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Sustainable Agricultural Economics: A Systematic Literature Review and Bibliometric Analysis

Rut Normasari[1], Stenly Kawuwung[2], Shapely Ambalao[3] ✉
[1] Faculty of Agriculture, Universitas Klabat
[2,3] Universitas Klabat

Abstract
Sustainable agricultural economics has emerged as an increasingly important research field in response to global challenges such as climate change, environmental degradation, food insecurity, and resource scarcity. Despite the growing volume of scholarly publications, the existing literature remains fragmented across multiple themes, methodologies, and disciplinary perspectives, limiting comprehensive understanding of the field's intellectual structure and future research directions. Therefore, this study aims to: (1) examine whether sustainable agricultural economics continues to be a significant area for future academic inquiry, (2) analyze the current research landscape and distribution within the field, and (3) identify key theoretical and practical implications for advancing future research. This study employs a combined Systematic Literature Review (SLR) and bibliometric analysis approach following the PRISMA 2020 framework. Data were collected from the Scopus database in May 2026 using structured keyword combinations related to agricultural economics and sustainability. Bibliometric mapping was conducted using VOSviewer to analyze publication trends, geographical distribution, institutional productivity, journal sources, authorship patterns, and keyword co-occurrence networks. Additionally, thematic analysis was applied to identify dominant research themes and emerging scholarly trends. The findings reveal that sustainable agricultural economics is a rapidly expanding and highly relevant field of academic inquiry. Publication trends demonstrate significant growth from only two publications in 1989 to 186 publications in 2025 and 161 publications in 2026. China emerged as the dominant contributor in terms of publication output and institutional productivity, while leading journals included the Journal of Environmental Management and the Journal of Cleaner Production. Thematic analysis indicates that the literature is increasingly focused on sustainable development, agricultural sustainability, economic analysis, crop production, circular economy practices, and technological innovation such as precision agriculture and digital farming systems. The study concludes that sustainable agricultural economics has evolved into a multidisciplinary and strategically important research domain integrating economic performance, environmental sustainability, technological adaptation, and social resilience. Future research should further explore sustainability governance, policy effectiveness, financial mechanisms, socio-economic inclusiveness, and climate-resilient agricultural systems to strengthen sustainable global food systems and long-term agricultural development.

Keywords: sustainable agricultural economics, systematic literature review, bibliometric analysis, sustainability, agricultural economics, PRISMA, VOSviewer

✉ Corresponding author :
Email Address : shapelyambalao@unklab.ac.id

INTRODUCTION

Sustainable agricultural economics has become an increasingly important field of study in response to global challenges such as climate change, environmental degradation, and food security pressures (Dey et al., 2026; Dhali et al., 2026; Miao et al., 2026). As agricultural systems are required not only to increase productivity but also to maintain ecological balance and social equity, the integration of sustainability into economic analysis has gained substantial scholarly attention. This shift reflects a broader transformation from conventional agricultural practices toward systems that emphasize long-term resilience and resource efficiency. In recent years, the literature has demonstrated significant development in this field, particularly through the adoption of innovative technologies such as precision agriculture, Internet of Things (IoT), and blockchain, as well as the implementation of circular economy principles and renewable energy integration (Ahmad et al., 2022; Liu et al., 2026; Rui et al., 2022). These advancements indicate that sustainable agricultural economics is evolving into a dynamic and interdisciplinary research domain. However, despite this growth, the extent to which the field continues to hold relevance for future academic inquiry remains insufficiently synthesized and systematically evaluated.

Moreover, the existing body of research is highly fragmented, with studies distributed across various themes, methodologies, and disciplinary perspectives. While some studies focus on environmental indicators and sustainability assessment tools, others emphasize economic viability, policy frameworks, or socio-economic impacts (Sisodia et al., 2021; Sousa et al., 2025). This diversity creates challenges in understanding the overall landscape and distribution of research within sustainable agricultural economics, thereby limiting the ability to identify dominant trends, emerging topics, and underexplored areas. In addition, there remains a lack of comprehensive synthesis regarding the theoretical and practical implications derived from existing studies. Issues such as the effectiveness of financial mechanisms, the role of regulatory frameworks, and the socio-economic dimensions of sustainable practices are often discussed in isolation (Balasamy et al., 2026; Tong et al., 2026). Consequently, a structured evaluation is necessary to consolidate these insights and to provide a clearer direction for advancing future research.

To address these gaps, this study employs a Systematic Literature Review (SLR) approach to critically analyze the existing body of knowledge in sustainable agricultural economics. Specifically, this study aims to: (1) examine whether sustainable agricultural economics continues to be a significant area for future academic inquiry, (2) analyze the

current landscape and distribution of research within the field, and (3) identify key theoretical and practical implications that can guide future research directions.

