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Leveraging Digital Platforms to Enhance Global Agrifood Systems Resilience: Implications for Social Sustainability

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Abstract

Digitalization in global agrifood systems plays a crucial role in translating sustainability principles into tangible actions, fostering more resilient practices along the entire supply chain. Nevertheless, the adoption process of innovative technologies in these systems is widely acknowledged as an inherently challenging phenomenon. While challenges persist in developed nations, they are profoundly emphasized in developing countries due to distinct socioeconomic constraints, leading to collaborative efforts among institutional, academic, and private actors to find solutions and reduce these disparities. In this regard, the literature highlights that Digital Platforms (DPs), owing to their heterogeneous nature and diverse range of applications, appear to be promising tools for fostering the adoption of sustainable and resilient practices worldwide. This systematic literature review investigates the challenges and potential solutions associated with employing DPs, emphasizing implications for global agrifood systems' social sustainability. The key findings underscore the significant influence that DPs, whether multi-stakeholder, high-tech/innovation or multi-sided, can exert on social sustainability, particularly in developing countries.

Keywords: Digitalization, Digital Platforms, Agrifood Systems, Resilience, Sustainability, Social Sustainability

Introduction

The agrifood sector is currently undergoing significant changes that impact the economy, society, and the environment globally. Numerous challenges lie ahead, with one of the most crucial being how to feed a growing global population while ensuring food safety and security (FAO, 2023). It is estimated that by 2050, the world's population will reach 9.7 billion, resulting in a 50% increase in food demand from 2013 levels (FAO, 2021a; UN/DESA, 2019). Moreover, significant concerns include the depletion of natural resources, climate change, rising energy costs,and inflation (FAO, 2017).

The debate for several decades has therefore centered around the growing need to make global agrifood systems sustainable, considering their economic, environmental, and social implications. This need has become even more pressing in the aftermath of the Covid-19 pandemic, which has disrupted production and distribution in many countries worldwide, putting food security at risk and highlighting the inherent vulnerabilities of current models (Barrett et al., 2021).

In this era of heightened tensions, the concept of sustainability has gained considerable prominence, along with resilience, which denotes the ability of agrifood systems to withstand, adapt, and thrive despite exogenous shocks that cyclically cause instability and turbulence in the food supply chain (Woodhill et al., 2022).

Intense research efforts have been undertaken to address the complexities of the modern agrifood landscape, involving different disciplines. In this context, the phenomenon of digitalization has emerged as a fundamental element, offering unprecedented opportunities to enhance the resilience of global agrifood systems by integrating innovative technologies across the entire supply chain (Klerkx & Rose, 2020; Panetto et al., 2020).

However, scientific research indicates that the implementation of digitalization faces significant obstacles worldwide, primarily due to the scale of enterprises, particularly small-medium and micro-enterprises, and resistance stemming from conservative managerial traditions (Thrassou, 2016; Vrontis et al., 2016). This phenomenon is even more pronounced in developing countries, where several socioeconomic factors, including limited access to financial resources, inadequate technological infrastructure, and low levels of education, hinder the widespread adoption of digital technologies (Abdulai, 2022; FAO, 2021b). As a result, disparities in global economic and social growth emerge (Quayson et al., 2021).

Within the expansive realm of digitalization, Digital Platforms (DPs) stand out as promising tools, offering notable and different solutions to drive the transition towards resilient agrifood systems. Here, the term “systems” encompasses an array of value-contributing stakeholders, including suppliers, producers, competitors, and consumers (FAO, 2021a; Lamine, 2015; Lezoche et al., 2020). DPs in the agrifood systems, whether they are *multi-stakeholder collaboration/innovation platforms* (MSTPs), *high-tech/innovation platforms* (HTPs), or *multi-sided platforms* (MSDPs), play a crucial role in fostering global collaboration, sustainable innovation synergies, and market access, with a particularly significant impact in developing countries (Massa et al., 2023). This would suggest profound implications for social sustainability, which this systematic literature review (SLR) aims to highlight.

