Proceedings of 8th International Conference of Economic, Business and Government Challenges 2025. Vol. 8 No. 1, October 2025: 25-32

Blockchain and Artificial Intelligence in Agrotechnology: A Systematic Literature Review on Sustainable Food Security and Inclusive Growth

Youmandja Arif Riyak Thiombiano[1*], Ebrima Jabbi[2]
Universitas Pembangunan Nasional Veteran Jawa Timur, Surabaya Indonesia
riyakthiombiano2001@gmail.com

Abstract. The combination of blockchain technology with artificial intelligence (AI) is an opportunity for advancement and a potential solution to pressing challenges in food security and equitable agricultural growth. Some studies demonstrate the specific applications of AI and blockchain technologies within the agricultural value chain, including precision farming, predictive analytics for crop yield, climate change, and supply chain analytics. This review aims to summarize existing research on the convergence of blockchain and AI in the agricultural value chain. Blockchain AI captures the strategic applicability of blockchain technology to enhance integrity, fairness, and trust in food distribution and supply networks, while AI augments decision-making through real-time analytics, smart, and automated pest and disease management. Synchronous application of the two technologies, Blockchain and AI, synergizes to eliminate inefficiencies, sustain low levels of post-harvest food loss, enhance sustainable post-harvest loss management, and align vertical and horizontal value chain integration. In addition, the synergistic adoption of the two technologies fosters inclusive growth by providing smallholder farmers with market access, digital finance, and equitable engagement in global supply chains. Although these are potential opportunities shown by the review, the barriers to access and digital infrastructure, high implementation costs, and governance in much of the global South still persist. This research sheds light on the prospects of achieving the SDGs, more precisely, the interlinked challenges of sustainable development that include zero hunger and responsible consumption. This review aims to bridge the gap in the existing literature and offers concrete recommendations for sustainable, technology-centric agrotechnology.

Keywords: Blockchain, Artificial Intelligence, Agrotechnology, Food Security

I. Introduction

Agriculture represents a critical global industry. Agricultural productivity directly influences national economies, food security, nutrition, and public health. To enhance output, farmers have recently adopted advanced technologies such as blockchain and the Internet of Things (IoT). Blockchain technology has been applied to address challenges in various sectors, including energy, health, and finance(Bermeo-Almeida et al., 2018). In agriculture, blockchain supports supply chain management systems by enhancing transparency, security, impartiality, and reliability. Blockchain also offers potential solutions to many security and reliability challenges associated with the Internet of Things. It is essential to assess the extent to which blockchain-related challenges in agriculture have been previously investigated and to identify the primary obstacles and limitations that remain. In order to answer these queries, we conducted a Systematic Literature Review (SLR) to find pertinent research on blockchain technology in agriculture. According to the methods suggested by Brereton et al. [7], the systematic literature review that was given was carried out. Farmers may find this material useful in understanding the technologies and methods being employed, and other researchers may find it useful in identifying potential research areas for future studies.

Infrastructure constraints, quality assurance, and product safety represent significant challenges for developing nations (Islam et al., 2022). High levels of unpredictability, stringent packaging requirements, traceability gaps, and inefficient transportation increase the complexity of the food supply chain (Lahane et al., 2023; Rahbari et al., 2023). The deliberate adulteration of food for financial gain or malevolent purposes, referred to as food crime, constitutes a serious threat to the integrity of the food supply chain (Manning & Soon, 2016; Soon & Manning, 2019). Existing weaknesses in traceability and transparency within the supply chain are routinely exploited by malicious actors. Traditional food supply chains may become sophisticated, data-driven systems through the use of blockchain technology(Wahyuni et al., 2025). For instance, real-time quality monitoring and tamper-proof digital records can be achieved by combining blockchain technology with RFID-based structures (Mondal et al., 2019). Furthermore, blockchain can trace the origins, whereabouts, and histories of products, which increases consumer confidence (Cozzio et al., 2023). Nevertheless, a number of obstacles, such as interoperability, privacy, and data security issues, as well as the requirement for robust intra-organizational support, are impeding the broad implementation of blockchain in the food industry (Sali et al., 2023).

