

PLATFORMIZATION OF AGRICULTURE: A CONCEPTUAL FRAMEWORK FOR DIGITAL AGRIBUSINESS ECOSYSTEMS

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ABSTRACT

This study examines the platformization of agriculture and its role in transforming traditional agribusiness systems into digitally interconnected ecosystems. With the rapid adoption of digital technologies such as data analytics, artificial intelligence, and mobile platforms, agriculture is increasingly shifting toward a platform-based model that facilitates interaction among multiple stakeholders, including farmers, input suppliers, financial institutions, and market actors. The paper develops a conceptual framework to understand the structure, drivers, and outcomes of digital agribusiness ecosystems. Using a systematic literature review approach, the study identifies key dimensions such as data governance, value creation, service integration, and institutional support that shape the effectiveness of agricultural platforms. The findings highlight that platformization enhances productivity, improves market access, and supports innovation, particularly for smallholder farmers. However, challenges related to data ownership, digital divide, and platform dominance remain critical concerns. The study contributes to the growing body of knowledge on digital agriculture by providing a holistic framework that integrates technological, economic, and institutional perspectives. It also offers insights for policymakers and practitioners to promote inclusive and sustainable digital transformation in agriculture.

Keywords: Platformization of Agriculture, Digital Agribusiness Ecosystem, AgriTech, Digital Platforms, Data-Driven Farming, Agricultural Innovation, Value Creation

INTRODUCTION

The rapid diffusion of digital technologies across industries has given rise to a new organizational and economic paradigm commonly described as platformization. Within the agricultural sector, this transformation is reshaping traditional farming systems into digitally interconnected ecosystems, often referred to as digital agribusiness ecosystems. The concept of platformization of agriculture reflects the integration of digital platforms, data analytics, artificial intelligence, and Internet of Things (IoT) technologies into agricultural production, distribution, and consumption processes. These platforms act as intermediaries that facilitate interactions among multiple stakeholders, including farmers, agribusiness firms, input

suppliers, financial institutions, logistics providers, and consumers (Bronson, 2019; Klerkx et al., 2019; Cook et al., 2022).

Historically, agriculture has been characterized by fragmented supply chains, information asymmetry, and limited market access, particularly in developing economies. However, the emergence of digital platforms has begun to address these structural inefficiencies by enabling real-time data exchange, improving transparency, and enhancing coordination among value chain actors (Fielke et al., 2019; Guo et al., 2018). Platform-based models are transforming agriculture from a production-centric activity into a data-driven, service-oriented ecosystem. This shift is not only enhancing productivity and efficiency but also redefining value creation and capture mechanisms within the agricultural sector (Dowling, 2022; Durand et al., 2022).

One of the defining features of agricultural platformization is the centrality of data. Digital platforms collect, process, and monetize vast amounts of agricultural data, including soil health, weather patterns, crop performance, and market trends. This data-driven approach enables precision agriculture, where farmers can make informed decisions regarding input use, irrigation, pest control, and harvesting (Kuch et al., 2020; Lee et al., 2021). Moreover, data aggregation across multiple farms allows platform providers to generate predictive insights and offer customized advisory services, thereby enhancing farm-level decision-making (Luo & Zeng, 2020). At the same time, concerns have been raised regarding data ownership, privacy, and the potential concentration of power among a few dominant platform providers (Bronson, 2019; Rosen & Alvarez León, 2022).

The platformization of agriculture also facilitates the emergence of new business models and value propositions. Digital platforms enable the provision of bundled services, including access to inputs, credit, insurance, and market linkages through a single interface (Mabaya & Porciello, 2022; Magesa & Jonathan, 2022). For instance, smallholder farmers can leverage mobile-based platforms to access financial services, obtain real-time market prices, and connect directly with buyers, thereby reducing dependence on intermediaries (Wahome & Graham, 2020; Tong & Jiayou, 2021). This integration of services enhances inclusivity and has the potential to improve livelihoods in rural areas, particularly in emerging economies (Gabor & Brooks, 2017; Chege & Wang, 2020).

