Contributions of FDI, Import and Export in Economic Growth

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Abstract

GDP measures a country's economic output, influenced by factors like foreign investment, inflation, market openness, supply, demand, population, and political environment. Natural forces, environment, and sustainable development also impact economic growth. Academics argue that FDI and GDP are causally related, impacted by inflation, and positively related to import and export. A consistent set of economic indicators cannot be built using a single set, but subjective assessment and potential duplication are used. This research helps Nepalese officials respond to external shocks and crises, focusing on economic growth and overall economic improvement. The data from 1970 to 2020 shows a 1.72 GDP average with a 6.56 standard deviation, with FDI, EX, and IM being reliable factors, with import to export being the least reliable. Ordinary least square estimation reveals a positive, statistically significant relationship between imports and exports, contrasting FDI and GDP. GDP and export are inversely connected, with a 1% change in export causing a -6.36% reduction in GDP. However, nonstationary variables and low Durbin Watson values may indicate incorrect regression.

Keywords

Export, FDI, GDP, Import, Inflation

1. Introduction

The economic output of a country is measured by its gross domestic product (GDP). The operation of economies is influenced by a number of essential variables, including foreign direct investment, inflation, import and export of goods and services, market openness, supply and demand for goods and services, population, political environment, and others. Natural forces like diversification, the environment, and sustainable development all have an impact on economic growth.

A nation's capacity to experience rapid economic growth is significantly influenced by foreign direct investment (FDI). Foreign direct investment (FDI) is the flow of both financial and nonfinancial resources into the country of origin. It is a way to obtain trustworthy, long-term funding for business operations through international channels. Foreign direct investment (FDI) occurs when a foreign company buys a majority stake in a local business. Through FDI, foreign businesses actively take part in ongoing activities in the host nation. This implies that they bring more than just financial support; they also bring technology, knowledge, and skills. Regarding the precise connection between monetary inflation and financial performance, there is limited consensus. There is still much to learn about the mechanism by which monetary inflation affects financial behavior. A few people are not the only ones affected by rising prices associated with monetary inflation; total financial performance is also affected.

Foreign investment in developing countries leads, first and foremost, to increased employment. Foreign direct investment plays a significant role in the economic development of any country. When a country's growth rate is slow, FDI inflows are low (Riedel, 1987). Inflation is a contentious issue because it is a direct effect of the country's economic success. The dependent variable in this study is gross domestic product. Cost-push inflation and demand-pull inflation are the two types of inflation. When there is an increase in total demand and a scarcity of supply, prices rise as a result of demand pull inflation.

2. Statement of the Problem

The primary issue that this study seeks to address is whether foreign direct investment affects economic growth, and if so, what kind of relationship should exist between it and GDP, inflation, exports and imports of goods and services, and Inflation.

3. Objectives of the Study

The objective of the study are as follows:

i. To examine the effect of foreign direct investment on economic growth.

ii. To examine the connection and casualties between inflation (INF), export of goods and services (EX), import of goods and services (IM) and gross domestic product (GDP).

4. Research Questions

This study attempts to answer the following research questions:

i. What is the effect of foreign direct investment on economic growth?

ii. How is inflation, import and export of goods and services and Gross Domestic Product interrelated?

5. Literature Review

Without capital formation, economic expansion is not even imaginable. Remittances and foreign direct investment are the two main sources of cash generation in developing nations like Nepal. The economies of the sending and investing nations may both grow and be supported by FDI. Developing countries have backed FDI as a method to finance new infrastructure and provide jobs for locals. Remittances from abroad, government development aid, and foreign direct investment are the key drivers of growth in poor countries (Alfieri & Havinga, 2006).

In essence, a nation's development is influenced by its rate of economic growth. Economic expansion is therefore seen as a crucial part of long-term development. Indonesia's economic growth varies and exhibits generally erratic trends. An administration that masks both internal and external economic and political volatility is necessary for a nation. A number of policies can aid in bringing the situation under control so that it is more beneficial. A nation's economy has been significantly impacted by the government (Economic Growth - Econlib, n.d.).

To grow, an economy needs a robust finance sector. The promotion of efficient resource allocation and the provision of more thorough information on projects that may be financially successful are the results of financial development. In other words, as financial institutions have expanded, the price of information collecting has come down while the efficiency of transactions and contracts has increased. Expanding financial access also instills dynamic efficiency in the system by causing structural change through innovation and bringing welfare benefits to the entire economy (Guru & Yadav, 2019).

Economic development is the process of social and economic change. This procedure often follows a well-organized flow and exhibits characteristics of different nations (Thirlwall 1999). Every country strives for urgent economic advancement despite several challenges such stale social and economic conditions (Todaro 1997).

Many nations have struggled with the negative consequences of internal and external forces and have been unable to determine their growth path due to bad socioeconomic rigidities and economic weakness. Foreign trade is thought to be a key element in fostering economic growth. The majority of nations participate in international trade to boost employment, savings, gains in foreign exchange, and investment productivity. The main way that developing nations can gain from globalization is through trade. Imports boost domestic markets' rivalry and variety, which is good for consumers (Hussain 1996).

Businesses profit from international trade because it increases productivity and gives them access to more modern capital inputs like tools and equipment. International trade promotes the redeployment of labor and capital to more productive industries. In example, it has made it easier for some manufacturing and service businesses to continue moving from developed to developing countries, creating new growth prospects (WDR 1999/2000). According to the World Development Report (1999/2000), the share attributed to developing nations increased from 23 to 29 percent during the 1990s, growing twice as quickly as the global GDP.

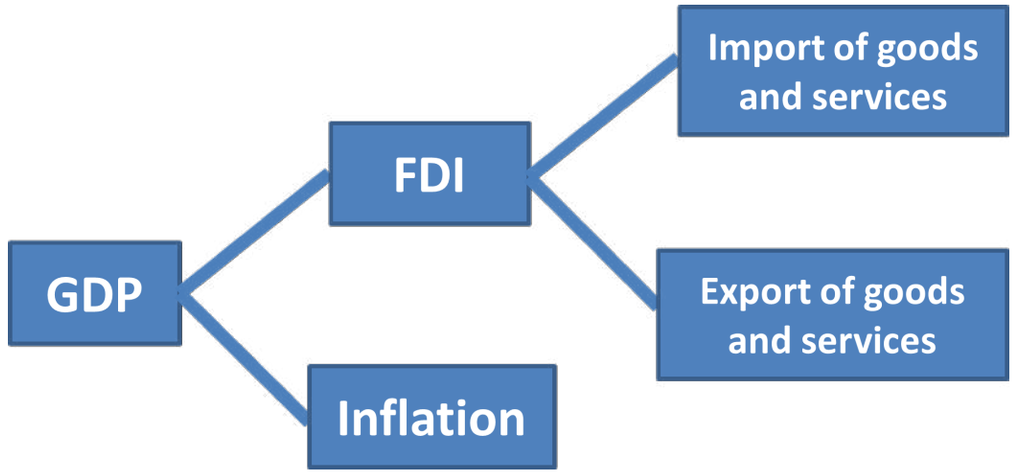
One of the key reasons for Nepal's inadequate industrial base is that it is a landlocked nation, which is related to an increase in raw material and equipment exports and imports. The 25% unexpected rise in information and communication technology between 1994 and 1997 has given emerging countries new opportunities. Its trade with other nations has also been impeded by its expansive border with India and its lacking shipping facilities. The only economically feasible alternative for

any commercial traffic is India because it is almost impossible to transit through China. In reality, Nepal is more reliant on a single country for transportation services than any other country (apart from Bhutan) (Poudyal 1998).

