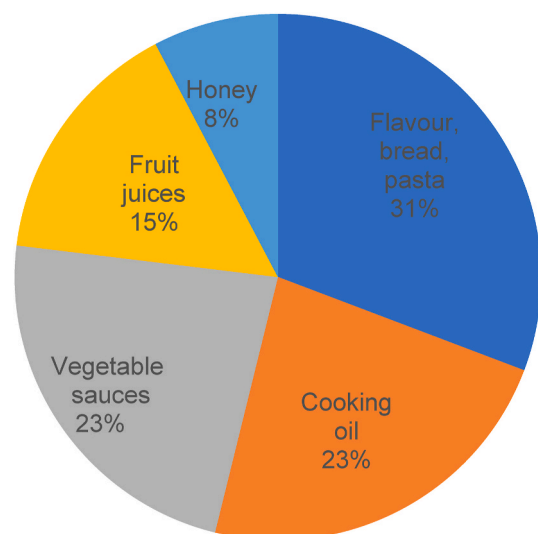


Fig. 4. Type of food processed. Source: data from our survey.

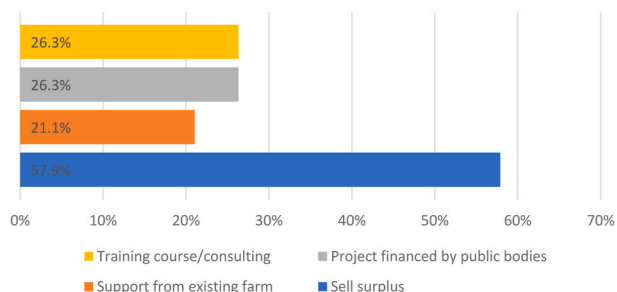


Fig. 5. Alternative CSA funding sources. Source: data from our survey.

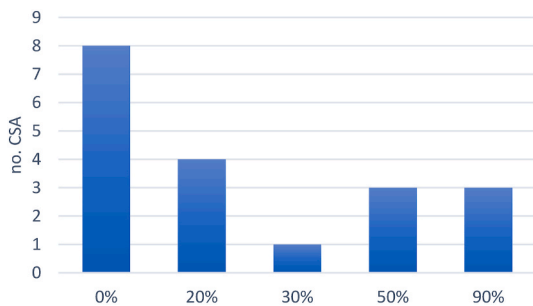


Fig. 6. Amount of surplus (estimate of CSA farmers). Source: data from our survey.

of one-time monetary sourcing helping the community in the early life stage are seldom noticed: private donations or crowdfunding, observed in 15.8% of cases, and private loans contracted with family members, friends, or CSA members (10.5%).

The following cost items are reported to measure how much member shares contribute to cover the costs. *Production costs*, representing the baseline costs to perform farming, include fixed costs (labour, land rent) and variable costs (fertilisers, water, seedlings, energy); besides these, *small expenses* regard the purchase of small equipment and maintenance costs. Instead, *high expenses* refer to investments in the agricultural system’s improvement, such as irrigation systems, agricultural facilities (e.g. greenhouses), reclamation of the countryside. Not all communities can cover the costs above with member shares: in most of the cases, only production costs are covered (68.4%), while roughly a half of cases can also cover small expenses (47.4%), with one fifth (21.1%) even able to cover higher expenses (Fig. 7). How little communities with a few members cover production costs deserves particular attention. For them, a lifeline is constituted by the participation in farmers’ markets and the already existing farm’s financial support.

We also investigated the extent to which possible land rent influences economic performance. The rent for land use is paid by roughly one-fourth of CSA, but only for 3 cases, member shares may be enough to cover this cost; otherwise, an integration with production surplus and resorting to a private loan were observed respectively for 2 cases.