This SLR aims to analyze the current literature on the role of DPs in supporting global agrifood social sustainability, by asking the following research question:

- RQ. How do DPs contribute to social sustainability outcomes within global agrifood systems, and what are the core mechanisms behind their application?

Enhancing Global Agrifood Resilience: the Role of Digital Platforms

Literature on DPs has been dominated by two separate and distinct theoretical perspectives (Gawer, 2014). One line of research, which originates from product development studies (Gawer & Cusumano, 2002), views platforms as a shared set of components, technologies,

and assets organized in modular architectures. These platforms serve as *venues for innovation*, enabling the creation of complementary products and services. A second perspective, stemming from industrial economics (Rochet & Tirole, 2003; Rochet & Tirole, 2006), views platforms as systems of regulations and structures that facilitate connections between *two or multiple entities*, mediating interactions and transactions among them.

From a product development standpoint (Gawer & Cusumano, 2002), DPs embody new forms of connectivity among diverse stakeholders, including suppliers, customers, developers of complementary assets, and competitors. The interactions observed on these platforms often involve a combination of cooperation and competition, which is commonly referred to as *coopetition*. The governance of these *ecosystems* is usually the responsibility of the platform leader, although it may be shared among other participants. In the agrifood sector these platforms can take the form of *multi-stakeholder-collaboration/innovation platforms* (MSTPs), and *high-tech innovation platforms* (HTPs) (Massa et al., 2023). MSTPs focus on adaptability, responding to disruptions in social and ecological domains (Berkes et al., 2003), where collaboration among diverse stakeholders across different scales is crucial (Barakat & Srour, 2024; Olsson et al., 2004). Research often centers on sustainability and resilience in disadvantaged rural areas or underdeveloped countries with limited technology investments (Omulo & Kumeh, 2020; Pamuk & van Rijn, 2019). Innovation is promoted through development programs and agricultural extension services, aiming to spread effective and sustainable agricultural practices and techniques (Sartas et al., 2018; Thiele et al., 2011). Whereas, research on HTPs focuses on leveraging cutting-edge technologies to enhance the resilience of agrifood systems, predominantly concerned with understanding the tangible effects of these advances on firms' ability to cope with disruptions in a sustainable manner (Yadav et al., 2023; Bechtsis et al., 2022). Indeed, digitalization enables end-to-end supply chain connectivity, leading to increased cost-effectiveness, enhanced information and communication efficiency, and promoted supply chain resilience to achieve better performance (Zhao et al., 2024).

Following instead the perspective of economic theory, DPs are conceptualized as *two-sided markets*, *multi-sided markets*, or *multi-sided platforms* (MSDPs) (Gawer, 2014). They act as intermediaries between two or more mutually dependent groups of users with shared economic interests, and are characterized by network effects, which arise between the different sides of the market (i.e. when one side's benefit of participating in the platform depend on the size of the other side) (Hagiu & Wright, 2015; Rysman, 2009). When the two groups of users are sellers and buyers, they are also called e-commerce platforms (Massa et al., 2023). In this vein, economists view platforms as special kinds of markets that play the role of facilitators of exchange between different types of consumers that could not otherwise transact with each other. These platforms can play a central role in enhancing the sustainability and resilience of agrifood systems (Massa et al., 2023). For instance, they enable food waste recovery and redistribution, broaden opportunities for smallholders to reach target markets, boost labor and land productivity, and facilitate smoother transactions with both suppliers and customers (Ciulli et al., 2020; Zeng et al., 2019), thereby carrying profound implications for issues related to social sustainability.

Methodology

To pursue the objectives of our research, we have adopted a methodological approach based on a Systematic Literature Review (SLR), following the protocol proposed by Tranfield et al. (2003). In order to identify the most relevant sources, we directed our focus towards the SCOPUS and Web of Science databases. Consequently, we devised an automated search string comprising keywords covering the topics addressed by the SLR, using different boolean combinations to optimize data collection. To ensure the inclusion of high-quality articles in our search results, we limited our selection to peer-reviewed publications, adhering to stringent inclusion and exclusion criteria. The article selection criteria are detailed in Table 1.

