REVISTA INVECOM
ISSN en línea: 2739-0063

Supply chain management analysis in agriculture: a systematic review

Análisis de la gestión de la cadena de suministro en la agricultura: una revisión sistemática

Received: 17/05/2025 - **Accepted:** 14/08/2025

Juan Carlos Álvarez-Arias
https://orcid.org/0000-0002-2201-1793
carlosalvarezarias2019@gmail.com
Universidad César Vallejo. Lima, Peru

Abstract

The study aimed to comprehensively analyze supply chain management in the agricultural sector, with the purpose of identifying the key factors that impact its effectiveness, sustainability, and adaptability. To this end, a detailed review of the existing scientific literature was carried out, following the guidelines of the PRISMA method, which allowed for the careful organization, selection, and evaluation of information from databases such as Scopus, ERIC, Dialnet, Springer, and Google Scholar. Inclusion criteria related to recency (last decade), relevance of the topic, availability of the full text, and academic support were applied, excluding those documents that lacked peer review or were not directly related to the agricultural field. The findings show that the agricultural supply chain faces common challenges, including limited modernization, logistical drawbacks, the absence of integrated technology, and risks associated with external factors such as economic instability and the effects of climate change. However, significant progress has also been identified through the implementation of management models, quality standards, digital tools, and collaborative strategies with a focus on sustainability. In summary, effective food chain management requires a comprehensive vision that takes into account economic, environmental, and social dimensions. This analysis provides a solid basis for the design of more effective regulations, business models, and practices within the agricultural sector.

Keywords: agriculture, supply chain, sustainability.

Resumen

El estudio tuvo como objetivo analizar de manera exhaustiva la gestión de la cadena de suministro en el sector agrícola, con el propósito de identificar los factores clave que impactan en su efectividad, sostenibilidad y capacidad de adaptación. Para ello, se realizó una revisión detallada de la literatura científica existente, siguiendo las directrices del método PRISMA, lo que permitió organizar, seleccionar y evaluar cuidadosamente la información proveniente de bases de datos como Scopus, ERIC, Dialnet, Springer y Google Scholar. Se aplicaron criterios de inclusión relacionados con la actualidad (última década), la pertinencia del tema, la disponibilidad del texto completo y el respaldo académico, excluyendo aquellos documentos que carecían de revisión por pares o que no se vinculaban directamente con el ámbito agrícola. Los hallazgos evidencian que la cadena de suministro agrícola enfrenta desafíos comunes, entre ellos la limitada modernización, los inconvenientes logísticos, la ausencia de tecnología integrada y los riesgos asociados a factores externos como la inestabilidad económica y los efectos del cambio climático. No obstante, también se han identificado avances relevantes mediante la implementación de modelos de gestión, estándares de calidad, herramientas digitales y estrategias colaborativas con un enfoque orientado a la sostenibilidad. En síntesis, una administración eficaz de la cadena alimentaria requiere de una visión integral que contemple dimensiones económicas, ambientales y sociales. Este análisis constituye una base sólida para el diseño de regulaciones, modelos comerciales y prácticas más efectivas dentro del sector agrícola.

Palabras clave: agricultura, cadena de suministro, sostenibilidad.

Introduction

How do supply chain management practices influence the efficiency and sustainability of agriculture, while maintaining effective approaches according to recent systematic review evidence? To address this question, it is essential to start from the premise that agriculture constitutes a fundamental component in ensuring global food security. Currently, this sector faces the challenge of responding to a growing demand for food in a context marked

SciELO Venezuela latindex LatinREV CC BY

by climate change, resource scarcity, and rapid technological evolution (Organización de las Naciones Unidas para la Alimentación y la Agricultura [FAO], 2025).

In this framework, agricultural supply chain management emerges as a crucial factor that can differentiate resilient and sustainable food systems from fragile and unsustainable ones. This article focuses on analyzing such management, exploring how the movement of goods, information, and resources is organized, coordinated, and optimized throughout the agricultural chain, from producers to final consumers (Flores, 2022).

The problem motivating this research lies in the lack of consensus regarding which management practices have demonstrated effectiveness, not only in terms of operational efficiency but also concerning environmental and social sustainability. Although there is a growing interest in building more sustainable agricultural supply chains, a gap persists in research on how sustainability principles are being incorporated, particularly in developing countries. This systematic review aims to bridge that gap by providing a critical and updated analysis of the strategies implemented, their outcomes, and the obstacles that remain (Arias, 2020).

