

A BIBLIOMETRIC ANALYSIS OF YOUTH MIGRATION AND ITS IMPACT ON AGRICULTURAL SYSTEMS

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ABSTRACT

Youth migration from rural to urban areas has become a significant demographic trend, particularly in developing countries, with far-reaching consequences for agricultural systems. The exodus of young people from agriculture due to lack of employment opportunities, unattractive working conditions, and limited innovation prospects has led to growing concerns over the sustainability, productivity, and generational continuity of farming. This study presents a comprehensive bibliometric analysis to explore the global research landscape on youth migration and its impact on agriculture, covering the period from 1984 to 2024. Using data sourced from Scopus and Web of Science databases, a total of relevant 29 peer-reviewed articles were extracted and analyzed using the Bibliometrix R package and Biblioshiny interface. The analysis identifies trends in scientific production, key contributing countries, institutional collaborations, influential authors, and dominant research themes. Results reveal a notable surge in publication activity post-2019, reflecting increasing academic interest driven by issues such as climate change, rural employment, food security, and sustainable development. The United States leads in research output, while countries like India and Australia exhibit strong international collaboration. Thematic mapping and word cloud visualizations highlight employment, migration, and agriculture as core issues, with emerging interest in climate adaptation, digital agriculture, and youth career development. The study also identifies critical gaps in the literature, particularly the underdevelopment of themes such as land access, vulnerability, and localized youth dynamics. This bibliometric assessment offers valuable insights into the evolution of the field and serves as a foundation for future interdisciplinary research, evidence-based policymaking, and youth-focused agricultural initiatives. The findings underscore the urgent need to reposition agriculture as a viable and sustainable career for rural youth globally.

KEYWORDS: Youth Migration, Agriculture, Rural Employment and Bibliometric Analysis

1.INTRODUCTION

Youth migration from rural to urban areas has become a defining demographic trend with far-reaching implications for agriculture particularly in developing countries (Kosecet.al.,2018). According to the United Nations (2022), over 1.2 billion people aged 15–24 comprise the global youth population, and a substantial proportion resides in rural areas. The International Fund for Agricultural Development (IFAD, 2019) reports that more than 75% of rural youth in low-income countries are either unemployed or engaged in informal work, prompting many to migrate in search of better livelihood opportunities. This migration trend is contributing to an aging rural workforce. The average age of farmers globally is rising, surpassing 60 years in many parts of sub-Saharan Africa and South Asia (FAO, 2018). The outmigration of young people from agriculture has resulted in serious concerns over the sustainability, innovation capacity, and labor intensity of farming systems (Maharajanet.al.,2020). In India alone, the proportion of rural youth (15–29 years) engaged in agriculture declined from 59% in 1993–94 to 38% in 2017–18 (NSSO, 2019), reflecting a broader shift away from traditional farming livelihoods.

At the same time, the relationship between migration and agriculture is complex. Remittances sent by migrants can sometimes improve agricultural investment and mechanization (World Bank, 2020) but often this is not sufficient to offset labor shortages and knowledge gaps. Furthermore, youth migration may lead to land abandonment or shifts toward less labor-intensive crops, ultimately affecting food security and rural economies.

Although research on youth migration and agriculture has grown in recent years, no comprehensive bibliometric assessment has yet been undertaken to map the scientific landscape of this field. A bibliometric analysis offers a quantitative method to evaluate the structure, volume, trends and intellectual networks of existing literature.

2. METHODOLOGY

2.1. Research Design

This study employed a bibliometric analysis approach to quantitatively evaluate the scientific literature on youth migration and its impact on agricultural systems. Bibliometric analysis helps to identify publication trends, prolific authors, influential journals, core research themes, and international collaborations within a specific field of study.

2.2. Data Source

The bibliographic data for this study were retrieved from two comprehensive academic databases such as Scopus and Web of Science Core Collection. These databases were selected due to their wide coverage of peer-reviewed literature and availability of citation and metadata for bibliometric mapping.