Table 1. *Selection process of research articles for SLR.*

<table>
<tr><td colspan="2">Phase 1. Search on SCOPUS and Web of Science databases:
TITLE-ABS-KEY(((agro* OR agri* OR farm* OR rural) AND (digit* OR platform OR technolog*) AND ("social sustainab*")))
(+ boolean combinations of keywords)</td></tr>
<tr><td>Search on SCOPUS database → n= 256</td><td>Search on Web of Science database → n= 323</td></tr>
<tr><td colspan="2">Phase 2. Inclusion and exclusion criteria
1. Articles peer-reviewed written in English (excluding books, notes, letters, editorials and non-referred publications).
2. Subject Area: Business, Management and Accounting and closely related disciplines.
3. Full-text availability.
4. Articles focusing on the role of DP in social sustainability.
5. Publication timeframe not considered for data collection.</td></tr>
<tr><td colspan="2">Number of articles after the application of inclusion and exclusion criteria
(relevance to the topic verified on abstract reading)
SCOPUS n= 48
Web of Science n= 40</td></tr>
<tr><td colspan="2">Phase 3. Merging databases, excluding duplicates, application of inclusion/exclusion criteria to full-text reading
Finale sample n= 29</td></tr>
</table>

Source: Authors elaboration.

Results and Discussion

This section presents a descriptive analysis of the papers considered for the SLR, with the aim of providing useful insights into the landscape of research relevant to our investigation. Following this, the thematic analysis will delve into the implications for social sustainability arising from the utilization of DPs, thereby providing a response to the research question.

Descriptive Analysis

The descriptive analysis provides a concise exploration of the current literature regarding the utilization of various DPs in the context of social sustainability in global agrifood systems. Within this overview, Table 2 presents a list of research articles identified for our SLR, Figure 1 illustrates the distribution of articles by year, and Figure 2 offers a geographical mapping of publications, providing valuable insights into the global research landscape in this area.

The articles identified for the SLR (Tab. 2) show an interesting variety of research areas. This diversity is reflected in the editorial placements of the papers, which span from the area of business and management to engineering and agricultural sciences. Scholars, guided by their respective specializations, have focused on analyzing the impacts of technological innovation both within the agrifood sector and society at large.

Table 2
Complete list of research articles

N°	Author(s)	Year	Title	Journal
1	Stoica M. & Roach W.L.	2010	Family business contribution to the sustainable development in the rural US Midwest: The case of new technology adoption	International Journal of Entrepreneurship and Innovation Management
2	Brehmer, M. et al.	2018	Sustainable business models as boundary-spanning systems of value transfers	Journal of Cleaner Production
3	Sharma, Y.K. et al.	2019	When challenges impede the process: For circular economy-driven sustainability practices in food supply chain	Management Decision
4	Archontakis, F. & Anastasiadis, F.	2019	Technology and innovation in southern europe's agri-food sector: A Delphi study	International Journal of Technology Management and Sustainable Development
5	Jurjevic, Z. et al.	2019	Information Technology as a Factor of Sustainable Development of Serbian Agriculture	Strategic Management
6	Fusté-Forné, F. & Jamal, T.	2020	Slow food tourism: an ethical microtrend for the Anthropocene	Journal of Tourism Futures
7	Agyekumhene, C. et al.	2020	Making Smallholder Value Chain Partnerships Inclusive: Exploring Digital Farm Monitoring through Farmer Friendly Smartphone Platforms	Sustainability
8	Troise, C. et al.	2021	Understanding the implications of equity crowdfunding on sustainability-oriented innovation and changes in agri-food systems: Insights into an open innovation approach	Technological Forecasting and Social Change
9	Chavosh Nejad, M. et al.	2021	An AHP-based multi-criteria model for assessment of the social sustainability of technology management process: A case study in banking industry	Technology in Society
10	Mangla, S.K. et al.	2021	Using system dynamics to analyze the societal impacts of blockchain technology in milk supply chains refer	Transportation Research Part E: Logistics and Transportation Review
11	Quayson, M. et al.	2021	Technology for Social Good Foundations: A Perspective from the Smallholder Farmer in Sustainable Supply Chains	IEEE Transactions on Engineering Management