The relevance of this topic is grounded both in the urgency of the global environmental crisis and in the need to improve economic conditions for millions of people who depend directly or indirectly on agriculture for their livelihoods. More efficient and sustainable management of agricultural supply chains can lead to fairer, more transparent, and resilient processes, contributing to the achievement of the Sustainable Development Goals (SDGs) (Gavilanes & Tipán, 2021).

This analysis is supported by systems theory and supply chain network theory, which help understand the agricultural chain as a dynamic system in which materials, information, and relationships circulate. Additionally, sustainability approaches based on the triple bottom line are considered, evaluating the economic, social, and environmental performance of organizations. Contributions from authors such as Christopher, who emphasizes the importance of visibility and collaboration in modern supply chains, and Mentzer and colleagues, who describe the levels of integration and alignment among chain actors, are also integrated (Peña & Velázquez, 2020).

Regarding prior research, various previous studies have addressed sustainability in supply chains, albeit in a fragmented manner. Works by authors such as Sarkis and collaborators, as well as Ahí and Searcy, have proposed general theoretical frameworks, but few have specifically focused on the agricultural sector. This systematic review aims to articulate these contributions with recent studies, highlighting current trends and key success factors identified in various production and geographical contexts (Santos & Ramírez, 2023).

The study unfolds in a context of profound changes: the digitization of the agricultural sector, the globalization of markets, the need to reduce environmental impacts, and the new demands of consumers who are increasingly aware of the origins and traceability of food. These circumstances render the present analysis not only pertinent but also urgent, particularly for policymakers, agricultural organizations, and academia.

In this sense, the central objective of the research is to conduct a comprehensive examination of the available information on supply chain management in the agricultural sector. It aims to identify methods, practices, and outcomes related to efficiency and sustainability, as well as to propose new lines of research and actions that contribute to the establishment of more equitable, innovative, and sustainable agricultural chains.

Methodology

The study is framed within a qualitative approach, utilizing a systematic review of a descriptive and inferential nature. The purpose is to examine and compile existing information regarding the challenges and strategies related to supply chain management in the agricultural sector. To ensure transparency, objectivity, and reproducibility in the process, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines were applied, allowing for the rigorous academic identification of the most relevant management practices, as well as the internal and external factors influencing the sustainability and viability of agricultural chains.

1. Identification stage

A systematic literature search was conducted in recognized academic databases: ERIC, Scopus, Dialnet, Springer, and Google Scholar. The searches were structured using keywords and Boolean operators such as: “Agricultural supply chain,” “Agriculture OR Farming,” “value chain,” “Agricultural logistics,” and “Supply chain optimization”.

Table 1
Search strategy for the study

Database	Keywords with Boolean operators	Identified studies
ERIC	"Agricultural supply chain" AND (efficiency OR logistics)	28
Scopus	("Agriculture" OR "farming") AND "supply chain" AND "management"	43
Dialnet	"Cadena de suministro agrícola" AND (logística OR distribución)	29
Google Scholar	("agricultura" OR "sector agrícola") AND "cadena de valor"	47
Springer	"Agricultural logistics" AND "supply chain optimization"	15

As an initial result, 181 records were identified. After eliminating 26 duplicate studies, 155 studies were retained for the selection stage.

2. Selection stage

To ensure the quality and relevance of the studies, inclusion and exclusion criteria were established:

Inclusion criteria:

- Publications from January 2020 to March 2025.
- Studies in Spanish and English.
- Research focused on agricultural supply chains.
- Documents with full-text access and academic backing.

Exclusion criteria:

- Duplicate articles or those in other languages.
- Methodologically unsound, opinion-based, or editorial works.
- Documents not directly related to agricultural supply chains, agri-food logistics, distribution, or transportation of agricultural products.

3. Eligibility stage

D Of the 155 selected studies, titles and abstracts were reviewed. In this phase:

- An additional 28 duplicate articles were excluded.
- 62 studies were eliminated for not meeting the inclusion/exclusion criteria.
- Of the remaining 72 articles, attempts were made to access full text, but 37 could not be retrieved due to availability restrictions.

