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EDITED BY
Marzia Ingrassia,
Università degli Studi di Palermo, Italy

REVIEWED BY
Emiliana Silva,
University of the Azores, Portugal
Francesco Bozzo,
University of Bari Aldo Moro, Italy

*CORRESPONDENCE
Giulia Magnano
✉ giulia.magnano3@unibo.it

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Exploring the nexus between social and environmental sustainability within EU organic agriculture: a systematic literature review

Giulia Magnano[1]*, Luca Falasconi[1] and Claudia Giordano[2]

[1]Department of Agricultural and Food Science of the University of Bologna, Bologna, Italy, [2]Natural Resource Institute Finland (LUKE), Helsinki, Finland

The European Union's Farm-to-Fork Strategy and Green Deal underscore organic farming's critical role in promoting sustainability and addressing socio-economic issues, including precarious, seasonal, and undeclared labor. The EU's objective to have at least 25% of the agricultural land dedicated to organic farming by 2030 highlights the need for research into the social implications of organic practices, particularly concerning labor conditions, which remains largely unexplored. While existing literature often focuses on organic agriculture's job creation potential, the specifics of labor conditions within this sector remain insufficiently examined. Limited attention has been paid to how private certification schemes shape labour processes, or to the effects of increased preventive measures on organic farmworkers' workloads. This study conducts a systematic review of 41 articles to assess how labor issues are framed within the organic farming sector, identifying three main themes: 1. regulatory frameworks; 2. production practices; 3. farmworkers' employment conditions. These themes are contextualized within the global agri-food value chain, demonstrating how organic agriculture is embedded in a globalized industry. The findings suggest that the social role of organic agriculture is often framed as an economic opportunity for farmers and rural communities or as a means of promoting rural development and increasing revenues through job creation. However, such perspectives risk overlooking the sector's potential to improve labor conditions. The review reveals an urgent need for qualitative studies that explore the experiences of marginalized groups, including migrant and female workers, in organic farming. It advocates for future research that incorporates labor issues into policy discourse, aiming to enhance labor standards within organic certification schemes. Empirical research is therefore essential to deepening our understanding of the intersection between social and environmental sustainability, particularly in relation to the varied labor regimes present in organic agriculture. This work offers a foundational basis for future studies on the evolving relationship between organic agriculture and social sustainability in the context of the green transition.

KEYWORDS

farmworkers, agricultural labor, organic agriculture, migrant labor, social sustainability

Introduction

In the last decades, the expansion of the global market and the transformation of global agri-food supply chains have favoured the creation of new channels for production, distribution and consumption. These changes have led to the emergence of new governance structures, significantly affecting the priorities and interests of the actors in the value chain (Riisgaard and Hammer, 2011). The accelerating process of land concentration and the decline of family farming, especially within the EU context (van der Ploeg et al., 2015), the restructuring and the verticalization of power along agri-food supply chains (de Castro et al., 2021), and the increasing role of private actors in standardizing production processes (Loconto, 2017) are just some of the most significant changes occurred in global agri-food industry over the last 70 years.

Within this broader context, however, this paper will focus on two fundamental aspects of these transformations: an anthropological and social one, and an environmental and ecological one. As in many other sectors (Alberti and Sacchetto, 2024), the process of globalization of agri-food supply chains has increasingly coincided with the process of globalization and transnationalization of the labour market (Mezzadra and Neilson, 2014), and currently the agri-food industry represents one of the sectors where migrant workers are mostly employed (Décosse and Hellio, 2022; Corrado et al., 2018; Gertel and Sippel, 2014). On the other hand, the recognition of the environmental impact of agricultural activities—which within the EU are estimated to account for around the 11% of greenhouse gas (GHG) emissions according to the European Environment Agency (EEA)—has favored a rapid expansion of alternative production systems, while at the same time encouraging the growth of demand for organic, ethical and quality products (Lo Cascio, 2022; Caruso, 2018). Within this evolving context, the Covid-19 pandemic and the breakout of the war in Ukraine have conferred new strategic significance to food systems. As a result, several objectives and targets outlined within the European Union (EU) Green Deal and its Farm to Fork Strategy (F2F) have also been integrated within the NextGenerationEU recovery plan, designed to support the economic upturn of European economies after the pandemic (EU Commission, 2020). With the EU Green Deal aiming to achieve carbon neutrality by 2050 and recognizing that food production contributes to a quarter of global greenhouse gas emissions (Ritchie and Rosado, 2022), the F2F Strategy sets the ambitious target of converting 25% of the EU's agricultural land to organic farming by 2030 (EU Commission, 2020).

The objective of promoting a transition to green practices and sustainable food systems, has led to the proliferation of financial instruments and subsidies primarily defined under the 2023–2027 EU Common Agricultural Policy (CAP) which also emphasized the need to "improve the position of farmers along the value chain" and to "promote employment, growth gender equality, including women's participation in agriculture, social inclusion and local development in rural areas" (Sotte, 2023). The 2023–2027 CAP has also introduced the "social conditionality clause" (article 14) aimed at linking EU direct payments for farmers support to the compliance with certain specific social conditions and labour standards. Despite these crucial considerations, existing EU regulations pertaining to organic agriculture and production, notably lack specific provisions addressing the social dimension of sustainability. On the other side, the F2F Strategy acknowledges the role of seasonal, precarious and undeclared workers in the agricultural sector, emphasizing the need to promote "the protection of health and safety" as crucial elements in building "equitable, robust and sustainable food systems" (EU Commission, 2020). Consequently, the F2F also introduced the Unfair Trading Practice Directive (EU Directive 2019/633) to strengthen the position of farmers in the supply chain, enhance market transparency and promote more sufficient and equitable practices (EU Parliament, 2019).

The rationale behind this study is therefore to investigate whether the adoption of higher environmental sustainability standards is accompanied by increasing attention to social sustainability and better working conditions. This research is based on the understanding that managing the transition towards fairer and more sustainable food systems requires a comprehensive integration of the social dimensions inherent in agri-food production chains. As the agricultural sector is one of the most labor-intensive and one of the sectors in which migrant labour is most concentrated (Corrado et al., 2018), exploring the consequences of the transition to more sustainable agri-food practices necessarily requires consideration of its links to migration and labour regimes. Moreover, as the social dimension is intricately linked to labour dynamics and migration regimes, a comprehensive understanding of the complex network of social and economic processes to which global value chains are currently linked is also required (Yap, 2023). While labour regimes are evolving in different and interdependent ways across global production systems (Baglioni et al., 2022), it is also crucial to understand how the increased emphasis towards ecological matters has also affected them, considering their differential impact across gender and race axes. In addition to the interplay between labour and migration regimes, the increasing influence of private actors—such as large multinational corporations, certification bodies and retailers, has significantly shaped the dynamics and equilibria of the supply chain.