12	Parth, S. et al.	2021	Digital technology-enabled transformative consumer responsibilisation: a case study	European Journal of Marketing
13	Rijswijk, K. et al.	2021	Digital transformation of agriculture and rural areas: A socio-cyber-physical system framework to support responsibilisation	Journal of Rural Studies
14	Li, J. et al.	2022	Innovation and Optimization Logic of Grassroots Digital Governance in China under Digital Empowerment and Digital Sustainability	Sustainability
15	Cavazza, A. et al.	2023	Artificial intelligence and new business models in agriculture: the “ZERO” case study	Management Decision
16	Mina, G. et al.	2023	Public perception and social sustainability of indoor farming technologies: A systematic review	Technology in Society
17	Fu, S. et al.	2023	The influence of corporate social responsibility information transparency on the consumption of green agricultural products on digital platforms	International Journal of Logistics Research and Applications
18	Costa, F. et al.	2023	Industry 4.0 digital technologies enhancing sustainability: Applications and barriers from the agricultural industry in an emerging economy	Journal of Cleaner Production
19	Wang, G. et al.	2023	Exploring Sustainable Development Pathways for Agri-Food Supply Chains Empowered by Cross-Border E-Commerce Platforms: A Hybrid Grounded Theory and DEMATEL-ISM-MICMAC Approach	Foods
20	Bustamante, M.J.	2023	Digital platforms as common goods or economic goods? Constructing the worth of a nascent agricultural data platform	Technological Forecasting and Social Change
21	Latino, M.E. et al.	2023	The Potential of Gamification for Social Sustainability: Meaning and Purposes in Agri-Food Industry	Sustainability
22	Hidalgo, F. et al.	2023	Digitalization, sustainability, and coffee. Opportunities and challenges for agricultural development	Agricultural Systems
23	Neethirajan, S.	2023	The Significance and Ethics of Digital Livestock Farming	AgriEngineering
24	Lakshmi, A.J. et al.	2023	Indian Cooperative Trade Platform (ICTP): A Grounded Model	Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems

25	Valencia-Payan, C. et al.	2023	Smart Contract to Traceability of Food Social Selling	Computers, Materials & Continua
26	Gangwar, H. et al.	2023	Adoption of big data analytics practices for sustainability development in the e-commerce supply chain: a mixed-method study	International Journal of Quality & Reliability Management
27	Cesco, S. et al.	2023	Smart agriculture and digital twins: Applications and challenges in a vision of sustainability	Europen Journal of Agronomy
28	Chen, S. et al.	2023	The design and implementation of a distributed agricultural service system for smallholder farmers in China	International Journal of Agricultural Sustainability
29	Zhang, Y.X. et al.	2024	An integrated mechanism and challenges of mountainous sustainable development: A review of Hani Terraces, China	Sustainable Development

Source: Authors elaboration.

Regarding the publication trend (Fig. 1), excluding the year 2024 where data collection is still partial (until the month of April), it is clear that the emphasis on DPs studies in the agrifood sector, with a focus on social sustainability, has mainly concentrated in the last five years (2019-2024). This is a very relevant result considering the absence of a parameter identifying a specific time period in the data collection phase. The trend indicates that the topic of research is gaining considerable interest and is likely to continue to develop in the future.