The increased need for ethical and sustainable agricultural supply chains makes the case for blockchain implementation even stronger (Wünsche & Fernqvist, 2022). Customer expectations for product authenticity, traceability, and transparency are rising. According to Lin et al. (2019), blockchain technology can offer these guarantees by facilitating the tracing of goods from farm to fork, guaranteeing that raw materials are sourced ethically and ecologically. Blockchain has the potential to improve food product trust and confidence by enabling all parties involved in the food supply chain to gather and exchange trustworthy information (Gurrala & Hariga, 2022; Mahmud et al., 2021). As a result, downstream players may gain a competitive advantage, and customers may feel more at ease knowing where their food comes from. Blockchain technology provides a new way to organize data, allowing transactions to be transparent and safe without the use of middlemen (Mermer et al., 2018). With the creation of Bitcoin by Satoshi Nakamoto in 2008, blockchain technology established a public, decentralized record that enables users to independently confirm transactions (Gaikwad, 2020). In order to provide data security and immutability, this technique makes use of a distributed network of linked blocks, each of which has its own hash code. Due to its decentralized nature, transactions are safer and more verifiable, as well as more transparent and traceable (Friedman & Ormiston, 2022; Rajasekaran et al., 2022; Zheng & Lu, 2022).

Achieving food security for a country is a challenging and complex task on a global scale. These include population growth, the intensifying effects of climate change, depletion of resources, disparities in income, economic disruptions, conflicts, food waste, poor infrastructure, and low levels of education. By making the food supply chain more transparent and traceable, blockchain technology can help with a number of issues. There are several different countries with varying economic and developmental stages in the MENA area. High-income, industrialized, oil-exporting states like the United Arab Emirates, Qatar, and Saudi Arabia are examples of this diversity, as are low-income and least-developed countries like Sudan, Mauritania, and Yemen [7]. Common climate-related challenges provide a unifying element in the fight to guarantee food security, notwithstanding the MENA region's stark differences in economic characteristics ("Breaking the Cycle," [8]). Economic stability and the opportunity to buy food at higher costs on the global market make the United Arab Emirates (UAE) a food secure country. One major issue that sets the United Arab Emirates apart from many other countries that are food secure is climate change. Due to its lack of water and fertile terrain, the United Arab Emirates has particular difficulties with regard to food security. The UAE must face this challenge head-on because to its incapacity to produce food; it imports between 80 and 90 percent of its food, which is a result of its growing population and rising consumption demands(Sundarakani & Ghouse, 2024). Despite the rapid growth of technology advancements like artificial intelligence (AI) and precision agriculture, their adoption in underdeveloped nations is still relatively low. Only 15% of farmers in sub-Saharan Africa have access to digital farming equipment, compared to 75% in North America and Europe, according to data from Scoones et al. (2020). The primary obstacles include limited digital literacy, infrastructure constraints, and the expensive cost of technology. Consequently, many developing regions continue to have agricultural productivity that is much below its potential(Jamtarat & Thongcha, 2025). High chemical input intensive farming methods have resulted in water contamination, biodiversity loss, and soil deterioration (Leach et al., 2021). According to the IPBES research from 2019, erosion and salinization have caused the degradation of 33% of the world's agricultural land.

