

Rural Development Research Trends: Bibliometric Analysis Using Publish or Perish and Vosviewer

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Abstract. This article aims to revisit the study of rural development, agricultural development, and rural livelihoods by highlighting publications in Google Scholar and Semantic Scholar from 1980 to 2023. The study utilized Google Scholar's and Semantic Scholar's 43-year citation database to compile articles. The keywords used in this study were "Rural Development," "Agricultural Development," and "Rural Livelihoods," with English document filters applied through the Publish or Perish software. Descriptive statistical methods were used to present graphs, diagrams, tables, and literature reviews. Subsequently, a bibliometric analysis was performed on the data using the VOSviewer software. In this study, visualization of citations and keywords was conducted. The study reveals significant research trends in rural development, agricultural development, and rural livelihoods over the past 43 years. Based on the visualization of a large cluster network map containing concepts related to rural development, agricultural development, and rural livelihoods, various advancements in concept development emerged. Studies on the mathematical modeling of rural development, agricultural development, and rural livelihoods remain separate. No study has integrated the topic of agricultural development and rural livelihoods within the context of agricultural development. The researcher further employs bibliometric analysis to identify relevant keywords related to the topics of study: rural development, agricultural development, and rural livelihoods. Thus, the researchers suggest further study on the rationalization of farmers in dryland areas to realize food security for local communities' livelihoods. Additionally, studying agricultural development programs on dryland areas is necessary, integrating the perspective of sustainable livelihoods to support and realize sustainable rural development.

Keywords: Agricultural Development, Rationalization of Farmers, Rural Development, Rural Livelihoods, Sustainable Livelihoods

1 Introduction

This study aims to reassess the study of rural development, agricultural development, and rural livelihoods by highlighting publications in Google Scholar and Semantic Scholar from 1980 to 2023. The relationship between rural development, agricultural development, and rural livelihoods is highly dynamic and complex. However, in this study, rural development, agricultural development, and rural livelihoods are considered as unified concepts that are interrelated, reflecting a growing trend. Rural development and agricultural development can be seen as efforts to address issues such as migration, food insecurity, inequality, lack of social protection, poverty in rural areas, unemployment, and the depletion or exploitation of natural resources, which have implications for environmental damage and climate change [1]; [2]. By 2050, it is estimated that more than half of the population in developing countries will continue to live in rural areas. Up to three quarters of the extremely poor rely on agriculture or other rural activities. The livelihood perspective has played a central role in rural development thinking and practice in recent decades [3]. The concept of sustainable livelihoods is an important component of sustainable development and long-term goals for poverty alleviation. Therefore, it is important to conduct a study on the trends of research topics in rural development, agricultural development, and rural livelihoods in their current contexts.

Over the past few decades, research focused on rural development has integrated a variety of theoretical and empirical studies [4]. Changes in the domain of knowledge in rural development research have also reflected the complexity and dynamics within the rural context. This study examines trends in rural development research by integrating the concepts of agricultural development and rural livelihoods through bibliometric analysis. Many studies have examined rural development using bibliometric analysis. For example, there are research studies that examine rural development using bibliometric and visualization methods [4] and a bibliometric analysis of sustainable livelihood research [5]; [6].

Previous research also examined rural revitalization in the process of modernization using bibliometrics [7] and the bibliometric method is used for the smart village theme and can be applied as a learning approach in rural Indonesia [8]. Bibliometric analysis of small-scale farming and mining in rural communities is conducted [9], the study examines the publication trends and growth potential of studies on sustainable agricultural development assessment [10]. The study investigates research trends and topics in engineering for rural development using bibliometrics [11].