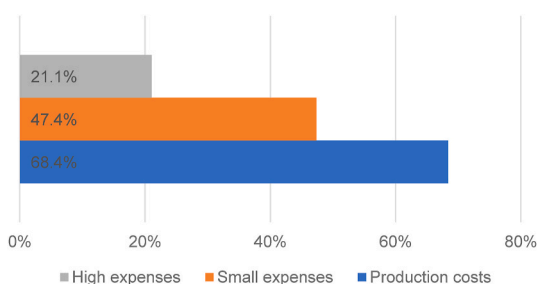


Fig. 7. Cost items covered by member shares. Source: data from our survey.

3.3. Social engagement: welfare, participation, and volunteering

Remarks on farmers’ welfare have been detected. Communities benefit from both full-time workers (from 1 to 7, 1.79 on average), often coinciding with CSA founders, and several part-time workers (ranging from 0 to 3, with an average of 0.89). For the majority of CSA, working conditions were defined as at least acceptable, with fair wages (73.7%), while in 10.5% of the cases, wages were considered very low, particularly for non-founding farmers. In the remaining 15.8% of cases, low salary from CSA is integrated by social safety nets or seasonal jobs.

Only in one-fourth of the CSA (26.3%), members offer volunteer-based work in the fields, with a dedicated follow-up by farmers. Besides working in the field, members may also volunteer to take care of other activities such as communication and order management every week; we have observed volunteer participation in 3 cases (15.8%).

Most communities (15 cases – 78.9%) have been promoting events to improve further members’ active participation and awareness of the community’s social value and attract new members. These events are based on know-how sharing about agricultural practices like sowing, manual-hand weeding, pruning and harvest. During these occasions, members can enrich their cultural heritage since most are not familiar with agriculture work. In this regard, the Fortier standard, a biologically intensive method based on hand tools and small-scale equipment (Fortier, 2014) adopted in 57.9% of the cases, represents an incentive for active member participation in the field. During the meeting, it was recognised that social media presence and word of mouth are useful to attract new members.

During the meeting emerged the issue of free field accessibility as a good mean to attract new visitors. A farmer reported the primary and secondary school’s involvement in its community, with children visiting the farm and many families interested in adhering to the civic agriculture project.

Also, it was recognised that food intolerance could be easily addressed within the community: due to the high social cohesion, food intolerant members can easily exchange specific products with other members.

CSAs can encounter organisational problems, as some members could not offer volunteer-based work, participate in CSA events, or contribute their time to other CSA activities, preferring to support the community in monetary terms only. In this case, enhancing member motivation was emphasised to let the community breaking through from a hybrid ethical purchasing group to a proper CSA. In this context, a number of farmers also have to handle a frequent request of basket customisation, which would request an important effort in processing orders, besides the fact of cannot please every member; basket customisation is an uncommon practice in a CSA and was observed in just one case.

Solidarity was observed in all CSA in terms of systemic economic change and partnership between farmers and members; besides, one case of CSA giving food surplus to charity was reported.

3.4. Care for the environment: integrated agriculture and holistic perspective

In estimating the CSA approach concerning the respect of the environment, the starting point was to define whether the farmers performed organic agriculture,² which, among other methodologies, aims at minimising external inputs and preserving the natural fertility of the soil, protecting biodiversity, representing a valuable option in order to work for more sustainable agriculture as suggested by Gomiero et al. (2011).

² “Organic Agriculture is one among the broad spectrum of methodologies which are supportive of the environment. Organic production systems are based on specific and precise standards of production which aim at achieving optimal agroecosystems which are socially, ecologically and economically sustainable.” (FAO, 2000).

All interviewed farmers defined their production systems as playing by the organic rules, although roughly one-fourth of cases (26.3%) decided not to pursue or quit the organic certification process. This circumstance takes on the contours of a consumer-driven decision as CSA members know or at least trust the agricultural cultivation performed within their community that somehow would meet the organic requirements already mentioned. Moreover, most farmers see organic certification as somehow useless and even time-consuming due to the bureaucratic burden and declared themselves aware that organic agriculture can go beyond any formal certification. We observed that the organic certification is retained by CSA supported by an existing farm, which got the organic certification to attract organic consumers' market segments.