The majority of prior transit and trade agreements between these two nations demonstrate that Nepal's assistance in providing incentives to Indian commodities inside Nepalese territory in exchange for transit services was almost always given by India. Due to its economic dependence on India, Nepal has the smallest window of opportunity for international trade, with only one partner remaining in the possibilities based on comparative advantage. Naturally, neither foreign trade nor the economy cannot be expected to increase much under such conditions.

The study came to the conclusion to design and adopt the following frameworks to examine the relationship among the variables gross domestic product, foreign direct investment, inflation rate, import and export of goods and services of Nepal and used secondary annual time series data from 1990 to 2020, sourced from Central Bank of Nepal (NRB). This was done after reviewing the previous related study in the review of literature chapter and established theory.

This section aims at describing the Gross domestic product (GDP).



6. Dependent Variable

Gross Domestic Product (GDP): The total market value of all currently created final goods and services from each and every producing unit within a country's geographical authority over a certain time period is known as the gross domestic product, or GDP. In other words the total amount of finished goods and services produced in a specific location over a given time period is known as the gross domestic product, or GDP. The Gross Domestic Product (GDP), which is calculated in monetary terms, only includes commodities and services intended for further processing and manufacture. A typical indicator of the health of an economy is GDP because it measures production activity.

The study has taken the Growth rate of GDP as the dependent variable.

7. Independent Variables

A. Foreign direct investments (FDI): Examples of foreign investments include joint ventures, portfolio investments, concessions, and other types including greenfield and brownfield investments, mergers, acquisitions, and so on.

B. Inflation (INF): Inflation is the term used to describe an increase in the cost of the majority of everyday or regularly used products and services, such as food, clothing, housing, recreation, transportation, consumer staples, and so forth. By tracking the average price increase over time, inflation is determined using a basket of goods and services. The opposite, less typical fall in the price index for this basket is called deflation. The loss of a unit of a country's currency's purchasing power is referred to as inflation. Inflation is expressed in percentage.

C. Export of goods and services (EX): Between citizens and non-residents, it includes transactions including the exchange of goods and services. Export contributes to GDP growth and shows that local companies are present in foreign markets.

D. Import of goods and services (IM): It consists of business dealings with locals and visitors exchanging goods and services. Export has a detrimental effect on GDP growth because it lessens the positive effects of export and increases a nation's dependency on imports.

8. Methods of Analysis

The relationship between Nepal's GDP (the dependent variable), foreign direct investments, imports and exports of goods and services, and inflation (the independent variables) was analyzed during the entire period of the study (from 2090 to 2020). The NRB was used to get the statistics information. E-Views software is employed for model comparison and analysis.

9. Nature and Sources of Data

The information used in this article was taken from the NRB, the World Bank, and their published materials, as well as from several issues of the Economic Survey issued by the Ministry of Finance and other research papers.

10. Tools and Methods of Data Analysis

The study of the data in the paper was descriptive and analytical. Mean and standard deviation will be employed in descriptive research, and the OLS method will be used in analytical research to assess the dependent and control variables. The study looked at the factors influencing GDP and utilized E-Views software to analyze the data.

11. Model Specification

A simple model for the determinant of the gross domestic product becomes

GDP = F (FDI, INF, EXP, IMP) ..... (i)

The OLS model that represents the model is presented in the equation as

GDP = a + b1 FDI + b2 INF + b3 EX + b4 IM + e ..... (ii)

Where;

GDP = Growth rate of GDP

FDI = Foreign Direct Investment

INF = Rate of Inflation

EX = Export of goods and service

IM = Import of goods and services

a = Constant

e = Error term

b1, b2, b3 = constant parameter

12. Data Analysis and Interpretation

Descriptive Statistics

The results of the descriptive statistics performed prior to the inflowing time series analysis are displayed in the following table.

Table: 1.1

Statistical analyses of selected variables

	GDP	FDI	INF	EX	IM
Mean	1.72E+10	40298277	8.306422	14.56143	32.28336
Median	1.59E+10	14778086	7.279093	12.85566	32.57072
Maximum	3.06E+10	1.96E+08	26.39731	26.32784	41.46959
Minimum	8.25E+09	-6647984.	3.070305	6.805290	21.66145
Std. Dev.	6.56E+09	55376010	5.075985	6.029252	4.514770
Skewness	0.521746	1.454313	1.825627	0.480325	-0.240420
Kurtosis	2.203162	4.291868	6.606931	1.898734	3.041244
Jarque-Bera	2.226609	13.08332	34.02458	2.758531	0.300841
Probability	0.328472	0.001442	0.000000	0.251763	0.860346
Sum	5.34E+11	1.25E+09	257.4991	451.4042	1000.784
Sum Sq. Dev.	1.29E+21	9.20E+16	772.9688	1090.557	611.4943
Observations	31	31	31	31	31

Source: Authors' calculation through E-views

The 31 observational years covered by the data are 1970 to 2020. The GDP average is 1.72, with a standard deviation of 6.56, as per the descriptive data. Additionally, 40298277, 14.561, and 32.28336, respectively, are the means for FDI, EX, and IM4. This shows that GDP is more reliable than other factors, with import to export being the least reliable. GDP also has a positive skew compared to other factors.

Table: 1.2

Statistical analysis of selected variables

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	26.84887	11.36464	2.362492	0.0259
INF	-1.89E+08	80687905	-2.347976	0.0268
EX	-6.36E+08	88616373	-7.171659	0.0000
IM	6.33E+08	1.13E+08	5.600013	0.0000
C	6.52E+09	3.58E+09	1.822970	0.0798

R-squared	0.915322	**Mean dependent var**	1.72E+10
Adjusted R-squared	0.902295	**S.D. dependent var**	6.56E+09
S.E. of regression	2.05E+09	**Akaike info criterion**	45.86721
Sum squared resid	1.09E+20	**Schwarz criterion**	46.09850
Log likelihood	-705.9417	**Hannan-Quinn criter.**	45.94260
F-statistic	70.26173	**Durbin-Watson stat**	1.345729
Prob(F-statistic)	0.000000		

Source: Authors' calculation through E-views

13. Result

The results of the ordinary least square estimation show a positive and statistically significant relationship between imports and exports, in contrast to the non-significant association between FDI and GDP. GDP and export of goods and services are inversely connected, which means that a change in export of 1% causes a reduction in GDP of -6.36%. R-squared is equal to 91%, which indicates that changes in all independent variables combined explain 91% of the variation in GDP. The nonstationary nature of the variable that biases the OLS estimation and the low Durbin Watson value, however, may be indicators of incorrect regression.