2.3. Search Strategy

A systematic search was conducted using a combination of keywords and Boolean operators. The keywords used included “Youth migration”, “Rural Youth Migration”, “Agriculture”, “Farming systems”, and “Impact”, with Boolean operators such as “AND” and “OR” employed to refine the search. This strategy ensured the inclusion of literature addressing the intersection of youth migration and agriculture across various thematic dimensions.

2.4. Inclusion and Exclusion Criteria

Only research articles, review papers, and conference papers were included, while book chapters, books, and book series were excluded to maintain consistency in publication types. The analysis was limited to English-language documents that were final and fully published, excluding articles in press.

2.5. Data Extraction and Analysis Tools

A total of 29 documents meeting the criteria were selected for analysis. Data were extracted from Scopus and Web of Science in BibTeX format. The analysis was conducted using the Bibliometrix R Package, a comprehensive tool for science mapping. The Biblioshiny web interface was used for ease of visualization and interaction (Moral-Munoz *et al.*, 2020).

3. RESULTS AND DISCUSSION

3.1. Annual Production

The annual scientific output on the topic of youth migration and its impact on agriculture from 1984 to 2024 was represented in the Figure 1. The early years (1984–2010) show sporadic and minimal publication activity, often with one or no articles published in a given year. However, from 2011 onward, there is a gradual increase, indicating a growing academic interest in this interdisciplinary area.

A notable surge is observed post-2019 with peak publication activity in 2023 reaching five articles the highest in the dataset. This trend suggests that global concerns about youth outmigration, rural sustainability and agricultural labor shortages have gained significant scholarly attention in recent years. These issues are often linked to broader factors such as climate change, rural-urban migration and food security which are increasingly discussed in recent academic literature (Akbar *et al.*, 2021; Abebawet *et al.*, 2023; D'Haeseet *et al.*, 2020). The growing attention reflects an urgent need to engage youth in agriculture to mitigate the risks of an ageing farm workforce and promote sustainable rural development. The rising interest reflects broader policy discourses that emphasize the need to retain youth in agriculture to ensure future productivity and rural development (HLPE, 2021).