Organic farming is not the endpoint of CSA. In general, we recognised that the method that best defines these communities is integrated agriculture. Not governed by specific laws and regulations, this method aims to reduce farm management costs on the one hand and its environmental impact on the other hand, with a focus on the long-term sustainability of agriculture practices (Gomiero et al., 2011). In general, the interviews highlighted that CSAs foresee applying at least one agricultural method favouring environmental sustainability, reducing air and soil pollution and reinforcing local biodiversity, with only one exception (5.3%). Moreover, 57.9% of farmers declared to adopt the already mentioned Fortier standard (Fortier, 2014).

Bearing the concept of integrated agriculture in mind, we have asked farmers how they interpreted environmental sustainability in practice and which methods they foresee to favour environmental sustainability. The first way to organise the collected feedbacks is given in Fig. 8, in which the most frequent keywords describing farmers' approach towards agriculture and the environment collected during the interviews are reported.

In 26.3% of cases, a close loop for vegetable waste was reported; 21.0% of the farmers declared a special focus on ecology, highlighting the preservation of the environment and natural resources, and also limiting the application of natural inputs (e.g. limiting or eliminating the quantities of copper used), going beyond the rules defining the organic cultivation. The same number of farmers (21.0%) declared to adopt a closed-loop cycle for water, intended as the non-dispersion of irrigation water in the surrounding environment thanks to limited irrigation and/or to a more efficient irrigation system. 15.8% of farmers defined their approach to agriculture as biodynamic, even with no certification. Biodiversity was mentioned in 10.5% of cases and concerned the cultivation of many plant species. In the vegetable garden, traditional crops are accompanied by ancient varieties, while outside of the garden, agricultural practices such as renaturation, permaculture and reforestation have been acknowledged. Other concepts such as lean farming, dryland farming, self-production of agricultural inputs and appropriate technologies singularly spotted.

It is evident that most of the concepts mentioned above are very similar and, in some cases, even overlapping. In fact, the integrated agriculture approach seems to embrace most of the concept above mentioned since it combines different management practices, both from conventional and organic agriculture. For instance, vegetable waste is used instead of chemical fertilisers whenever it is possible. Also, crop management combines several methods such as crop rotation, physical



Fig. 8. Most frequent environmental sustainability keywords listened. Source: data from our survey.

weed management, increased plant biodiversity (e.g., planting flowering hedgerows).

Last, we have grouped the communities to understand how much they could be defined as holistic realities. Based on the keywords above, we have classified the CSA in three categories according to the number of environmental claims (1, 2, or more). The fact that some CSA (47.3%) have focused on more than three environmental aspects suggests for them a holistic approach to agriculture (Fig. 9).

4. Discussion

CSA is a very recent phenomenon in Italy, with most communities born in the last three years. Hence, it is not surprising that several communities are still figuring out some key aspects, having to cope with economic and social constraints such as means of financing, member acquisition, and member involvement. In Italy, many consumers are still unaware of what a CSA is and how it operates, as Forbes and Harmon (2008) suggested regarding other countries.

Some factors place Italian CSAs in the very early stage of their life-cycle. To name a few, the fact that the CSA founder is heavily involved in daily decisions with variable and intermittent involvement of other members and the fact that important information regarding assigned tasks and agricultural practices are personally stored and not written down.

On the whole, CSA farmers have proven to be experienced and with excellent agriculture and managerial skills since they have been building strong relationships with tens (in some case hundreds) of consumers and many of them have been holding training courses and consulting activities, educating the community members and external farmers, too. Knowledge sharing from CSA members has been already acknowledged by Shelton (2012). Strong relationships in CSA reinforced trust and transparency, which were recognised as critical success factors for alternative food chains (Maier et al., 2020).

In many cases, the CSA concept is still tied with the GAS concept, although the desire is to break free from the purchasing group logic, incentivising members to participate in the community actively and to achieve a real, genuine CSA framework. CSA phenomenon has also shown a direct link with other civic agriculture instances like farmers' markets: production surplus, when it exists, is generally directly sold in such marketplaces.