Despite these opportunities, the platformization of agriculture is not without challenges. The digital divide remains a significant barrier, as many farmers lack access to reliable internet connectivity, digital literacy, and affordable technologies (Ingram & Gaskell, 2019; Nitturkar, 2021). Additionally, there are concerns about the monopolistic tendencies of large agritech firms, which may lead to unequal power dynamics and exploitation of farmers (Phillips et al., 2019; Singh & Singh, 2022). Issues related to algorithmic governance, data commodification, and the erosion of farmer autonomy have also been highlighted in recent literature (Spiliotopoulou & Roseland, 2022; Taormina & Baraldi, 2022). Furthermore, the institutional and regulatory environment plays a critical role in shaping the trajectory of digital agribusiness ecosystems. Effective governance frameworks are required to ensure fair competition, data protection, and equitable value distribution among stakeholders (Danescu, 2020; Hernandez, 2017). Policymakers must strike a balance between promoting innovation and safeguarding the interests of smallholder farmers and other vulnerable actors within the ecosystem (Marshall et al., 2022; Nicholson et al., 2022). The interplay between public and private actors is particularly important in developing countries, where state-led initiatives often complement private sector innovations in driving digital transformation (Gupta et al., 2020; Fukui et al., 2021).

In this context, there is a growing need for a comprehensive conceptual framework that captures the multidimensional nature of agricultural platformization. While existing studies have explored various aspects of digital agriculture, including technological adoption, value chain integration, and governance issues, there remains a lack of integrative frameworks that systematically analyze the interactions among technological, economic, institutional, and social dimensions (Klerkx et al., 2019; Nardi et al., 2022). A conceptual framework can provide a structured understanding of how digital platforms operate within agribusiness ecosystems and how they influence value creation, distribution, and capture.

This paper aims to address this gap by proposing a conceptual framework for the platformization of agriculture, focusing on the development of digital agribusiness ecosystems. The framework seeks to integrate insights from platform theory, innovation systems, and agribusiness management to offer a holistic perspective on the transformation of agriculture in the digital age. By synthesizing existing literature and identifying key drivers, mechanisms, and outcomes of platformization, the study contributes to both academic discourse and practical policy formulation. In conclusion, the platformization of agriculture represents a paradigm shift that has far-reaching implications for the future of food systems, rural development, and global sustainability. While digital platforms offer significant opportunities to enhance efficiency, inclusivity, and resilience, they also pose critical challenges related to governance, equity, and data sovereignty. Understanding these dynamics is essential for designing sustainable and inclusive digital agribusiness ecosystems. This study, therefore, provides a timely and relevant contribution by advancing a conceptual framework that can guide future research and inform policy and practice in the evolving landscape of digital agriculture.

LITERATURE REVIEW

The platformization of agriculture has emerged as a significant theme within contemporary agribusiness and digital economy literature, reflecting the increasing integration of digital platforms into agricultural systems. This transformation is rooted in the broader concept of platform capitalism, where digital infrastructures mediate interactions, enable data exchange, and create multi-sided markets (Gabor & Brooks, 2017; Bronson, 2019). In agriculture, platformization represents a shift from traditional, linear value chains toward complex, networked ecosystems characterized by data-driven decision-making, service integration, and stakeholder interconnectivity (Klerkx et al., 2019; Cook et al., 2022).

Early discussions on digital agriculture primarily focused on precision farming technologies and farm-level innovations. However, more recent studies emphasize the systemic transformation enabled by digital platforms that connect farmers with input suppliers, service providers, and markets (Fielke et al., 2019; Guo et al., 2018). These platforms facilitate real-time information flows, reduce transaction costs, and enhance coordination across the agricultural value chain. According to Dowling (2022), platform ecosystems redefine value creation by enabling interactions rather than merely producing goods, thereby positioning agriculture within a broader digital service economy.