METHOD

This study employs an integrated approach combining a systematic literature review (SLR) and bibliometric analysis to examine the intellectual structure and thematic development of sustainable agricultural economics. The review protocol follows the **PRISMA** guidelines to ensure methodological transparency and reproducibility (Page et al., 2021). Data were retrieved from the **Scopus** database in Mei 2026 using a structured keyword combination targeting the intersection of agricultural economics and sustainability. To ensure analytical rigor, explicit inclusion and exclusion criteria were applied during the screening process. The inclusion criteria comprised: (1) peer-reviewed journal articles, (2) publications written in English, (3) The studies included in this review were collected from the earliest available publications up to 2026. (4) articles with a primary focus on sustainable agricultural economics. Conversely, exclusion criteria included: (1) conference papers, book chapters, and non-peer-reviewed documents, (2) articles outside the scope of agricultural or economic sustainability, and (3) studies with insufficient methodological clarity or incomplete data. This filtering process ensures that only high-quality and relevant studies are retained for analysis (Moher et al., 2009; Donthu et al., 2021).

The study selection process followed the four-stage PRISMA framework, including identification, screening, eligibility, and inclusion. Duplicate records were first removed, followed by title and abstract screening, and subsequently full-text evaluation against the predefined criteria, resulting in a final dataset suitable for bibliometric and thematic analysis.

Bibliometric analysis was conducted using **VOSviewer** to map publication trends and intellectual structures (Van Eck & Waltman, 2010). This includes performance analysis (e.g., leading authors, journals, and countries) and science mapping techniques such as co-authorship, co-occurrence, citation, and bibliographic coupling (Donthu et al., 2021). To complement these findings, an inductive thematic analysis was applied to identify recurring patterns and emerging research themes, enabling a deeper interpretation of the literature (Braun & Clarke, 2006).

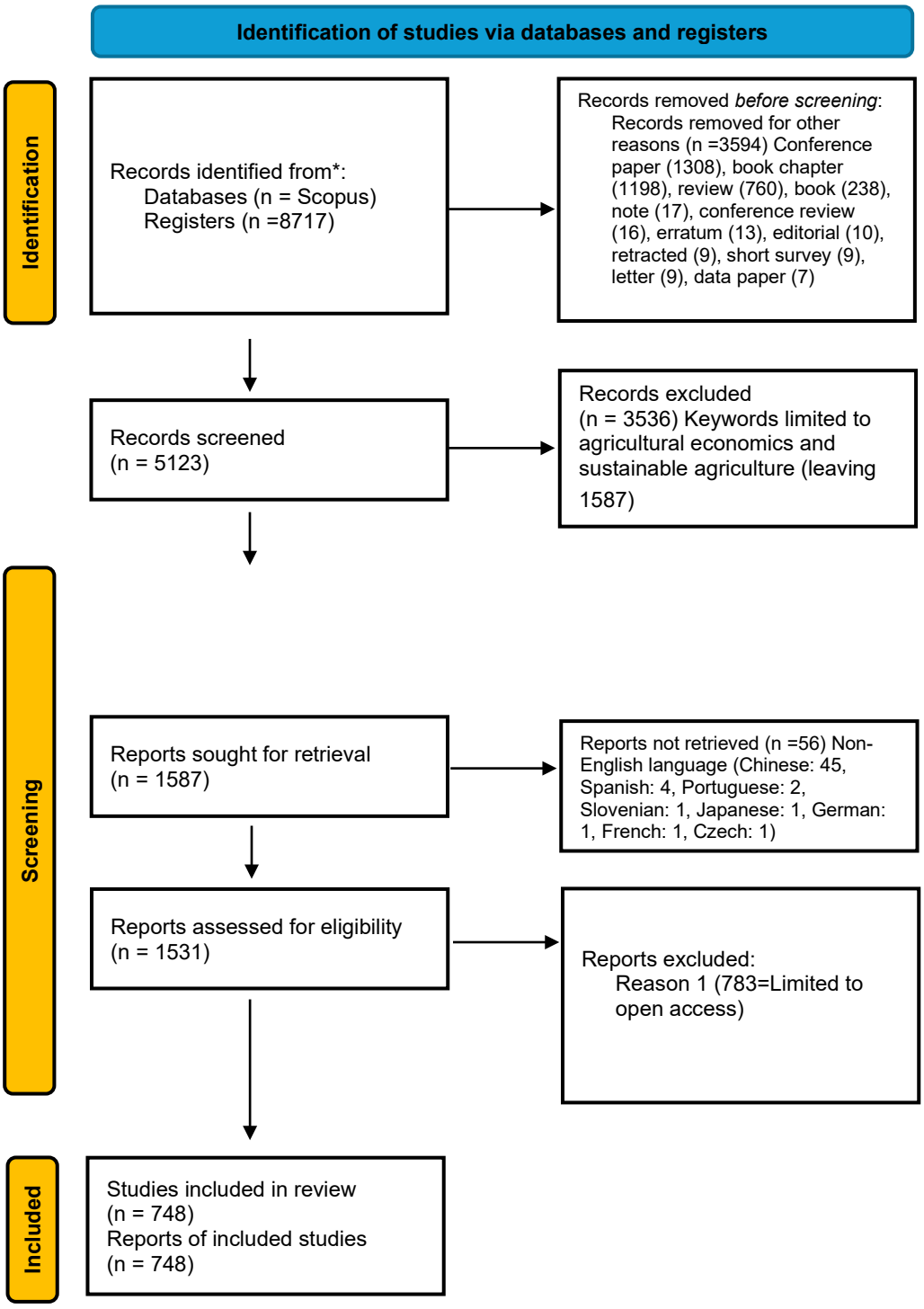

Figure 1. Systematic Literature Review Information flow using PRISMA
Source Page et al., 2021, BMJ 2021;372:n71. doi: 10.1136/bmj.n71.