Based on several previous studies, it is observed that studies on the concepts of rural development, agricultural development, and livelihoods are still conducted separately. However, there has been significant integration of research on the topic of rural development at both theoretical and empirical levels [4]. There has been no bibliometric analysis conducted on the interrelationships and broad trends of rural development, agricultural development, and rural livelihoods. Therefore, this study aims to re-examine studies in the field of rural development, particularly agricultural development, which will have implications for the livelihoods of rural communities through bibliometric analysis. In other words, it aims to integrate the concept of rural development and livelihoods within the framework of rural development analysis. Integrating these concepts is crucial for comprehensively understanding the challenges and opportunities in improving the welfare of rural communities. In addition, this bibliometric analysis is expected to become a reference in rural development programs by related actors and strategies within them. Moreover, in providing an understanding of the evaluation of agricultural and rural development policies, especially in dryland.

2 Research Methods

This study uses the Google Scholar and Semantic Scholar databases. Literature searches were conducted in June and July 2023 using Publish or Perish with a period from 1980 to 2023. The keywords used included: Rural Development, Agricultural Development, and Rural Livelihoods. Search identification in the form of citations, manuscript titles, authors, and publishers. From the search results obtained as many as 800 publication documents.

Identification and categorization of research trends is carried out through the following stages: 1) determining the tracing period within 43 years. 2) perform document searches using relevant keywords. 3) collect and identify relevant topics. 4) analyzing documents through descriptive statistics, data visualization and literature studies with the help of N vivo 14 software. Descriptive statistical analysis was assisted by Microsoft Excel version 2010 for Windows. Meanwhile, data visualization is assisted by VOSviewer software, which enables the compilation and visualization of bibliometric maps in terms of network and cluster visualization, analyzing key co-words and co-ideas, and creating temporal maps. VOSviewer software is important as a medium for interpreting the relationship between relevant concepts or entities [12]. Finally, categorizing documents with a range of 10 years and identifying findings on topics that are rarely studied based on bibliometric maps.

Through this bibliometric analysis, frequency analysis and co-occurrence of the research topic were used. Data visualization was carried out in the following stages: 1) citation analysis was carried out using VOSviewer, by looking at the highest citation which was then cited for writing this article. Apart from that, cluster and network visualization was also made; and 2) keyword analysis is carried out on selecting relevant documents and categorizing keywords based on concepts in relevant topics.

After analyzing the data with statistics and data visualization, researchers also used literature studies to corroborate the main findings, gap literature and support general information. A literature review is performed on selected analyses to categorize and synthesize them in relation to the main findings of previous literature, supporting the findings derived from the bibliometric analysis. The outcomes of this literature review will then be presented to identify research gaps and will also be incorporated into the results and discussion section.

In this literature study, the Nvivo 14 software is utilized, making use of the matrix framework feature. The findings from the literature study, presented in Table 1, collectively contribute to various areas such as socio-economic mapping, poverty analysis, rural development, sustainable agriculture, and livelihood enhancement. These findings provide valuable insights for policymakers, researchers, and practitioners who aim to enhance the well-being of rural communities and promote sustainable development.

Table 1. Literature Review of Rural Development, Agricultural Development, and Rural Livelihood