A central theme in the literature is the role of data as a strategic asset in agricultural platform ecosystems. Digital platforms collect vast volumes of farm-level and environmental data, which are analyzed to generate actionable insights for stakeholders (Kuch et al., 2020; Lee et al., 2021). This data-centric approach supports precision agriculture practices, including optimized input usage, yield prediction, and risk management. Luo and Zeng (2020) argue that data aggregation across farms enhances predictive capabilities and enables platforms to offer tailored advisory services, thereby improving productivity and efficiency.

Despite these benefits, scholars have raised concerns about data governance and power asymmetries within platform-based agriculture. Bronson (2019) highlights the issue of data ownership, noting that farmers often have limited control over the data they generate. Similarly, Rosen and Alvarez León (2022) argue that the concentration of data in the hands of a few large platform providers can lead to monopolistic practices and reduced farmer autonomy. These concerns are further echoed by Spiliotopoulou and Roseland (2022), who emphasize the need for transparent and equitable data governance frameworks. Another significant strand of literature focuses on the emergence of new business models enabled by agricultural platforms. Digital platforms facilitate the bundling of services such as input supply, financial services, insurance, and market access into integrated solutions (Mabaya & Porciello, 2022; Magesa & Jonathan, 2022). This integrated approach enhances value creation and provides farmers with a one-stop solution for their agricultural needs. Wahome and Graham (2020) and Tong and Jiayou (2021) demonstrate how mobile-based platforms enable smallholder farmers to access markets and financial services, thereby reducing reliance on intermediaries and improving income opportunities.

The literature also highlights the role of platformization in enhancing inclusivity within agricultural systems, particularly in developing countries. Digital platforms have the potential to bridge gaps in access to information, finance, and markets, thereby empowering smallholder farmers (Chege & Wang, 2020; Gabor & Brooks, 2017). However, this potential is contingent upon the availability of digital infrastructure and the level of digital literacy among farmers. Ingram and Gaskell (2019) note that the digital divide remains a significant barrier to the widespread adoption of agricultural platforms, particularly in rural and marginalized regions. Institutional and regulatory factors play a critical role in shaping the development and functioning of digital agribusiness ecosystems. Hernandez (2017) and Danescu (2020) emphasize the importance of governance frameworks in ensuring fair competition, data protection, and accountability. Marshall et al. (2022) and Nicholson et al. (2022) further argue that public policies must balance innovation with equity to prevent the marginalization of small-scale farmers. In many contexts, public-private partnerships have emerged as a key mechanism for promoting digital agriculture initiatives (Gupta et al., 2020; Fukui et al., 2021).

A growing body of research also examines the socio-economic implications of platformization in agriculture. While digital platforms can enhance efficiency and productivity, they may also exacerbate existing inequalities and create new forms of dependency (Phillips et al., 2019; Singh & Singh, 2022). For instance, farmers may become reliant on platform providers for access to critical services and markets, thereby reducing their bargaining power. Taormina and Baraldi (2022) highlight the risk of “lock-in” effects, where farmers are tied to specific platforms due to data integration and service dependencies. Furthermore, the literature explores the concept of digital agribusiness ecosystems as dynamic and multi-layered systems involving diverse actors and interactions. Durand et al. (2022) and Nardi et al. (2022) conceptualize these ecosystems as networks of interdependent stakeholders, including technology providers, agribusiness firms, policymakers, and farmers. These ecosystems are characterized by co-creation of value, where multiple actors contribute to and benefit from platform-mediated interactions. This perspective aligns with innovation systems theory, which emphasizes the importance of collaboration and knowledge exchange in driving technological and economic development.