14. Conclusion

In conclusion, academics can assert that FDI and GDP are causally related in both directions. Additionally, both FDI and GDP are impacted by inflation. Finally, compared to the insignificant association between foreign direct investment and GDP, there is a positive and statistically significant relationship between import and export.

A consistent set of indicators on the status of the economy cannot be built using a single set of economic indicators. When selecting these indications, the authors' subjective assessment is employed, and their interdependence as well as the potential for duplicity are taken into account.

Economic officials may find the research findings useful in determining how best to respond to external shocks and crises, enabling them to concentrate their efforts more precisely on economic growth and the general betterment of the Nepalese economy.

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Two Decades Retrospective Bibliometric Analysis: The Journal of Agriculture and Rural Development in the Tropics and Subtropics

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Abstract

This paper analyses the trends with regard to the Journal of Agriculture and Rural Development in the Tropics and Subtropics research since 2002, when it was first indexed in Scopus. This study's overarching objective is to provide a bibliometric analysis of the journal by tagging down its most cited articles, most influential authors, most frequently used keywords, and most prominent regional publishers. Bibliometric data, both quantitative and qualitative, were explored using descriptive and visual methodologies. Using VOS Viewer and Advanced Excel, the authors mined bibliometric information from Scopus, the largest interdisciplinary database in the social sciences. Most of the authors in the journal are affiliated with the University of Kassel, Germany and the journal itself contains 2317 citations for 521 (369+152) publications, including publications from the Journal of Agriculture and Rural Development in the Tropics and Subtropics and the Journal of Agriculture and Rural Development in the Tropics and Subtropics- Supplement. J. Agric. Rural Dev. Trop. Subtrop. is a publication of the University of Kassel in Germany.

Keywords

J. Agric. Rural Dev. Trop. Subtrop., Bibliometric analysis, Citations, Trends

1. Introduction

The University of Kassel, based in Germany, publishes a journal called The Journal of Agriculture and Rural Development in the Tropics and Subtropics. The Journal's mission is to advance academic inquiry and research in the field of rural development. It makes an effort to forge and

strengthen linkages between rural development and the social sciences wherever such efforts are deemed necessary. It provides a place for dialogue amongst the various social science sectors and politicians, planners, and executives interested in rural development. The publisher disclaims any and all liaanythe opinions presented in the articles collected in the Journal. The views expressed here are those of the authors.

Recent years have seen a rise in the number of researchers interested in the topic of bibliometrics (Alvarez-Betancourt & Garcia-Silvente, 2014). Since its inception, bibliometric analysis has experienced rapid expansion and widespread adoption as a reliable method for assessing the redibility of a research topic or publication (Shang et al., 2015). According to He et al. (2017), this is because bibliometrics is an interdisciplinary topic that draws from philology, information science, mathematics, and statistics, and bibliometric indicators may be used to track the evolution of a research field through time. For its many advantages, bibliometrics has found applications in many other areas, including business and economics (Merigo et al., 2016), taking tactical decisions (Liu & Liao, 2017), renewable energy (Hache & Palle, 2019), and the renewable power supply chain (Scott, 2019). (Merigo et al., 2016). To wit: (Azevedo et al., 2019). Bibliometric analysis can also be used to look at how publications are organized and how a journal is changing over time. In recent years, scholars have been more interested in research journals in a systematic way.

1.1 Journal of Rural Development

- **An Insight**

  The Journal of Agriculture and Rural Development in the Tropics and Subtropics is a publication that talks about all things related to the development of the rural section of society. The University of Kassel puts out the journal. This journal's highest-quality content can be found in the third quarter or Q3. ISSN 1612-9830 is the number assigned to issues of the Journal of Agriculture and Rural Development in the Tropics and Subtropics. ISSNs are eight-digit codes used internationally to identify certain publications. Journals, newspapers, magazines, and other print and digital periodicals use this to identify themselves.

- **Abbreviation**

  The Journal of Agriculture and Rural Development in the Tropics and Subtropics is usually written as J. Agric. Rural Dev. Trop. Subtrop. because that is how it is written in IS0 4. This abbreviation, " J. Agric. Rural Dev. Trop. Subtrop," is recommended and accepted for indexing, summarizing, citing, and referencing purposes. It meets all of the important requirements of ISO 4.

- **Spotlighting: h-index**

  The h-index of the J. Agric. Rural Dev. Trop. Subtrop. is 19. If 19 out of the journal's articles have more than 19 citations, then the journal is considered highly cited. A publication's usefulness and impact can be gauged by looking at its h-index. If a journal or author has a high h-index, it signifies that at least many of their papers have been cited by other works. Over the past three years, 64 articles have referenced J. Agric. Rural Dev. Trop. Subtrop. (Preceding 2021).

- **Impact Score**

  Journal of Agriculture and Rural Development in the Tropics and Subtropics has an impact score (IS) 2021 of 1.04, as calculated in 2022. From 2020 to 2021, the impact factor (IS) of the J. Agric. Rural Dev. Trop. Subtrop. increased by a factor of 0.31 or approximately 42.47 per cent. A journal's impact score (IS), sometimes abbreviated as JIS for "Journal impact score," is a calculation based on the average annual number of citations received by its most recent articles. Evidence for this conclusion comes from the Scopus database.



Figure 1(I). Recent 8 years J. Agric. Rural Dev. Trop. Subtrop. Impact Score (IS) by year. According to Scopus data

- **Overall and SCImago Journal Rank (SJR) of the J. Agric. Rural Dev. Trop. Subtrop.**

  The current global rank of the J. Agric. Rural Dev. Trop. Subtrop. is 15825. According to the SCImago Journal Rank, this publication is ranked at 0.268. (SJR). The SCImago Journal Rank is a way to measure how important a journal is in the scientific world. It looks at how many times a journal has been cited and how important the journals that have cited the journal are.

2. Methods and Data

Management (Podsakoff et al., 2008), Entrepreneurship (Landstrom et al., 2012), Innovation (Fagerberg et al., 2012), and Accounting (Fagerberg et al., 2012) authors are just a few of the many that have considered bibliometric as a potential instrument for research (Merigo and Yang, 2017).

