

Unveiling Agripreneurial Path to Sustainable Food Security: A Bibliometric Exploration of Agriculture Dynamics

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a) ABSTRACT

Objective: The objective of this research is to examine the convergence of agriculture, entrepreneurship, food security, dynamics, technology, and sustainability, with the goal of understanding the changing environment and significant patterns within these interrelated fields. Utilising the extensive collection of the Scopus repository, data encompassing the time period from 2004 to 2024 were obtained and subjected to a rigorous filtering process to assure its pertinence and comprehensiveness. A comprehensive selection of 1,571 articles and reviews was made for the purpose of analysis. These sources encompass a wide range of academic fields, such as social sciences, environmental science, agriculture and decision sciences, business, management and accounting, economics, econometrics and finance, psychology, arts and humanities, biological science, multidisciplinary studies.

Methodology: The study used a quantitative technique, specifically using bibliometric analysis to investigate trends related to authorship, publications, citations, as well as significant journals and contributors.

Findings: The results emphasise the increasing significance and cross-functionality of research in various areas, demonstrating a stronger emphasis on tackling intricate issues like sustainable food security as well as agricultural dynamics via technical advancements and entrepreneurial endeavours.

Conclusion: This study enhances understanding and contribution to agripreneurship, food security, technology, and sustainability, offering valuable insights for scholars, practitioners, and policymakers.

Keywords: Agripreneurship, Food Security, Bibliometric analysis, Technology in agriculture, Sustainability.

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II. INTRODUCTION

The attainment of sustainable food security requires a thorough understanding of agricultural dynamics and the implementation of novel strategies [9]. The concept of agripreneurship which refers to the entrepreneurial endeavour inside the agriculture industry, is gaining recognition as a significant catalyst for the development of a sustainable food system [8]. This is achieved via the utilization of innovation, technology, and an entrepreneurial mindset [8]. The acknowledgement of this phenomenon highlights the need for a fundamental change in the approach to educational, research, and extension aspects within the agricultural

academic community in order to effectively tackle the issues of sustainability on an ecological scale and social responsibility [3]. In the present context, the significance of sustainable agriculture cannot be overstated, as it necessitates the reconfiguration of methodologies grounded on a thorough understanding of the agriculture system [12]. It is essential for developing nations to acknowledge the lucrative nature of sustainable agriculture as a sector that requires a considerable degree of expertise [12].

This research seeks to discover significant patterns and trends within the intersectional area of agripreneurship, in order to get a full understanding of its multiple dynamics

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and its influence on security that is sustainable and hunger eradication.

1. To assess the aggregate quantity of scholarly works including the convergence of agricultural entrepreneurship, sustainable food security, along with hunger-free sustainable development.
2. To examine the progression of literature and research in the field of agricultural dynamics, with a specific emphasis on entrepreneurial strategies for tackling food security issues.
3. The objective of this study is to examine the impact of technology on the farming process, agricultural systems, and agripreneurial businesses, with a particular focus on sustainability and resilience.
4. To evaluate the impact of agripreneurship on the attainment of zero hunger objectives and the promotion of inclusive economic development in rural areas.

In light of the detected trends and patterns, this study aims to provide valuable insights and suggestions to policymakers, practitioners, and stakeholders to improve agricultural entrepreneurship, nutritional security, and zero hunger programmes.

III. LITERATURE REVIEW

The incorporation of entrepreneurial ideas into the agricultural sector, known as agripreneurship, has been recognized as a significant catalyst for ensuring food security and promoting sustainable economic growth in diverse settings. It is imperative to include agripreneurship education in the national curriculum, with a particular focus on its capacity to generate economic prospects and foster food security [13]. Likewise, agripreneurship plays a significant role in India by tackling rural unemployment, enhancing production, and advocating for sustainable farming methods [1]. The increasing need for agricultural products, feed and fuel necessitates the development of customized solutions in the field of agronomy, whereby agripreneurship assumes a pivotal role [11]. The potential of agriculture entrepreneurship in enhancing Indian agriculture, namely in terms of creating job opportunities, diversifying revenue sources, and reducing poverty. Collectively, these studies highlight the substantial impact of agripreneurship on the improvement of agripreneurship on the improvement of food security and the promotion of sustainable economic growth [2].