While scholars have extensively investigated the impact of organic agriculture on natural resources (Kanianska, 2016; Tilman, 1999) and numerous studies have analyzed working conditions within the agricultural sector (Castracani et al., 2021; Lo Cascio and Perrotta, 2022; Piro, 2021; Piro and Sanò, 2018), there is still a notable gap in the literature regarding the interplay between sustainable agri-food supply chains and their impact on labor standards. This paper aims to fill this gap by elucidating the consequences of the green transition and the integration of environmental standards within the agricultural actor, particularly considering how this has impacted on farmers and farmworkers employed within the organic agri-food sector. Several reasons suggest that organic production may affect working conditions, primarily by reducing workers' exposure to fertilizers, pesticides and other hazardous substances. Conversely, other scholars have emphasized the association between organic farming and an increased workload, which often implies longer time commitment. Therefore, through a systematic literature review, this research explores the extent to which existing scholarship has focused on this nexus and a comprehensive overview of the main social topics addressed by literature focusing on organic and sustainable agri-food practices.

The paper is structured as follows. (1) The first part provides elements about the methodological approach that led to the identification of the main body of literature. (2) The second part presents the results of the systematic review and groups them under three main themes (organic regulatory framework; production and farming; farmworkers and wages) around which the nexus between

organic agriculture and social sustainability has been conceptualized within the body of literature. (3) Finally, results are discussed providing a critical perspective aimed at exploring how these themes have evolved with the increasing attention toward sustainable food systems. The conclusion section provides an overview of the most relevant insights into the impact of the green transition on working conditions, along with recommendations for future research.

Methods

The review was conducted in accordance with the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) protocol (Moher et al., 2009). The method was selected for its rigorous approach to the analysis of the results and its provision of a robust framework for the analysis of social impacts of agricultural transformations (Packer and Zanasi, 2023; Dentzman et al., 2023; House et al., 2023). The initial stage of the review process entailed the identification of peer reviewed scientific articles and book chapters published between 2000 and 2023. This specific time frame was selected to encompass the growing attention directed towards organic and sustainable agricultural practices since the late 1990s, particularly following the reform of the CAP second pillar, which led to an increased interest by scholars in this field (Lillemets et al., 2022).

This approach implied an initial exploratory phase that was focused on the analysis of the literature pertaining to the interaction between labour regimes and conventional agriculture. Consequently, an investigation was conducted into studies that examined the development and evolution of the organic market. The research was conducted between September 2022 and February 2023 in the web platform database of Scopus. This approach enabled the identification of keywords for data selection, which were selected in accordance with the scope of the research. Keywords were searched in the title, abstract and keywords of the Scopus database, and the operator "AND" was included to ensure that all documents referenced the organic sector. Therefore, the material was collected, and the eligibility criteria were defined according to the scope of the research. This was followed by a descriptive and critical content analysis.

Figure 1 provides a schematic representation of the selection process. The term "organic production" was initially included among the keywords, but it was subsequently removed from the search criteria as it did not produce any relevant results. The preliminary research conducted on Scopus, led to a total of 483 results. Subsequently, a set of inclusion and exclusion criteria were applied for further refinement (Table 1).

For the purpose of this review, only contributions in the English language were considered. As the analysis is focused on the EU context, only case studies focused on EU countries or regions were deemed relevant, while contributions specifically focused on Asian and South American contexts were excluded, despite representing a significant proportion of the initial results. In the screening phase, duplicates were then removed, resulting in 194 contributions deemed eligible for further consideration. The full texts were then read and assessed against the pre-established inclusion and exclusion criteria. Studies that solely addressed the environmental impact of organic agriculture were excluded. Conversely, studies that focused on organic production through an examination of agricultural management, the impacts of organic conversion, and worker health within the agricultural sector, with reference to social and economic impacts and effects on working conditions, were deemed highly relevant to the present research. Despite the selected keywords, which were intended to encompass the dimension of labour within the literature focusing on organic agriculture, most articles from Scopus emphasized environmental implications. The final body of literature comprised 41 contributions. A data extraction file was then defined to record the main characteristics and arguments of each publication (see Supplementary material).

Results

General characteristics of selected articles

This section outlines the essential attributes of the articles that were ultimately incorporated into the body of literature. The majority of the contribution was published in the last 10 years, which coincides with a period of substantial growth observed in the organic agriculture market (Figure 2).

The final body of literature comprised a total of 41 contributions. The materials were selected, in accordance with the research objectives and interests. Subsequently, these contributions were subjected to a systematic examination through the lens of three primary themes, which collectively represent the nexus between working conditions and the sustainability of agricultural production. The first one groups the contributions under which the overarching regulatory framework of EU organic production was analyzed. This framework delineates the specific relationships among value chain actors, which are primarily influenced by the organic certification schemes and subsidies for organic production displayed by EU policies. The second theme explores the pivotal role of organic producers and farmers and how the priorities and values of these actors may influence the transition to organic production, which may in turn give rise to distinct relationships with their employees. The third theme addresses the labour conditions experienced by workers and agricultural labourers within the context of organic agriculture. Although only a limited number of the selected contributions explicitly address the analysis of labour conditions within sustainable supply chains, this analytical framework was essential for providing a comprehensive overview of the dynamics and factors shaping the structures and relationships within the organic agri-food value chain. The employed methodological approach has facilitated the identification of distinctive aspects of working conditions in organic agriculture, which are summarized in Table 2.

Notwithstanding the preliminary findings, no contributions were ultimately deemed to meet the inclusion criteria for the following streams: The search terms "organic agriculture" and "seasonal work," "organic farming" and "wage," "organic farming" and "farm work," and "organic farming" and "seasonal work" were used. Figure 3 illustrates the geographical focus of the contributions, with the majority of them focusing on the European context in a broader sense. Ten articles specifically target southern European countries (France, Italy, Portugal and Spain), which are recognised as playing a leading role in EU agri-food production.