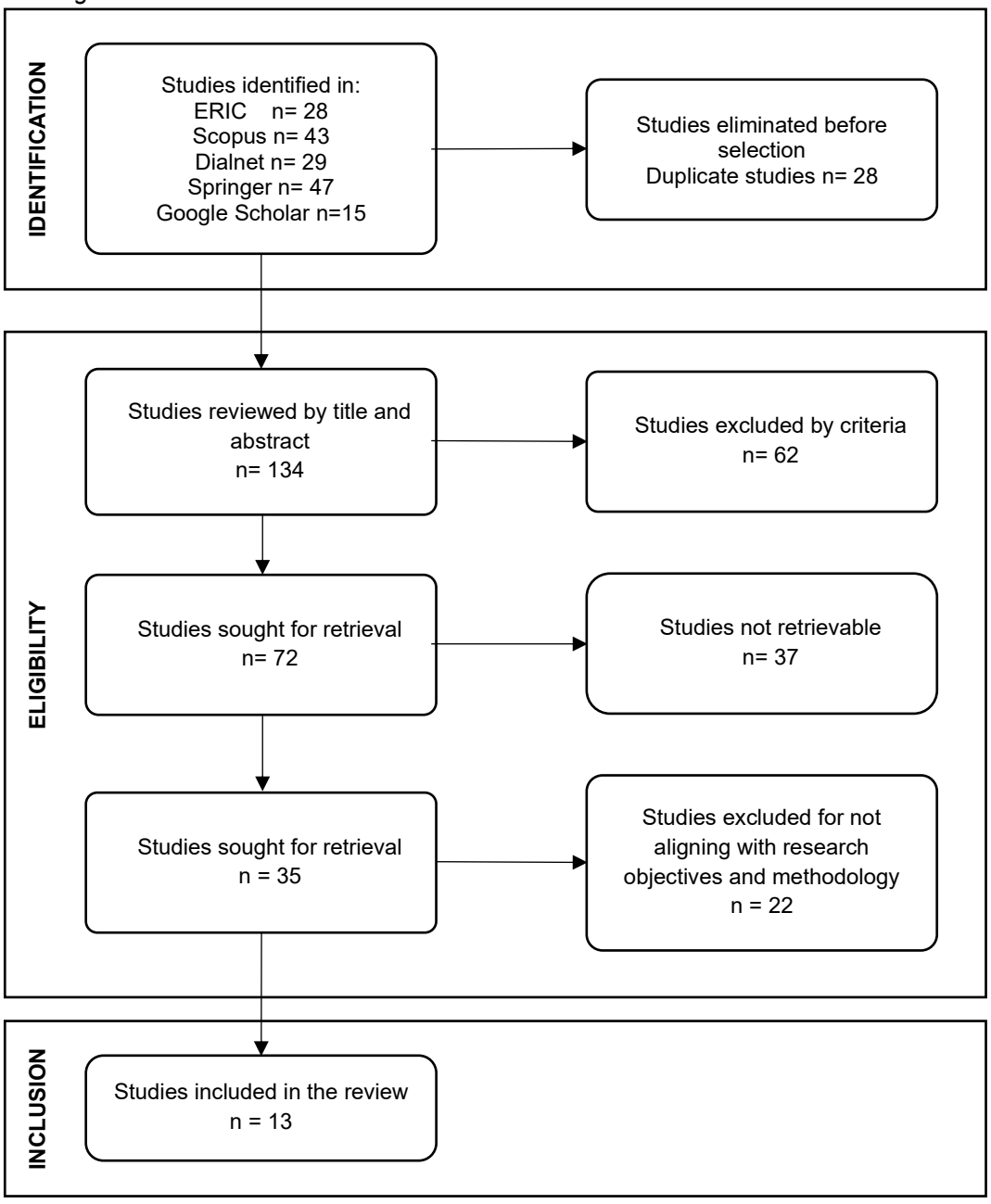
Finally, after a full-text review, an additional 22 studies were excluded due to methodological limitations or lack of direct relevance to the agricultural context.

4. Inclusion and synthesis stage

The final phase included 13 studies that fully met the established criteria. These were subjected to a thorough analysis that allowed for the extraction of key findings regarding the factors affecting the efficiency, sustainability, and resilience of the supply chain in the agricultural sector.

Figure 1

PRISMA flow diagram



Results and discussion

Based on the review conducted of the 13 articles selected for the systematic review, the findings are presented in tabular format. Below are the results from various studies that have addressed agri-food logistics, distribution, marketing, and transportation of agricultural products. Relevant information was compiled from recent research highlighting the relationship between these processes and agricultural supply chain management.