II. Literature Review

Food Security and Inclusive Growth

According to the Food and Agriculture Organization (2010), food security is "adequate, physical, social, and economic access to sufficient, safe, and nutritious food that meets dietary needs and preferences for an active life." The impact of food security on inclusive growth might be either direct or indirect. It offers the framework for sustained economic growth. The majority of research on the connection between inclusive growth and food security concentrates on economic growth (Osinubi et al., 2022). The rationale is that consistent economic growth is a prerequisite for food security, and if the gains are shared equitably, this growth can be converted into inclusive growth (McGregor et al., 2020). Using a dynamic Generalized Method of Moments System (GMM-SYS), for example, Munap and Ismail (2019) examine how food security affects economic growth in dry-land developing nations. The authors suggest that economic growth is positively impacted by food security and that its correlation with higher employment rates, longer life expectancies, and lower levels of poverty would contribute to economic growth. According to Arcand's (2001) analysis, undernourishment has a detrimental effect on economic growth in France, but life expectancy at birth has a favorable effect. Similar to this, Onime (2019) examines how Nigeria's population and food security affected the country's economic expansion between 1981 and 2016. The results of the error correction model (ECM) suggest that while population has a negative impact on economic growth in Nigeria, food security and government spending have a negligible impact. Another study on food security in developing countries from 1970 to 1990 found six major issues: economic dependency, modernization, neo-Matlhusian population pressure, urban bias, militarism, and urban bias (Jenkins and Scanlan 2001). The macrolevel conditions set by policymakers include access to food in local marketplaces and household resources (Timmer 2000). The findings indicate that there is a moderate relationship between food security and economic growth because the study largely focuses on Asia in terms of trade policies, income distribution levels, and the volatility of food prices on the global rice market (Hartono et al., 2023).

Technology Adoption in Agriculture

Agriculture development is regarded as one of the most successful methods for eradicating poverty. The distribution of wealth among communities will be further enhanced, and it will be the primary factor in meeting the rapidly rising need for food brought on by population expansion (Rozi et al., 2023). A significant share (65%) of the "poor but employed adults" globally rely on agriculture as their primary source of income, according to a 2016 World Bank Group analysis (Dissanayake et al., 2022). Therefore, the development of agriculture is essential to a nation's economic progress. 4% of the world's gross domestic output comes from agriculture. Nonetheless, for certain nations, this contribution could increase even further to about 25% [1]. As a result, agriculture must be developed consistently on a global scale. Technology is a major force for change in many fields [2]. Agricultural economists constantly search for new technology that can help advance food production and enhance food safety and quality. Global technology advancements have shown significant growth in recent years (Konfo et al., 2023). After the creation of a technology, it takes a considerable amount of time to maximize awareness and utilization. Aside from adoption, the ultimate objective of technology generation may be something far more expansive. For instance, the ultimate objective of introducing a new high-yielding paddy variety is to boost the nation's productivity or paddy production. The adoption of new technologies in the agriculture sector is influenced by a number of factors that have been recognized and explored by numerous authors worldwide. Ugochukwu and Phillips (2018) quoted numerous writers to create a list of criteria that fit into five categories: 1. Personal, 2. Cultural, 3. Social, 4. Economic, and 5. Technology characteristics. The adoption process and other elements that impact them, such as farm size, land ownership and availability, credit availability, extension services, and labor availability, have also been described (Dissanayake et al., 2022). Moreover, individual attributes including educational attainment, gender, and other demographic traits, as well as farmers' perceptions of the threats posed by the technology, were also mentioned as significant aspects. However, Melesse (2018) and Teklewold et al. (2013) divided these factors into three groups: "(1) Producer/farmer characteristics, (2) Technology characteristics and relative performance, and (3) Program and institutional factors." The "factors related to the characteristics of producers" included factors like age, gender, education level, prior experience with the introduced technology, wealth status, farm size and plot characteristics, labor availability, acquisition of necessary resources (own resources, subsidies, grants, etc.), and the ability to tolerate risks associated with the introduced technology. A few of these elements are comparable to those mentioned by Ugochukwu and Phillips (2018).