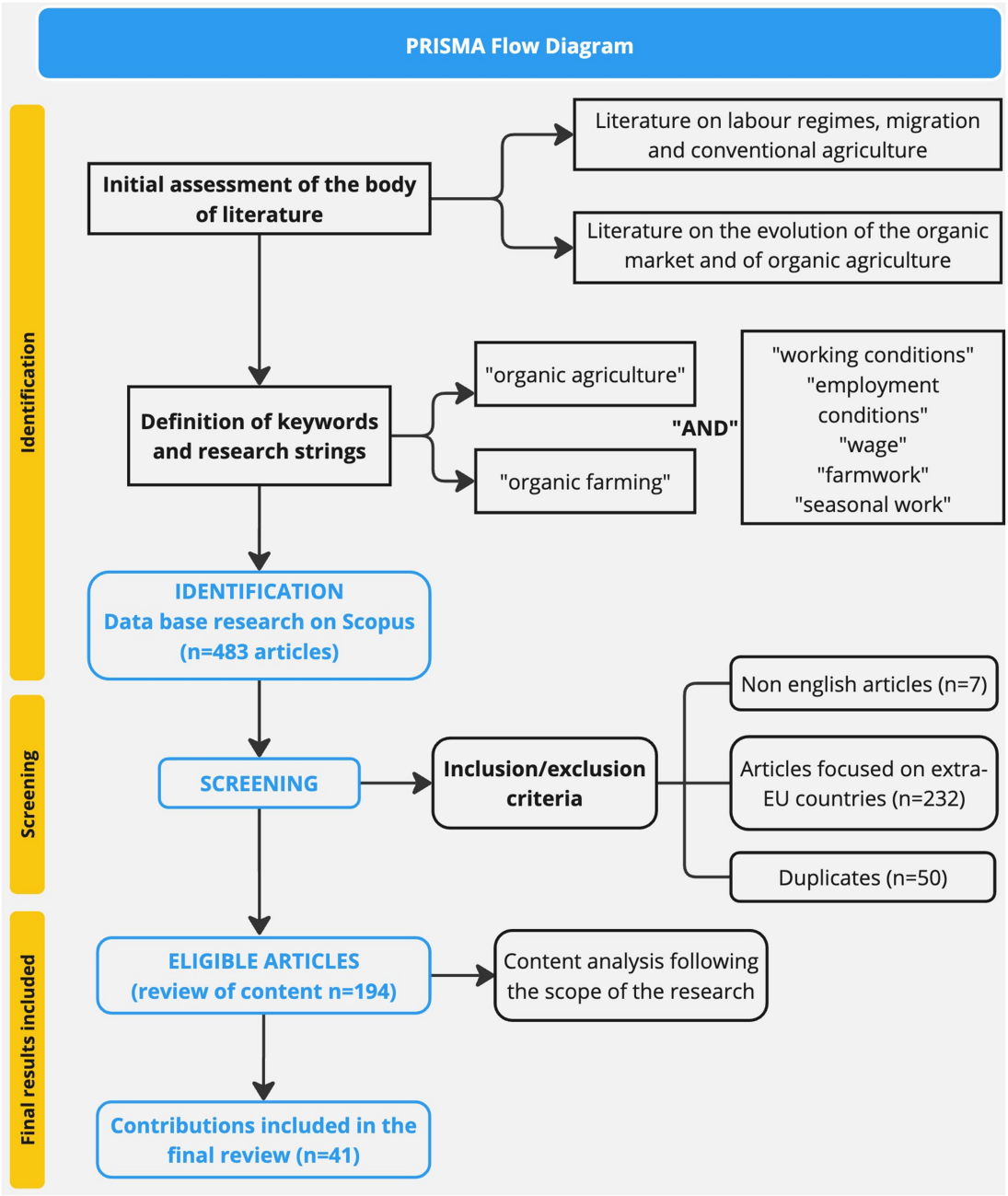

FIGURE 1
Three-phase systematic review process illustrating the number of records identified, screened and included in the final body of literature.

Theme 1. Regulatory framework for organic production

Organic certification schemes

The evolution of agricultural systems, influenced by industrial development, has undergone a significant transition from large-scale landed properties to the emergence of smallholders and the industrialization of agriculture. Notwithstanding this shift, the growth of large agribusiness companies has resulted in the formation of oligopolies within global agri-food supply chains. In their 2021 study, Fullana Llinàs et al. (2021) emphasized the significant influence of large agribusiness actors on the dynamics of global agri-food supply chains. They stressed that these actors have shaped the relationships among participants in these chains over time. To foster political and economic ties between public and private actors within EU common market, EU institutions have promoted the implementation of standards and regulations to govern and promote the growth of the agri-food sector. In this context, Sansavini (2006) highlighted how the introduction of several specialized labels, including PGI (Protected Geographic Indication), DPO (Denomination of Protected Origin) and DCO (Denomination of Controlled Origin), has empowered major retail chains, which already control approximately 70% of the market. This empowerment is attributed to what the author terms a "certification regime," which was also favored by the proliferation of

TABLE 1 Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
• English peer-reviewed studies • Contributions published between 2000 and 2023 • Case-studies focused on EU countries or regions • Documents that refer to organic production considering its social and economic consequences and referring to working conditions • Final publications	• Duplicate studies • Non-English written contributions • Papers and book chapters focused on case-studies that are located in extra-EU countries • Documents approaching organic agriculture merely from an environmental perspective

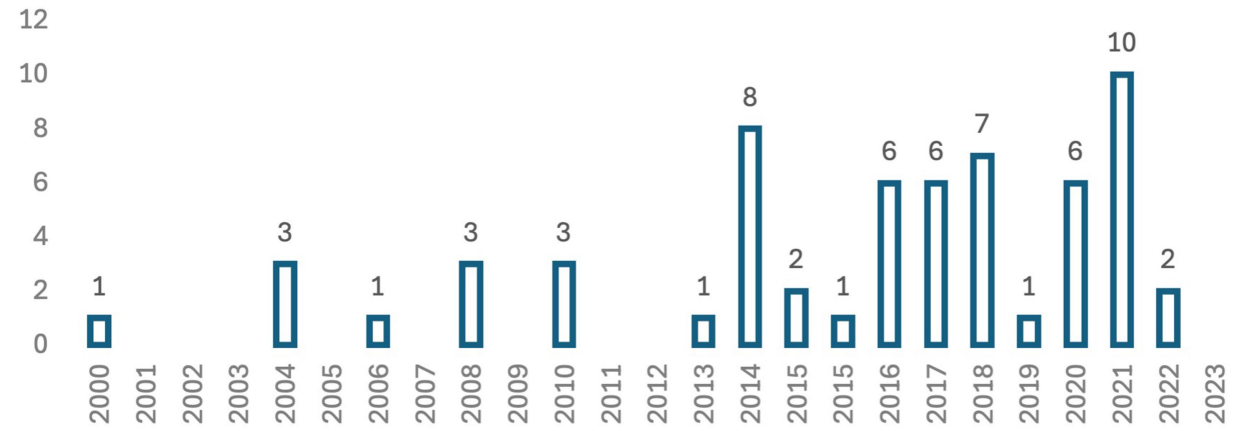

FIGURE 2
Number of articles published per year.

private certification bodies. This regulatory framework has resulted in the codification and standardization of organic practices, which has considerably diminished the flexibility of organic farming. In a study exploring the self-perception of organic farmers, Zagata (2010) reported that organic farmers expressed their general dissatisfaction with the extensive rules imposed by certification systems claiming that "European farmers are the least free creature on earth."

As observed by Kröger and Schäfer (2014), the absence of clear EU regulations ensuring transparency regarding environmental and ecological factors in agri-food production, has contributed to the proliferation of third-party certification systems. To this extent, Dias et al. (2021) stressed the importance of eco-regions[1]in promoting biological and agroecological practices as they provided a different approach in favoring a more comprehensive understanding of the interrelationship between agricultural practices and ecological priorities.