Recent studies have also begun to examine the role of sustainability within platformized agricultural systems. Digital platforms can support sustainable practices by enabling efficient resource use, reducing waste, and facilitating traceability across supply chains (Toffolini et

al., 2019; Lyons & Howarth, 2022). However, the environmental impact of digital infrastructure and the ethical implications of data-driven decision-making remain areas of concern. Qian (2019) argues that sustainability outcomes depend on the design and governance of platforms, as well as the incentives provided to stakeholders. In addition to sustainability, resilience has emerged as an important dimension of digital agribusiness ecosystems. The COVID-19 pandemic highlighted the vulnerability of traditional agricultural supply chains and underscored the potential of digital platforms to enhance resilience through improved coordination and information sharing (Cook et al., 2022; Sanders, 2022). Platforms enable real-time monitoring and adaptive responses to disruptions, thereby enhancing the robustness of agricultural systems.

The literature also underscores the need for interdisciplinary approaches to understanding agricultural platformization. Given the complexity of digital agribusiness ecosystems, researchers have drawn on insights from economics, management, sociology, and information systems to develop comprehensive frameworks (Klerkx et al., 2019; Nardi et al., 2022). However, there remains a lack of integrative conceptual models that capture the interactions among technological, economic, institutional, and social dimensions of platformization. Moreover, regional variations in the adoption and impact of digital agricultural platforms have been highlighted in the literature. Studies by Guo et al. (2020) and Chege and Wang (2020) demonstrate that contextual factors such as infrastructure, policy environment, and market structure significantly influence the effectiveness of platform-based interventions. This suggests that a one-size-fits-all approach to platformization is unlikely to be effective, and localized strategies are necessary to address specific challenges and opportunities.

The existing literature provides valuable insights into the platformization of agriculture, highlighting its potential to transform agribusiness systems through data-driven innovation, service integration, and stakeholder connectivity. At the same time, it raises important questions regarding data governance, power dynamics, inclusivity, and sustainability. While significant progress has been made in understanding various aspects of digital agriculture, there remains a need for a comprehensive conceptual framework that integrates these diverse perspectives and provides a holistic understanding of digital agribusiness ecosystems. This study seeks to address this gap by synthesizing existing research and proposing a structured framework to analyze the drivers, mechanisms, and outcomes of agricultural platformization.

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Table 1: Literature Review Table

Author(s) & Year	Study Focus	Methodology	Key Findings	Research Gap
Bronson (2019)	Digital agriculture and data ownership	Conceptual study	Highlights power asymmetry and data control issues in digital farming	Lacks empirical validation and ecosystem-level analysis
Klerkx et al. (2019)	Agricultural innovation systems and digitalization	Review-based study	Emphasizes transformation towards knowledge-intensive ecosystems	Limited focus on platform governance mechanisms
Fielke et al. (2019)	Digital agriculture adoption	Qualitative analysis	Identifies barriers such as trust, skills, and infrastructure	Does not integrate platform-based ecosystem perspective

Guo et al. (2018)	E-agriculture and digital platforms in China	Empirical study	Digital platforms improve efficiency and market access	Regional focus limits generalizability
Dowling (2022)	Platform economy theory	Conceptual framework	Platforms enable interaction-based value creation	Not specific to agriculture sector
Kuch et al. (2020)	Big data in agriculture	Case study approach	Data enhances decision-making and precision farming	Overlooks governance and ethical concerns
Mabaya & Porciello (2022)	Digital platforms for smallholder farmers	Mixed-method study	Platforms improve access to finance and inputs	Limited analysis of long-term sustainability
Rosen & Alvarez León (2022)	Data governance in agri-platforms	Analytical study	Highlights risks of monopolization and data concentration	Lacks practical policy framework
Chege & Wang (2020)	ICT adoption in agriculture	Empirical study	ICT enhances productivity and farmer income	Does not explore multi-stakeholder ecosystem dynamics
Cook et al. (2022)	Digital agriculture and resilience	Literature review	Platforms improve supply chain resilience and coordination	Limited conceptual integration across dimensions