Bibliometric research is useful for several reasons, including but not limited to analyzing the most influential journals, authors, countries, and institutions; offering thorough overviews of a studied subject; (Bjork et al., 2014). One more reason to provide bibliometric research is to find out which types of bibliographic displays get the greatest attention. Inquiries in the library sciences, which use massive amounts of bibliographic materials, are the genesis of bibliometric methods (Broadus, 1987). In particular, bibliometric findings investigate and categorize bibliographic resources by developing bummaries of the present content. Journals (Martnez-Lopez et al., 2018), universities (Merigo et al., 2019), countries (Mas-Tur et al., 2019), and keywords (Gurzki and Woisetschl€ager, 2017) have all been evaluated using this method previously. Bibliometric and other methodological attempts show that there is a convergence in the academic world in terms of shared sources and patterns (Kessler, 1963). Co-occurrence and co-authorship are commonplace and overarching results in the bibliometric literature. Co-authorship reveals the network of interconnected authors and their working relationships (Koseoglu, 2016), whereas the co-occurrence of phrases shows how the literature is organized theoretically or by familiar conventions (Cheng et al., 2018).

2.1 Bibliometric methods

The authors were able to review the bibliometric information of the Journal of Agriculture and Rural Development in the Tropics and Subtropics found in the Scopus database by using the preceding description as a guide. They were able to accomplish this through the use of a network visualization tool and descriptive analysis. Figure 1a depicts the procedure the authors followed to achieve their goals. Specifically, there are three stages to the procedure:

(1) Data Extraction, Information retrieval from public databases,

(2) Data Cleaning, alternatively, the process of removing unnecessary or redundant entries, and

(3) Bibliographic Analysis (using computational methods on the cleaned data).

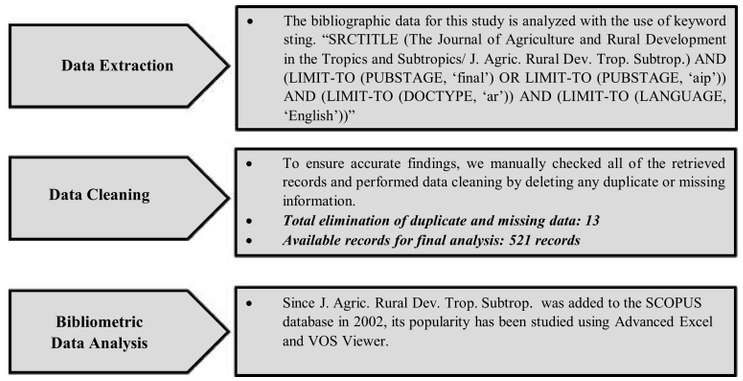


Figure 1a. showing step-by-step process undertaken for the conduct of bibliometric data analysis

- Bibliometric data were explored both descriptively and visually. The authors used the VOS Viewer application package and Advanced Excel to extract bibliometric data from Scopus, the largest social sciences database, and further conclude the obtained data, respectively. A better understanding of the history of the J. Agric. Rural Dev. Trop. Subtrop., key publication trends, and advice for future writers were all uncovered thanks to this study. The bibliometric information in this investigation is assessed with the use of keyword sting: "SRCTITLE (The Journal of Agriculture and Rural Development in the Tropics and Subtropics/ J. Agric. Rural Dev. Trop. Subtrop.) and (LIMIT-TO (PUBSTAGE, 'final') or LIMIT-TO (PUBSTAGE, 'aip')) and (LIMIT-TO (DOCTYPE, 'ar')) and (LIMIT-TO (LANGUAGE, 'English'))". (Refer to figure 1a)
- **We first examine publications and citations using bibliometric data.**
- Secondly, we provide a list of the top donors. Below, we show you the mapping features of VOS Viewer. Connections can be uncovered with the use of co-citation networks. New writers and periodicals can be discovered by a bust analysis. Google Scholar was used to locating the authors' details. 521 publications are generated and assessed to provide informative and representative data perspectives. This article evaluates the research's impact and output using standard bibliometric metrics. We look at total publications (521), total citations, citations per paper, and the h-index.

3. Data source

Since the first document for the Journal of Agriculture and Rural Development in the Tropics and Subtropics article was published in 2002, we analyzed the journal from 2002 to 2022. Using the publication's title, we extracted data from Scopus, the most comprehensive and multi-disciplinary social sciences database. This allows for forward and reverse-time searching. The database can be used for study and collection building. All journal articles from 2002 to December 1, 2022, have been exported in CSV and plain text. These formats include bibliographic, keyword, and citation information.

The H-index ranks countries, organizations, and individual authors. It keeps track of how often a work is cited. Research quality can be gauged by looking at metrics like the H-index and the number of citations, both of which exclude self-citations. The rankings may vary due to the criterion employed, and academics may draw various conclusions based on their demands or pursuits. (Hsieh & Chang, 2009). VOS viewer is a visualization tool used to map journal articles. Both programmes have sophisticated user interfaces and can visually map information. Co-citation analysis can be used to find a trend and quantify proximity. References, sources, and authors can be analyzed. By analyzing the connections between authors, institutions, and countries, co-authorship networks can be used to quantify the amount of work produced by a pair of authors,

groups, or institutions. Keyword co-occurrence analysis reveals the frequency with which two terms appear in the same publication. A timeline study (Kamdem et al., 2019) shows how the journal's overall trajectory changed over the studied period.

4. Results

Publication characteristics, leading countries/regions and institutions, and a scientific mapping analysis are the three lenses through which the journal's bibliometric study presents its data.

In this part, we examine the works published in the J. Agric. Rural Dev. Trop. Subtrop. from three perspectives: the most-cited articles, the people who pay close attention to the journal, and the annual study of publications.

4.1 Annual analysis of publications

The figures in Figure 1a and 1b show the distribution of articles published and cited in rural development-focused journals, respectively. According to official statistics from the Scopus database, Figure 1b compares the J. Agric. Rural Dev. Trop. Subtrop. with several other top publications in the field of rural development from 1982 to 2022.

Figure 1b demonstrates conclusively that the majority of citations have been made to the J. Agric. Rural Dev. Trop. Subtrop.