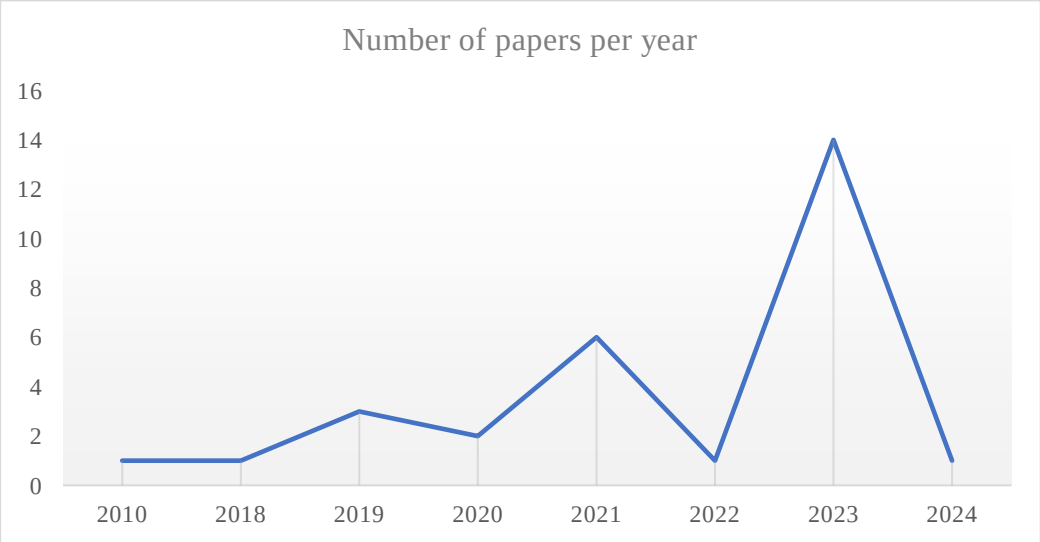
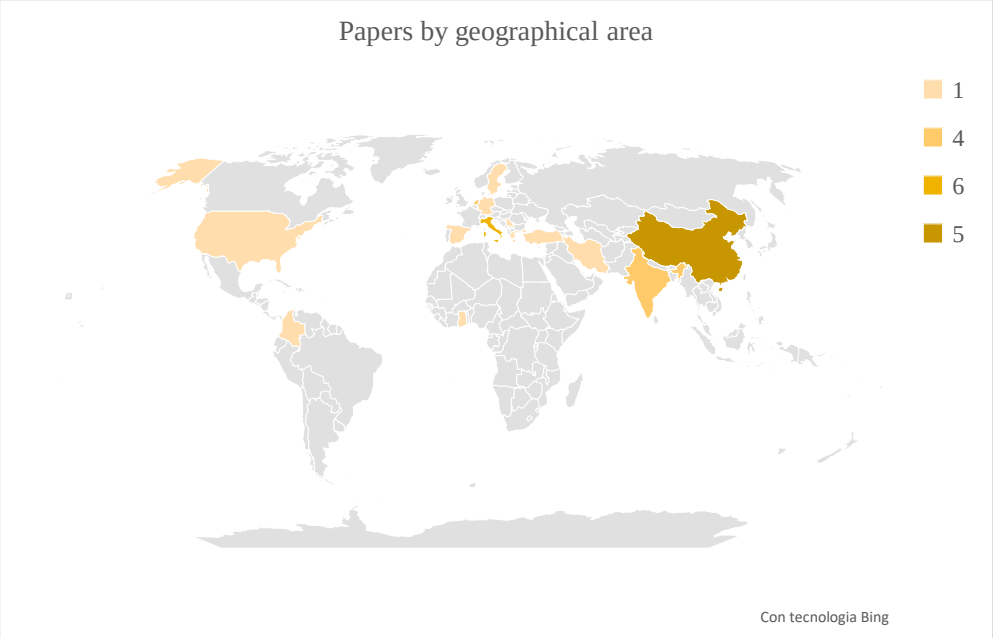


Figure 1. *Trend of publications*
*Partial result for 2024, data collection up to April.
Source: Authors elaboration.

The geographical distribution of publications (Fig. 2) reveals a considerable interest from various countries in the study area in question. In particular, there is a significant concentration of studies from countries such as Italy (with a total of 6 publications), China (5 publications), the Netherlands (4 publications) and India (4 publications), which demonstrates a strong involvement and commitment of researchers and academic institutions in these

countries. However, despite the smaller number of publications from other countries, a widespread geographical distribution is evident. This emphasizes that although some countries may be more active in the field of study under consideration, interest in the topic is broad and involves different cultural and academic realities.