Table 2

Results of the systematic review

No.	Authors (Year)	Title	Study Type	Results	Relation in agricultural product logistics
1	(Piedra et al., 2021)	Optimization Model for the Distribution Chain of Family Farming in the Quingeo and Santa Ana Parishes of Cuenca Canton	Based on surveys to diagnose the main obstacles along family farming routes	The study shows that the most severe problems facing farmers are lack of market access, transportation, unfair pricing, and limited dissemination. Organizational strengthening and technical assistance also emerged as significant issues. The study concluded that it defined an optimization model for the distribution chain that visualizes the complexity of the process.	Significant obstacles identified include lack of sales points, inefficient transportation, inconsistent rates, and limited dissemination. The analysis emphasizes the importance of establishing a solid structure and providing specialized assistance to farmers to improve logistics efficiency and competitiveness in rural environments.
2	(Mendoza, 2021)	Supply Chain Management Model to Improve Productivity in an Agro-industrial Company, Chiclayo 2021	Analysis of the current situation applying the 5S tool, which was necessary for better management within processing areas	The research identified improvements in supplier management through records and adherence to company standards and policies. Additionally, training was proposed for all personnel and suppliers to enhance relationships within the work environment and aim to increase production while innovating product designs.	Through tools like the 5S, Ishikawa diagram, and Pareto curve, the research identifies and addresses difficulties in production processes. Findings indicate that effective management of material movement, including training for personnel and suppliers, can increase production and innovation in the agro-industrial sector.
3	(Rodríguez et al., 2025)	Agricultural Circular Economy and the Supply Chain: A Literature Review	Search in the Web of Science (WoS) and Scopus databases following PRISMA methodology, resulting in 182 documents after applying inclusion	The efficiency of resources in the supply chain (SC) is discussed, proposing a model that integrates blockchain technology. Both studies are recognized for their high citation counts and impact in the field. Furthermore, the need	The researchers conduct a deep analysis of documents on circular economy in agriculture and its relation to the supply chain. They underscore the necessity of having precise evaluation tools and the importance of exploring new technologies, such as blockchain

			and exclusion criteria	for more precise evaluation tools, the exploration of innovative technologies, and fostering collaboration between academics and industry is highlighted.	implementation, to optimize resource use in the agricultural chain.
4	(Flores C. L., 2021)	Supply Chain Management in the Marketing of Agricultural Products in Ecuador	Theoretical study on supply chain management in the marketing of agricultural products	The article presents a documentary investigation with a bibliographic design, employing an analysis matrix as an instrument. It concludes that supply chain management will establish strategies aimed at improving marketing in the agricultural sector both nationally and internationally, contributing to the sector's growth.	The theoretical perspective on supply chain management in the marketing of agricultural products in Ecuador indicates strategies that could enhance sales at both national and international levels. The research emphasizes the importance of effective supply chain management to promote growth in Ecuador's agricultural sector.
5	(Fares, 2024)	Lack of Security in Supply Chain Management in the Ecuadorian Agro-industry	The research explored the security challenges affecting the supply chain in Ecuador and potential solutions. The study had a mixed approach	The export of key products such as bananas, shrimp, flowers, and crude oil is vital for the economy, and any disruption can severely affect it. Corruption and bureaucracy in ports and customs have been significant obstacles, slowing down the chain and increasing costs. Solutions are needed to improve transparency and efficiency in customs procedures and ensure the country's economic stability.	The study highlights security challenges affecting the supply chain in the Ecuadorian agro-industry. It reveals issues such as corruption and bureaucracy in ports and customs, causing delays in the chain and increased costs. Proposals are offered to clarify and make customs procedures more efficient, which is essential for maintaining the country's economic stability.
6	(Peña & Perdomo, 2024)	Analysis of the Financial Effects of COVID-19 on the Supply Chain of SMEs in the Agropecuary Sector in Colombia	Immediate effects of the pandemic on the regional economy and the behavior of agropecuary marketers	In terms of liquidity, profitability, activity, and indebtedness, highlighting the need for solid financial management in times of uncertainty. This analysis provides a comprehensive and detailed view of the agricultural supply chain in Colombia, as well as	The impact of COVID-19 on the finances of small and medium-sized enterprises marketing agricultural products in Colombia. The study reveals repercussions on cash availability, profits, economic activity, and debts, underscoring the necessity for sound financial management in uncertain times.