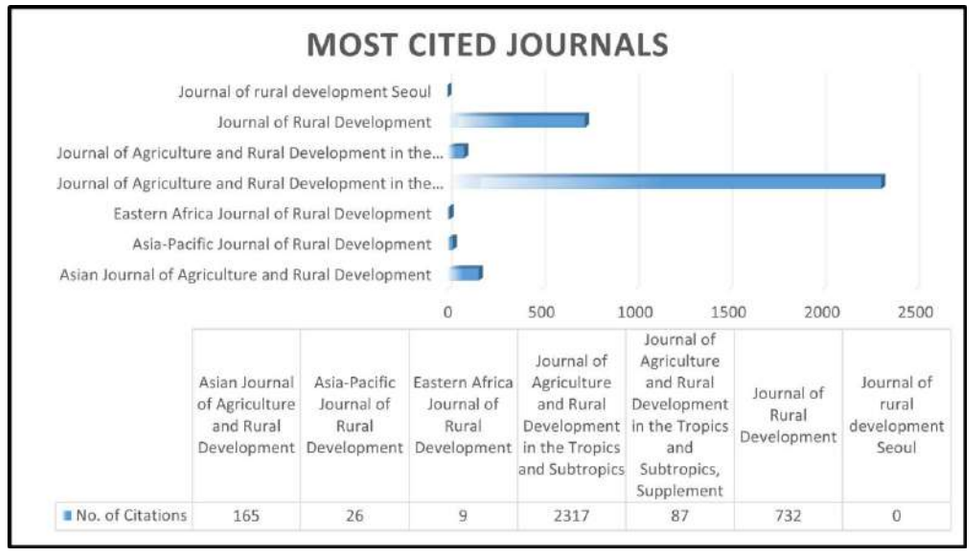
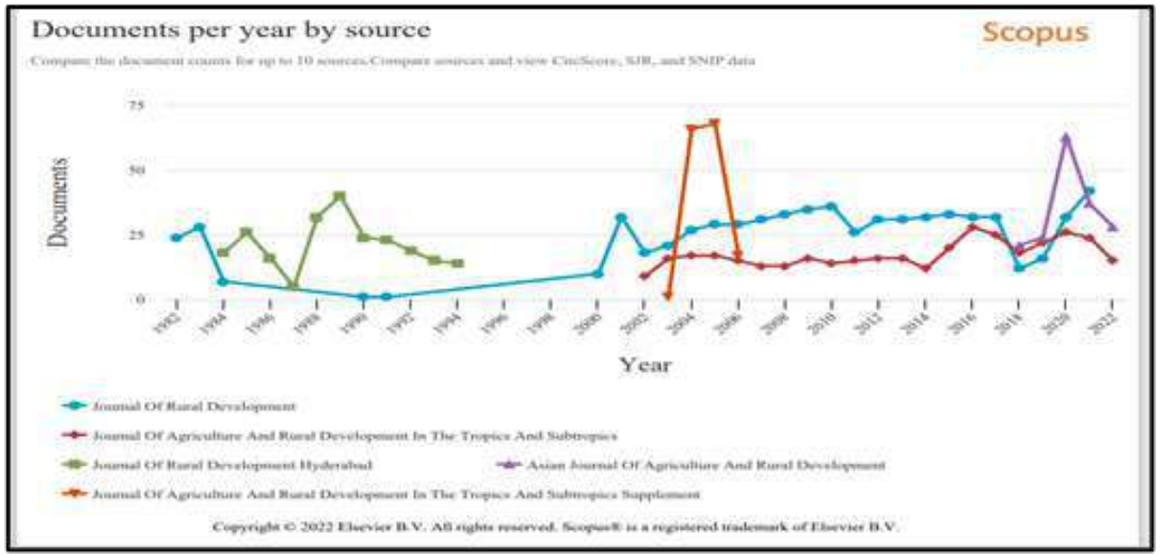


Figure 1b. showing most cited J. Agric. Rural Dev. Trop. Subtrop.

(Source: Author's own calculation using Advanced Excel; Data source: Scopus)

But as can be seen in Figure 1c, the aforementioned journal didn't begin publication until 2002, 20 years after the Journal of Rural Development did, which appears to be the first journal to relate the research on rural development. Despite a later start than its competitors, this publication has the most citations and appears to be the most effective in rural development.



- **In-depth scientific mapping analysis**

We use the VOS viewer to undertake a scientific mapping study of articles published in the J. Agric. Rural Dev. Trop. Subtrop. from four vantage points: co-citation analysis, co-authorship analysis, co-occurrence analysis, network visualization and timeline view analysis.

- **The use of a co-occurrence analysis**

Taking into account the sources and authors cited in publications published in the J. Agric. Rural Dev. Trop. Subtrop., we display and analyze co-citation networks. The analysis is based on a combination of a chronological timeline and the occurrence of concurrent events. Co-occurrence analysis of keywords is an efficient and vital tool for knowledge mining that offers a snapshot of the knowledge structure and research trend, making it a useful method for understanding the research themes of papers published in the Journal of Agriculture and Rural Development in the Tropics and Subtropics.

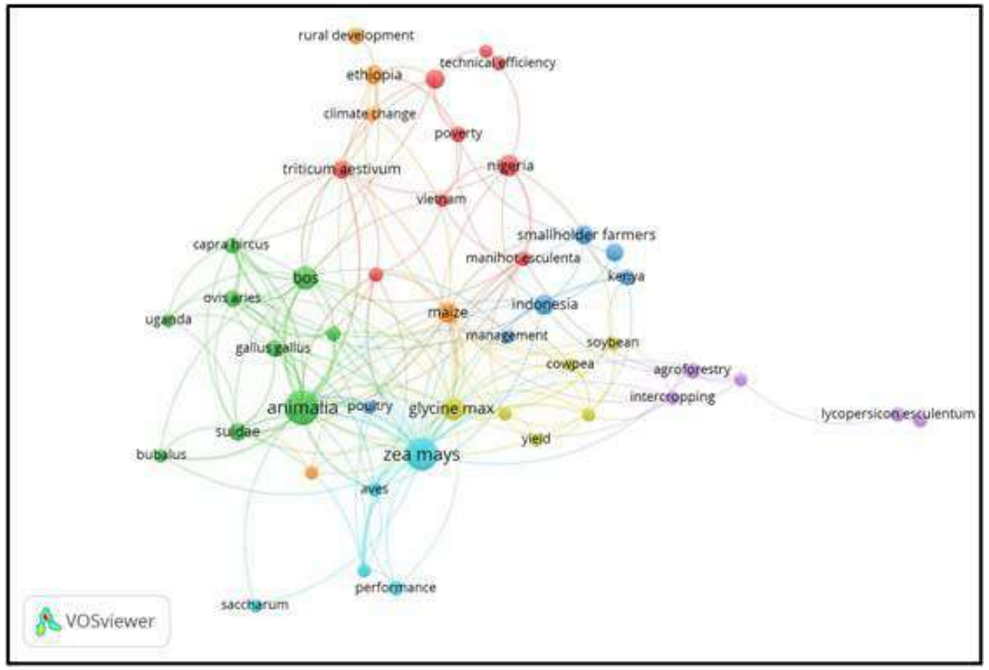


Figure 2a shows Keyword analysis with the help of co-occurrence analysis
(Source: Author's own calculation using VOS Viewer; Data source: Scopus)

The co-occurrence analysis showing association strength by means of network visualization in Figure 2a was generated with VOS Viewer. Analysis revealed that there was a total of 45 keywords employed across 7 clusters, resulting in 8998 links and a total link strength of 19203. The major keywords used here as per the data have been 'poverty, 'technical efficiency', 'Nigeria' and others that form part of the red-themed clusters of the 7 clusters formed to perform the analysis.