It is noticeable that CSA initiatives, with the uncertain economic situation caused by member share shortage, receive support from the existing parent farm. According to farmers, the coexistence with a profit-oriented farm, noted in at least half of the communities, represents a driving force for agricultural production and support for investments. The connection with both farmers' markets and the existing parent

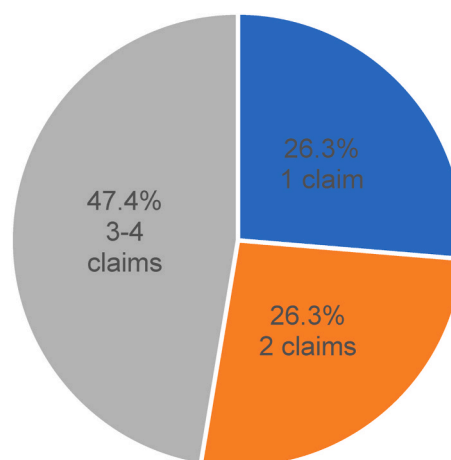


Fig. 9. Holistic perspective of communities. Source: data from our survey.

farms constitute a peculiarity of the Italian CSA phenomenon.

The need to broaden membership is pivotal for the smaller CSA, whereas it is unnecessary for those communities already relying on a critical mass. Additional member shares would put the CSA in a most viable position and would increasingly benefit from scale economies, thus decreasing share price and attracting new members. It also emerged that more could be done in the direction of co-production between farmers and members as this practice is realised just in a few communities. As noted in many CSA, the possibility of offering volunteer-based work in safer conditions with no heavy machinery may constitute an incentive to participate in the agricultural activities. CSA social events, also reported from other communities at the European level (European CSA Research Group, 2016), are the entrance doors for the public and constitute a new approach to agriculture; the need to extend external communications and social networking it is essential to share existing CSA experiences involving new farmers and potential members. This aspect was stressed by Samoggia et al. (2019), who argued that CSA farmers' management activity should invest in communication, provide information, and organise social events.

Extending the number of members and motivating them to support CSA activities are current issues for all communities.

At the global level, the close connections between farmers and members are contributing to the creation of socially constructed markets (nested markets) organised around the values of food quality, locality and respect for the environment, as defined by Polman et al. (2010) and observed in other civic agriculture instances in Italy by Fonte and Cucco (2017). CSA can also be viewed as a 'grassroots innovation' (Seyfang and Smith, 2007), being a solution that responds locally to the interests and the values of communities focused on sustainable development. In this regard, creating a sense of collective interests was recognised as one of the requirements for this initiatives' success (Axon et al., 2018).

With respect to environmental impact, CSAs have, in general, emerged with their peculiarities according to the characteristics of the local environment, farmers' attitudes and members' expectations. In general, CSA green dimension must be seen from a holistic perspective, in line with (Landwehr et al., 2021). The widening of this perspective is important not just in relation to the socio-economic dimensions discussed in this study but also in terms of food safety/food quality dimensions for future research (Djekic et al., 2018).

The CSA positive contribution to the environmental impact is double driven: members support for sustainable practices are translated by expertise and knowledge into less reliance on fossil fuels, less pollution and reduced use of agrochemicals, in agreement with Forbes and Harmon (2008). The recycling of water, observed in many instances, is one of the most relevant benefits of food localisation, which was found to be in agreement with Yang and Campbell (2017). In several cases not certified organic, organic agriculture's adoption is always emphasised to claim limited environmental impact. In most cases, CSA green development is characterised by several integrated environmental principles, following an approach close to integrated agriculture that can represent a valuable option to enhance both economic and environmental sustainability. On the demand side, the absence of organic certification is counterbalanced by mutual farmer-member trust, and at the same time, most farmers see organic certification as an additional time-consuming bureaucratic burden somehow useless.

Other benefits derive from the reduced distribution chain compared to large-scale food distribution, with lower externality costs. Solé and Gonzalez (2017) demonstrated that externality costs associated with civic agriculture could be significantly lower when compared to traditional food chains.