The importance of eco-regions in promoting biological and agroecological practices is emphasized by Dias et al. (2021), who highlight their role in facilitating a more comprehensive understanding of the interrelationship between agricultural practices and ecological considerations. This, in turn, also encourages the differentiation of production and highlights the vital role of technology in facilitating the coexistence of diverse practices. However, the adoption of differentiated production models often results in significant additional costs, which can force small producers to forgo differentiation at each processing step and, consequently, to sell their products under the same label, regardless of their origin, with no proper recognition of the efforts made by farmers (*Ibid*). A study conducted by Aubert and Enjolras (2017) revealed that farmers are indeed less incline to pursue organic farming certification, especially in the case of small-scale farmers involved in a diverse range of agri-food production activities. Authors were therefore suggesting that certifications are more commonly adopted by either larger, well-equipped farms or by smaller farmers with minimal diversification aiming to join the large market of distributors, which is traditionally more competitive (*Ibid*).

The proliferation of guidelines and standards of certifications has led to a progressive departure from the initial holistic approach of organic agriculture, and according to Zagata (2010) this resulted in numerous small-scale farmers disengaging from this evolving certification system. To this extent, Jouzi et al. (2017) identified two principal categories of organic producers: those situated in developed countries, predominantly certified as organic and thus able to command premium prices for their final products; and non-certified producers, often found in developing countries or engaged in direct sales at local markets. The distinction between these two groups is further highlighted by the fact that smaller farmers are required to bear the additional costs associated with organic production,

1 According to Basile (2014) an "ecoregion is a non-administrative, but functional, geographical area, in which an alliance is established between farmers, citizens, tour operators, associations and public administrations, for the sustainable management of resources. Thus synergy takes place based on the biological principles and practices of production and consumption (short chain, organized groups of supply and demand, quality restoration, biological canteens). In the ecoregion, the promotion of organic products is intrinsically linked to the promotion of the territory and its peculiarities, to achieve the full development of the economic, social and cultural scope."

TABLE 2 Selected contributions.

Keywords	Theme 1—Regulatory framework for organic production	Theme 2—Production and farming	Theme 3—Farmworkers and working conditions
"organic agriculture" AND "working conditions"	Sansavini (2006)	Bouttes et al. (2020), Lundqvist (2000), Maas et al. (2020)	Lundqvist (2000), Maas et al. (2020), Mitloehner and Calvo (2008), Mołocznik (2004)
"organic agriculture" AND "employment conditions"	Bradut et al. (2017), Farreras and Salvador (2022), Renner et al. (2008)	Dumont and Baret (2017), Jevtic et al. (2020), Pissonnier et al. (2017)	Dumont and Baret (2017), Farreras and Salvador (2022)
"organic agriculture" AND "wage"	Berbeć et al. (2018), Fullana Llinàs et al. (2021), Kröger and Schäfer (2014)	Kröger and Schäfer (2014), Pergola et al. (2013)	Berbeć et al. (2018), Hilal et al. (2021), Kröger and Schäfer (2014)
"organic agriculture" AND "farm work"		Medland (2016), Sbicca (2015)	Medland (2016)
"organic agriculture" AND "occupation"	Zagata (2010)	Brigance et al. (2018), Bourgeois et al. (2015), Lončarić et al. (2008), Mattila et al. (2021), Zagata (2010)	Brigance et al. (2018), Mattila et al. (2021)
"organic farming" AND "working conditions"	Aubert and Enjolras (2017), Dias et al. (2021), Di Vita et al. (2018), Florea et al. (2021), Jouzi et al. (2017), Konstantinidis (2016), Kozáková et al. (2014), Lecole (2021), Rakauskiene et al. (2015)	Di Vita et al. (2018) Ferasso et al. (2021). Jouzi et al. (2017), Kozáková et al. (2014), Shubha et al. (2021), Ulman et al. (2021)	David et al. (2010) Di Vita et al. (2018), Jansen (2000), Jouzi et al. (2017), Konstantinidis (2016), Kozáková et al. (2014), Lecole (2021), Lobley et al. (2009), Shubha et al. (2021)
"organic farming" AND "employment, conditions"	Dias et al. (2021)	Siddique et al. (2014)	Briz et al. (2020), Siddique et al. (2014)

including those deriving from the certification (*ibid*). Consequently, a considerable number of small-scale producers are unable to access the primary retail market, as their do not result compliant with the requirements of certification guidelines. To answer to this market exclusion, networks of farmers often join participatory guarantee systems (PGS). Authors (Farreras and Salvador, 2022; Konstantinidis, 2016) investigated the potential PGSs in supporting smaller farmers by creating networks and organizations of mutual-support and self-certifications mostly operating outside the channels of conventional agri-food industry.[2] Indeed, the International Federation of Organic Movements (IFOAM) defines PGSs as "locally focused quality assurance systems that certify producers based on the active participation of stakeholders and are built on a foundation of trust, social networking and knowledge exchange."

Subsidies for organic agriculture under the EU framework

The EU CAP represents the principal framework for public support for organic farming, with the objective of fostering rural employment and assisting small-scale farmers. However, several scholars (Konstantinidis, 2016; Lecole, 2021) stressed how large farmers are receiving a disproportionate share of public subsidies, deviating from the initial expectations of policymakers. To this extent Lecole (2021) argued that CAP support mechanisms (such as aid per hectare) tend to exacerbate disparities between large and small-scale farmers, thereby diminishing the overall support for smaller farmers. Conversely, Di Vita et al. (2018) suggest that the EU's additional payment systems for organic producers, enable farmers to sell their products at higher prices. Although EU subsidies and support instruments for the are widely considered vital for agri-food farmers—both conventional and organic—Kozáková et al. (2014) also highlighted their negative effects as often resulting in efficiency losses that contribute to strengthen geographical and regional asymmetries among EU economies. Authors focusing on Eastern European countries (Rakauskiene et al., 2015; Bradut et al., 2017; Berbeć et al., 2018) advocated for an increase in the instruments and investments to support organic agriculture and contribute to the green transition of these countries. In this regard, the work of Florea et al. (2021) offers substantial recommendations concerning the potential of organic agriculture to assume a pivotal role in the Romanian agricultural sector. This also highlights the sectors' capacity to contribute to green transition and sustainable development. Indeed, as Bradut et al. (2017) posit, policy supporting sustainable and rural development could help overcome the excessive fragmentation of ownership, the predominance of subsistence and semi-subsistence farming, and the precarious state of rural infrastructure. These factors also negatively affect labour markets, contributing to the migration of workers toward Western European countries.

Theme 2. Production and farming

Economic factors influencing producers' choices

The expansion of the organic market has resulted in a significant transformation of the role played by farmers, influencing also their chances to adopt sustainable agricultural practices. A significant contributing factor to the overall growth of the organic sector has indeed been the enhanced economic profitability associated to this

2 IFOAM estimates show an increase in the number of PGS producers from 6,000 in 2010 to 1,328,496 in 2022 (IFOAM, 2017, available at: http://www.organic-world.net/yearbook/yearbook-2023.html).

