Journal of Agricultural Science and Supply Chain Management, 2025, 1(1), 1-6
https://doi.org/10.71204/wpc3p539

Towards a New Era of Intelligent, Green, and Integrated Agricultural Industry and Supply Chains

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Received: 27 October 2025/ Accepted: 10 November 2025/ Published online: 12 November 2025

Abstract

Against the backdrop of multiple challenges such as population growth, climate change, resource constraints, and evolving consumption demands facing the global agricultural industry chain and supply chain, the Journal of Agricultural Science and Supply Chain Management has been launched. This journal focuses on cutting-edge issues in the intelligent, green, and integrated transformation of agricultural systems, and is committed to promoting the deep integration of agricultural science, supply chain management, information technology, and other disciplines. It emphasizes key topics including the application of agricultural technologies and low-carbon mechanisms, digital supply chains and smart logistics, innovation in agricultural product circulation systems, and agricultural strategy and sustainable development. The journal aims to establish a high-level, interdisciplinary international academic exchange platform to foster knowledge innovation and technology transfer, providing theoretical support and practical pathways for building a more resilient, efficient, equitable, and sustainable global agricultural industry and supply chain system.

Keywords: Agricultural Industry Chain; Digital Supply Chain; Smart Logistics; Low-Altitude Economy; Low-Carbon Technologies

1. Introduction

Amidst multiple challenges and profound transformations facing global agricultural industry and supply chain systems, we are pleased to announce the official launch of the Journal of Agricultural Science and Supply Chain Management. This journal is dedicated to promoting the deep integration of modern agricultural industry science with supply chain logistics management and information technology. It focuses on cutting-edge issues in the intelligent, green, and integrated transformation of modern agricultural industry and supply chains, aiming to establish an interdisciplinary, high-level international academic exchange platform serving academia, industry, and policymakers in the global fields of agriculture and supply chain logistics.

2. Background and Journal Mission

As the cornerstone of human civilization, agriculture is not only fundamental to global food security but also a crucial support for socio-economic stability and sustainable development[1]. With the continuous growth of the global population, intensifying climate change, increasing strain on natural resources, shifts in the geopolitical landscape, and rising consumer demands for food quality, safety, and sustainability, traditional agricultural industry and supply chain systems are facing unprecedented systemic pressures[2]. Against this backdrop, emerging concepts and technologies such as smart agriculture, digital supply chains, smart logistics, the low-altitude economy, the low-carbon economy, and ESG (Environmental, Social, and Governance) are profoundly reshaping the organizational methods, operational efficiency, and development pathways of traditional agricultural industry and supply chains.

The complexity of agricultural systems dictates that their transformation relies not only on breakthroughs in single technologies but more so on collaborative innovation across multiple disciplines and fields. Traditional agricultural disciplines such as crop science, animal science, soil science, and agricultural engineering remain the foundation of agricultural modernization[3][4]. However, in the era of digitalization, networking, and intelligence, the future of agriculture depends more on its cross-integration and systemic convergence with supply chain management, data science, logistics engineering, environmental policy, regional economics, information technology, social sciences, and other disciplines. This convergence involves not only technological integration but also comprehensive collaboration in methodology, knowledge systems, and institutional design.

The establishment of this journal is precisely based on a profound insight into and active response to this era of change. We recognize that the modern transformation of agricultural industry and supply chains is not merely a technical issue, but a systemic project involving multiple dimensions such as economy, society, environment, and policy[5]. Therefore, the mission of this journal is to: promote the systematic integration of agricultural science with digital technology and supply chain logistics management; facilitate the synergistic development of knowledge innovation, technology application, and institutional design; and provide solid academic support for building more resilient, efficient, equitable, and sustainable global agricultural industry and supply chain systems.

Specifically, the journal will commit to the following tasks: First, to build a truly interdisciplinary exchange platform, encouraging scholars from different fields to engage in in-depth dialogue on common issues in agriculture and supply chains. Second, to promote the translation from basic research to applied research, facilitating the practical implementation and promotion of scientific and technological achievements within agricultural industry chains. Third, to address inequality issues within global agricultural supply chains, advocating for more equitable and inclusive agricultural development models. Fourth, to strengthen research on the resilience, risk prevention and control, and sustainable development pathways of agricultural supply chains, providing theoretical foundations and practical guidance for addressing future uncertainties.