Source: Authors elaboration.

Thematic Analysis

This section aims to answer the research question by drawing on the different types of DPs that have emerged in the literature as tools for pursuing resilience in agrifood systems (Massa et al., 2023), capturing their implications for social sustainability (Tab. 2).

MSTPs have assumed a crucial role in promoting social sustainability in the agrifood sector by facilitating collaboration and knowledge sharing (Cavazza et al., 2023; Cesco et al., 2023; Chen et al., 2023; Jurjevic et al., 2019; Lakshmi et al., 2023; Mina et al., 2023). The existing literature indicates that the implementation of MSTPs has had a positive impact on the welfare of farmers in poor areas, due to increased earnings from production, as evidenced by higher yields and gross margins (Cavatassi et al., 2011). These platforms offer considerable potential to foster sustainable rural development through digital empowerment, collaborative innovation and stakeholder engagement (Cavazza et al., 2023; Chen et al., 2023; Lakshimi et al., 2023). It is crucial to adopt participatory and inclusive approaches to ensure the effectiveness of such platforms in improving the living conditions of communities and promoting long-term social sustainability (Cesco et al., 2023).

The study conducted by Zhang et al. (2024) emphasizes the importance of co-designing smartphone platforms with smallholder farmers, which improves their communication skills and perception of inclusiveness, thus facilitating their interaction with value chain partners. MSTPs are also used in the context of gamification, as highlighted by Fu et al. (2023), where they provide a rule-based digital environment to engage consumers through interactive experiences and influence their behaviors. The application of gamification in agrifood systems can have a significant impact on social sustainability, with the potential to stimulate healthy

nutrition, improve education, promote the use of technology and facilitate learning and training. Furthermore, open innovation (OI) and crowdfunding platforms have emerged as valuable tools to address sustainability challenges in the agrifood sector, influencing companies' innovation trajectories and promoting social sustainability-oriented changes (Jurjevic et al., 2019).

In the literature concerning the sustainability and resilience of agrifood systems, HTPs emerge as valuable digital tools that can facilitate ecosystem-based approaches to solve highly complex social and ecological challenges (Massa et al., 2023). In this context, the integration of emerging digital technologies embedded in platforms such as Big Data, Blockchain, Artificial Intelligence (AI), Internet of Things (IoT) and machine learning has been demonstrated to significantly enhance social sustainability along agricultural supply chains (Agyekumhene et al., 2020; Fusté-Forné & Jamal 2020; Hidalgo et al., 2023; Mangla et al., 2021). Other HTPs, which combine social and physical data through technologies such as wireless sensor networks and cloud computing, offer a wide range of benefits, such as decision support, real-time monitoring, predictive analysis and crop planning (Valencia-Payan et al., 2023; Zhang et al., 2024). Some authors concur that these technologies have the potential to contribute to gender equality by digitizing industries, replacing some heavy manual jobs and improving the overall work experience of employees (Rijswijk et al., 2021). Furthermore, these technologies can address concerns regarding the authenticity, traceability, and safety of food products, while also improving overall productivity, efficiency, and the quality of products and services (Bustamante 2023; Chavosh et al., 2021; Latino et al., 2023).

However, the implementation of these technologies necessitates a rigorous assessment of organizational, cultural, and digital competence factors to ensure a positive social impact (Fusté-Forné & Jamal 2020; Quayson et al., 2021; Sharma et al., 2019; Troise et al., 2021). In fact, several studies have identified a number of challenges that must be overcome to realize the full potential of these technologies. These include the need for improved government policies, greater access to technology and techniques, enhanced farmer knowledge and awareness, and the adoption of technologies to counteract exploitation, corruption and child labor along supply chains (Agyekumhene et al., 2020; Archontakis & Anastasiadis 2019; Costa et al., 2023; Sharma et al., 2019).