Authors	Research Findings	Research Purposes	Research Title
Ariyanto (2023)	The Singosari village has a variety of resources, both socio-economic and ecological. Even though the village has limitations in terms of education and health facilities, on the other hand, it has the potential for dryland farming which can be developed and become the focus of agricultural development program interventions.	This study aims to analyze the participatory mapping of socio-economic conditions in the village of Singosari, Tanggamus.	Participatory socio-economic mapping of singosari village, Talang Padang District, Tanggamus Regency
Bebbington (1999)	In this framework, the problem of rural livelihoods is analyzed by understanding access to capital assets, changing assets and developing livelihoods, expanding the asset base by market logic, and increasing capabilities. In addition, it also examines the importance of social capital as an asset that allows people to expand their access to resources and other actors.	This paper develops an analytical framework for analyzing rural livelihoods in terms of their sustainability and their implications for rural poverty.	Capitals and Capabilities: A Framework for Analyzing Peasant Viability, Rural Livelihoods and Poverty
Castañeda et al. (2018)	The largest poverty profile is in rural areas, where 80% of the people are very poor and 75% of the poor live in rural areas. These findings show the importance of studying households with many children in rural areas to reduce extreme poverty, and consistency in increasing education levels and reducing urbanization in order to alleviate poverty.	This study provides a new demographic profile of extreme and moderate poverty, which is defined as those living on a daily income indicator from a household survey in 89 developing countries.	A New Profile of the Global Poor
Creswell & Martin (1998)	Learning is needed from local agriculture in arid land, including in terms of adaptive cropping techniques.	This article comes from primary sources. It is necessary to improve local techniques to increase innovation and be revolutionary.	Dryland farming: crops & techniques for arid regions
Ellis & Biggs (2001)	Studies on the sustainability of smallholder farming have long been in the spotlight. The sustainable livelihoods approach offers a different technique for future rural development. This approach is cross-sectoral and multi-livelihood to alleviate rural poverty in the country.	Contains an overview of the shifts in thinking in rural development that have occurred in the last half century.	Evolving Themes in Rural Development 1950s-2000s
Ellis (1998)	In the study of rural development, livelihood diversification contributes to developing diverse portfolios in the household economy to increase livelihood security and living standards. Livelihood diversification plays a role in increasing income and agricultural output and has an effect on poverty alleviation.	This literature review discusses the diversification of rural livelihoods in developing countries.	Household strategies and rural livelihood diversification
Mishra et al. (2023)	The results of the study show that the majority of writers play a role in SDGs in developed countries compared to developing countries. Reviewed the study of sustainable development goals from economic, social and environmental	Using bibliometric analysis in studying SDGs topics to provide information on scientific research trends in the field	A bibliometric analysis of sustainable development goals: a review of progress,

	aspects.	globally.	challenges, and opportunities
Parr et al. (1990)	Studies on sustainable agriculture have uncovered problems with land, land resources, farmer incomes, and agricultural commodity prices. These things need to be considered in the development of dryland agriculture.	Scientific work is needed that examines the problem of increasing productivity and stability in the sustainability of dryland agriculture with a multi-perspective nature in facing the challenges of dryland agriculture.	Improving the Sustainability of Dryland Farming Systems: A Global Perspective
Stewart et al. (2006)	The new challenge in this research topic is sustainable agro-ecosystems in increasing living standards in order to deal with resource imbalances with human needs in dryland.		Dryland Agriculture Defined and Its Importance to the World
Scoones & Wolmer (2003)	The findings show that livelihood practices in rural areas are full of power and politics, coupled with decentralized policies and interventions in this case study.	This article discusses rural development in terms of managing water resources in a southern African country.	Livelihoods in Crisis: Challenges for Rural Development in Southern Africa
Scoones (1998)	The Sustainable Livelihoods Framework discusses and analyzes issues of livelihood sources and livelihood strategies as well as institutional factors.	A sustainable livelihoods framework with five indicators is described.	Sustainable rural livelihoods a framework for analysis
Scoones (2009)	Political analysis is needed in broadening the livelihood perspective as a filler in the study of politics and dynamics in the countryside.	Using a historical review of the discussion of rural livelihoods and their challenges.	Livelihoods perspectives and rural development

Source: N Vivo 14 output results.

3 Results and Discussion

In the results and discussion section, we will describe the development of the number of international publications on the topics of rural development, agricultural development, and rural livelihoods using the Google Scholar and Semantic Scholar databases from 1980 to 2023. The documents obtained are based on institutional cooperation in international publications in various fields, including economics, environment, social sciences, culture, industry, and other multidisciplinary studies. In this study, the trend of international publications related to the topics is analyzed based on publishing institutions and publication development maps with keywords. A total of 800 documents were collected, and their distribution fluctuated across several years. The data or documents are presented in the form of graphs or charts below:

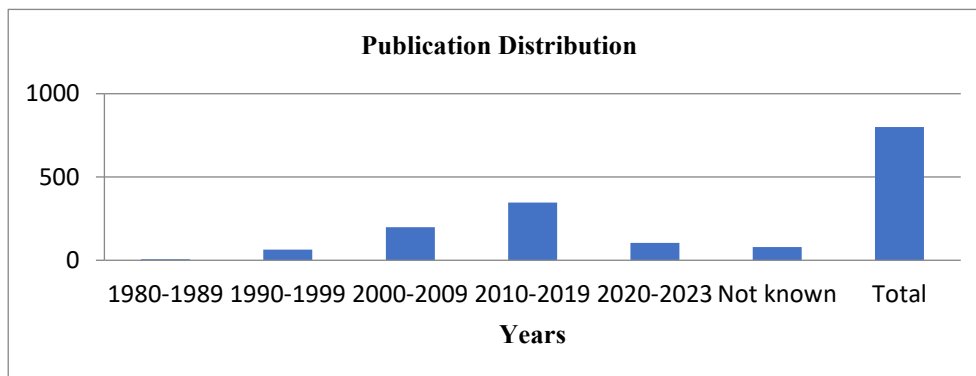


Figure 1. Illustrates the Distribution of Publications on Rural Development, Agricultural Development, and Rural Livelihoods Over a Period of 10 Years

Figure 1 demonstrates the fluctuating development of interest in village development, with periods of both increase and decrease. The highest number of articles examining rural development, agricultural development, and rural livelihoods was observed in the 2010-2019 period, with 346 documents, while the lowest number was recorded in the 80s with only 6 documents. There are indications of an increase in the number of documents published in international publications during the 2010-2019 period, coinciding with the introduction of the 2015-2030 Agenda for Sustainable Development Goals (SDGs) by the United Nations (UN). The SDGs, with their four pillars, provide a framework for researchers, writers, and stakeholders to concentrate on studying rural development, particularly agricultural development. As evident from the data, 75 percent to 79 percent of the world's poor reside in rural areas [13]; [14]; [15] the majority of people in rural areas rely on livelihoods in the agricultural sector, comprising 64 percent of the population [16]. Agricultural development has significant implications for the livelihoods of people, particularly farmers, in rural areas. Regarding the distribution of publishers, out of the 800 documents, 278 were published in book form, accounting for 35 percent. Proquest accounted for 162 documents or 20 percent, Researchgate for 84 documents or 10 percent, Springer for 67 documents or 8 percent, Elsevier for 23 documents, and other publishers for the remaining percentage. This distribution can be attributed to the dominance of researchers and research institutions in these particular publishers. The image below provides a visual representation of this review:

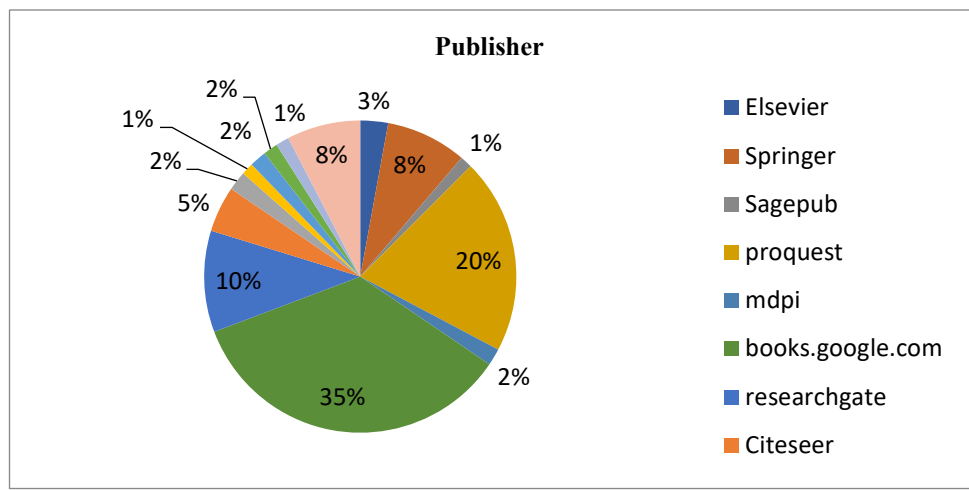


Figure 2. Distribution of interest in the topics of rural development, agricultural development and rural livelihoods by publisher.