Blockchain in Agrotechnology

As blockchain technology becomes popular and demonstrates its usefulness in a number of cryptocurrencies, different organizations and other entities seek to use its fault tolerance and transparency to address issues when a large number of unreliable actors participate in the distribution of a resource [16], [17]. The food supply chain and agriculture are two significant, extremely pertinent fields [18], [14]. Since agricultural products are nearly always utilized as inputs in multi-actor distributed supply chains, where the consumer is typically the final client, agriculture and food supply chains are closely related [19]. The usage of blockchain applications in supply chain management appears to have begun shortly after the technology's introduction [20]. By 2023, supply chain management blockchain is predicted to have grown from $45 million in 2018 to $3,314.6 million, with an 87% annual growth rate [21]. Two survey articles that attempt to document this expansion and application of blockchain in the industry have already been published in scholarly publications [22], [23], and [24]. AgriDigital successfully completed the world's first blockchain-based settlement of the sale of 23.46 tons of grain in December 2016 [25]. Since then, more than 1.6 million tons of grain and more than 1,300 customers have used the cloud-based system, resulting in producer payments totaling $360 million (Kamilaris et al., 2019). The possible application of this technology in the agricultural supply chain was spurred by AgriDigital's success. AgriDigital is now working to use blockchain technology to create reliable and effective agricultural supply systems [26]. As an additional recent example, one of the largest food traders in the world, Louis Dreyfus Co. (LDC), partnered with Dutch and French banks to conduct the first blockchain-based agricultural commodities exchange, which involved shipping soybeans from the United States to China [27]. LDC claims that document processing was slashed to a fifth of its previous time by automatically matching data in real time, avoiding duplication and laborious inspections. Blockchain technology makes it possible for peer-to-peer transactions to occur in a transparent manner without the need for a middleman in the agricultural industry or a bank, as is the case with cryptocurrencies (Xiong et al., 2020). The technology shifts the way trust is given by doing away with the requirement for a central authority. Instead of putting trust in an authority, people now trust cryptography and peer-to-peer architecture. Thus, it contributes to the restoration of consumer-producer confidence, which can lower transaction costs in the agri-food sector (Reitano et al., 2024). Transactions between anonymous individuals can be reliably traced using blockchain technology. This allows for the prompt detection of fraud and malfunctions. Smart contracts also allow for real-time problem reporting (Haveson et al., 2017; Sylvester, 2019).

Artificial Intelligence in Agrotechnology

Agriculture has made extensive use of mechanization, which helps solve a number of issues, including weather-related issues with drying agricultural products (Wijayanto & Puspitojati, 2024). Many coffees drying devices, for instance, have been created using heat from LPG or natural gas. Even though the weather is typically rainy, this approach works well enough to dry coffee items (Winarno et al., 2025). This tool's benefits include being practical, affordable, and efficient. One disadvantage of the developed tools is their uncontrolled temperature management, which causes the drying temperature to fluctuate with a significant amount of variation (Santoso, Muhidong, & Mursalim, 2018). Using fuzzy logic and expert systems, Santosoett. developed a coffee drying equipment with temperature control. The coffee dryer's construction allows it to save fuel and maintain a consistent drying temperature (Siregar et al., 2025). Artificial intelligence is being used in agriculture for purposes other than coffee drying. Rice field clusters can be established using artificial intelligence (Chang & Wan, 2015). Using this method, more rice can be produced, ensuring a steady supply of the grain. In the hydroponic planting concept, artificial intelligence can also be applied by regulating the amount of nutrients that plants receive (Domingues, Takahashi, Camara, & Nixdorf, 2012). The amount of nutrients dissolved in water is controlled to maintain nutritional balance. It is guaranteed that hydroponic plants produced using this technique will utilize nutrients effectively (Rajendran et al., 2024). Diagnostics of citrus diseases can also be performed using fuzzy logic (Marengo, Robotti, Righetti, & Antonucci, 2003). A variety of applications of artificial intelligence can help improve agricultural technologies, including food processing and farming. Knowledge of technology enables farmers or the food business to process food properly and create high-quality goods (Wolfert, Ge, Verdouw, & Bogaardt, 2017). Enhancing food processing is likely to increase food stability and enhance farmer well-being. Thus, the growth of the digital world and manufacturing based on artificial intelligence will have a significant impact on agricultural technology in the future since it will operate as the brain behind the operation of agricultural machinery and equipment (Santoso & Murdianto, 2022). AI applications in agriculture are divided into three stages: planting, monitoring, and harvesting. It takes a variety of approaches to apply AI to agricultural activities (Wildan, 2023). Among the techniques examined are K-Nearest Neighbor (KNN), Decision Support System (DSS), Genetic Algorithm (GA), Support Vector Machine (SVM), Artificial Neutral Network (ANN), Machine Learning (ML), Deep Learning (DL), and Fuzzy Logic (FL). According to an analysis of the 21 examined studies, FL and ML were the most widely employed methodologies. Integrating FL, SVM, and DSS on a field-programmable gate array (FPGA) to successfully adjust for agricultural performance decline with a 95% forecast accuracy rate is the most remarkable finding in the literature review.