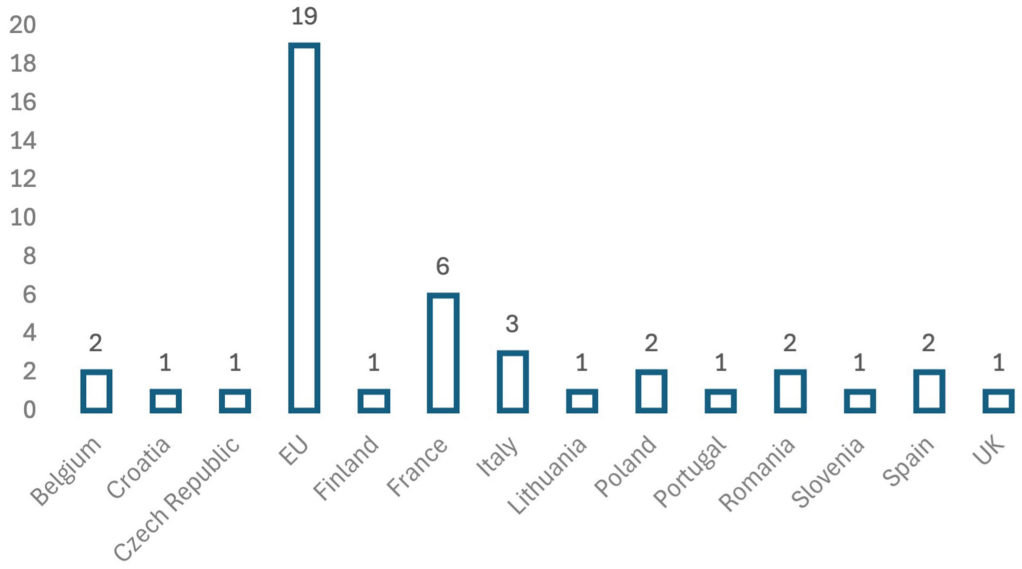

FIGURE 3
Geographic focus.

approach and Pissonnier et al. (2017) reported a net increase in the raw margins following the conversion to organic farming. Within a study focusing on Italian and Portuguese organic producers, Ferasso et al. (2021) found that the premium price for organic products ranged between 20 and 40% resulting in an overall profit increase of 22%. This economic advantage was also corroborated by Pergola et al. (2013) who conducted a comparative analysis of the economic sustainability of orange and lemon orchards produced under organic and conventional farming in Sicily. Their findings showed how organic agriculture results in lower costs of production (*Ibid*). The positive effects of increased profits is confirmed also by Mattila et al. (2021) who mentions the potential increase in wages of workers, illustrating how compensation for farmworkers' labor could even triplicate within the milk sector. To confirm this, the analysis conducted by Bouttes et al. (2020) measuring farmers' satisfaction after organic conversion revealed that the highest satisfaction scores were related to the economic status of the farm, including cash flows and debt levels.

The increase in profitability is primarily attributed to higher prices for organic products, estimated by Jouzi et al. (2017) to be between 29 and 32% higher than those of their conventional counterparts. However, several authors note increased input costs associated with organic farming. Ferasso et al. (2021) reported a 11.7% increase in organic costs, while Lončarić et al. (2008) reported a 33% increase compared to conventional agriculture. Siddique et al. (2014) emphasize how the ban of pesticides and synthetic fertilizers together with the abandonment of energy-intensive inputs associated with organic production, might also increase the costs of inputs and enhance farmers' self-sufficiency or result in lower yields compared to conventional farming (Kozáková et al., 2014). Di Vita et al. (2018) revealed that organic farming yields typically correspond to 80% of conventional yields. Consequently, several authors (Shubha et al., 2021) consider organic farming an inefficient approach to food security, especially in developing countries, where the estimated decline in total yield is approximately 43% (Di Vita et al., 2018). Finally, authors have also stressed how the abandonment of energy-intensive inputs used in traditional agriculture also increases the reliance on human labour, as this sector demands for more preventive activities, therefore demanding deeper knowledge of agricultural techniques and processes (Siddique et al., 2014).

In this context, prices play a key role in allowing farmers to overcome uncertainties within organic agriculture. On the other hand, power asymmetries among supply chains actors, as well as between larger and smaller farmers has been stressed by Kröger and Schäfer (2014), who underscored the role of price as a key indicator of the allocation of value along the production chan. Decisions concerning commodity prices are indeed often agreed upon by large retailers and wholesalers who play a crucial role in shaping dynamics and relations throughout the entire chain and to even increase competition among small-scale farmers, favoring the integration of conventional practices within the production chain (*Ibid*). Dumont and Baret (2017) delved into the tradeoffs encountered by organic farmers, emphasizing the overall prioritization of economic efficiency over social and ecological aspects. Examining the potential conflicts between environmental and social goals, authors (Ulman et al., 2021) identified employment conditions as a major concern for organic farms in terms of economic efficiency, highlighting the complex interplay between economic priorities and other sustainability dimensions within the organic agricultural sector.

Environmental and health aspects

In addition to economic profitability, the literature emphasized producers' sensitivity to environmental issues as a key driver of the conversion to organic agricultural practices. Mattila et al. (2021) highlight that producers are primarily motivated by the benefits of organics, focusing on human health, safety and environmental biodiversity, while other authors (Dumont and Baret, 2017) explore the practices of the most committed organic producers, who often go beyond the requirements of organic certification schemes rather following agroecological principles, therefore prioritizing more

environmental and social aspects over economic profits. Therefore, the traditional holistic approach of organic farming is promoted by going beyond traditional certification requirements and choosing organic farming primarily for its environmental and health benefits (Brigance et al., 2018). Besides environmental concerns, the growth of the organic market is also linked to a growth of consumers' awareness which has therefore increased the demand for healthier food (Lončarić et al., 2008). However, other authors (Lundqvist, 2000; Mattila et al., 2021) have also stressed how the elimination of technological tools and innovative agricultural techniques—such as pesticides and fertilizers—might increase the reliance on time-consuming tasks, which in turn may increase the exposure to weather conditions and dust, overall leading to adverse effects on workers' health and increase poor working postures. As such, these authors (*Ibid*) have stressed the existence of a trade-off between consumers' and farmworkers' health considering the organic farming sector.