Red	Cluster 1	9 Keywords
Green	Cluster 2	9 Keywords
Blue	Cluster 3	6 Keywords
Yellow	Cluster 4	6 Keywords
Pink	Cluster 5	5 Keywords
Teal	Cluster 6	5 Keywords
Orange	Cluster 7	5 Keywords

Table 1 shows clustering theme colours based on the keywords used
(Source: Author's own calculation; Data source: Scopus)

Cluster 1, Cluster 2, Cluster 3, Cluster 4, Cluster 5, Cluster 6 and Cluster 7 correspond to the colours red, green, blue, yellow, pink, teal and orange, respectively, in Table 1, shedding light on the cluster dispersion and its identification based on the colours. If you look at Figure 2, you'll see that the red cluster and the green cluster have the most keywords (9), the blue cluster and yellow cluster have the second-most (6) keywords, and so on down the line to the pink cluster, the teal cluster and the orange cluster (5).

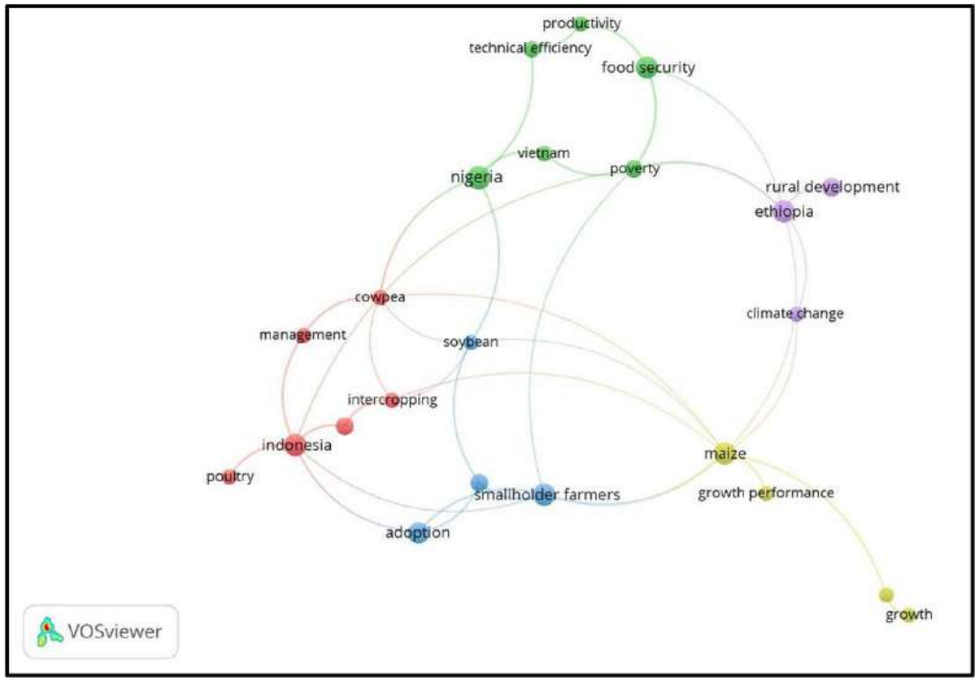


Figure 2b Author Keyword Analysis using fractional counting

(Source: Author's own calculation using VOS Viewer in 5 clusters; Data source: Scopus)

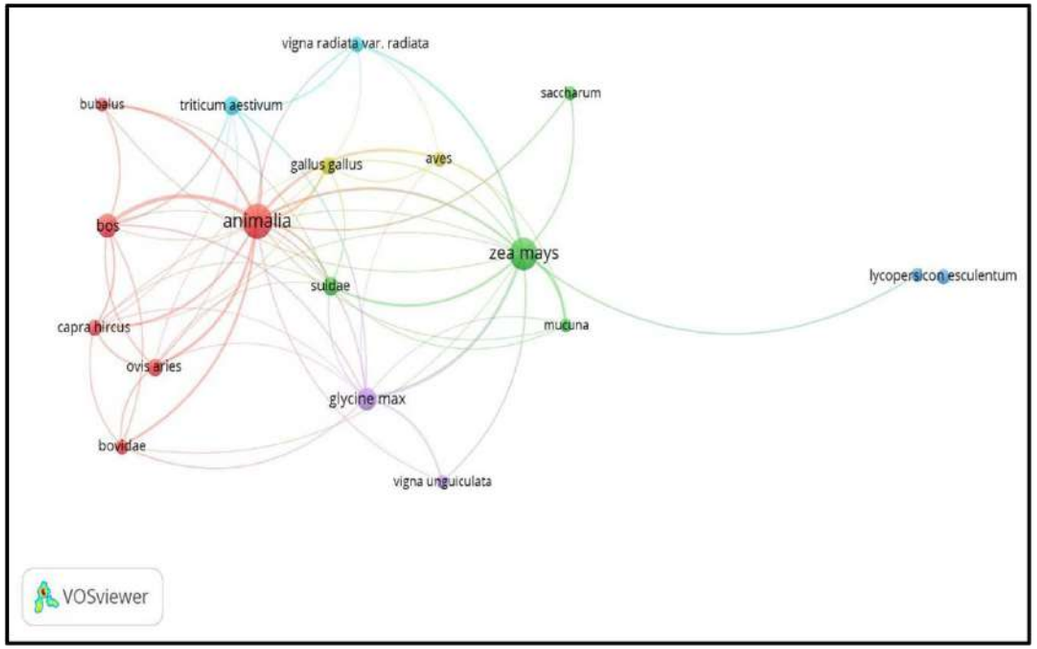


Figure 2c Index keywords analysis

(Source: Author's own calculation using VOS Viewer; Data source: Scopus)

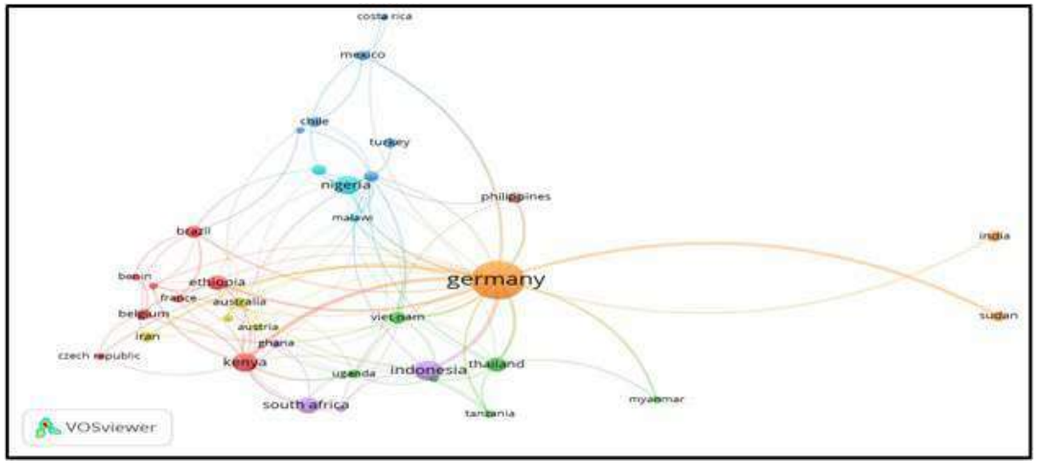


Figure 3. Country-wise co-authorship analysis

(Source: Author's own calculation using VOS Viewer; Data source: Scopus)