3. Journal Positioning and Core Themes

As an international and interdisciplinary academic journal, we adhere to the publishing philosophy of "problem-oriented, interdisciplinary integration, international perspective, and practical value." We will primarily focus on the following four major research clusters, covering the entire spectrum of topics from technological application to strategic management:

3.1. Application of Agricultural Science & Technology and Economic Mechanisms

This cluster focuses on the innovative application of cutting-edge technologies at the forefront of agricultural production and the industry chain, along with their economic and management value. With the rapid development of technologies such as intelligent agricultural machinery and robotics, agricultural big data analytics, precision farming, and low-altitude equipment like drones, agricultural production is transitioning from experience-dependent to data-driven, and from labor-intensive to intelligent and efficient. We encourage research on the application scenarios, benefit assessment, business models, and impacts of these technologies on agricultural productivity, resource use efficiency, and farmer livelihoods. Concurrently, the policies and practices of low-carbon agriculture and ESG governance will also be key components of this cluster, aiming to steer agriculture towards greater environmental friendliness and clear social responsibility.

Specific research topics include, but are not limited to: integrated application of intelligent sensor technology and crop growth models; adaptive operation of agricultural robots in complex environments; farmland information acquisition and decision support based on remote sensing and IoT; agricultural data ownership and privacy protection mechanisms; economic incentives and policy support for the adoption of smart agricultural technologies; pathways and barriers for smallholder participation in digital agriculture. We will pay special attention to topics such as agricultural carbon footprint accounting, emission reduction technology pathways, ecological compensation mechanisms, and the application of green finance in agriculture, promoting a more active role for agriculture in addressing climate change.

3.2. Application and Operational Management of Digital Supply Chain & Smart Logistics Technologies

Supply chains and logistics are critical bridges connecting production and consumption in the national economy; their efficiency and resilience directly impact the overall performance of the agricultural system. This cluster focuses on both general and frontier supply chain and logistics management theories, and the application of digital technologies like Artificial Intelligence, providing methodological support for building modern agricultural industry and supply chains. Digital & Intelligent Supply Chains, Digital Twins, Blockchain & Traceability Technologies, Smart Logistics Systems, Green Supply Chains, Low-Carbon Logistics, Low-Altitude Logistics, and Transportation System Optimization are all core research areas within this cluster.

We encourage scholars to delve into questions such as: How to build a panoramic visualisation and simulation platform for supply chains based on digital twins? How can blockchain technology achieve a balance between cost and benefit in product traceability? How can AI algorithms enhance the response speed and accuracy of supply chains in demand forecasting, inventory optimization, and route planning? How can smart logistics reduce total societal costs? What are

the coverage models and operational efficiency of low-altitude logistics networks in rural and remote areas? We anticipate that through technological integration and innovation in operational models, we can systematically enhance the transparency, responsiveness, and risk resilience of supply chains, achieving value optimization across the entire chain.

3.3. Agricultural Industry Chain Optimization and Digital Agricultural Product Circulation Systems

The journey of agricultural products from field to fork involves multiple stages—production, processing, storage, transportation, and sales—and its complexity underscores the critical role of digital means. This cluster is dedicated to exploring how to leverage digital tools to integrate and optimize the entire agricultural industry chain, ensuring the efficient operation of the agricultural supply chain system. Research will concentrate on areas including blockchain technology application and the construction of agricultural product traceability systems; digital twins and agricultural product supply chain visualization; intelligent warehousing and cold chain logistics for agricultural products; agricultural product e-commerce and live-streaming commerce models; consumer insights and agricultural product brand building; geographical indication products and brand strategy; and the development of digital trading platforms.

We will focus particularly on how digitalization is reshaping the business models and organizational structures of agricultural product circulation. For instance, how can consumer behavior analysis based on big data guide precision marketing and product development for agricultural products? What impacts and opportunities do new business formats like live-streaming e-commerce bring to traditional agricultural product distribution channels? How can digital platforms effectively connect smallholders with broader markets? How can innovations in intelligent warehousing and cold chain technologies solve the bottlenecks at the "first mile" and "last mile" of agricultural product distribution? How can digital management and brand protection mechanisms for geographical indication products be established? Through rigorous academic research, we aim to advance the modernization, standardization, and branding of the agricultural product circulation system, effectively enhance the added value and market competitiveness of agricultural products, and contribute to increasing farmers' income and revitalizing rural industries.