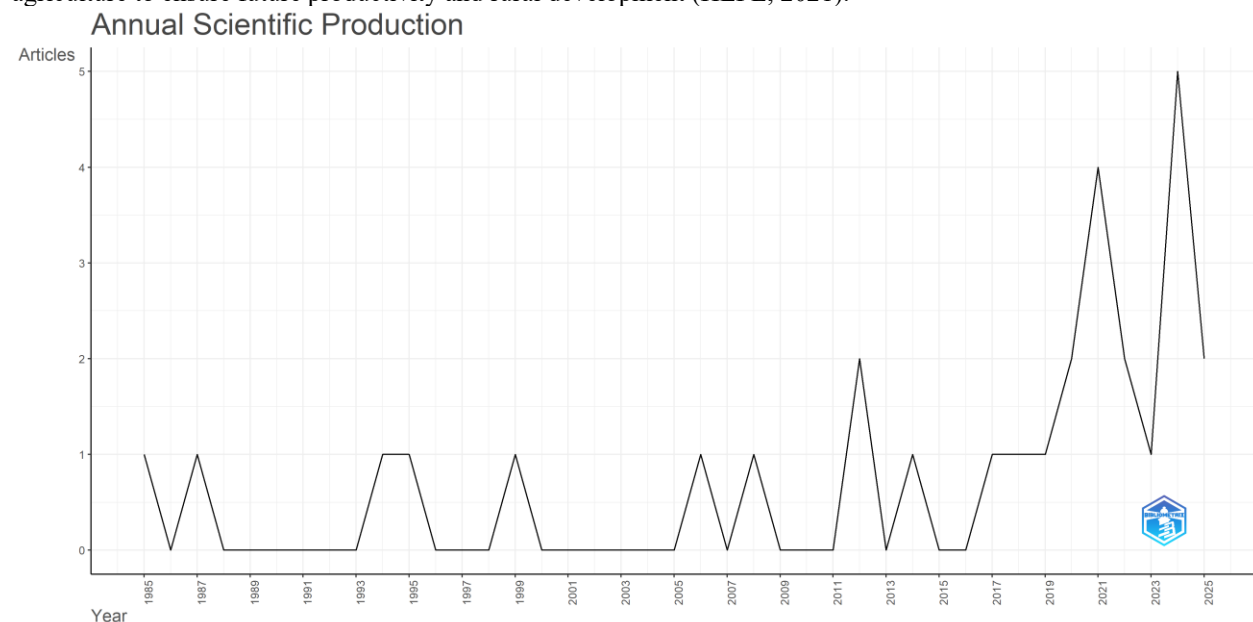


Figure 1. Annual Scientific Production

3.2. Corresponding Author Countries

The bar chart visualizes the geographic distribution and collaboration patterns of corresponding authors who have contributed to academic publications on Youth and Agriculture is presented in the Figure 2. It classifies their output into:

- SCP (Single Country Publications) – research done solely within one country.
- MCP (Multiple Country Publications) – international collaborations involving authors from more than one country.

The United States leads in research output with the highest number of publications (5), showcasing a balanced contribution of both Single Country Publications (SCP) and Multiple Country Publications (MCP). This indicates that the USA is not only actively conducting independent research but is also deeply engaged in international collaborations, reflecting its global influence and leadership in this field.

In contrast, countries like Australia and India are exclusively involved in MCPs, suggesting their strong inclination towards international collaborations, possibly driven by cross-border policy dialogues, global research networks, or donor-funded initiatives. Meanwhile, countries such as Kenya, Malaysia, South Africa, Sri Lanka, and Vietnam have only SCPs, implying that their research is more nationally focused, addressing localized challenges related to youth engagement in agriculture such as unemployment, access to land, or rural migration.

Additionally, countries like Bangladesh, Canada, and the Netherlands contribute solely through MCPs, signaling that their involvement is primarily within joint global projects rather than standalone national programs. The geographic diversity represented in the chart with countries from North America, Asia, Africa, and Europe underscores that youth and agriculture is a globally acknowledged issue requiring a multi-pronged approach (Moseley,2017).

The prevalence of international collaborations (MCPs), particularly among major contributors like India and Australia, suggests that youth involvement in agriculture is recognized as a transnational concern necessitating shared learning, comparative research, and best practices. On the other hand, countries engaged solely in SCPs may be more focused on internal policy frameworks or specific socio-economic contexts. The mix of independent and collaborative efforts reflects the complex, context-specific, and multi-dimensional nature of youth participation in agriculture.