RESULTS AND DISCUSSION

RQ1: The Significance of Sustainable Agricultural Economics as a Future Academic Inquiry

The longitudinal analysis of publication data reveals that sustainable agricultural economics is a field characterized by robust growth and increasing academic significance. Historically, research in this domain began with very limited output, as evidenced by the identification of only two pioneering articles published in 1989 by Muir and Weinschenck in Figure 2. Since that period, the field has undergone a transformative evolution. A systematic search of the Scopus database, conducted on 17 May 2026, initially identified 8,717 records. After a rigorous screening process following the PRISMA 2020 framework—which included the removal of 3,594 records for document type ineligibility and further filtering for keywords and open access—the final dataset underscores a significant trend in scholarly production. The recent trends from 1989 to 2026 demonstrate a clear upward trajectory in research interest (see Figure 3 and Table 1). Recent trends from 2020 to 2026 demonstrate a clear upward trajectory in research interest. In 2020, the database recorded 32 documents, a figure that remained relatively stable through 2021 with 24 documents and 2022 with 28 documents. While there was a slight decline to 22 articles in 2023, a temporary fluctuation occurred in 2024 with an increase to 48 articles. The most striking finding is the dramatic surge in 2025, which saw a record high of 186 articles. This represents a nearly fourfold increase in productivity compared to the previous year. Most significantly, the data for 2026 already shows 161 documents, suggesting that the field is currently experiencing its most prolific period of academic inquiry. This sustained momentum confirms that sustainable agricultural economics is a vital and expanding area for future exploration, driven by global priorities such as food security and sustainable development.