3.1 Citation Analysis

According to Andriani [17], authors often cite previous studies to strengthen their findings, provide an overview of existing research, explain concepts or theories, and identify research gaps and innovations. Therefore, recent scientific articles typically reference relevant previous articles. In other words, the research topics addressed in scientific articles are interconnected and linked to pre-existing research topics. The cited sources of information are essential for authors to support their published scientific articles. Based on the analysis of citations from Publish or Perish, economic, environmental, and studies related to farmers appear to be highly significant and deserving of analysis within the context of rural development and sustainable development [18], [19], [20]. This finding is consistent with the results of studies by [21]; [22]; [23]; [24]; [25]; [26]; and [27] which examine the concepts of peasant viability, rural livelihoods, poverty, rural development, and sustainable livelihoods. These studies offer valuable insights for policymakers, researchers, and practitioners involved in these areas, with the objective of improving the well-being of rural communities and attaining sustainable development goals. However, the impact of these studies remained limited to the 1990s, as evidenced by the minimal number of international publications (see Figure 1).

3.2 Co-word Network Map Visualization

Based on the results generated by the VOSviewer software, a co-word network visualization map focusing on rural development, agricultural development, and rural livelihoods was obtained. The map consists of 61 items and is divided into five clusters. These clusters are categorized as follows: cluster 1 (14 items), cluster 2 (14 items), cluster 3 (12 items), cluster 4 (12 items), and cluster 5 (9 items). Additionally, a total of 636 links were identified, with a combined strength of 871. The network map can be observed in Figure 3.

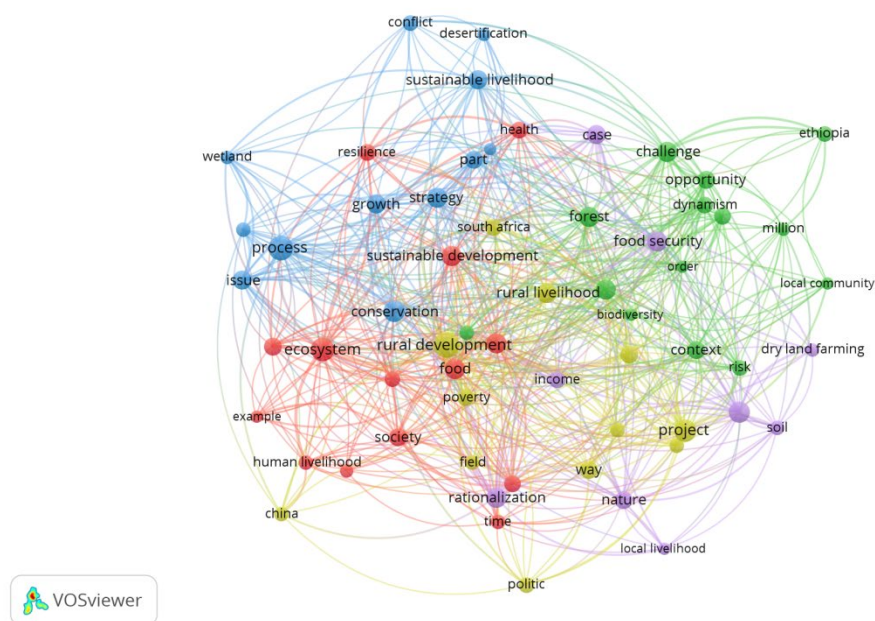


Figure 3. Displays the Network Visualization of Mapping Types for the Topic of Rural Development, Agricultural Development, and Rural Livelihoods