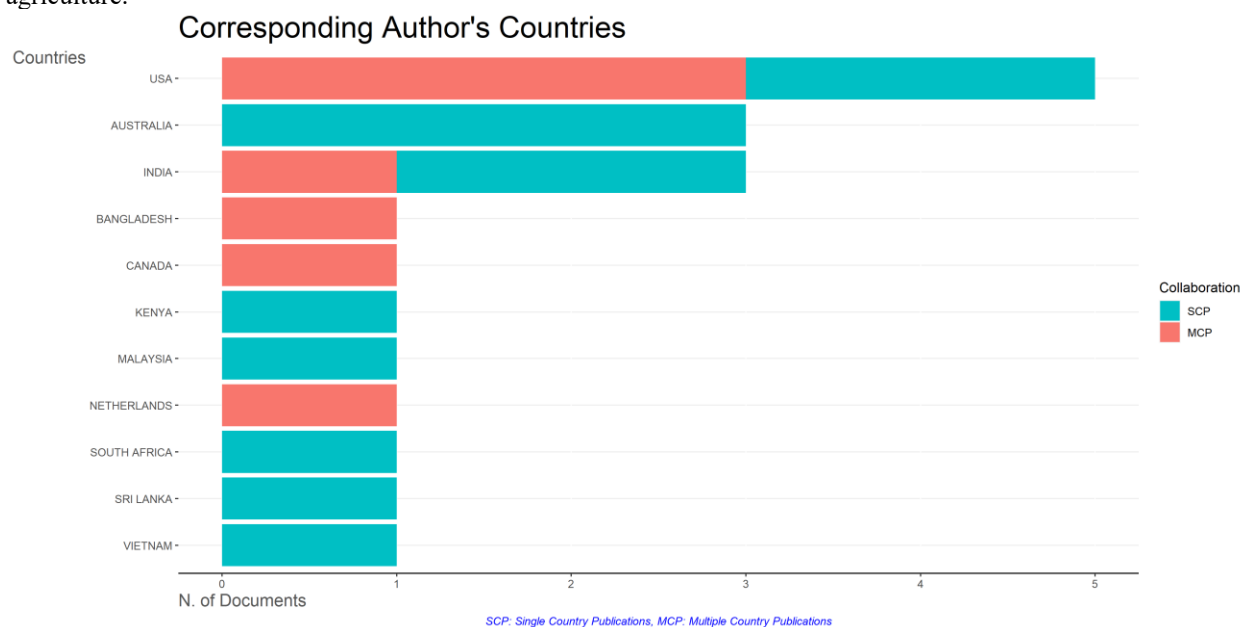


Figure 2. Corresponding Author's Countries

3.3.Three-Field Plot Diagram

The Three-Field Plot Diagram give the interconnections between Cited References (CR), Authors (AU) andKeywords/Descriptors (DE) were given in the Figure 3.

The left section of the diagram, representing the cited references, reveals both foundational and emerging studies that significantly contribute to the current research landscape. Noteworthy among them is the FAO publication “Youth and Agriculture: Key Challenges and Concrete Solutions” (2014), which acts as a central node connected to multiple authors and descriptors. More recent works such as “A Social Network Analysis of the Use of Social Media to Promote Agriculture to Indonesian Youth” (2022) and studies on the application of digital technologies to improve agricultural productivity and food resilience (2023–2024) underscore the rising importance of technology-driven approaches in addressing youth engagement in agriculture.

The central section of the plot maps the contributing authors, highlighting key players in the domain such as Coleman M, Chau KM, Condon J, and Bezu S. These authors demonstrate multi-dimensional involvement across several thematic areas. For instance, Coleman and Chau are closely aligned with descriptors such as climate change and career, while Bezu's work intersects with migration and African contexts. This suggests a collaborative and interdisciplinary approach, where researchers contribute to multiple overlapping domains such as environmental change, socio-economic transitions, and rural development. The presence of other contributors like Amare M and Boedhihartono AK, who are linked with advanced technological descriptors like “crop scouting and phenotyping,” signals a shift towards precision agriculture and the integration of digital innovations in farming practices. The descriptors, positioned on the right, provide a thematic overview of the field. Dominant keywords such as “climate change,” “agriculture,” “youth,” “adaptation,” and “career” indicate the core issues being addressed. The prominence of climate change as a frequently linked descriptor suggests that it is a central concern affecting youth livelihoods in rural areas. Keywords such as “migration,” “Africa,” “Asia,” and “age” point to demographic and geographical specificities, indicating that the impact of climate and socio-economic conditions on youth differs by region. The emergence of descriptors like “crop scouting and phenotyping” further highlights the relevance of technological innovation in shaping agricultural practices and youth engagement.