CC BY

				the financial challenges faced by sector companies, offering valuable insights for strategic decision-making that foster development and competitiveness in the national agropecuary sector.	
7	(Santamaría, 2023)	Supply Chain Management (SCM) for Sustainable Development in Poultry	Analytical research with a non-experimental, field, cross-sectional design	Results indicate that 84.21% of poultry farms do not apply the three most critical steps of the SCM model, such as customer service management, perfect orders, and waste management. It concludes that the steps in the poultry supply chain are ineffective due to poor inventory management, lack of resources, and other factors that jeopardize business sustainability.	The SCM model compared to the traditional model in poultry farms in Tungurahua province. The study indicates that many farms do not implement basic SCM principles, such as good customer service, proper order fulfillment, and adequate waste management.
8	(Espinosa & Nájera, 2023)	Analysis of the Influence of Quality Management Systems on the Supply Chain of Pitahaya Exporting Companies in Ecuador	Bibliographic research allowed for the collection of existing literature on the study topic	Data were gathered through various techniques, including documentary review, surveys, and interviews. It concludes that although pitahaya cultivation has been conducted in the country for several years and is currently exported to various countries, there is a lack of formalization in processes that detracts from the quality of the exported product.	Quality management systems impact the supply chain of companies exporting pitahaya in Ecuador. The study highlights the informality present in processes, which affects the quality of the exported product. It emphasizes that implementing quality management systems is essential to enhance competitiveness and sustainability in agro-exportation.
9	(Chumpitasi & Gonzales, 2023)	Systematic Review of the Literature on Green Supply Chain Management in the Food Packaging Industry	The method used in this research was a systematic review of the scientific literature, allowing us to investigate various authors, compile their	By synthesizing the perspectives of several authors, a timeline was constructed illustrating the evolution of Green Supply Chain Management (GSCM), enabling specific improvements within the food packaging industry.	A detailed analysis of how to manage the ecological supply chain in the food packaging industry. It identifies several obstacles, such as lack of knowledge, inadequate technology, and high costs, which hinder the adoption of sustainable practices. Their research provides a solid

			contributions, and analyze them to gain new insights	This analysis not only reaffirms the initial objectives of the article but also provides a foundation of tools and information for future research on GSCM. The work contributes to understanding the benefits and challenges of GSCM, facilitating sustainable practices in a vital industry.	foundation with tools and useful information for future sustainable research and practices in the food sector.
10	(Flores C. L., 2022)	Supply Chain Management for Establishing the Marketing Network in Micro, Small, and Medium Enterprises in the Agricultural Sector	The design was non-experimental, descriptive, and cross-sectional, utilizing a sample of 15 user entrepreneurs	The results indicated a high level of relevance in each of the selected indicators for the study, as there was a strong agreement among the consulted users. To develop the management strategy, the systematically gathered results from the national and international scientific community were taken into account.	This strategy aims to manage the supply chain to establish a marketing network in micro, small, and medium agricultural enterprises in Ecuador. The study highlights the significance of the selected indicators, underscoring the need for efficient management to optimize marketing and foster the growth of the agricultural sector.
11	(Acuña et al., 2020)	Quality Management in the Supply Chain of the Production Line at Agropecuaria Valdivia Rice Mill in the First Half of 2019	The design was non-experimental, descriptive, and cross-sectional	This research examined the effectiveness of quality management by proposing productive improvements in the supply chain with suppliers and customers at Agropecuaria Valdivia Rice Mill through the study results. It specifically aims to demonstrate the effects of the production line on interactions with suppliers and customers.	The study of quality management in the supply chain of the production process at Agropecuaria Valdivia Rice Mill. Their research evaluates the effectiveness of quality management and suggests improvements in interactions with suppliers and customers. They emphasize that quality in the supply chain is essential for increasing competitiveness in the agro-industry.
12	(Lezama et al., 2023)	Comprehensive Supply Chain Management: Challenges and Trends	Bibliographic documentary research	Information technologies within the supply chain are essential for maintaining real-time communication across the entire chain, enabling reliable operations and rapid responses to emergencies. However, it also requires trust and	The study highlights comprehensive supply chain management, emphasizing the current challenges and trends. Their research stresses the importance of information technologies for effective communication and the need for trust and transparency in the supply

				transparency within the supply chain; otherwise, it will not function properly, necessitating the sharing of accurate information.	chain, indicating that these factors are crucial for achieving efficient and effective management.
13	(Garrido, 2024)	Analysis of Risk Management in the Supply Chain in the Automotive Sector	Exhaustive bibliographic review	Risk Management in the Supply Chain in the Automotive Sector analyzes the complexities, risks, strategies, and existing management practices associated with it, highlighting the current state of practice. This research aims to contribute to knowledge in this important field by providing a comprehensive and updated perspective on Risk Management in the Supply Chain in the Automotive Sector.	The strategy for the agricultural sector promotes more robust, sustainable approaches prepared to anticipate crises that may threaten food supply security. Thus, their research serves as a useful reference for adapting risk management models applicable to different sectors in agriculture, especially in a globally uncertain environment.