Social and relational aspects among small-scale farmers

Considering the social aspects influencing producers' decisions converting to organic farming, Jevtic et al. (2020) highlight the important role of the relational dimensions, which can be considered as a distinctive feature of part of the organic farming sector. This increased attention to this dimension of organic farming is attributed to the increase reliance on networks and community systems that can provide support in choosing the best farming practices in response to adversities that may affect the harvest (Siddique et al., 2014). The relevance of social relationship and networks often emerges in the literature focused on alternative food networks (Brigance et al., 2018; Bouttes et al., 2020), where this relational dimension can encourage farmers to initiate a conversion process. Bourgeois et al. (2015) note that this reliance on networks and community channels of farmers is particularly important for young farmers, who may have limited access to traditional intergenerational knowledge transmission. Moreover, joining networks and socializing agricultural practices, is considered to have a positive impact on mental health as it implies the chance to share values and visions linked to agri-food practices which are note solely business oriented (*Ibid*) for instance by joining alternative food channels like PGSs and local farmers networks (Farreras and Salvador, 2022). To this extent, Bouttes et al. (2020) stress how the interaction of farmers and agri-food informal network, is linked to the promotion of new management approaches which often follow the conversion to organic practices, and to the need to increase a sense of security and control. These aspects are particularly important considering that conversion to organic often opens long periods of uncertainty that can last from 18 to 24 months, requiring multiple changes and high costs to comply with organic regulations (*Ibid*).

In this regard, Maas et al. (2020) stress the need for higher levels of integration and coordination between different actors, including government and local authorities, especially in supporting farmers in a process of transition. Financial support is therefore crucial to spread the added value of organic farming throughout society (Zagata, 2010). Medland (2016) highlights the importance of this relational dimension while particularly stressing the increased pressure from actors positioned at higher levels of the supply chain. While the previous contribution mentioned emphasize the social and communal commitment within organic farming, Sbicca (2015) notes that labor exploitation and unfavorable working conditions are not fully integrated into the aspirational ideals held by many organic farmers.

Theme 3. Farmworkers and employees

Effects of organic farming on workers' health and wellbeing

The literature has mostly explored the interrelationship between work and organic farming by focusing on health benefits and improved well-being. Scholars (Maas et al., 2020; Mołocznik, 2004) have examined the reduced risks associated with the elimination of agrochemicals and pesticides, which reduced also the exposure toxic substances and enhanced safety. To this extent, Mołocznik (2004) acknowledge that agriculture inherently carries risks stemming from continuous exposure to dust, noise, vibrations, chemicals and biological agents. Mitloehner and Calvo (2008) highlighted the recurrence of fatal and nonfatal injuries associated with machinery use and animal feeding operations in organic agriculture. In an analysis comparing labor conditions across diverse agricultural approaches (agroecological, organic and conventional practices), Dumont and Baret (2017) conclude that workers employed in agroecological and organic farming express higher levels of satisfaction, primarily attributed to their reduced exposure to harmful pesticides. These findings are also in line with the results emerging from Medland's (2016) work on organic agricultural enclaves in Spain, which indicate a slight preference of workers for organic work, largely attributed to safety and health considerations. Positive impacts on workers' perceptions are also linked to mental health impacts on workers, and a study conducted by Brigance et al. (2018) revealed several psychological and mental benefits resulting from workers' commitment to organic farming, mostly linked to a general major level of personal satisfaction.

Effects on workload

Increased workload is one of the aspects that scholars (Lundqvist, 2000; Berbeć et al., 2018) have focused more on when exploring the social implications of sustainable agriculture, emphasizing also how this is often related to an increase in job opportunities within organic agriculture (Hilal et al., 2021). Lundqvist (2000) and Berbeć et al. (2018) highlight the increased workload and physical tasks associated with organic agriculture, which could favor illness, physical diseases and time-consuming practices. Hilal et al. (2021) estimate a 13% increase in labor usage in organic and food quality production compared to conventional methods, potentially generating increased employment opportunities. Authors (Di Vita et al., 2018; Farreras and Salvador, 2022) stressed how this increased workload is also related to an increased variety of tasks associated with the production of certified and quality-labeled products (e.g., organic, PGI, DCO), which often has positive implications for rural and local communities. According to Siddique et al. (2014), the expansion of crop varieties and the adoption of year-round planting schedules in organic agriculture—aimed at improving soil health and protecting bio-diversity—can reduce the reliance on seasonal migrant labour and create more year-round employment opportunities for local workers. On the other hand, although there is empirical evidence that most types of organic farming promote rural development through their positive impact on employment (*Ibid*), Lobley et al. (2009) suggest that additional jobs

are mostly limited to part-time contracts, contributing to increase flexibility of working conditions, and therefore favoring a general reliance on migrant workers, most of whom send part of their wages back to their home countries, reducing the overall local development. On the other side, other contributions (Mattila et al., 2021; Konstantinidis, 2016) stressed possible negative consequences of increased workload, especially stressing the effects on physical strain. Mattila et al. (2021) found that 39% of organic farmworkers experience a decline of their work ability compared to 32% of conventional farmworkers.

Despite most of the findings collected highlight how organic farming is generally associated with increased workload, Konstantinidis (2016) observes that at the EU-27 level, conventional farms employ twice as much labour per hectare as organic farms, with exceptions in France, Ireland and Luxembourg. This observation is also supported by Kozáková et al. (2014), who analyzed the situation of organic and conventional production in Slovakia over different years, showing that the number of workers employed per hectare is higher in conventional agriculture and that organic farming can have different consequences on socio-economic aspects depending on the context where it is implemented.

Increased specialization

Another frequently investigated consequence of the shift towards organic agriculture is the relationship between organic practices and high levels of specialization. As observed by Hilal et al. (2021) and Siddique et al. (2014), high levels of technological infrastructure required by organic certification guidelines, often call for highly skilled and educated workforce which can potentially lead to the upskilling of local communities. A survey, conducted by Briz et al. (2020) aimed at evaluating the employment market for the EU organic agricultural industry, revealed a clear willingness on the part of farmers to employ graduates of organic agricultural studies or studies related to food quality and plant protection. To this extent, the most sought practical skills are those related to teamwork and problem solving. Accordingly, several authors (Konstantinidis, 2016; Jouzi et al., 2017) argue that organic farming is characterized by knowledge-intensive activities based on constant experimentation of practices. On the other hand, as farms operating within organic agriculture are very heterogeneous, ranging from small family producing farms to large production companies, the demand for labor varies significantly from business to business or from activity to activity (Shubha et al., 2021).

Wages, income and working conditions

Notwithstanding contributions such as those of Lundqvist (2000) and Lecole (2021), which emphasize the continued dominance of family farming within the agricultural sector, it is evident that large agri-business companies are assuming a dominant role within agri-food value chains. The progressive change in the structure and size of farms has resulted in a change in the composition of the labour force, increase the need to ensure a certain level of flexibility, which intrinsically characterizes agricultural production. While the flexibility of labour force was previously ensured through family members, the growth of many business activities has increased the reliance on paid labour, which is often hired through subcontracting systems, machinery cooperatives or employer groups that allow high levels of flexibility (David et al., 2010). However, most of the articles included in this study predominantly neglect to address the relationship between organic and paid work in terms of wages and contracts. One of the earliest authors suggesting the need of furthering our understanding the meaning of social sustainability concerning labour processes and working conditions within the organic sector was Jansen (2000). The author emphasized the interrelating elements of gender roles, social differences and social reproduction, as shaping the labour dimension within the agricultural sector. However, among the contributions included in this work, only a few provided a comprehensive analysis of the impact of organic farming on the wages and income levels of farmworkers. An empirical study conducted by Berbeć et al. (2018), which compared the performance of 10 organic and 10 conventional farms in Poland, revealed no significant differences in terms of wages and income levels. Furthermore, the study found that farmers and workers were generally dissatisfied with both farming systems.