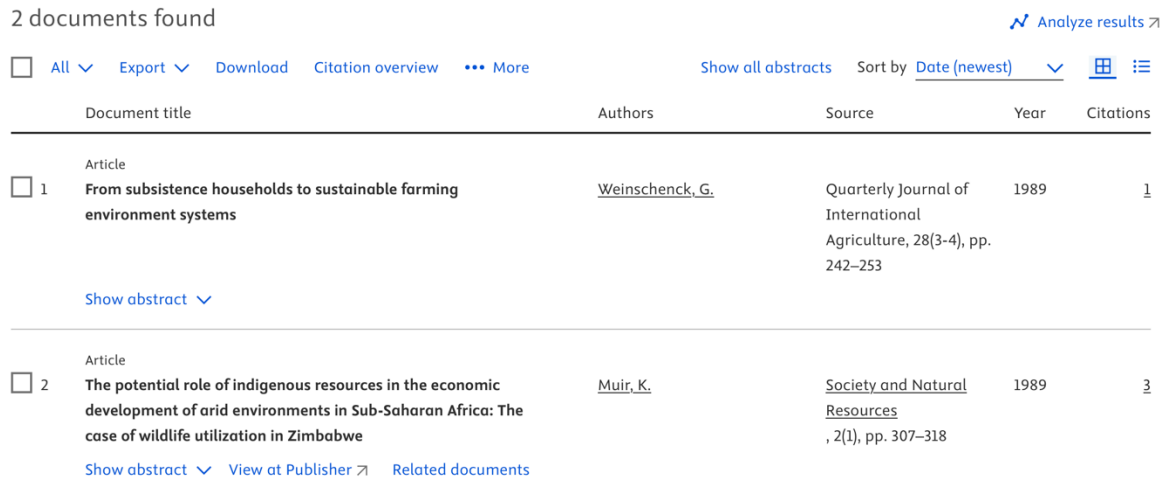

Figure 2. Early Publication

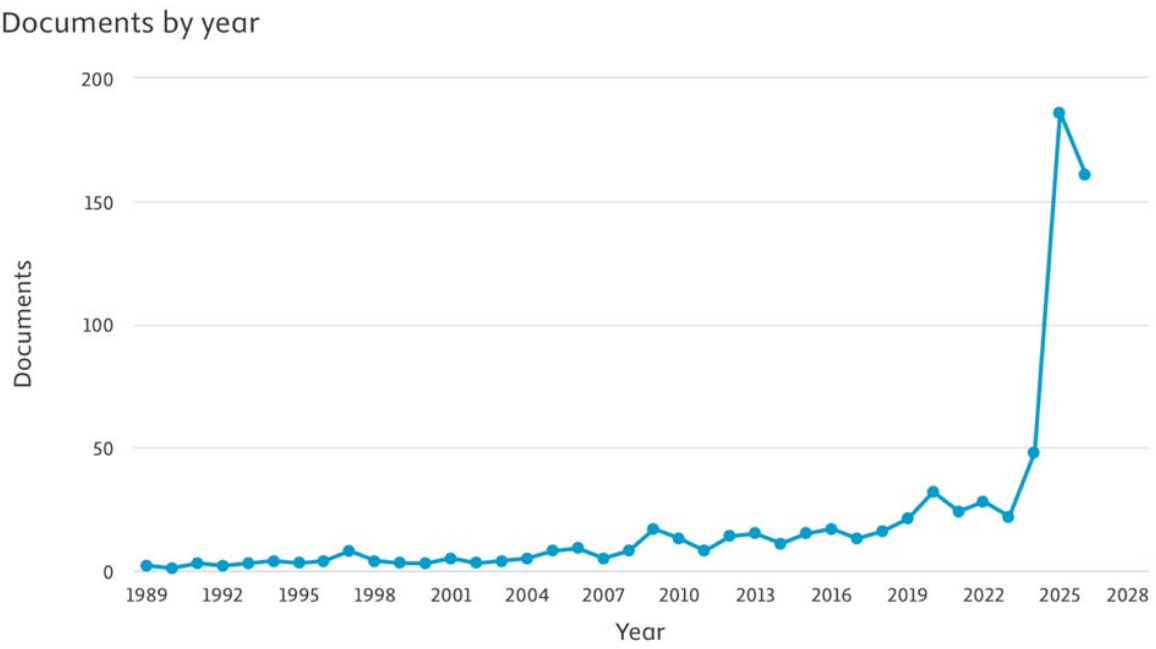

Figure 2. Publication Trends in Sustainable Agricultural Economics (1989–2026)

Table 1. Annual Publication Trends in Sustainable Agricultural Economics (2020–2026)

No	Year	Documents
1	2020	32
2	2021	24
3	2022	28
4	2023	22
5	2024	48
6	2025	186
7	2026	161

The expansion of this research area is not merely quantitative but reflects its qualitative importance in addressing global challenges. The massive spike in 2025 publications suggests that sustainable agricultural economics is entering a "hot" phase of academic inquiry, likely fueled by urgent global needs for food security, climate resilience, and sustainable development. The transition from just 2 articles in 1989 to 186 articles in 2025 confirms that this field is a vital and expanding area for future scholarly exploration. This momentum indicates that the integration of sustainability within agricultural economic frameworks will continue to be a dominant theme in the academic landscape for years to come.

The longitudinal publication analysis demonstrates that sustainable agricultural economics has evolved into a rapidly growing and strategically important field of academic inquiry. The historical trajectory of the literature reveals a substantial transformation from a relatively underexplored topic into a highly dynamic and multidisciplinary research domain. Early scholarly contributions were limited, with only two pioneering articles identified in 1989 by Muir and Weinschenck. However, the field has experienced remarkable expansion over the last several decades, particularly after 2020.

The PRISMA-based screening process identified 8,717 initial records from the Scopus database. After applying inclusion and exclusion criteria, the final dataset confirmed a significant increase in publication output between 2020 and 2026. Publication trends indicate relatively stable development from 2020 to 2023, followed by dramatic growth beginning in 2024 and peaking in 2025 with 186 publications. The 2026 data already records 161 publications, indicating that the field continues to maintain strong scholarly momentum.

This trend confirms that sustainable agricultural economics remains highly relevant for future academic investigation. The sharp increase in publication activity reflects the growing urgency of addressing interconnected global challenges such as climate change, food insecurity, environmental degradation, sustainable resource management, and agricultural resilience. The findings suggest that sustainability considerations are no longer peripheral within agricultural economics but have become central components of economic planning, policy development, and technological innovation.

Moreover, the expansion of this field demonstrates a broader paradigm shift from conventional productivity-oriented agricultural systems toward integrated sustainability-based economic frameworks. Current research increasingly emphasizes balancing economic viability, ecological preservation, and social equity. This transformation aligns with global sustainability agendas, including the United Nations Sustainable Development Goals (SDGs), particularly those concerning zero hunger, climate action, and responsible consumption and production.

The findings also indicate that sustainable agricultural economics has transitioned into a "hot research area" characterized by strong interdisciplinary collaboration and methodological diversification. Increasing attention toward renewable energy integration, circular economy principles, precision agriculture, artificial intelligence, and Internet of Things (IoT)-based agricultural systems further reinforces the field's future relevance.

Therefore, sustainable agricultural economics can be considered a vital and continuously expanding research area with substantial implications for future academic scholarship, policy formulation, and sustainable global development.

The rapid growth of sustainable agricultural economics reflects increasing global concern regarding climate change, food insecurity, environmental degradation, and sustainable resource management (Dey et al., 2026; Miao et al., 2026). The significant rise in publication output between 2024 and 2026 demonstrates that sustainability has become a central component of agricultural economic research rather than a peripheral concern. This finding aligns with previous studies emphasizing the transition from conventional agricultural systems toward resilience-oriented and environmentally sustainable production models (Ahmad et al., 2022; Rui et al., 2022).

Furthermore, the increasing integration of technological innovation such as precision agriculture, blockchain systems, renewable energy, and Internet of Things (IoT)-based farming indicates that sustainable agricultural economics is evolving into a highly interdisciplinary research domain (Liu et al., 2026). The field therefore continues to hold strong relevance for future academic inquiry because it directly addresses global sustainability agendas and food security challenges.

RQ2: Current Landscape and Distribution of Research within Sustainable Agricultural Economics

Geographical Distribution

China emerged as the dominant contributor with 263 publications, significantly surpassing other countries. The United States ranked second with 118 publications, followed by India with 87 publications, the United Kingdom with 47 publications, and Australia with 26 publications. Additional contributors included Canada, Germany, Brazil, France, and Italy.