III. Research Method

A literature review is an essential part of every research endeavor since it provides insightful information for investigating new areas and directing future studies. which summarizes the insights obtained from examining correlating areas and proposes novel ones to be investigated in the future(Schryen et al., 2017). This study has gaps in research which is the outcome of the scrutiny and selective analysis of relevant literature which, in turn, has supported the strengthening of the research. This systematic review literature was done in a rudimentary fashion that involved the definition of relevant search terms, analysis, collection and screening of relevant documents, and consolidation of outcomes(Chigbu et al., 2023). This review focuses on the uses of blockchain and artificial intelligence (AI) in agrotechnology, especially in advancing sustainable and inclusive food security and growing the economy. The relevant documents were collected from the Scopus database which is known for its research that is peer reviewed and published. The review process followed a four-step methodology.

1. Selection of Database

The investigators employed systematic search strategies which included relevant information sources. To ensure complete coverage of research pertaining to blockchain and artificial intelligence in agrotechnology, Scopus was selected as the primary database. Scopus is a deep abstract and citation database that enables the examination of peer-reviewed literature spanning a number of disciplines relevant to food security and inclusive development such as agriculture, technology, management, and sustainable development which is why it was chosen.

2. Collection of Articles

The literature review included articles published from 2019 to 2025. The first search resulted in 200 publications on blockchain and artificial intelligence in agrotechnology. To provide a robust underpinning for this research, the search strategies used included ed. journals, book chapters, and doctoral dissertations, targeting only peer-reviewed academic publications. The application of the stated inclusion and exclusion criteria further narrowed the set and brought the total number of articles to 247, to guarantee sufficient coverage on sustainable food security and inclusive development.

3. Keyword Selection

During the research process, the authors focused on and cited only studies that were most pertinent and important in the field. The authors assigned these terms as keywords in their search and strategy, “blockchain”, “artificial intelligence”, “agrotechnology”, “sustainable food security”, “inclusive growth”, “smart farming”, and “digital agriculture”. The presence of these keywords also sets the limits for the bibliometric analysis for the scope of the present study.

4. Filtering

In order to improve accuracy, duplicated and duplicate publications with incomplete bibliographic data points were removed from the evaluation; as a result, 143 papers were selected for comprehensive bibliometric and network analysis. Based on the recommendations of the PRISMA standard for literature reviews, this filtering procedure.

IV. Results and Discussion

Blockchain’s trust and data integrity assurance combined with value added predictive analytics and data management by AI in agriculture demonstrate powerful synergies in the value chain. Insightful agrotechnology integrates AI with Blockchain with the aim of sustaining growth in environmentally friendly and sustainable food security practices(Aremora et al., 2025). Enhancements in food systems security result from trust and transparency improvements attributable to increased traceability and monitoring systems for farmers during transactions by AI. Reduction in food systems fraud due to blockchain adoption arms farmers and enhances trust in agricultural markets. Discriminatory wealth practitioners are enabled by unclouding market access and civilization practices from consumers. This research review shows the global shift in food systems brought by AI agrotechnology. This review indicates defining our food systems and the growth conditions within delimitated bound carves of the AI agrotechnology in the near future. The decentralized and distributed ledger system known as blockchain technology is becoming recognized as an essential tool for enhancing the transparency and efficiency of the supply chain. According to Hellani et al. (2021) and Zaabar et al. (2021), blockchain is essentially a digital ledger that records transactions across several computers safely, transparently, and irrevocably. These transactions are grouped together into "blocks," which results in a chain of connections—thus the term "blockchain." Due to its decentralized nature, the system is immune to fraud and manipulation because no single entity can control the full ledger (Oyeyemi et al., 2024). The fundamental ideas of blockchain technology—decentralization, immutability, transparency, and security—provide a convincing framework for resolving a number of issues that arise in African agricultural value chains (Tang et al., 2024; Kshetri, 2021). Blockchain technology not only makes traceability possible but also makes it easier to employ smart contracts, which are self-executing contracts with their conditions encoded directly into code (Tang et al., 2024; Kshetri, 2021). These smart contracts can automate a number of agricultural value chain operations, including payments, quality control, and ownership transfers, if certain predetermined criteria are fulfilled (Tang et al., 2024; Kshetri, 2021).