In recent years, the study of how supply chains are managed in agriculture has gained importance due to the increasing challenges related to sustainability, logistical efficiency, and international competition in the sector. A review of various studies reveals that the agri-food chain faces complex situations that require a comprehensive solution, integrating theory with the practical implementation of management models.

First, authors such as Piedra et al. (2021) and Flores (2021) emphasize the need to improve sales in the context of family farming and small and medium agricultural enterprises. Their studies point out that the absence of adequate logistical infrastructure, inefficiency in producer organization, and weak market connections constitute significant challenges for the sector. Through diagnostic tools such as surveys and documentary analysis, they propose strategies aimed at strengthening the weaknesses of the chain from a local perspective.

On the other hand, research conducted by Mendoza (2021) and by Espinosa and Nájera (2023) highlights the relevance of implementing management models based on quality and efficiency standards in production. Mendoza applies methodologies such as the 5S and process analysis to optimize production in agro-industrial companies, while Espinosa and Nájera focus on formalizing the export processes of pitahaya, demonstrating the need to professionalize agricultural management to meet international demands.

Additionally, Rodríguez et al. (2025) introduce a new debate by incorporating the circular economy and emerging technologies, such as blockchain, into the analysis of the agricultural supply chain. Their perspective suggests that the sector should adopt more sustainable and interconnected models, moving away from viewing food production and distribution as isolated elements. This aligns with the findings of Chumpitasi and Gonzales (2023), who propose green management as a strategy to transform the food packaging industry, promoting environmental sustainability without compromising operational efficiency.

The issue of risk within the supply chain is also addressed by Fares (2024) and Garrido (2024). Although their studies focus on the automotive industry, their conclusions can be applied to agriculture, especially in regions where the supply chain is affected by external factors such as bureaucracy, corruption, or unexpected events, including pandemics. In line with this, Peña and Perdomo (2024) analyze the economic impact of COVID-19 on small and medium agricultural enterprises, highlighting the need for robust systems that can withstand health or economic crises.

Finally, the studies by Santamaría et al. (2023) and Lezama et al. (2023) focus on examining how the Supply Chain Management (SCM) model and information technologies can improve traceability, control, and

sustainability in the agricultural chain. Both agree that the lack of technological integration and low levels of training hinder efficient resource management.

Conclusions

After analyzing supply chain management in the agricultural sector, common patterns, various forms of action, and the current requirements of the food industry were identified. Scientific investigations were carefully selected, paying attention to their relevance, which allowed for a solid foundation to understand which aspects work well and which present limitations in agricultural supply chains across different regions.

In conclusion, for the agricultural supply chain to function effectively, it is necessary to simultaneously consider multiple aspects: logistical planning, technology incorporation, environmental protection, formalization of enterprises, and strategies to mitigate risks. Only through a comprehensive approach to these factors will it be possible to enhance the competitiveness of the agricultural sector and ensure food availability, even in contexts of difficulties and changes.

References

Acuña, A. D., Navarro, L. N., & Gutiérrez, M. E. (2020). Gestión de calidad en la cadena de suministro de la línea de producción en empresa arrocera agropecuaria Valdivia en el I semestre del año 2019. *Estudiante de Ingeniería Industrial FAREM, 23*(5), 1–15. Recuperado de https://repositorio.unan.edu.ni/id/eprint/11464/1/19950.pdf

Arias, C. J. (2020). Plantear y formular un problema de investigación: un ejercicio de razonamiento. *Revista Lasallista de Investigación, 17*(1), 300–313. https://doi.org/10.22507/rli.v17n1a4

Chumpitasi, O. R., & Gonzales, C. V. (2023). Revisión sistemática de la literatura sobre gestión de la cadena de suministro verde en la industria del envasado de alimentos. *Ingeniería Industrial, 45*(1), 131–154. https://doi.org/10.26439/ing.ind2023.n45.6599