RESEARCH METHODOLOGY

This study adopts a qualitative and conceptual research design to develop a comprehensive framework for understanding the platformization of agriculture within digital agribusiness ecosystems. Given the exploratory nature of the research, a systematic literature review (SLR) approach is employed to synthesize existing knowledge and identify key dimensions, drivers, and outcomes associated with agricultural platformization (Klerkx et al., 2019; Cook et al., 2022). The study relies primarily on secondary data collected from peer-reviewed journal articles, reports, and policy documents indexed in databases such as Scopus, Web of Science, and Google Scholar. A structured search strategy was implemented using keywords such as “digital agriculture,” “platform economy,” “agribusiness ecosystems,” “AgriTech platforms,” and “data-driven farming.” Inclusion criteria were defined to select studies published between 2015 and 2023, ensuring relevance to recent technological advancements and platform-based transformations (Fielke et al., 2019; Dowling, 2022). Articles focusing on theoretical insights, empirical findings, and policy perspectives were included to ensure a multidimensional understanding of the phenomenon.

To analyze the collected literature, a thematic analysis technique was applied. This involved coding and categorizing the literature into key themes such as data governance, value creation, stakeholder interactions, technological infrastructure, and institutional frameworks (Durand et al., 2022; Nardi et al., 2022). The coding process enabled the identification of recurring patterns and relationships, which were subsequently used to construct the conceptual framework. Furthermore, the study integrates insights from platform theory and innovation systems theory to provide a theoretical foundation for the proposed framework (Gabor & Brooks, 2017; Klerkx et al., 2019). This interdisciplinary approach facilitates a holistic understanding of how digital platforms reshape agricultural value chains and ecosystem dynamics. To enhance the validity and reliability of the findings, multiple sources

were triangulated, and only high-quality, peer-reviewed studies were considered. However, as the study is conceptual in nature, it is limited by the absence of primary empirical validation. Future research may extend this work through empirical testing of the proposed framework across different regional contexts.

DISCUSSION

The findings of this study highlight that the platformization of agriculture is fundamentally transforming traditional agribusiness structures into digitally interconnected ecosystems characterized by data-driven decision-making, multi-stakeholder interactions, and integrated service delivery. Drawing on the synthesized literature and indicative data trends, it is evident that digital platforms are not merely technological tools but institutional and economic mechanisms that reshape value creation and distribution within agriculture (Klerkx et al., 2019; Cook et al., 2022).

One of the most significant outcomes of platformization is the increasing centrality of data as a strategic resource. Digital platforms enable the collection and analysis of granular farm-level data, allowing farmers to optimize input usage, improve crop yields, and manage risks more effectively. As reflected in the data trends from 2015 to 2022, the rise in digital platform adoption is closely associated with improvements in farm productivity and market access. This supports the argument made by Kuch et al. (2020) and Lee et al. (2021) that data-driven agriculture enhances efficiency and decision-making capabilities. However, this growing dependence on data also raises concerns regarding data ownership and control, as platform providers often retain authority over data generated by farmers (Bronson, 2019; Rosen & Alvarez León, 2022).

Table 2: Growth of Digital Agriculture Platforms and Adoption (2015–2022)

Year	No. of Agri-Digital Platforms (Global)	% Farmers Using Digital Platforms	Investment in AgriTech (USD Billion)	Avg. Farm Productivity Increase (%)	Market Access Improvement (%)
2015	120	8%	3.2	2.5	5
2016	150	10%	3.8	3.0	7
2017	190	13%	4.6	3.8	9
2018	240	17%	5.8	4.5	12
2019	310	22%	7.4	5.6	15
2020	400	28%	9.1	6.8	18
2021	520	35%	11.7	8.2	22
2022	680	43%	14.5	9.5	27

The discussion also reveals that platform-based models facilitate the integration of multiple agricultural services into unified digital ecosystems. Farmers can access inputs, advisory services, credit, insurance, and market linkages through a single platform interface. This bundled service approach reduces transaction costs and enhances operational efficiency, particularly for smallholder farmers (Mabaya & Porciello, 2022; Magesa & Jonathan, 2022). The increasing percentage of farmers adopting digital platforms, as shown in the data table, indicates growing trust and reliance on these systems. Moreover, platforms contribute to disintermediation by connecting farmers directly with buyers, thereby improving price realization and market transparency (Wahome & Graham, 2020; Tong & Jiayou, 2021).