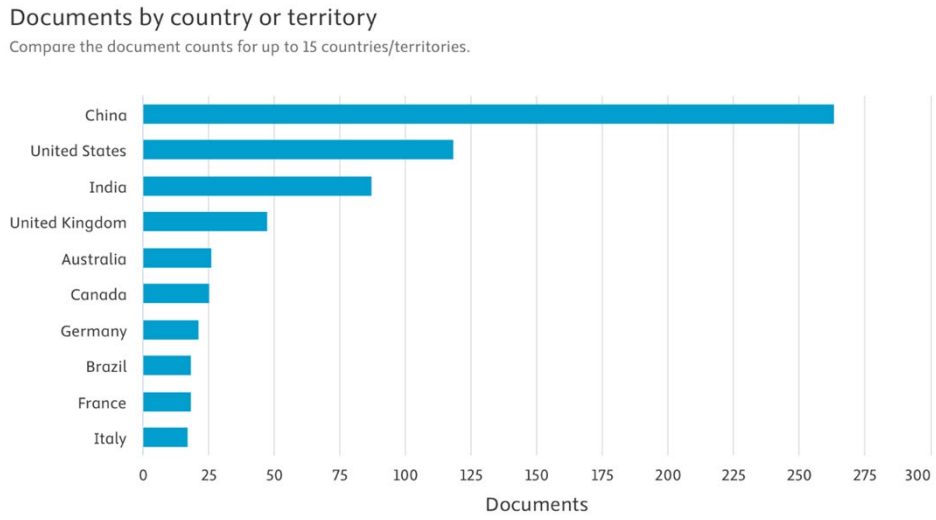

Figure 3. Number of Article by Country or Teritory

In figure 4. shown that the dominance of China reflects the country's extensive investment in agricultural modernization, environmental sustainability initiatives, and food security programs. The rapid growth of Chinese research output also indicates the strategic importance of sustainable agricultural transformation within emerging economies facing population growth and environmental pressures. The presence of developed countries such as the United States, the United Kingdom, and Germany highlights the increasing integration of sustainability into agricultural economic policy and technological innovation. Meanwhile, the participation of developing countries such as India and Brazil demonstrates growing global awareness regarding sustainable agricultural development.

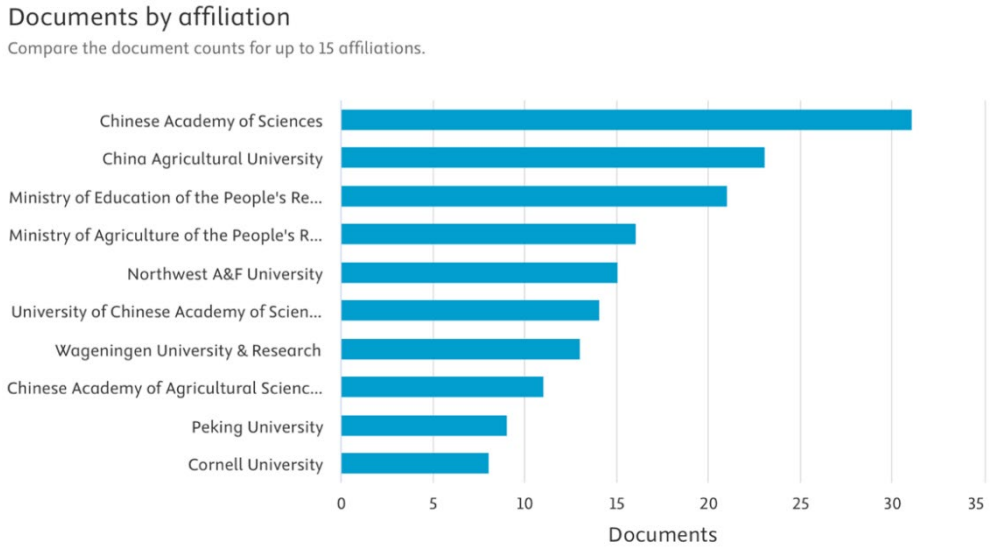

Figure 4. Number of Article by Affiliation

Seconds based on scholar pertinent in figure 5 institutional affiliation is predominantly by Chinese Academy of Sciences with 31 articles, followed by China Agricultural University with 23 articles, Ministry of Education of the People's Republic of China with 21 articles, Ministry of Agriculture of the People's Republic of China with 16 articles, Northwest A&F University with 15 articles, University of Chinese Academy of Sciences with 14 articles, Wageningen University & Research with 13 articles, Chinese Academy of Agricultural Sciences 11 articles, Peking University with 9 articles, Cornell University with 8 articles.