Although the CSA approach emerged as a significant attempt to reconcile food production with nature and reconnect consumers to farmers, at the same time, it appears as the less institutionalised and not as widespread example of civic agriculture. A well-defined national legal framework for CSA is still missing, and the lack of policy support contains further CSA consolidation. Without legal recognition, several other

factors associated with the CSA phenomenon cannot be recognised. These factors include social utility, civic engagement, effort to limit the environmental impact, and, most importantly, the value of farmers' work: farmers' labour rights need to be further considered and properly covered to improve alternative food chains' sustainability, as also claimed by Forssell and Lankoski (2014).

In general, CSA is associated with intangible benefits such as cooperation in sharing resources, civic engagement, sense of place and emotional attachments that cannot be valued in monetary terms (Lu et al., 2021). By ignoring them, community wellbeing is likely to be marginalised (Chan et al., 2012).

4.1. Managerial and policy implications

The results of our study provide significant implications for CSA coordinators and policy stakeholders.

Regarding practical CSA management, extending CSA members while motivating them to support CSA activities is a current issue for CSA survival.

In order to enhance consumers' interest in CSA, farmers' should focus on the communication of the benefits of producing locally and on the organisation of social and educational events to attract and maintain members. At the same time, farmers' need to consider facilitating conditions to enhance members' active participation in CSA activities, like, for instance, the possibility of offering volunteer-based work in safe conditions.

The lack of policy support is containing further CSA diffusion and consolidation. Public stakeholders should support and incentivise civic agriculture instances when they respond to local communities' interests and values focused on sustainable development. A defined national legal framework for CSAs, with descriptions of methods and guidelines for sustainable and inclusive agriculture and proper measures to figure out the environmental sustainability locally promoted, is required. Also, CSA connection with farmers' markets and already existing parent farms calls for a harmonisation of the legal framework.

Several communities quitted organic certification schemes while practically meeting or exceed most of them. In addition to this, diffused sustainable practices like recycling water, integrated agriculture, and reducing externality costs due to reduced food distribution call for recognition at a wider public level. For these reasons, new mechanisms are necessary to figure out, recognise, and reward the mitigation of environmental impacts characterising local food production and distribution.

5. Conclusions

From its origin, CSA has always been part of the agricultural sustainability movement, with a special focus on environmental protection. Today its potential in addressing sustainability issues is limited by the absence of methodological tools to measure CSA performance. This situation has also restricted the creation of incentives and supporting regulation to recognise and award farmers' work and characterise CSA green development, mostly characterised by several integrated environmental principles that only partially meet mainstream certification schemes.

This study demonstrates that the CSA phenomenon is advancing in Italy through farmers and citizens engaging in the activities and promoting the concept. Italian CSA are tied with farmers' markets and existing parent farms. These features are considered added values in CSA early life stages and help communities to deal with uncertainty. However, the relatively small scale of CSA economics characterised by the absence of any return on the capital invested on members' subscriptions, which constitute the first and foremost CSA economic support, makes members' subscriptions the only way to mitigate production and market risks. On the production side, farmers prioritise economic viability in the short term and have to cope with many obstacles, even outside

agricultural operations. Attracting new members and letting them participate actively within the community are the major challenges for all organisations.

Public bodies must play a role by formally recognising CSA as sustainable social systems to avoid the risk of marginalisation of the various economic, social and environmental benefits promoted at the local level. In this regard, a national legal framework with descriptions of methods and guidelines on how to make agriculture more sustainable and inclusive, as well as proper measures to figure out the environmental sustainability locally promoted, could guide interested stakeholders about the socio-ecological benefits of CSA and how the CSA paradigm can be utilised to generate economic growth.

CRedit authorship contribution statement

Marco Medici: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing. **Maurizio Canavari:** Validation, Formal analysis, Resources, Writing – review & editing, Visualization, Supervision, Project administration, Funding acquisition. **Alessandra Castellini:** Methodology, Validation, Formal analysis, Resources, Writing – review & editing, Visualization, Project administration, Funding acquisition.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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