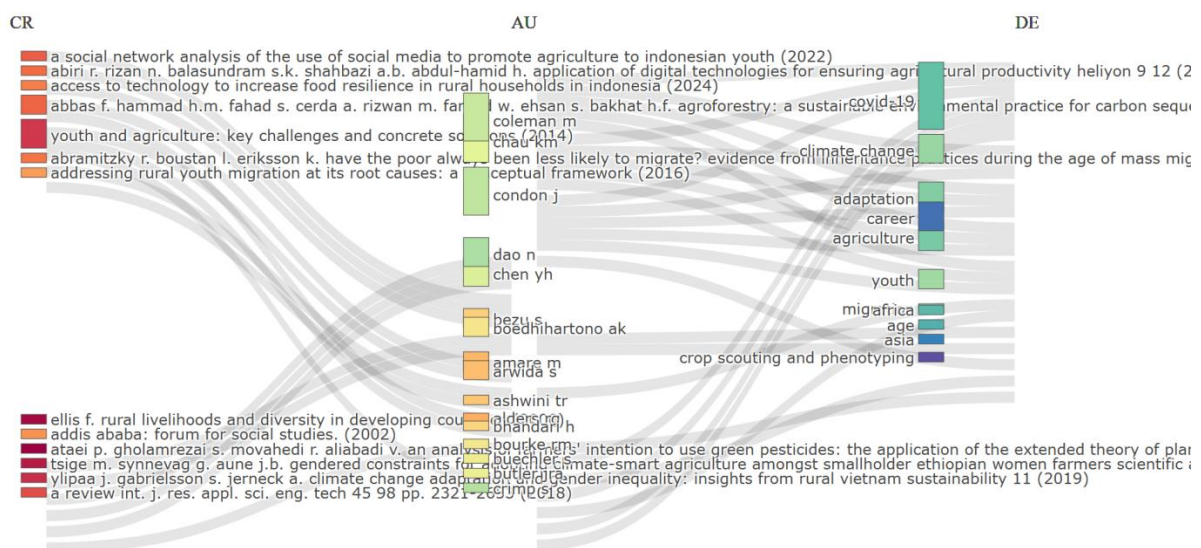


Figure 3. Three Plot Diagram

3.4. Thematic Map

The thematic map visualized in the Figure 4. categorizes key research themes related to youth and agriculture across four quadrants based on their centrality (relevance degree) and density (development degree), providing valuable insights into the intellectual structure and evolution of the field. The thematic

In the upper-right quadrant (**motor themes**), clusters such as employment, migration, and agriculture emerge as well-developed and highly central themes, indicating their importance and strong integration within the research field. These themes reflect pressing global concerns about rural employment and youth migration, which are central to sustainable agricultural development. Supporting themes like developing country, emigration and immigration, and population further reinforce the socio-economic and demographic context in which youth-in-agriculture issues are examined.

The lower-right quadrant (**basic themes**) includes climate change, which, despite its relatively low density, shows moderate centrality. This suggests that while climate change is foundational and widely discussed, it has yet to be deeply developed in the specific context of youth in agriculture. This presents a notable opportunity for future research to integrate climate adaptation strategies with youth-led agricultural initiatives.

The upper-left quadrant (**niche themes**) features concepts like econometrics, household survey, and labor supply. These are specialized and methodologically focused themes, relevant to specific subsets of the literature but with limited cross-thematic interaction. Although well-developed, their niche character implies that they are not yet central to the broader discourse on youth in agriculture, possibly due to their technical nature.

Meanwhile, the lower-left quadrant (**emerging or declining themes**) includes topics such as vulnerability, Viet Nam, young population, and land market. These appear less developed and peripheral, suggesting they are either nascent areas of inquiry or experiencing a decline in scholarly attention. For instance, the presence of Viet Nam might indicate a regional focus that has not been widely integrated with global discourse. Similarly, vulnerability

and land market may represent critical but underexplored dimensions, especially concerning land access challenges and socio-economic precarity faced by rural youth (Pramono *et al.*, 2023; Sumber *et al.*, 2012).