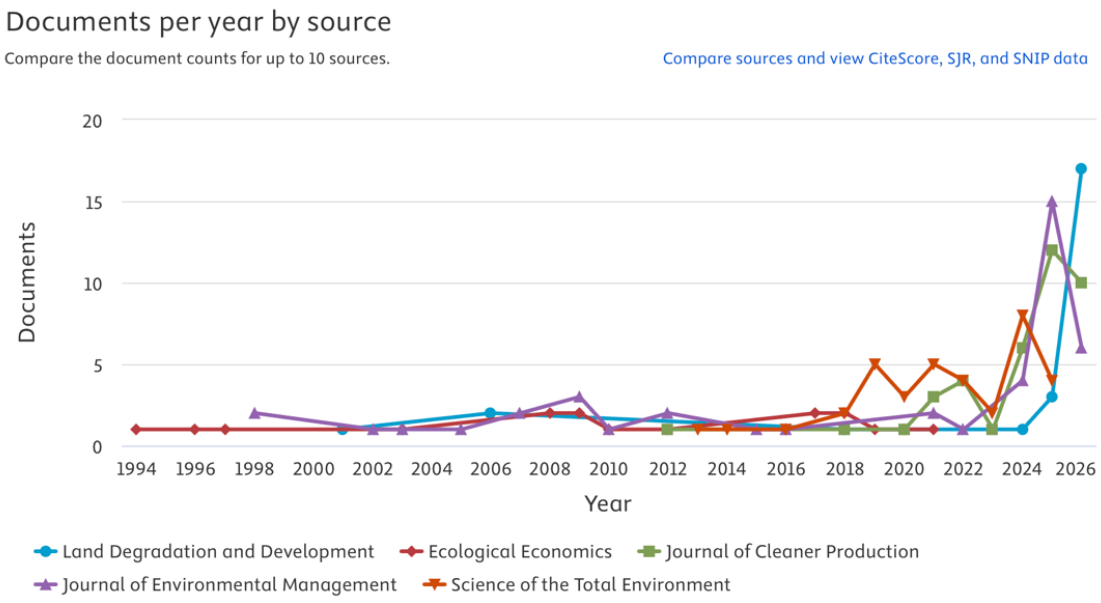

Figure 5. The Number of Articles by sources

The third in figure 6, allocation of inquiries about sustainable agriculture based on source is predominantly characterized by Journal of Environmental Management with 43 articles, and journal of cleaner production with 39 articles, sciences of the total environment with 36 articles, land degradation and development with 25 articles, and ecological economics with 17 articles, in figure 6 show that land degradation in 2026 there is 17 articles. Number of articles by sources (5 top sources)

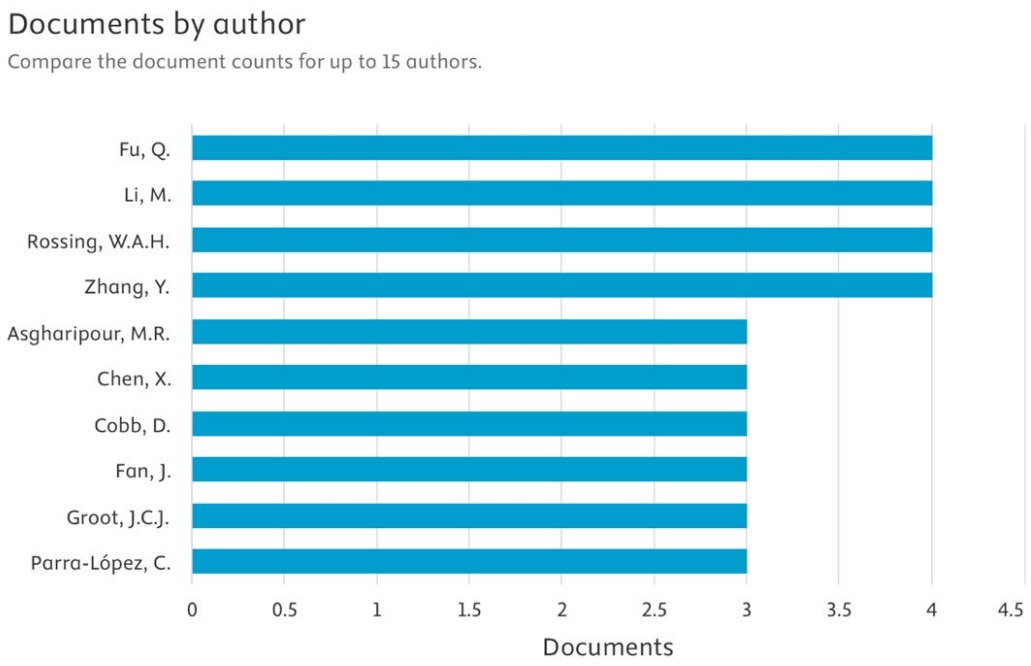

Figure 6. Count publication by author

The forth in figure 7, allocation of inquiries about sustainable agriculture based on author is predominantly characterized by Fu, Q., Li, M., Rossing, W.A.H., Zhang, Y (table 2). each them with 4 articles, and following with each 3 articles there are Asgharipour, M.R., Chen, X. Cobb, D. Fan, J. Groot, J.C.J. and Parra-López, C.