Conversely, Hilal et al. (2021) investigated the impact of food quality schemes (FQS), including geographical indications and organic production on the social and economic sustainability of farmers and regions. Their findings indicated that within FQS, wage levels are 32% higher due to the higher prices of organic products. The authors argues that the processing level is the most remunerative, as it necessitates a greater degree of specialized labour skills (*Ibid*). In their analysis of the consequences of the growth of green jobs, Renner et al. (2008) emphasized the need of focusing more on the role of wages and recommend that future research prioritize the examination of working conditions in sustainable sectors. According to the authors, this approach would facilitate the formulation of recommendations that could ensure a fair green transition, guaranteeing dignity and safety at the workplace and adequate remuneration. The role of the minimum wage in guaranteeing social minimum standards for workers was a central aspect of the concept of "internal fairness" developed by Kröger and Schäfer (2014). In this context, the term "internal fairness" is used to describe the conditions and relationships existing between workers and employers within a given organization. This is distinguished from the concept of "external fairness," which refers to the relationships existing between different actors in a value chain. The authors highlight that none of the farms considered within their empirical research, defined any minimum wage or minimum working standards, despite their commitment to ensure regular training for their employees (*Ibid*). Therefore, as several contributions have stressed (Medland, 2016; Jansen, 2000; Hilal et al., 2021), from workers' perspectives, organic agriculture may bring little or no change at all in terms of employment relations and working conditions. The empirical research conducted by Medland (2016) on the organic enclaves of El Ejido in southern Spain showed that only a very small number of the farmworkers interviewed usually preferred to work in organic farming; however, no differences in terms of wages or tasks were recorded, but rather, those related to health benefits were recorded. In contrast, the study conducted by Maas et al. (2020) revealed a greater level of satisfaction on the side of farmworkers employed on organic farms, which was mostly linked to increased cohesion among workers and more sustainable labor tasks.

Discussion

This article presents a comprehensive examination of the contemporary state of the organic market, addressing a range of

factors that influence its evolution over the past decades. The initial section sheds light on the transformation of agricultural systems, emphasizing the rise of agribusiness and the function of EU certification regimes and subsidies. Additionally, it presents an overview of the main challenges confronting small-scale organic producers. In this regard, the article stresses how the proliferation of third-party certifying bodies, frequently established by major supermarket chains investing considerable resources in the organic market, has been a pivotal factor in the evolution of this sector. This transformation coincides with the industrialization of the entire agricultural sector, resulting in the gradual linearization of organic production as it becomes integrated into the agri-food industry. This process of conventionalization represents not only a progressive departure from the original values of organic farming, but also a progression of capital to the terrain of sustainability. The rise of third-party certifications, particularly within the EU, has contributed to the increased influence of agri-business companies and private bodies, leading to a progressive divergence from the initial organic values. This transformation has resulted in a clear delineation between those who advocate for proximity agriculture, environmental conservation and short supply chains, and those who view organic production as an opportunity for investments and profit. The introduction of certification systems, extending beyond the organic sector to include geographical indications of origin and quality labels, has resulted in a further reduction in the number of small producers who are able to meet certification requirements, making this market sector less accessible and exacerbating already existing divisions.

Despite these challenges, the article notes a general lack of interest within existing literature, in exploring the nexus between organic production and working conditions, both concerning the contributions focused on the role of small-scale farmers and those that focused on large agri-business actors. Even within studies exploring the role of alternative and community networks such as PGSs, which focus more on the relational dimension of organic farming, authors often ignore the labour dimension and the effects of the shift towards environmentally sustainable practices over workers. Nevertheless, IFOAM also identifies the principle of "fairness" among the four principles for organic agriculture. The contributions included in this systematic literature review have largerly overlooked the impact of organic regulatory frameworks on the capacity of farmers and organic producers to influence job security, to facilitate access to training, and to reduce wage disparities among their employees. Nonetheless, the principle of "fairness" stipulates that social justice, and social rights are an integral part of organic agriculture and processing. Despite the original attempt to adopt a more comprehensive approach encompassing the three dimensions of environmental, economic and social sustainability, the organic farming sector continuous to focus primarily on farmers' interests and priorities, with a minimal attention paid to the impacts over working conditions. Moreover, several actors within the organic production chain, including certification bodies and large retailer, also show a limited interest in prioritizing labour conditions of workers within their managerial and industrial strategies. In this regard, scholars have investigated how the influence of major retailers has been amplified by the rise of institutional frameworks such as third-party certification systems, which have increased their control role, thereby reinforcing the ties between public and private forms of regulation (de Castro et al., 2021; Loconto and Busch, 2010). From this perspective, the findings presented in this article contribute to a deeper understanding of the way the incremental integration of organic principles into industrial production has served to diminish the transformative scope of this approach, rendering it increasingly aligned with conventional and intensive agriculture. This has also favored the gradual integration of organic principles into what Friedmann (2005) has referred to as "green capitalism" to describe the increased role of private actors and standards—supported also by governmental authorities and intergovernmental actors—and the comprehensive transformation of agri-food supply chains in response to social movements, consumer pressures, and an increased awareness of environmental and social issues.

The article therefore suggests adopting an analytical perspective that would facilitate a deeper examination of the dynamics of labour processes within workplaces at various stages of the organic agri-food supply chain. Such an approach would enable to gain a full understanding of the interrelationship between the restructuring of organic agriculture as a whole and the progressive transformation of the labour population in the sector. Further contributions should focus on the intermediary role played by certification schemes, and the differential effects they have on farmers and producers, depending on the size of their farms. In particular, the impact of these standards on working conditions and employers' ability to ensure fair wages and safe working environments to their employees should be examined. To this extent, contributions from authors who have explored the experiences of everyday farmworkers within the workplace (Barrientos et al., 2011; Gereffi et al., 2016) would enable a more comprehensive understanding of the ways in which workers exercise their agency and the diverse challenges faced by both native and migrant populations. This approach would therefore enable an understanding of how the verticalization and fragmentation of global agri-food value chains, even within alternative and sustainable sectors, can contribute to the racialization of low-paid working sectors with common features such as temporary contracts and irregular working conditions.