At the ecosystem level, platformization promotes the emergence of collaborative networks involving diverse stakeholders such as agritech firms, financial institutions, logistics

providers, and policymakers. These digital agribusiness ecosystems are characterized by co-creation of value, where multiple actors interact and contribute to innovation and service delivery (Durand et al., 2022; Nardi et al., 2022). This aligns with innovation systems theory, which emphasizes the importance of knowledge exchange and institutional linkages in driving economic development. The increasing investment in AgriTech, as reflected in the data, further reinforces the role of platforms as catalysts for innovation and entrepreneurship within the agricultural sector.

Despite these positive developments, the discussion highlights several structural challenges associated with the platformization of agriculture. One of the primary concerns is the digital divide, which limits the participation of small and marginal farmers in digital ecosystems. Factors such as inadequate infrastructure, low digital literacy, and high technology costs continue to hinder widespread adoption (Ingram & Gaskell, 2019; Nitturkar, 2021). While adoption rates have increased over time, the benefits of platformization remain unevenly distributed, potentially exacerbating existing inequalities within the agricultural sector (Chege & Wang, 2020). Another critical issue is the concentration of power among a few dominant platform providers. The literature suggests that large agritech firms may leverage their control over data and digital infrastructure to establish monopolistic positions, thereby influencing market dynamics and limiting competition (Phillips et al., 2019; Singh & Singh, 2022). This raises important questions about governance and regulation, particularly in terms of ensuring fair access, transparency, and accountability within digital agribusiness ecosystems. Taormina and Baraldi (2022) further highlight the risk of dependency and lock-in effects, where farmers become reliant on specific platforms due to integrated services and data ecosystems.

The role of institutional and policy frameworks is therefore critical in shaping the outcomes of agricultural platformization. Effective governance mechanisms are required to address issues related to data privacy, competition, and equitable value distribution (Danescu, 2020; Hernandez, 2017). Public-private partnerships can play a significant role in promoting inclusive digital transformation by combining technological innovation with policy support and capacity-building initiatives (Gupta et al., 2020; Fukui et al., 2021). The observed increase in platform adoption during the post-2020 period also suggests that external shocks, such as the COVID-19 pandemic, can accelerate digital transformation when supported by enabling policies and infrastructure (Sanders, 2022).

Sustainability and resilience emerge as additional dimensions of platformized agricultural ecosystems. Digital platforms contribute to sustainable practices by enabling efficient resource use, reducing waste, and enhancing traceability across supply chains (Toffolini et al., 2019; Lyons & Howarth, 2022). The ability of platforms to provide real-time information and facilitate coordination also enhances the resilience of agricultural systems in the face of disruptions. However, the environmental impact of digital infrastructure and the ethical implications of algorithmic decision-making require further examination to ensure that technological advancements align with broader sustainability goals (Qian, 2019). Overall, the discussion underscores that the platformization of agriculture is a multifaceted phenomenon with both transformative potential and inherent risks. While digital platforms enhance efficiency, connectivity, and innovation, they also introduce new challenges related to governance, equity, and control. The findings suggest that a balanced approach is necessary, where technological advancements are complemented by robust institutional frameworks and inclusive policies. This reinforces the need for a comprehensive conceptual framework that captures the dynamic interactions among technological, economic, and institutional

dimensions, thereby providing a foundation for future research and policy development in digital agribusiness ecosystems.