The importance of these technologies is also to foster equity in development by lowering barriers to entry for smallholder farmers (Kumarathunga & Calheiros, 2022). Blockchain-enabled systems directly link smallholder producers to digital marketplaces offering better net returns through lower taxation and fewer transactions(Susan et al., 2023). In addition, AI-powered advisory systems focused on soil, weather, and pest dynamics provide recommendations directly to farmers, even those in remote locations, thus eliminating information and innovation gaps. Furthermore, literature on the subject continues to highlight the importance of blockchain on inclusion, through smart contracts and Decentralized Finance (DeFi) as mesh networks, providing farmers with better access to credit and insurance. All these enhancements increase productivity and foster greater resilience toward shocks induced by climate change and volatile markets(Adesiyan, 2025).

The literature review included articles published from 2019 to 2025. The first search resulted in 200 publications on blockchain and artificial intelligence in agrotechnology. To provide a robust underpinning for this research, the search strategies used included ed. journals, book chapters, and doctoral dissertations, targeting only peer-reviewed academic publications. The application of the stated inclusion and exclusion criteria further narrowed the set and brought the total number of articles to 147, to guarantee sufficient coverage on sustainable food security and inclusive development.

V. Conclusion

As stated in this review, it is crucial for agri businesses and the policymakers to undertake incorporation of blockchain and AI technologies with precise objectives and strategies. This in turn necessitates the stakeholders to re-frame agri food systems, develop ‘tech-savvy’ digital skill training modules for farmers and other supply chain practitioners, institue responsible organizational accountability for execution, and assess the value added from the application of blockchain and AI technologies to the agricultural value chain. Thus, these technologies serve as instruments for enhancing food security and inclusive development, as they facilitate the prompt and reliable exchange of data, which is vital for policymakers, farmers, investors, and the public, especially during critical periods involving supply chain interruptions, climate shocks, or other emergencies.

The agri-tech industry demonstrates the application of the SIF by integrating blockchain and AI technologies across the economic, social, environmental, and technological domains. SIF's economic dimension appreciates the cost savings, operational improvements, and market access services that blockchain and AI technologies provide to the farmers. Social dimension of SIF appreciates how AI and blockchain services tend to pitch, service, and trace back the workflows in the farming communities as well as provide the framework for fairer trade practices. Environmentally sustainable internal business processes appreciate the resource-efficient farming, farming precision, and the supply chain clarity that these technologies foster. SIF's internal processes and environmentally sustainable business practices are in connection with the seamless integration of blockchain and AI technologies in agricultural education and training programs, empowering the stakeholders to drive out the innovations needed in the industry.

Considering the scope of the paper and the evidence available, it can be argued that Blockchain and AI can agrotechnology by enhancing resilience, sustainability and inclusiveness in food systems. Nevertheless, there are still underlying challenges within the industry, the state of culture, and the institutional infrastructure all play a highly influential role in the success of implementation. More extensive research in different areas of agriculture and in varied contexts over a longer timeframe are required to affirm these findings and develop a thorough understanding of the ability of Blockchain and AI in promoting food security and inclusive sustainable growth.

Future Research

For future research, considering the application of blockchain and artificial intelligence (AI) in agrotechnology, especially in the domain of sustainable and inclusive food security, needs greater attention. This would include real-world studies of the application of blockchain and AI in various segments of the agricultural supply chain and an assessment of their scalability, flexibility, and sustainability. Moreover, future work will need to synergize blockchain and AI with other emerging technologies such as the Internet of Things, machine learning, precision farming, and other tools to create a more integrated framework for sustainable resilient food systems. In addition, the role of the policy, regulatory, and ethical aspects of the application of these technologies for equitable, inclusive, and transformative change in agri-food systems needs more attention. As the innovation becomes faster, there is a need for more sustained work to position this discipline for defining the strategy for equitable economic growth and food security for the world.