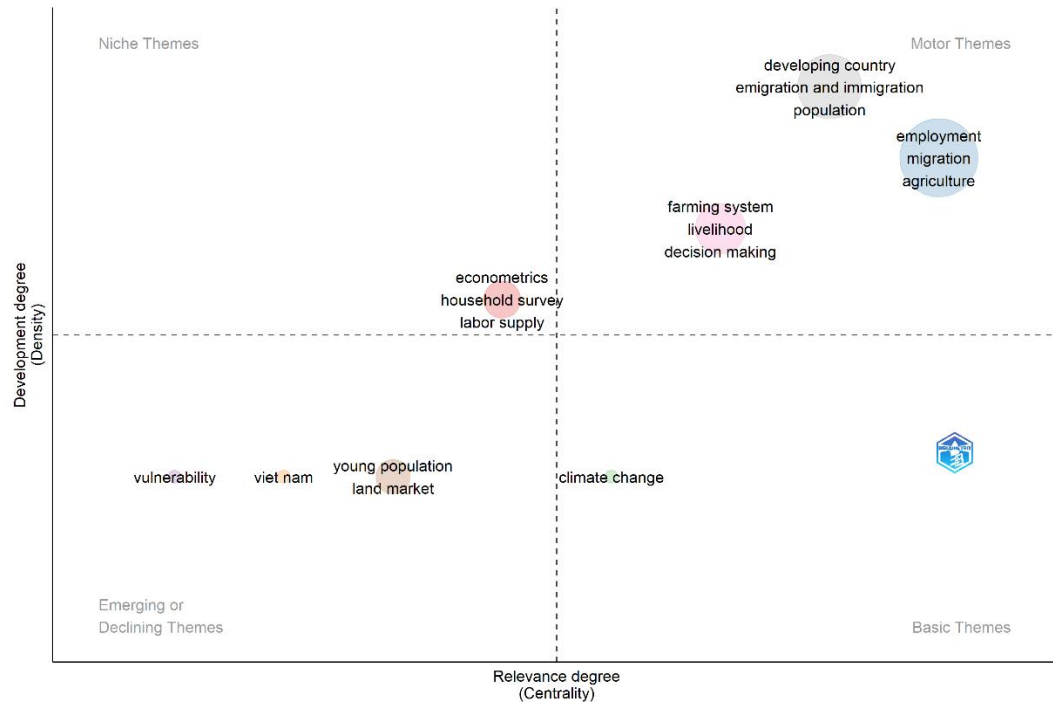


Figure 4. Thematic Map

3.5. Word Cloud

The word cloud presented in the Figure 5. visually represents the frequency and prominence of keywords in scholarly literature related to youth engagement in agriculture. Key themes such as employment, migration, and agriculture stand out as the most dominant and centrally placed terms. This underscores their centrality in discussions surrounding rural development and youth livelihoods.

The prominence of employment signifies its critical role in youth retention in agricultural sectors. Youth disengagement from agriculture is frequently attributed to limited job prospects, low returns, and a lack of innovation in rural settings. This aligns with global research indicating that enhancing employment opportunities in agriculture is vital to curbing youth migration and ensuring rural sustainability (OECD, 2021; Maurya *et al.*, 2021). The term migration appearing prominently alongside employment indicates a strong correlation between the two. Migration, particularly rural-to-urban, is often a response to employment challenges. Many young individuals move away from agriculture due to perceived or real limitations in income generation, as supported by studies in Nepal (Timsina, 2024) and Indonesia (Pramono *et al.*, 2023).

Agriculture itself remains a foundational theme, central to understanding broader socio-economic and environmental dynamics. Its association with terms like rural population, farming system, and livelihood highlights its multifaceted role not only as a food production system but also as a livelihood strategy for many rural youth.

Other significant terms such as developing countries, population dynamics, rural population, and socioeconomic factors suggest that the youth-in-agriculture discourse is heavily contextualized within the broader developmental challenges of the Global South. Countries with rapidly growing populations and limited employment avenues face unique pressures in integrating youth into agricultural systems sustainably.

Terms like child welfare, education, unemployment, urbanization, and climate change further reveal the interdisciplinary nature of this research field. They point to the fact that addressing youth engagement in agriculture requires not only sector-specific interventions but also broader social, economic, and policy reforms.



4. CONCLUSION

The analysis reveals that core themes such as employment, migration, and agriculture are central to the discourse, while areas like climate change, vulnerability, and land markets remain underdeveloped, indicating future research potential. Thematic mapping and author keyword co-occurrence further underscore the multidimensional and interdisciplinary nature of this field, with strong linkages between socio-economic, demographic, and technological factors.

In summary, this study underscores the urgency of developing inclusive, innovative, and sustainable agricultural strategies that effectively respond to youth migration trends. Strengthening international cooperation, promoting youth-led agri-entrepreneurship, and aligning policy with research evidence will be key to revitalizing rural economies and ensuring the future sustainability of global food systems.

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