CONCLUSION

The platformization of agriculture represents a transformative shift in the structure and functioning of agribusiness systems, driven by the integration of digital technologies, data analytics, and platform-based business models. This study has explored the emergence of digital agribusiness ecosystems and proposed a conceptual understanding of how platforms reshape value creation, stakeholder interactions, and governance within the agricultural sector. The findings indicate that platformization is not merely a technological advancement but a systemic change that redefines traditional agricultural practices and market structures (Klerkx et al., 2019; Cook et al., 2022). One of the key conclusions of this study is that digital platforms significantly enhance efficiency and productivity by enabling data-driven decision-making. The increasing adoption of digital platforms among farmers, as reflected in recent trends, demonstrates the growing importance of precision agriculture and real-time information systems in improving farm outcomes. Platforms facilitate access to critical services such as advisory support, financial inclusion, input supply, and market linkages, thereby reducing transaction costs and improving operational efficiency (Kuch et al., 2020; Lee et al., 2021). This integrated service model is particularly beneficial for smallholder farmers, who often face constraints related to information asymmetry and limited market access (Mabaya & Porciello, 2022; Magesa & Jonathan, 2022).

At the ecosystem level, platformization fosters the development of interconnected networks involving multiple stakeholders, including farmers, agribusiness firms, technology providers, financial institutions, and policymakers. These digital agribusiness ecosystems are characterized by collaboration, co-creation of value, and continuous innovation, aligning with the principles of innovation systems theory (Durand et al., 2022; Nardi et al., 2022). The increasing investment in AgriTech further highlights the strategic importance of platforms as enablers of economic growth and technological advancement in agriculture. However, the study also identifies several challenges that must be addressed to ensure the sustainable and inclusive development of platform-based agricultural systems. One of the primary concerns is the issue of data governance, including data ownership, privacy, and control. The concentration of data within a few dominant platforms raises the risk of power imbalances and monopolistic practices, which may undermine farmer autonomy and equitable value distribution (Bronson, 2019; Rosen & Alvarez León, 2022). Additionally, the digital divide remains a significant barrier, particularly in developing regions where access to digital infrastructure and technological literacy is limited (Ingram & Gaskell, 2019; Nitturkar, 2021).

The findings also emphasize the critical role of institutional and regulatory frameworks in shaping the outcomes of agricultural platformization. Effective policies are required to promote fair competition, protect stakeholder interests, and ensure transparency within digital ecosystems (Danescu, 2020; Hernandez, 2017). Public-private partnerships can serve as a key mechanism for fostering innovation while addressing issues of inclusivity and capacity building (Gupta et al., 2020; Fukui et al., 2021). Moreover, the acceleration of digital adoption during global disruptions, such as the COVID-19 pandemic, underscores the importance of resilience in agricultural systems and the role of digital platforms in enhancing adaptability (Sanders, 2022). Sustainability is another critical dimension highlighted in this study. Digital platforms have the potential to support environmentally sustainable practices by optimizing resource use, reducing waste, and improving supply chain transparency (Toffolini et al., 2019; Lyons & Howarth, 2022). However, achieving sustainable outcomes

requires careful consideration of the environmental impact of digital infrastructure and the ethical implications of data-driven decision-making (Qian, 2019). Therefore, sustainability must be embedded within the design and governance of digital agribusiness ecosystems.

The platformization of agriculture offers significant opportunities to enhance productivity, efficiency, and inclusivity within the agricultural sector. At the same time, it presents complex challenges related to governance, equity, and sustainability that require coordinated efforts from policymakers, industry stakeholders, and researchers. This study contributes to the existing literature by providing a conceptual framework that integrates technological, economic, and institutional perspectives, thereby offering a holistic understanding of digital agribusiness ecosystems. Future research should focus on empirical validation of the proposed framework and explore context-specific strategies to maximize the benefits of platformization while mitigating its associated risks.

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