Agripreneurs are essential for improving agricultural output and adapting to market volatility by adding value, diversifying, and establishing connections with the market [6]. Technological advancements, such as the use of technologically advanced cultivation and precision farming techniques, have significantly transformed agricultural methodologies, leading to enhanced resource utilisation and heightened environmental sustainability [4]. The problem of

world poverty and hunger, which has been further intensified by the COVID-19 epidemic, is a multifaceted one that needs a comprehensive strategy [6]. Historically, governmental solutions have been centred upon the implementation of assistance, trading agreements, and social security systems [6]. However, it is imperative to acknowledge and tackle gender inequalities, encourage young people in agricultural activities, and foster inclusive business models [6]. This has significant importance, especially when considering the problems posed by changing climate and other socioeconomic elements [6]. Enhancing food security requires heightened investment and legislative changes, with a special emphasis on emerging nations [10].

IV. METHODOLOGY

A. Bibliometric Analysis

The present research employs bibliometric analysis as its technique, a quantitative strategy used to examine the quantity and trajectory of literature inside a burgeoning field. Two methodologies were used in the investigation, namely analysis of performance and science mapping. The performance study assessed the publishing output and growth patterns over time for different nations, authors, and affiliated institutions. The science mapping analysis included many techniques, including co-citation evaluation, co-authorship evaluation, co-word analysis, and theme evolution analysis. These methods were used to ascertain the interconnections between publications and to investigate the organisation and progression of the study domain. The purpose of the evolution study was to comprehend the progression of the research area throughout time and forecast forthcoming patterns [5].

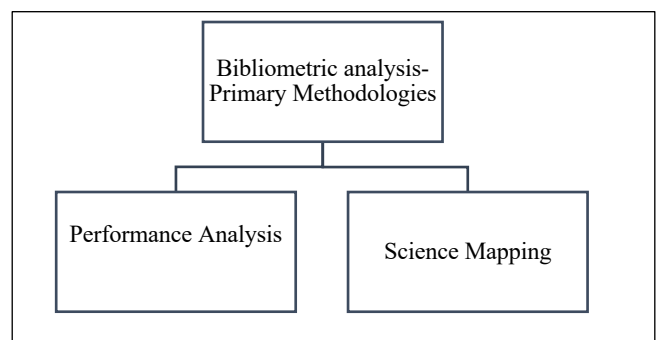


Fig1. Bibliometric evaluation methods

B. Data Source

The research utilised a multi-step process to gather and analyse pertinent material from the Scopus repository. The first stage included the establishment of selection criteria, which specifically targeted articles from 2004 to 2024. These publications covered a wide variety of topic areas that are pertinent to agriculture, entrepreneurship, food security,

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List of countries' scientific output		List of most significant authors	
Country	Frequency	Authors	Articles
China	648	Klerkx l	25
Uk	394	Leeuwis c	10
India	382	Wang y	10
Italy	335	Zhang y	8
Usa	314	Brunori g	7
Indonesia	279	Kumar s	7
Netherlands	242	Li x	7
Germany	210	Li y	7
Australia	198	Liu y	7
Nigeria	160	Zhang z	7

dynamics, technology, and sustainability. Following that, the process of retrieving and cleaning data was carried out by using a search string that included essential phrases pertaining to the research's focal point, such as "agriculture AND entrepreneurship," "food AND security," "agriculture AND dynamics," and "technology AND agriculture AND sustainability." The scope of the search was restricted to articles and reviews written in the English language, encompassing a wide range of subject areas such as social sciences, environmental science, agriculture and biological science, business, management and accounting, economics, econometrics and finance, decision sciences, multidisciplinary, psychology, as well as arts and humanities. Following the implementation of filters and the refinement of search results, a complete dataset consisting of 1,571 documents was chosen for the purpose of analysis and interpretation.

V. FINDINGS

To get comprehension of the research inquiries, the database was examined in two distinct aspects performance evaluation and scientific mapping.

A. Publication production and development trend

The subject field had remarkable growth since 2004, as depicted in Figure 1, over a total of 479 papers published in 2023. The predominant sources of literature were derived from China and the United Kingdom, including primary sources such as Sustainability (Switzerland) and the Journal of Cleaner Production. Klerkx, Leeuwis, and Wang were the principal contributors who made noteworthy contributions. Agriculture and food security, sustainable development, and innovation were the most frequently used keywords.