MSDPs in agrifood systems are defined in the literature as tools that, by connecting different user groups, have a positive impact on resilience, especially in developing countries, by enabling the recovery and redistribution of food waste, extending also the possibilities for small-scale farmers to access target markets and simplifying transactions with suppliers and customers (Ciulli et al., 2020; Zeng et al., 2019).

Stoica & Roach (2010) argue that the adoption of mobile commerce (m-commerce) by small and medium-sized enterprises emerges as a key driver of technological progress in rural communities, with access to digital markets proving essential for economic and social inclusion. Sustainable development in these chains refers to the establishment of end-to-end digital platforms, which enable efficient coordination between upstream and downstream actors (Li et al., 2022). Social interaction facilitated by MSDPs can foster support for disadvantaged groups, thus promoting greater equity and inclusion in the agricultural sector (Brehmer et al., 2018). Indeed, access to digital marketplaces and traceability systems

facilitates communication between producers and buyers, enabling manufacturers to access differentiated markets with added value (Fu et al., 2023). These types of platforms improve the efficiency of the agricultural supply chain and incorporate mechanisms to support transparency and social responsibility throughout, as well as risk management, ensuring a positive impact on the community and environment (Gangwar et al., 2023; Neethirajan, 2023; Parth et al., 2021). In the context of MSDPs, the digital divide serves as a significant driver of societal exclusion processes, fostering the creation of hierarchies among producers. Consequently, it is imperative that institutions and regulators make concerted efforts to enhance digital literacy and develop technological infrastructure in rural areas. Cooperatives and NGOs can facilitate the democratization of access to digital technologies, thereby reducing the digital divide and creating a more inclusive and equitable environment (Fu et al., 2023; Wang et al., 2023).

Table 2
Results of the SLR

Type of DP	Articles	Core Mechanisms	Strategic Aim	Implications for Social Sustainability
MSTP	Cavazza, et al., 2023; Cesco et al., 2023; Chen et al., 2023; Jurjevic, et al., 2019; Lakshimi et al., 2023; Mina, et al., 2023.	Cooperation and knowledge sharing among stakeholders, including researchers, local NGOs, governments, private and public organizations. Knowledge diffusion on new technologies and agricultural practices. Design, implement and assess the effectiveness of sector programs, policies and monitoring systems	Improve economic conditions of farmers in poor rural areas and in underdeveloped countries. Preventing and counteracting the effects of climate change in sensitive areas prone to drought, flooding, and desertification through the introduction of new, non-advanced technologies that are compatible with the limited investment opportunities of local farmers.	Digital literacy; co-design; farm monitoring; perception of inclusion; stakeholders engagement; value co-creation; digital empowerment; rural development; collaborative innovation, adaptation of technology and innovation.
HTP	Agyekumhene, et al., 2020; Archontakis & Anastasiadis, 2019; Bustamante, 2023; Chavosh, et al., 2021; Costa et al., 2021; Fusté-Forné & Jamal, 2020; Hidalgo et al., 2023; Latino	Application of IoT, Cloud Computing technologies, Blockchains, Agent-Based simulation, Big Data Analytics to solve complex agricultural and ecological issues.	Solve complex social and ecological issues. Support decision making to improve land resource management, reduce food waste problems, mitigate risks thus improving sustainability of the entire food supply chain.	Technological adoption; rural development; social inclusion; reduction of food fraud; animal health and welfare; food security; food education; improving the vulnerability of small-scale farmers; resolving inefficiencies; community well-

	et al., 2023; Manga et al., 2021; Quayson et al., 2021; Rijswijk et al., 2021; Sharma et al., 2019; Troise et al., 2021; Valencia-Payano et al., 2023; Zhang et al., 2024.			being; reduction of poverty and social inequalities, food quality, financial sustainability, digital competence, urban resilience.
MSDP	Brehmer et al., 2019; Fu et al., 2023; Gangwar et al., 2023; Li et al., 2021; Neethirajan, 2023; Parth et al., 2021; Stoica & Roach, 2010; Wang et al., 2023.	Creating linkages between food waste generators and potential users. Formation of logistics clusters along with an e-commerce type supply chain to align demand and supply of food. Adoption of the sharing economy paradigm to match producers with possible consumers. Providing easier access to knowledge, markets and credit.	Reduce food waste; Benefit small, local producers while increasing trust and knowledge about sustainable agricultural practices.	Technological advancement in rural areas; access to digital markets; social interaction; support for disadvantaged groups; business transparency; social responsibility; social progress; local employment opportunities.