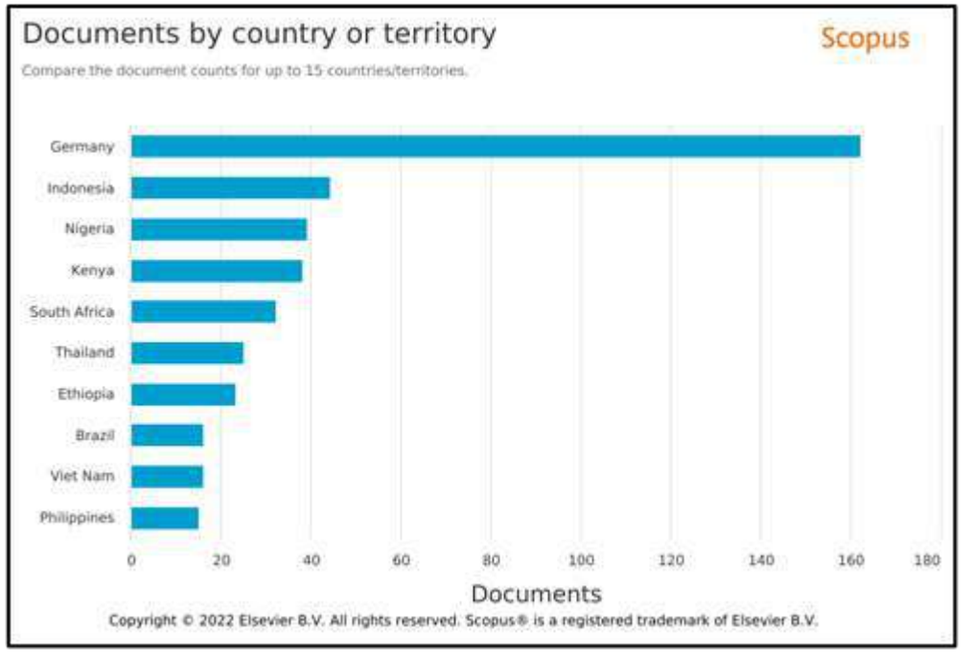


Figure 4 shows the distribution of publishes across nations
(Source: Scopus)

4.2 Who is paying attention to the journal?

With regard to the future of the J. Agric. Rural Dev. Trop. Subtrop., it is essentially important to understand the prospects of the journal and the potential interests who in future shall contribute in direction of betterment of the journal. Figure 4 shows the distribution of publications across nations globally. In the history of J. Agric. Rural Dev. Trop. Subtrop., Germany has published the most articles (about 162). It is followed by 44 publications from Indonesia and 39 from Nigeria. Kenya at the fourth spot has contributed 38 documents to the journal. The gap between Germany and Indonesia which stand in the first and second position is wide.

According to the official database on Scopus, a total of 158 authors have by far contributed to the J. Agric. Rural Dev. Trop. Subtrop. However, despite German authors contributing majorly to the journal (Refer Figure 4) with maximum co-authorship with Indonesian authors (Refer Figure 4). Further, the J. Agric. Rural Dev. Trop. Subtrop. can be propagated more among them and in countries like South Africa, Thailand and Ethiopia journals must be promoted to attract interested researchers as potential authors can be observed through trends. (Refer to figure 4)

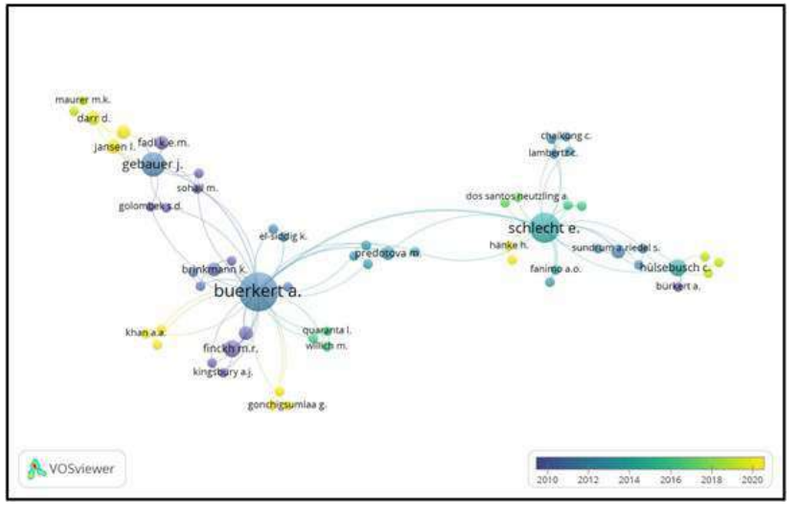


Figure 5. Year-wise authors distribution involved in publications
(Source: Author's own calculation; Data source: Scopus)

It has been considering 59 authors for analysis using VOS Viewer (with reference to Figure 5) that bussing contributors to the J. Agric. Rural Dev. Trop. Subtrop. are authors like Andreas Buerkert who have had a long-time association with the journal. Eva Schlecht is another major contributor to the journal. However, overall, the German author Andreas Buerkert affiliated with the University of Kassel has by far contributed a maximum of 15 documents to the Journal. Thus, it can be said that German, Indonesian, Nigerian and Kenyan interests align majorly with the prospects of the journal and thus, they are potential contributors to it.

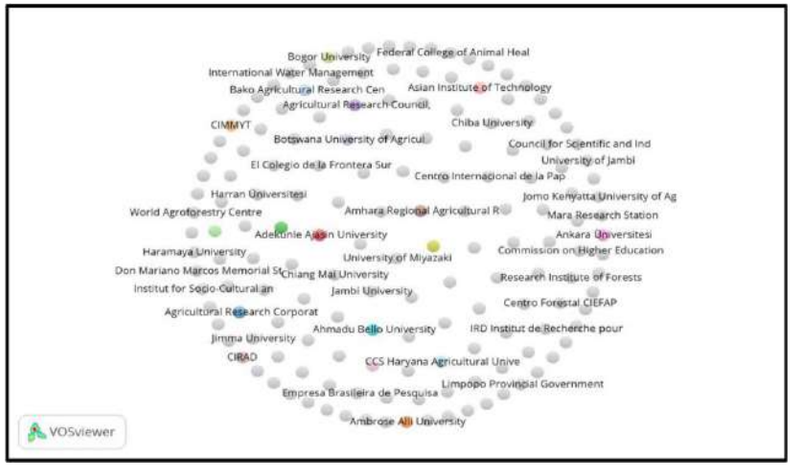


Figure 5a. Network visualization map based on network data
(Source: Author's own calculation using VOS Viewer; Data source: Scopus)

Figure 5a represents the majority of affiliations of the contributors to the J. Agric. Rural Dev. Trop. Subtrop. It can be seen that institutions from all across the globe have had their share of contributions to the journal. Thus, making it a journal of attraction for diversified interests and potential.