The outcomes of this study indicate a growing pattern and potential areas for investigation in the integration of

agriculture and technology across many fields, such as business, social sciences, management and humanities. It is advised to do more studies in novel and advanced fields to

List of most significant sources	
Sources	Frequency
Sustainability (switzerland)	160
Journal of cleaner production	37
Environment, development and sustainability	31
Land	31
Environmental science and pollution research	29
Frontiers in sustainable food systems	29
Journal of rural studies	27
British food journal	24
Agriculture (switzerland)	23
Technological forecasting and social change	22

enhance the comprehension of agripreneurial dynamics. The results further emphasise the need os thoroughly analyzing the long-term correlation between the factors in the endeavour to achieve sustainable food security.

TABLE I. LIST OF TOP CONTRIBUTING COUNTRIES AND AUTHORS

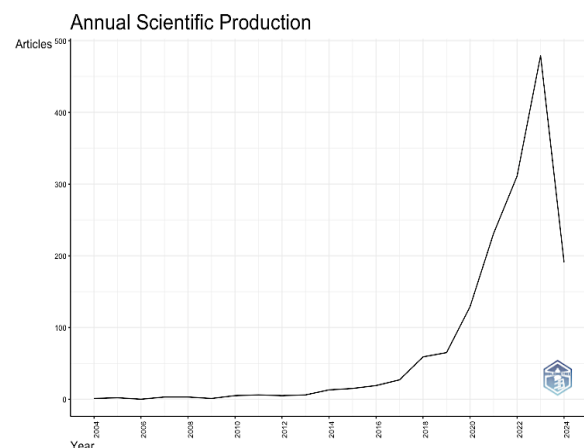


Fig. 1. (Annual scientific production)

TABLE II. LIST OF MOST FREQUENTLY REFERENCED AND IMPACTFUL PUBLICATIONS PRODUCED FROM 2004 TO 2024

TABLE III. LIST OF TOP CONTRIBUTING AFFILIATING UNIVERSITY AND

List of articles and total citation	
Article	TOTAL CITATION
Klerkx I, 2019, A review of social science on digital agriculture, smart farming and agriculture 4.0: New contributions and a future research agenda	589
Chowdhury P, 2021, COVID-19 pandemic related supply chain studies: A systematic review	560
Hyde KD, 2019, The amazing potential of fungi: 50 ways we can exploit fungi industrially	457
Rissman J, 2020, Technological and policy measures to decarbonise the global industrial sector: An analysis and evaluation of mitigation catalysts through 2070	432
Orsini F, 2013, Urban agriculture in the developing world: A review	424
Banerjee AV, 2005, Growth Theory through the Lens of Development Economics	397
Silvestre BS, 2019, Innovations for sustainable development: Moving toward a sustainable future	336
Horlings LG, 2011, Towards the real green revolution? Exploring the conceptual dimensions of a new ecological modernisation of agriculture that could 'feed the world'	325
Frizzo-barker J, 2020, Blockchain as a disruptive technology for business: A systematic review	322
Sima V, 2020, Influences of the industry 4.0 revolution on the human capital development and consumer behavior: A systematic review	292

List of most significant affiliating universities and keywords			
Affiliation	Article	Keyword	Occurrence
Wageningen university	87	sustainable development	183
Wageningen university and research	63	sustainability	172
University of kwazulu-natal	41	innovation	112
International institute of tropical agriculture (iita)	39	agriculture	101
Covenant university	28	china	100
Mae fah luang university	25	food security	90
Sichuan agricultural university	25	climate change	85
Ghent university	22	human	77
Kwame nkrumah university of science and technology	22	literature review	74
University of ghana	21	food supply	72

B. Total Citations

To get comprehension of the research inquiries, the database was examined in two distinct aspects performance evaluation and scientific mapping. Table III indicates that the article “Review of Social Science on Digital Agriculture, Smart Farming and Agriculture 4.0: new Collaborations and a Future Research Agenda” by Klerkx I, 2019, received a significant number of citations in the field of digitalized agriculture and food security, totalling 589. In his work, Klerkx elucidated that the integration of digital technology has resulted in novel economic structures and institutional transformations, which can enhance productivity, effectiveness and sustainability in the agricultural sector.