Espinosa, Z. M., & Nájera, A. S. (2023). Análisis de la influencia de los SGC en la cadena de suministro de empresas agroexportadoras de pitahaya en Ecuador. *Digital Publisher CEIT, 6*(6), 181–195. https://doi.org/10.33386/593dp.2021.6.761

Fares, J. O. (2024). Falta de seguridad en la gestión de la cadena de suministros en la agroindustria ecuatoriana. *Sapientia Technological, 5*(2), 33–40. https://doi.org/10.58515/028RSPT

Flores, C. L. (2021). Gestión de la cadena de suministro en la comercialización de productos agrícolas en Ecuador. *Revista Disciplinaria en Ciencias Económicas y Sociales, 3*(1), 112–128. Recuperado de https://dialnet.unirioja.es/servlet/articulo?codigo=8664264

Flores, C. L. (2022). La gestión de cadena de suministro para la conformación de la red de comercialización en micro, pequeñas y medianas empresas del sector agrícola. *Revista Universidad y Sociedad, 14*(4), 729–736. Recuperado de http://scielo.sld.cu/pdf/rus/v14n4/2218-3620-rus-14-04-729.pdf

Garrido, G. R. (2024). Análisis de la gestión del riesgo en la cadena de suministro en el sector automoción. *Universidad de Valladolid, 2*(1), 1–78. Recuperado de https://uvadoc.uva.es/bitstream/handle/10324/66037/TFM-I-2785.pdf?sequence=1

Gavilanes, C. R., & Tipán, B. B. (2021). La educación ambiental como estrategia para enfrentar el cambio climático. *Alteridad, 16*(2), 286–298. https://doi.org/10.17163/alt.v16n2.2021.10

Lezama, E., Echeverría, R. O., & Cruz, A. E. (2023). Gestión integral de la cadena de suministro, retos y tendencias. *Editorial Colegio de Ciencias y Artes de Tabasco, 12*(3), 183. Recuperado de https://www.researchgate.net/publication/369997876_GESTION_INTEGRAL_DE_LA_CADENA_DE_SUMINISTRO_RETOS_Y_TENDENCIAS

Mendoza, S. V. (2021). Modelo de gestión de cadena de suministro para mejorar la productividad en una empresa agroindustrial Chiclayo 2021. Recuperado de https://repositorio.uss.edu.pe/handle/20.500.12802/10294

Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAO). (2025, enero 12). *Alimentación y agricultura sostenibles*. Food and Agriculture Organization of the United Nations. Recuperado de https://www.fao.org/sustainability/es/

Peña, C. G., & Velázquez, Á. R. (2020). Algunas reflexiones sobre la teoría general de sistemas y el enfoque sistémico en las investigaciones científicas. *Revista Cubana de Educación Superior, 37*(2), 31–44. Recuperado de http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=s0257-43142018000200003

Peña, R. L., & Perdomo, M. V. (2024). Análisis de los efectos financieros del COVID-19 en la cadena de suministros en las pymes comercializadoras del sector agropecuario en Colombia. *Valle del Cauca (Colombia).* Recuperado de http://hdl.handle.net/10554/68119

Piedra, R. M., Banegas, C. C., & Castillo, O. Y. (2021). Modelo de optimización de la cadena de distribución de la

agricultura familiar campesina en las parroquias Quingeo y Santa Ana del Cantón Cuenca. *ConcienciaDigital, 4*(2), 114–134. https://doi.org/10.33262/concienciadigital.v4i2.1630

Rodríguez, L. O., Guaita, P. I., & Marques, I. (2025). La economía circular agrícola y la cadena de suministro: Una revisión de la literatura. *Cuadernos de Gestión, 3*(1), 1–13. https://doi.org/10.5295/cdg.242224lo

Santamaría, D. A. (2023). *Supply chain management (SCM) para el desarrollo sostenible en avícolas*. *Revista Científico-Académica Multidisciplinaria, 9*(7), 123–136. https://doi.org/10.23857/pc.v9i7.7649

Santos, H. B., & Ramírez, O. D. (2023). Sostenibilidad de cadenas de suministro: Caracterización y gestión. *Revista de Ciencias Empresariales, 17*(4), 12–28. Recuperado de https://revistas.ubp.edu.ar/index.php/revista-ciencias-empresariales/article/view/477/560