Table 2. List of Article by Fu, Q., Li, M

No	Name	Title	Journal	Link
1	(M. Li et al., 2026)	Meta-Analysis-Based Tillage Systems Optimization Promotes Synergy Among Crop Productivity, Water Use Efficiency and Carbon Emissions Under Changing Environments	Land Degradation and Development	https://www.scopus.com/pages/publications/105014596266?origin=resultslist
2	(H. Li et al., 2023)	An optimization approach of water-food-energy nexus in agro-forestry-livestock system under uncertain water supply	Journal of Cleaner Production	https://www.scopus.com/pages/publications/85152593687?origin=resultslist
3	(Cao et al., 2022)	A modeling framework for the dynamic correlation between agricultural sustainability	Journal of Cleaner Production	https://www.scopus.com/pages/publications/85126866913?origin=resultslist

		and the water-land nexus under uncertainty		
4	(M. Li et al., 2020)	Optimization of sustainable bioenergy production considering energy-food-water-land nexus and livestock manure under uncertainty	Agricultural Systems	https://www.scopus.com/pages/publications/85088369803?origin=resultslist

The bibliometric analysis reveals a highly uneven but globally expanding distribution of research productivity within sustainable agricultural economics. The findings indicate that research output is predominantly concentrated among technologically advanced and agriculturally strategic countries.

Institutional Distribution

Institutional analysis reveals that Chinese institutions dominate the research landscape. The Chinese Academy of Sciences ranked first with 31 publications, followed by China Agricultural University with 23 publications. Other leading institutions included the Ministry of Education of the People's Republic of China, Northwest A&F University, Wageningen University & Research, and Cornell University. This institutional concentration indicates strong governmental and academic support for sustainability-oriented agricultural research. Furthermore, the presence of internationally recognized institutions such as Wageningen University highlights the increasing globalization and interdisciplinary collaboration within sustainable agricultural economics.

Source and Journal Distribution

The analysis of publication sources demonstrates that environmental and sustainability-oriented journals dominate the field. The *Journal of Environmental Management* ranked first with 43 publications, followed by the *Journal of Cleaner Production* with 39 publications and *Science of the Total Environment* with 36 publications. This pattern indicates that sustainable agricultural economics is increasingly integrated with environmental science, ecological management, and sustainability studies. The dominance of interdisciplinary journals further confirms that agricultural economics is evolving beyond traditional economic analysis into broader sustainability-oriented frameworks.

Author Productivity

The most productive authors included Fu, Q., Li, M., Rossing, W.A.H., and Zhang, Y., each contributing four publications. Their research primarily focuses on water-food-energy nexus systems, agricultural optimization models, and sustainability assessment under uncertain environmental conditions. The thematic concentration among leading authors demonstrates that current research trends increasingly prioritize systems-based approaches integrating economics, environmental management, climate adaptation, and

technological optimization. Overall, the research landscape reflects a highly interdisciplinary and globally interconnected field characterized by strong contributions from environmental sciences, sustainability studies, agricultural systems analysis, and economic policy research.

RQ3: The Theoretical and Practical Implications Emerging from the Literature for Advancing Future Research