Figure 3 illustrates that the larger clusters encompass the concepts of rural development, agricultural development, and rural livelihoods, along with various advanced concept developments. The concept of rural development is located in cluster 4 and is associated with other concepts such as rural livelihoods, dryland agriculture, and rationalization. Of particular interest is the interrelation between the concept of rationalization and concepts like dryland farming, local livelihoods, human livelihoods, and food security. Cluster 3, which is linked to the concept of sustainable development, is related to concepts such as conflict, conservation, and drought. Cluster 1 pertains to the concepts of sustainable development and sustainable living. Moreover, the topic of agricultural development is connected to the concept of dryland farming in clusters 4 and 5. In cluster 4, there is also a relationship between the topic of rural livelihoods and concepts like livelihood strategies and human livelihoods. Cluster 3 encompasses the concept of sustainable livelihoods, while cluster 5 is associated with the concept of local livelihoods.

Therefore, the researchers propose further studies concerning the rationalization of dryland farmers in achieving food security for local communities' livelihoods. Additionally, it is essential to investigate the agricultural development programs on dry land while integrating the perspective of sustainable livelihoods to support and achieve sustainable rural development. This is in line with the findings of [28]; [29]; [30]; [31]; and [32], which highlight the understanding of socio-economic mapping, poverty dynamics, dryland farming practices, and the global significance of dryland agriculture. These findings offer valuable insights for policy makers, researchers, and practitioners working in their respective fields, with the goal of enhancing community well-being and addressing sustainability challenges in the dryland region.

3.3 Visualization of Co-word Density Map

From the output of the Vos-viewer software, the visualization displays the density of each cluster through labeled items, making them easily identifiable and distinguishable. Each concept is represented by a different color (contrast) based on its density. The color of a point on the map is interconnected and influenced by the number of connections it has with other items. This aspect is crucial for gaining an overview of the overall structure of a bibliometric map. It helps identify the significant and relevant parts of the items for analysis. By examining this view, we can interpret the most frequently used keywords in publications. The visualization of the density map for research development, focusing on rural development integrated with the concepts of agricultural development and rural livelihoods, is presented in the image below:



Figure 4. Displays the Density Visualization of Mapping Types for the Topics of Rural Development, Agricultural Development, and Rural Livelihoods.

From Figure 4, it is evident that the keyword "village development" has a relatively high density, and there are several other keywords surrounding it, both in close proximity and at a distance from the "rural development" keyword. The denser distribution of keywords indicates a significant number of studies conducted on this topic, while those farther away suggest a lack of research and exploration in that area.

Based on Figure 4, in line with the researcher's analysis in Figure 3, it is recommended to conduct a study on the rationalization of farmers in dryland areas to achieve food security for local communities. Additionally, studying the agricultural development program in dryland regions while integrating the perspective of sustainable livelihoods is crucial for supporting and achieving sustainable rural development. This aligns with the concepts of dryland farming and local livelihoods, which have received relatively less attention in the field of rural development. In other words, these areas require further exploration and research. These recommendations correspond to the findings of Yu and Mu, who identified the need for more research on sustainable agricultural development and the application of sustainability theories to agrarian systems [10] in this study, the focus is primarily on dryland farming from the perspectives of rationalization and livelihoods. The dynamics of dryland farming are consistently intertwined with the concepts of environment, development, and sustainability. According to Ellili, research papers and citations indicate a growing emphasis on the significance of environment, development, and sustainability, highlighting their substantial contributions to the field of sustainability research [33]. Based on the research findings regarding the study of rural dryland agricultural development with a sustainable livelihoods approach, future research in the areas of rural development, agricultural development, and rural livelihoods can contribute to a deeper understanding, more sustainable approaches, and stronger cross-disciplinary collaborations. To conduct such studies, careful planning, consideration of potential challenges, and the development of appropriate methodologies are crucial to yield meaningful research results that contribute to rural development and dryland agriculture.