KEYWORDS

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Nevertheless, it is crucial to take into account the societal ramifications of these innovations, including their influence on the identity, competencies, and labour of farmers, as well as the dynamics of power, privacy, and ethical considerations within agricultural practices and value chains. Further exploration of these topics and the contribution of digital agriculture to food security and the elimination of hunger need future multidisciplinary and transdisciplinary studies [7].

C. Thematic Evolution: Future developments and evolution analysis of themes in the fields of agripreneurship, sustainable food security, and zero hunger sustainable development

An examination of agroentrepreneurship, sustainable development, zero starvation, and food security underscores the significance of rural development, innovation, agroindustry, and technology adoption. Initially, innovations in technology and agroindustry were prioritised, but with the intensification of environmental and social challenges, there is a transition towards sustainability and inclusivity. This consists of nurturing inclusive rural development pathways, addressing accessibility, nutrition, and resilience, and promoting sustainable practices. Potential future advancements could involve a greater degree of technological integration, including blockchain and precision agriculture, with the aim of streamlining supply chain transparency and optimising resource allocation. Furthermore, a greater emphasis could be placed on the concepts of the circular economy, which promotes mutually beneficial connections among renewable energy, waste reduction, and agricultural production. Additionally, there may be an increased emphasis on social entrepreneurship as the evolution takes place, enabling marginalised groups and local communities to benefit from and partake in sustainable agricultural systems. It is anticipated that these themes will experience dynamic changes as a result of further research, stimulating the development of inventive approaches to attain worldwide food security and eradicate poverty in a sustainable manner.



Fig. 2. (Thematic Evolution)

VI. DISCUSSIONS AND CONCLUSION

An in-depth understanding of the intricacies of agriculture is provided through the bibliometric investigation of agripreneurial routes to sustainable food security. Research at the convergence of agricultural entrepreneurship, sustainability, as well as food security is gathering traction, according to the findings, which indicate an increasing interest in interdisciplinary approaches. The key themes of the discourse encompass the importance of policy frameworks in promoting sustainable food systems, the value of innovation in augmenting agricultural productivity, and the necessity of market-oriented strategies for achieving success as an entrepreneur. As additional paradigms shift within the field, the analysis highlights the emergence of novel ideas such as social agripreneurship and agri-tech entrepreneurship. As a whole, this research underscores the intricate complexities surrounding food security and the pivotal significance that agripreneurship possesses in this regard.

A. Theoretical Implications

The study's results acknowledge the significant contributions made by writers with high citation rates and their important publications. These works have played a crucial role in establishing a solid foundation of knowledge and enhancing existing research on agricultural entrepreneurship, sustainable food security, along with sustainable development with the goal of eradicating hunger. The research offers vital insights into the underlying principles, frameworks of theory, and methodological techniques that have formed the subject by identifying these major writers and their essential publications. Furthermore, the ramifications include the creation of theories and frameworks, as emerging scholars and researchers may use the discovered deficiencies in research, obstacles, and ethical issues to propel the progress of theoretical constructions and conceptual frameworks. Future research endeavours have the potential to enhance the comprehension of agricultural entrepreneurship and its role in promoting sustainable food security and zero hunger by establishing upon existing knowledge and addressing critical gaps in the literature. This can be achieved through the refinement and expansion of theoretical models.

B. Practical Implications

This study's results have important practical implications for management, governments, and organisations engaged in agricultural entrepreneurship, security that is sustainable, and sustainable development with the goal of eliminating hunger. Through the identification of writers with high citation rates and prominent works, this study provides vital insights into the fundamental knowledge and significant research deficiencies within their respective domains. Managers have the ability to use this knowledge in order to

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enhance strategic decision-making and allocate resources effectively. This involves prioritising research and innovation efforts that are in line with current trends and developing issues. In contrast, policymakers have the opportunity to use the discovered research gaps and impediments in order to guide the formulation of policies and regulatory frameworks that are designed to foster agripreneurial enterprises, bolster food security, and attain the objectives of zero hunger. Furthermore, the study results may be used by organisations working in the food and agricultural sectors to inform investment choices, facilitate cooperation with research institutes, and develop programmes that encourage sustainable practices and equitable development. In summary, this research has practical consequences that may improve cooperation, stimulate innovation, and promote joint endeavours in order to achieve long-term food security and eliminate hunger worldwide.