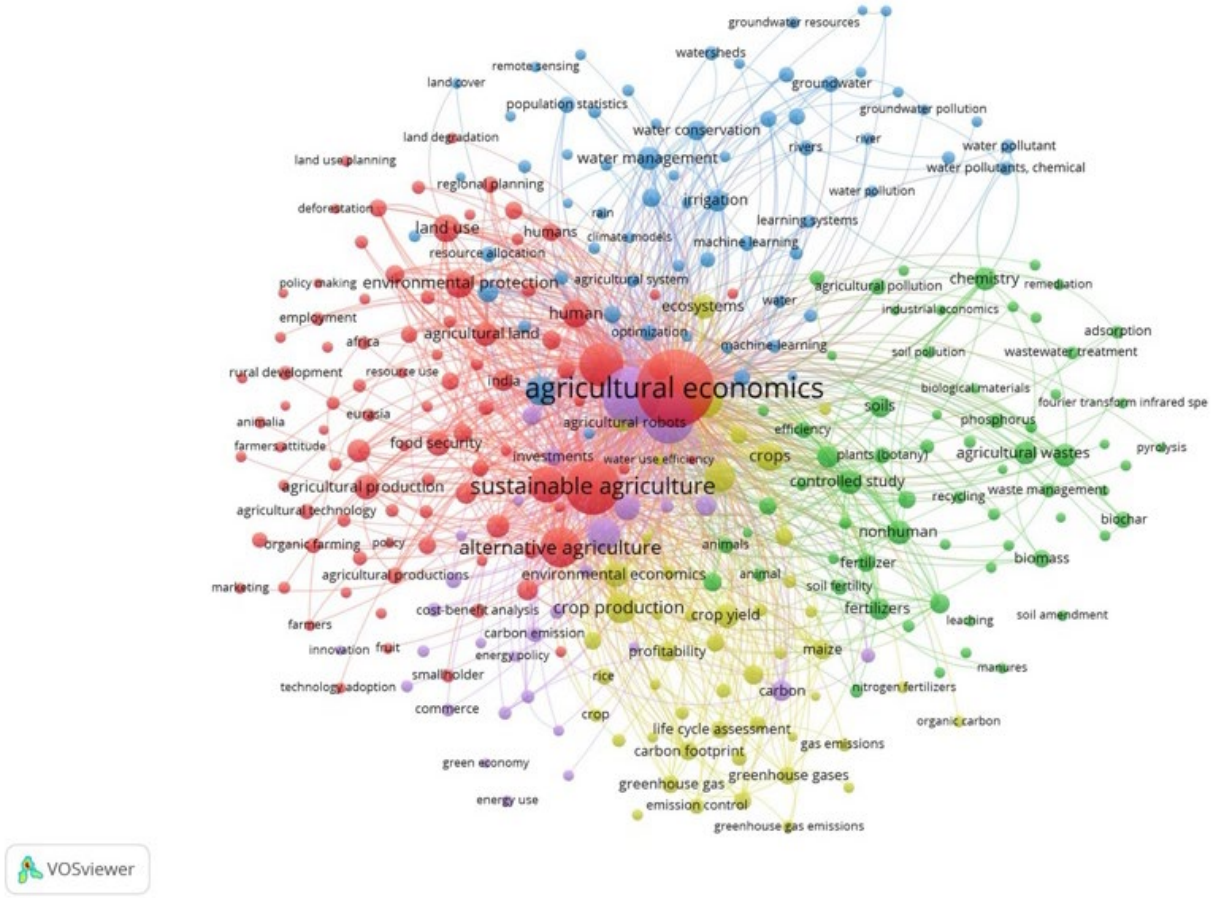

Figure 7.Co-Occurrence framework and representation of key terms

Table 3. Keywords by Author

No	Keywords	Occurrence	Total Link Strength
1	Agricultural economics	561	5481
2	Sustainable development	312	4318
3	Sustainable Agriculture	273	3417
4	Agriculture	244	3666
5	Economics	177	2625
6	Alternative Agriculture	148	1871
7	Economic and social effects	106	1586
8	Sustainability	124	1518
9	Economic analysis	98	1484
10	Crop Production	89	1306

As presented in Figure 8 and Table 3 the co-occurrence analysis reveals several dominant themes shaping the intellectual structure of sustainable agricultural economics. The most frequent keywords include "agricultural economics," "sustainable development," "sustainable agriculture," "agriculture," "economics," "alternative agriculture," "economic and social effects," "sustainability," "economic analysis," and "crop production."

These findings suggest that sustainable agricultural economics is fundamentally structured around the integration of economic performance, environmental sustainability, and social impact assessment. The strong interconnection among these keywords demonstrates that sustainability is no longer treated as an isolated environmental issue but as a multidimensional framework influencing all aspects of agricultural economic systems.

Theoretical Implications

Theoretically, the findings indicate that sustainable agricultural economics is increasingly adopting systems-oriented and interdisciplinary perspectives. Traditional agricultural economic models focused primarily on productivity and profitability are gradually being replaced by integrated frameworks emphasizing resilience, ecological sustainability, and socio-economic inclusiveness.

The literature also demonstrates growing emphasis on nexus-based approaches such as water-energy-food-land systems, reflecting the recognition that agricultural sustainability cannot be analyzed through isolated variables. This shift contributes to the development of more holistic economic theories capable of addressing complex sustainability challenges.

Furthermore, the increasing integration of technological innovation—including blockchain, IoT, artificial intelligence, and precision agriculture—suggests that future theoretical frameworks must incorporate digital transformation and technological adaptation within sustainability economics.

Practical Implications

Practically, the findings emphasize the need for policymakers, agricultural stakeholders, and economic institutions to adopt integrated sustainability strategies. The increasing prominence of themes such as alternative agriculture, circular economy practices, and resource optimization indicates that future agricultural systems must balance productivity with environmental protection and social welfare.

The findings also suggest that sustainable agricultural policies should prioritize: climate resilience, efficient resource utilization, renewable energy integration, sustainable land management, and socio-economic inclusiveness.

In addition, the dominance of sustainability-related keywords demonstrates the importance of incorporating sustainability indicators into agricultural economic evaluation and policy assessment.

The study further indicates that future research should focus on underexplored areas such as: financial mechanisms for sustainable agriculture, socio-economic inequality in agricultural transitions, policy effectiveness evaluation, sustainability governance, and technological accessibility for small-scale farmers.

Overall, the literature confirms that sustainable agricultural economics has evolved into a multidisciplinary and policy-relevant field with significant implications for global food systems, environmental sustainability, and economic resilience.

CONCLUSION

This study examined the development, distribution, and future implications of sustainable agricultural economics through a combined Systematic Literature Review and bibliometric analysis approach. The findings demonstrate that sustainable agricultural economics has experienced substantial growth and has become an increasingly important area of academic inquiry. Publication trends reveal strong and continuous expansion, particularly between 2024 and 2026, confirming the growing global relevance of sustainability-oriented agricultural research.

The bibliometric analysis indicates that research productivity is dominated by China and several technologically advanced countries, while leading institutions and journals emphasize interdisciplinary integration between economics, sustainability, and

environmental sciences. The thematic analysis further reveals that major research themes revolve around sustainable development, agricultural economics, crop production, sustainability assessment, and economic analysis.

The study concludes that sustainable agricultural economics is evolving into a comprehensive and multidisciplinary field that integrates economic performance, environmental sustainability, technological innovation, and social equity. Future research should continue exploring integrated policy frameworks, sustainability governance, technological adaptation, and socio-economic dimensions to strengthen resilient agricultural systems capable of addressing future global challenges.

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