3.4 Mapping the Main Keywords in the Topic of Rural Development, Agricultural Development and Rural Livelihoods

In this section, the researcher will analyze the relevant keywords for each cluster, as shown in Figure 3. The analysis will involve filtering based on the significance of the keywords "rural development," "agricultural development," and "rural livelihoods." This will result in the following data:

Table 2. Keyword Analysis Relevant to the Concept of Rural Development, Agricultural Development and Rural Livelihood Based on Clusters

No.	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
1	Dynamic system	Biodiversity	Conflict	Dryland agriculture	Dryland farming
2	Ecosystem	Local community	Conservation	Politic	Food security
3	Food	Risk	Desertification	Poverty	Local livelihood
4	Health	Forest	Drought	Project	Rationalization
5	Human livelihood	Challenge	Sustainable livelihood	Rationalisati on	Income
6	Livelihood strategy	Context	Process	Rural development	Nature
7	Resilience	Ethiopia	Strategy	Rural livelihood	Population
8	Society	Life	Wetland	South Africa	Case
9	Sustainable development		Growth	China	Soil
10	Sustainable living				

From table 1, we can observe that there are 45 keywords relevant to the topics of rural development, agricultural development, and rural livelihoods. Each of these keywords holds a conceptual meaning that pertains to the topic. However, among the keywords, some exhibit a strong relationship with the concept, while others are less relevant. Consequently, researchers have categorized the concepts based on the distribution of these keywords. The categorization of relevant keywords, organized according to the topic, is presented in table 2.

Table 3. Categorization of Keywords Based on the Concept of Rural Development, Agricultural Development and Rural Livelihoods

Rural Livelihood	Agriculture Development	Rural Livelihood
Rural development	Dryland agriculture	Rural livelihood
Sustainable development	Dryland farming	Sustainable livelihood
Local community	Food security	Human livelihood
Society	Food	Livelihood strategy
Conflict	Biodiversity	Sustainable living
Health	Soil	Local livelihood
Dynamic system	Conservation	Risk
Dynamism	Ecosystem	Life
Politic	Forest	Strategy
Poverty	Desertification	Income
Project	Drought	Resilience
Population	Wetland growth	
	Rationalisation	
	Rationalization	
	Nature	

4 Conclusion

Based on the description of the results and discussion provided above, several findings can be identified. Firstly, there is a fluctuating trend in the interest in rural development, characterized by both increases and decreases. The highest number of articles examining rural development, agricultural development, and rural livelihoods was recorded during the 2010-2019 period, with 346 documents, while the lowest number was observed in the 1980s, with only 6 documents. Of the 800 literature documents, 35% were published in book form, 20% were published through Proquest, 10% through Researchgate, 8% through Springer, and 23 documents were published through Elsevier and other publishers.

There are indications of an increase in the number of documents published internationally between 2010 and 2019, coinciding with the inauguration of the United Nations' 2015-2030 Agenda for Sustainable Development Goals (SDGs). The SDGs, with their four pillars, have provided a platform for researchers, writers, and stakeholders to focus on studying rural development, particularly agricultural development. The implications of agricultural development extend to the livelihoods of people, specifically farmers, residing in rural areas.

From the results of data visualization on the research topic, it is known that the concept of rural development is related to rural livelihoods, dry land agriculture, and rationality. Thus, it is necessary to study the rationality of dryland agriculture in order to increase livelihood security and food security in rural areas. From the visualization of the data it is also known that sustainable livelihoods for rural communities are related to conflict, conservation and drought studies. Whereas in cluster 1 it is associated with the concept of sustainable development and sustainable livelihoods and the development of dry land agriculture in clusters 4 and 5. Moreover, the topic of rural livelihoods in cluster 4 is related to livelihood strategies, while cluster 1 is associated with human livelihoods. Cluster 3 represents sustainable livelihoods, and cluster 5 incorporates the concept of local livelihoods.

Based on these observations, the researchers suggest conducting further studies on the rationalization of farmers in dryland areas to achieve food security and enhance the livelihoods of local communities. Additionally, it is necessary to explore agricultural development programs in dryland regions by integrating the perspective of sustainable livelihoods, thereby supporting and realizing sustainable rural development.

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