Reference

Adesiyan, T. (2025). *Leveraging Agricultural Credit and Digital Finance for Enhancing Smallholder Leveraging Agricultural Credit and Digital Finance for Enhancing Smallholder Productivity and Rural Economic Growth Taiwo Adesiyan*. *August*. https://doi.org/10.55248/gengpi.6.0825.3090

Aremora, S., Sarfo, J. B., Fashina, A. T., Kehinde, M., Adebote, M. O., Peay, A., & Tech, V. (2025). *Blockchain and AI Integration for Agricultural Value Chains in African Markets*. *21*(3), 268–276.

Bermeo-Almeida, O., Cardenas-Rodriguez, M., Samaniego-Cobo, T., Ferruzola-Gómez, E., Cabezas-Cabezas, R., & Bazán-Vera, W. (2018). Blockchain in agriculture: A systematic literature review. *Communications in Computer and Information Science*, *883*(July 2020), 44–56. https://doi.org/10.1007/978-3-030-00940-3_4

Chigbu, U. E., Atiku, S. O., & Du Plessis, C. C. (2023). The Science of Literature Reviews: Searching, Identifying, Selecting, and Synthesising. *Publications*, *11*(1). https://doi.org/10.3390/publications11010002

Dissanayake, C. A. K., Jayathilake, W., Wickramasuriya, H. V. A., Dissanayake, U., Kopiyawattage, K. P. P., & Wasala, W. M. C. B. (2022). Theories and Models of Technology Adoption in Agricultural Sector. *Human Behavior and Emerging Technologies*, *2022*. https://doi.org/10.1155/2022/9258317

Hartono, W., Kodrat, D. S., Tambunan, D. B., Pramana, I. E., & Alexander, J. R. (2023). Empirical Research: The Impact of Food Security on Economic Growth (Case Study in Indonesia). *Business and Accounting Research (IJEBAR) Peer Reviewed-International Journal*, *7*(4), 2622–4771. https://jurnal.stie-aas.ac.id/index.php/IJEBAR

Jamtarat, S., & Thongcha, C. (2025). Agricultural Sector Transformation Through A Systematic Literature Review (SLR) Approach: Innovations, Challenges And Future Opportunities. *Anshara Internasional Journal of Education and Science (AIJoES)*, *2*(1), 1–7. https://journal.anshara.id/index.php/aijoes/article/view/65

Kamilaris, A., Fonts, A., & Prenafeta-Boldύ, F. X. (2019). The rise of blockchain technology in agriculture and food supply chains. *Trends in Food Science and Technology*, *91*, 640–652. https://doi.org/10.1016/j.tifs.2019.07.034

Konfo, T. R. C., Djouhou, F. M. C., Hounhouigan, M. H., Dahouenon-Ahoussi, E., Avlessi, F., & Sohounhloue, C. K. D. (2023). Recent advances in the use of digital technologies in agri-food processing: A short review. *Applied Food Research*, *3*(2). https://doi.org/10.1016/j.afres.2023.100329

Kumarathunga, M., & Calheiros, R. N. (2022). *Smart Agricultural Futures Market*.

McGregor, J. A., Hay, C., & Hunt, T. (2020). Inclusive growth: the challenges of multidimensionality and multilateralism. *Cambridge Review of International Affairs*, *35*(6), 1–27. https://doi.org/10.1080/09557571.2020.1784849

Osinubi, T. T., Osinubi, O. B., & Ibukun, C. O. (2022). Achieving Inclusive Growth through Food Security in Nigeria. *Ife Social Sciences Review*, *30*(1), 91–108.