C. Limitations and Future Scope of the Research

There are various limitations inherent in this research that require careful examination. Initially, the search parameters and keywords used may have unintentionally omitted pertinent material, perhaps disregarding crucial ideas and viewpoints in the areas of agricultural entrepreneurship, and sustainable food security, including eliminating hunger via sustainable development. Enhancing the scope of the review might be achieved by expanding the search criteria to include a wider array of keywords and databases. Furthermore, the omission of non-peer-reviewed materials, such as novels, book sections, and conference papers, may have constrained the research's breadth, disregarding significant contributions and alternate perspectives. Moreover, the study's dependence on a solitary database structure, such as Scopus, would have unintentionally added prejudice and limited the applicability of the results. Future research has the potential to overcome these constraints by using a more inclusive methodology, integrating a wide range of literature sources, and utilising numerous databases to conduct a more thorough study. Moreover, while the bibliometric methodology offers useful quantitative perspectives, it may not fully include the intricate qualitative dimensions of the subjects being examined. Hence, the integration of qualitative research methodologies with bibliometric analysis has the potential to provide a comprehensive comprehension of agripreneurship, food security for all, along with zero hunger sustainable development. This may facilitate the acquisition of profound insights and the formulation of more resilient conclusions.

D. Recommendations

According to the results obtained from the study, several suggestions may be put forward to enhance scholarly inquiry

and practical applications in the fields of agripreneurship, sustainable food security, and the eradication of hunger.

- **Interdisciplinary Integration:**

Promote cross-functional cooperation among scholars, professionals, policymakers, and individuals with vested interests from several domains like agriculture, the entrepreneurial process, the field of economics ecological science, and the social sciences. Adopting a cooperative approach may foster creative ideas that successfully address the complex challenges related to maintaining adequate nutrition and ending poverty.

- **The promotion of technology use in agriculture is crucial for enhancing production, efficiency, and sustainability:**

To improve efficiency, productivity, and sustainability in agriculture, technology use must be encouraged. The study should focus on exploring unexplored advancements such as machine learning, the blockchain, and high-tech farming to improve logistics administration, reduce food wastage and maximise conservation of resources.

- **potential enhancement:**

Assign facilities to develop the expertise, abilities, and assets required for farm innovators, small to medium growers, and agrarian populations. This will enable them to adopt sustainable farming methods, diversify their means of revenue, and mitigate the negative impact of environmental change on the cultivation of crops.

- **Political action for practices changes:**

Highly supporting legislative structures that reward enterprising farmers, encourage sustainable farming practices, and put an emphasis on improving the nutritional needs of individuals and ensuring their access to healthy food. The authorities should prioritise funding agro development and research, trading rights, improvements to infrastructure, and protective measures to aid small-scale growers and minority groups.

- **Mutual support and the sharing of knowledge:**

Promote collaborative alliances and information dissemination networks across governmental bodies, non-governmental organisations, academic institutions, and private enterprises to facilitate the exchange of exemplary methodologies, acquired insights, and incentive strategies in the realms of agricultural entrepreneurship with sustainable food security. Collaborative endeavours have the potential to enhance the expansion of effective treatments and the duplication of established models across diverse settings.

- **Involvement of the Community:**

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This proposal supports the adoption of community-led approaches in the areas of sustainable food manufacture, sale, and usage. It highlights the importance of effectively engaging and empowering communities in how decisions are made. Community-led efforts like community-supporting cultivation, growers associations, and marketplaces have the potential to enhance regional agricultural economies, enhance nutritional well-being, and promote unity among people.

- Tracking and appraisal:

Developing comprehensive protocols for monitoring and evaluation is essential to correctly evaluate the effect of agripreneurial efforts on larger growth objectives, as well as the attainment of hunger eradication and secure food for all. Comprehensive impact evaluations provide a scientifically validated understanding of the effectiveness of different strategies, hence influencing future decisions about initiatives and policies. By implementing these instructions, players may help to establish long-lasting nutritional stability and eliminate poverty. Establishing that entrepreneurial farming effectively contributes to positive economic, environmental, and social transformations is assured.

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