Furthermore, the article underscores the need to define policies delineating explicit strategies and directions for a transition towards more sustainable food systems, with a specific emphasis on the need to address social aspects related to labor conditions. As Leonardi (2023) notes, reaffirming a strategy that integrated economic growth and environmental sustainability, while leveraging the social dimension of this relationship, could enhance attention given to the political and social representation of work. Considering the growing significance of the organic market, which has been a key focus of EU institutions in their pursuit of a green transition, there is a pressing need to examine the potential benefits this sector could offer to workers, considering the heterogeneity of this sector, and the different existing approaches to organic principles. Moreover, given that agriculture is structurally dependent on a non-local workforce (Corrado et al., 2018), the literature exploring the social impacts of organic farming must urgently deepen its comprehension of how the international division of labor is embedded within sustainable and green practices. Most of the contributions incorporated into the final body of literature predominantly focus on policy analysis and on the exploration of the social implications of organic agriculture in a wide sense. Nevertheless, literature examining the advantages of sustainable strategies in agriculture, must also consider the specific characteristics of the agricultural sector, which relies heavily on migrant workers who are already fragmented and stratified by migration policies and restrictions within the labour markets

(Anderson, 2010). Additionally, studies examining the impact on the labour market tend to overlook the role of migrant workers' agency and mobility, even though they represent the majority of those employed in EU's agricultural sector. It is therefore notable that studies exploring the potential effect of organic production in terms of social reproduction and living conditions are lacking. Although several studies acknowledge the positive impact of organic farming on health outcomes, most of the results fail to consider the broader social context shaping work and the conditions under which work is put to value.

Several contributions mostly from feminist literature (Mezzadri, 2018; Federici, 2020; Baglioni et al., 2022) stressed how the reproductive sphere, comprising care work predominantly performed by women and unpaid individuals, is rendered invisible. This is coupled with the absence of integration of aspects pertaining to housing conditions, access to welfare, and migrant status. This strand of literature has attributed this invisibilization to the Fordist approach to economic growth and development which has mostly devaluated and ignored reproductive processes. As a result, Leonardi (2023) argues that this has also contributed weaken the connection between social and environmental sustainability, rather favoring the integration of a perspective of sustainable growth based on accumulation that has largely overlooked the impact on working conditions. This has also entailed a further marginalization of the agricultural sector, with the risk of accentuating the normalization of the "exceptional nature" of agricultural work as "naturally" characterized by strenuous and irregular working conditions (Perrotta, 2015). This approach results in the assignment of a predominant role to the interests of entrepreneurs, large business actors and private certification bodies, thereby leading to a narrowing of the analytical scope (Rutvica and Sacchetto, 2017). The narrow lens through which the social impacts of organic agriculture have been analyzed in relation to working conditions also highlight the necessity to reconsider the impact of organic farming on local and rural development. This calls for a deeper understanding of its potential beyond the mere sphere of work. In this regard, Siddique et al. (2014) emphasized the necessity to enhance the examination of diverse economic and social settings where organic farming may be adopted, to elucidate intricate social dynamics, such as the interconnections between the augmented diversification of practices and the diminished reliance on seasonal migrant labour. Such contexts may indeed prove conducive to the adoption of disparate agricultural techniques, with the potential for divergent working conditions contingent upon the requisite degree of specialization. Similarly, despite the numerous contributions (Rakauskiene et al., 2015; Bradut et al., 2017; Berbeć et al., 2018) that have focused on the pivotal role of organic and sustainable agricultural practices in driving the development of the agricultural sector, particularly in Eastern European countries, further consideration is merited. Firstly, the international division of labour and the price competition among EU Mediterranean countries, which represent the first agricultural producers, are intertwined with the hierarchical structuring of global value chains (Gertel and Sippel, 2014). It is therefore necessary to evaluate new global and regional development scenarios based on the complex mechanisms involved, which include European mobility policies, wage shifts and competitive business strategies, all of which are interconnected with supply chain structures.

Conclusion

Organic agriculture is a rapidly expanding sector in the EU context, particularly driven by the emphasis on sustainable agri-food practices within the green transition. However, the literature exploring its social impacts, particularly on working conditions, remains. This systemic review contributes to the discourse on labour regimes and to the literature exploring the evolution of labour conditions within the agri-food sector, highlighting how existing contributions have addressed the nexus between organic agriculture and social sustainability from a labour perspective. Through a content analysis of 41 articles, three main themes were identified: the regulatory framework for organic production (Theme 1); production and farming (Theme 2); farm workers and employees (Theme 3). Each of these themes highlight some of the most relevant social dimensions explored by the existing body of literature. Despite the valuable insights provided, the review underscores a scarcity of studies specifically focusing on working conditions, with existing contributions often adopting a quantitative rather than a qualitative approach. Future research should therefore delve deeper into the factors influencing labour conditions in the context of organic agriculture, especially concerning migrant and female workers. The systematic approach adopted in this article has enabled a comparison between contributions coming from diverse disciplinary backgrounds, offering a comprehensive view of the nexus between social and environmental sustainability in organic agriculture. One of the limitations of this research is the linguistic criterion adopted for the selection of the results, which was primarily adopted due to time constraints, and led to the exclusion of contributions written in languages other than English. Nevertheless, future research by the authors will be director towards a more comprehensive examination of the existing literature on this topic. Despite the limited number of articles included in this review—which is also linked to the stringent eligibility criteria adopted since the beginning—the analysis has led to the identification of key recommendations for future research. First, policy discussion and debates on the future of sustainable agricultural practices should emphasize the importance of labour, addressing the inefficiencies and precariousness associated with agricultural work. It is therefore essential that future research on organic and sustainable agriculture goes beyond health and environmental benefits and adopts a qualitative approach to the analysis of the employment opportunities linked to the expansion of the organic sector. With respect to the European regulatory framework, future studies may also examine the impact of the strategic plans developed by individual member states for the transposition of European measures, with a particular focus on those pertaining to the introduction of social conditionality measures in the latest CAP reform (2023–2027). Furthermore, studies on certification and quality schemes for organic practices should explore how these frameworks integrate labour standards, providing evidence on their role in promoting the principle of "fairness" as outlined by IFOAM (2017). This research therefore offers a baseline for the empirical investigation into the social implications of organic farming's growth, particularly considering the differential effects on different workers' categories (e.g., migrant, women workers). Considering the findings of this literature review, which identified the key factors characterizing the organic supply chain in the EU context, there is an opportunity to empirically investigate the substantive differences in working conditions and labour between organic and conventional agricultural sectors. Given the predominance of migrant labor within

the agricultural workforce, it is crucial to consider how the ecological transition within the agrifood sector intersects with a racialized and stratified labor force. Future research could, therefore, focus on examining the extent to which the organic agriculture industry remains dependent on a flexible, low-cost workforce, often comprised of migrant workers (Gertel and Sippel, 2014). In conclusion, there is a pressing need for empirical studies that provide evidence on the impact of organic agricultural practices over working conditions. Such contributions would help develop a more nuanced understanding of the dynamic relationship between social and environmental sustainability in agriculture, and how these changes might unfold for diverse labor regimes and workers.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

GM: Conceptualization, Data curation, Formal analysis, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing. LF: Funding acquisition, Methodology, Supervision, Validation, Writing – review & editing. CG: Investigation, Methodology, Supervision, Validation, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Generative AI was used in the creation of this manuscript.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fsufs.2024.1502085/full#supplementary-material

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