Oyeyemi, B. B., Orenuga, A., & Adelakun, B. O. (2024). Blockchain and AI Synergies in Enhancing Supply Chain Transparency. *International Journal of Future Engineering Innovations*, *1*(1), 115–126.

https://doi.org/10.54660/ijfei.2024.1.1.115-126

Rajendran, S., Domalachenpa, T., Arora, H., Li, P., Sharma, A., & Rajauria, G. (2024). Hydroponics: Exploring innovative sustainable technologies and applications across crop production, with Emphasis on potato mini-tuber cultivation. *Heliyon*, *10*(5), e26823. https://doi.org/10.1016/j.heliyon.2024.e26823

Reitano, M., Pappalardo, G., Selvaggi, R., Zarbà, C., & Chinnici, G. (2024). Factors influencing consumer perceptions of food tracked with blockchain technology. A systematic literature review. *Applied Food Research*, *4*(2). https://doi.org/10.1016/j.afres.2024.100455

Rozi, F., Santoso, A. B., Mahendri, I. G. A. P., Hutapea, R. T. P., Wamaer, D., Siagian, V., Elisabeth, D. A. A., Sugiono, S., Handoko, H., Subagio, H., & Syam, A. (2023). Indonesian market demand patterns for food commodity sources of carbohydrates in facing the global food crisis. *Heliyon*, *9*(6), e16809. https://doi.org/10.1016/j.heliyon.2023.e16809

Santoso, D., & Murdianto, D. (2022). Artificial Intelligence in the Perspectives of Agricultural Technology Development in Indonesia. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, *5*(1), 4348–4354. https://bircu-journal.com/index.php/birci/article/view/4141

Schryen, G., Benlian, A., Rowe, F., Gregor, S., Larsen, K., Petter, S., Paré, G., Wagner, G., Haag, S., & Yasasin, E. (2017). Literature reviews in IS research: What can be learnt from the past and other fields? *Communications of the Association for Information Systems*, *41*(1), 759–774. https://doi.org/10.17705/1CAIS.04130

Siregar, R. M., Mulyara, B., Dian, R., Maisarah, M., Pane, M. A. S., & Prayogi, A. (2025). Design of Control System and Temperature in Coffee Dryer Arduino Based Automatic Using Fuzzy. *JITK (Jurnal Ilmu Pengetahuan Dan Teknologi Komputer)*, *10*(3), 634–642. https://doi.org/10.33480/jitk.v10i3.6166

Sundarakani, B., & Ghouse, A. (2024). A Systematic Literature Review and Bibliometric Analysis of Blockchain Technology for Food Security. *Foods*, *13*(22). https://doi.org/10.3390/foods13223607

Susan, A., Sylvester, O., Eliud, B., & Enock, K. (2023). Digital agriculture platforms: Understanding innovations in rural finance and logistics in uganda's agri food sector. *International Food for Security*, *1*(1), 1–149.

Wahyuni, H. C., Alfan Rosyid, M., Sabrina, B., Gunawan, I., & Tieman, M. (2025). Blockchain in the Food Supply Chain: A Literature Review and Bibliometric Analysis. *Spektrum Industri*, *23*(1), 42–57. https://doi.org/10.12928/si.v23i1.302

Wijayanto, B., & Puspitojati, E. (2024). Optimizing Agricultural Mechanization to Enhance The Efficiency and Productivity of Farming In Indonesia: A Review. *AJARCDE (Asian Journal of Applied Research for Community Development and Empowerment)*, *8*(3), 209–217. https://doi.org/10.29165/ajarcde.v8i3.493

Wildan, J. (2023). A Review: Artificial Intelligence Related to Agricultural Equipment Integrated with the Internet of Things. *Journal of Advanced Technology and Multidiscipline*, *2*(2), 47–60. https://doi.org/10.20473/jatm.v2i2.51440

Winarno, K., Sustiyo, J., Aziz, A. A., & Permani, R. (2025). Unlocking agricultural mechanisation potential in Indonesia: Barriers, drivers, and pathways for sustainable agri-food systems. *Agricultural Systems*, *226*(January), 104305. https://doi.org/10.1016/j.agsy.2025.104305

Xiong, H., Dalhaus, T., Wang, P., & Huang, J. (2020). Blockchain Technology for Agriculture: Applications and Rationale. *Frontiers in Blockchain*, *3*(February), 1–7. https://doi.org/10.3389/fbloc.2020.00007