3.4. Agricultural Industry Strategy, Sustainable Development, and Regional Coordination Mechanisms

This cluster focuses on macro-level strategy and systemic development issues, aiming to examine the sustainable development pathways of agricultural industry and supply chains from a higher dimension. Agriculture is not only an economic industry but also a strategic one vital to national well-being, ecological security, and social stability. Research themes include: ESG systems and green agricultural industry chains; food security and supply chain resilience; agricultural industry clusters and regional coordinated development; pathways for digital inclusion within the context of rural revitalization; and agricultural policy evaluation and institutional innovation.

We encourage scholars to explore the strategic role of agricultural industry and supply chains in promoting economic development, social equity, and ecological protection across global, national, and regional scales. Specifically, research could investigate risk identification and resilience-building strategies for national food supply chains amidst shifts in the global trade landscape; how ESG principles can be integrated into the strategic decision-making and performance evaluation systems of agricultural enterprises; the formation mechanisms, evolution patterns, and role in driving regional economies of agricultural industry clusters; the potential and pathways for digital technologies to promote rural revitalization and the inclusive development of smallholders; and the evaluation of implementation effects and optimization directions for various agricultural support policies (e.g., subsidies, insurance, green credit). This cluster aims to provide policymakers, industry leaders, and researchers with forward-looking strategic insights and evidence-based support.

4. Interdisciplinary Integration and Academic Contribution

This journal emphasizes interdisciplinary integration and methodological innovation. The challenges facing agricultural supply chains are systemic, and perspectives from any single discipline are insufficient to provide comprehensive solutions. We welcome research contributions from diverse fields including agricultural science, management science, transportation engineering, information science, environmental science, economics, sociology, geography, political science, law, and policy studies.

We encourage researchers to break down disciplinary barriers and employ diverse research methodologies. Whether it is rigorous empirical research, cutting-edge technological innovation, insightful theoretical modeling, in-depth case studies from the field, or reviews that systematically synthesize and offer critical reflection on a particular area – all fall within the journal's scope, provided they demonstrate academic rigor, originality, and practical value.

We firmly believe that by fostering the collision and integration of different disciplinary paradigms, theoretical schools, and research methods, we can catalyze the generation of new knowledge with greater explanatory power, predictive capacity, and transformative potential. This will, in turn, provide novel ideas and solutions for understanding and addressing the complex problems confronting global agricultural industry and supply chains.

5. Outlook and Acknowledgments

The launch of the Journal of Agricultural Science and Supply Chain Management has been made possible by the longstanding attention and steadfast support of colleagues in global academia, industry, and policy circles. We hope this journal becomes a significant vehicle for promoting knowledge innovation and practical advancement in the field of agricultural industry and supply chains, serving as a bridge connecting science and policy, technology and industry, and regions and the globe.

Looking ahead, we will adhere to fundamental principles such as open access, international peer review, and academic ethics. We will form an editorial board composed of leading global scholars, implement a strict double-blind peer-review process, and ensure the journal's academic quality, impartiality, and international influence. We also look forward to establishing extensive collaborations with domestic and international universities, research institutions, industry associations, enterprises, and government departments to jointly advance agricultural industry and supply chains towards greater intelligence, sustainability, and integration.

Finally, we take this journal as a platform to sincerely invite scholars from around the world to contribute your manuscripts and share your research findings and intellectual insights. Let us join hands to promote the integrated development of agricultural science and supply chain logistics management, and to collectively contribute academic strength towards building a safer, more efficient, inclusive, and sustainable global agri-food system.

Author Contributions:

Writing—original draft preparation, Xi Zhang; Writing—review and editing, Xi Zhang.

Funding:

This research received no external funding

Institutional Review Board Statement:

Not applicable

Informed Consent Statement:

Not applicable.

Data Availability Statement:

Not applicable

Acknowledgments:

Not applicable

Conflict of Interest:

The authors declare no conflict of interest.