Source: Authors elaboration.

Conclusions

The resilience of global agrifood systems is now recognized as a critical priority for a diverse array of stakeholders, including policymakers, businesses, public and private institutions, and the research community. Challenges span from economic to environmental and social realms. Digitalization is increasingly recognized as a key factor in tackling these challenges, as digital technologies offer different of solutions across all stages of the agrifood supply chain. In this context, academic literature highlights that DPs, characterized by their diverse nature and multifaceted applications, could serve as promising tools to promote the adoption of sustainable and resilient practices on a global scale.

Our research aimed to conduct an SLR to explore the diverse landscape of DPs used to enhance the resilience of global agrifood systems. Specifically, our goal was to analyze the core mechanisms of these platforms, their strategic objectives, with a focus on their implications for the social sustainability in the agrifood sector.

Our findings suggest that MSTPs may play a role in promoting collaboration, knowledge sharing, and improved farmer welfare, particularly in impoverished areas. Through participatory and inclusive approaches, MSTPs have demonstrated the potential to improve

livelihoods and facilitate sustainable rural development. HTPs may offer a promising avenue for addressing complex social and ecological challenges within agrifood systems. The integration of emerging digital technologies such as Big Data, Blockchain, AI, IoT and machine learning has the capacity to significantly improve social sustainability along agrifood supply chains. This could promote gender equality and ensure food traceability and safety as well as productivity and efficiency.

MSDPs facilitate economic and social inclusion by granting small and medium enterprises in rural communities access to digital markets. These platforms enhance supply chain efficiency and promote transparency, social responsibility, and resource efficiency.

However, challenges such as the digital divide and technology infrastructure gaps need to be addressed through concerted efforts by institutions, regulators, cooperatives, and NGOs to ensure equitable access to digital technologies and promote inclusiveness in agrifood systems. We argue that investments in education, training and capacity building programs are essential to bridge the digital divide and improve digital literacy among farmers and other stakeholders, particularly in rural and underserved areas. Policy makers play a key role in creating an enabling environment for the development and deployment of digital technologies on a global scale. This includes formulating supportive policies, investment in digital infrastructure and financial incentives.

Theoretical and Contextual Contributions

This systematic literature review offers several important contributions to both theory and practice in the field of DPs and sustainability of global food systems. From a theoretical perspective, our research extends the existing literature by providing a broad framework that integrates different types of digital platforms (MSTPs, HTPs, and MSDPs). Indeed, while previous literature has been fragmented in its focus on various DPs or specific technological applications (Cesco et al., 2023; Gangwar et al., 2023; Omulo & Kumeh, 2020), our work synthesizes these different approaches to provide an understanding of how different types of platforms contribute to social sustainability outcomes, a dimension that still remains underexplored in agrifood research (Massuça et al., 2023; Toussaint et al., 2020).

From a contextual perspective, our research provides valuable insights into the strategic and practical implementation of DPs in different geographical and socioeconomic contexts, with particularly significant implications for developing countries (Abdulai et al., 2022). Our work contributes to the literature by identifying specific mechanisms through which different types of DPs improve the resilience of global agrifood systems. These mechanisms include knowledge sharing in MSTPs (Chen et al., 2023; Lakshmi et al., 2023), technology integration in HTPs (Agyekumhene et al., 2020; Hidalgo et al., 2023), and market access facilitation in MSDPs (Ciulli et al., 2020; Stoica & Roach, 2010).

Furthermore, our findings highlight the critical role of institutional support and policy frameworks in addressing the digital divide, thus contributing to the broader debate on technology adoption in agricultural contexts (Fu et al., 2023; Wang et al., 2023).

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