4.3 The most cited publications

Figure 6a shows the year-wise publications in the J. Agric. Rural Dev. Trop. Subtrop. between 2002-2022, highlighting its legacy of 20 years. Based on the figure it has been observed that the years 2012 with 262 citations followed by 2013 with 230 citations have had the maximum number of publishes for the J. Agric. Rural Dev. Trop. Subtrop. to date.

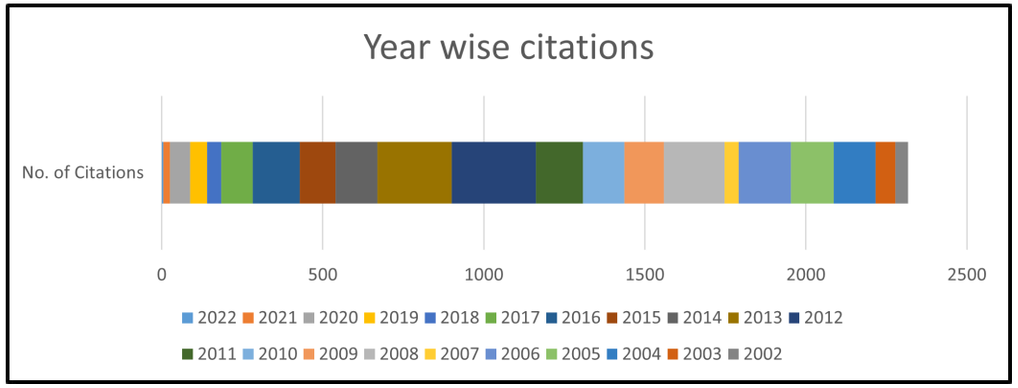


Figure 6a. Year-wise citations in the J. Agric. Rural Dev. Trop. Subtrop.
(Source: Author's own calculation using Advanced Excel; Data source: Scopus)

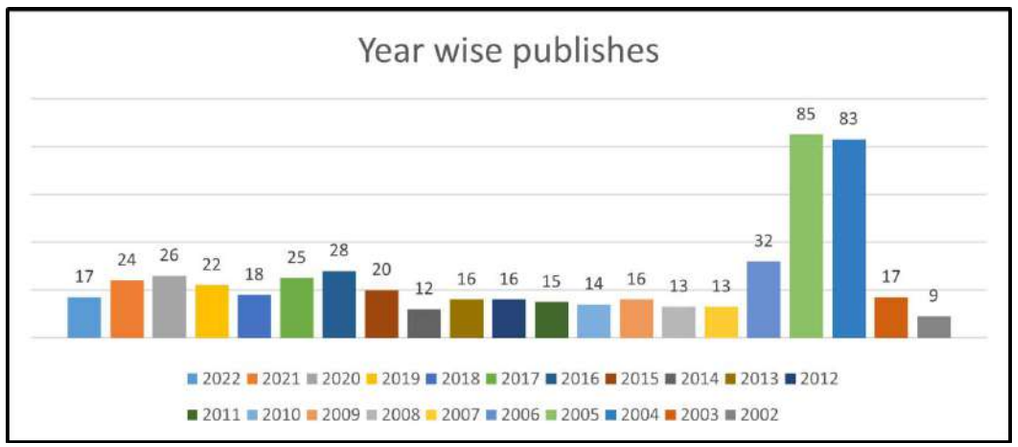


Figure 6b. Year-wise publications in the J. Agric. Rural Dev. Trop. Subtrop.
(Source: Author's own calculation using Advanced Excel; Data source: Scopus)

Further taking a look at Table 2 and Figure 6b, it can be stated that the years 2005 followed by 2004 have had the maximum number of publications for J. Agric. Rural Dev. Trop. Subtrop. While the year 2012 has been the year of maximum recognition with an average of 16 citations in a year, which is a remarkable figure to be achieved followed by the year 2008 when the average number of citations stood at 15 per year.

Table 2. Trends of publications in the J. Agric. Rural Dev. Trop. Subtrop.

Years	Number of documents published	Average citations per year
2022	17	1
2021	24	2
2020	26	3
2019	22	3
2018	18	3
2017	25	5
2016	28	6
2015	20	6
2014	12	12
2013	16	14
2012	16	16
2011	15	10
2010	14	11
2009	16	9
2008	13	15
2007	13	4
2006	32	12
2005	85	9
2004	83	11
2003	17	6
2002	9	5

(Source: Author's own calculation using Advanced Excel; Data source: Scopus)

Taking references from Table 2, it can also be observed that the journal published 9 documents in its year of inception i.e., 2002 with an average of 5 citations in spite of it being a new journal.

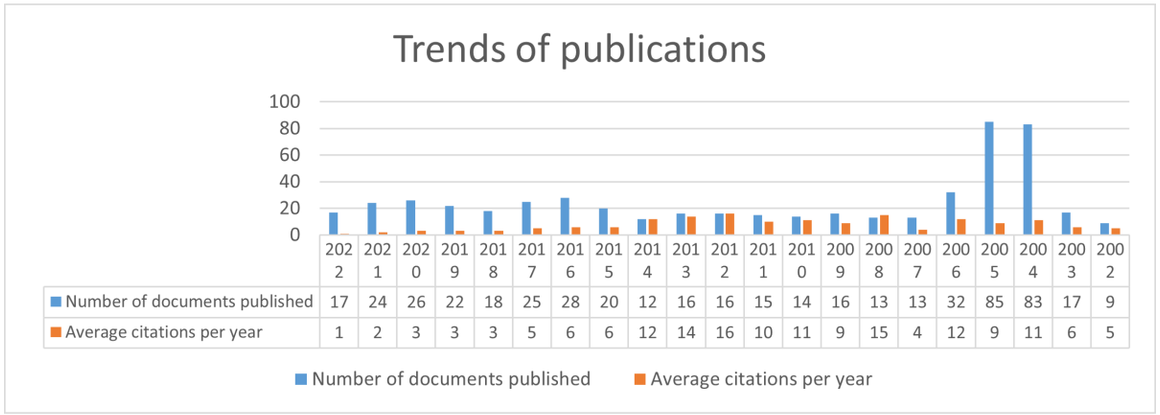


Figure 7. Trends of publications in the J. Agric. Rural Dev. Trop. Subtrop.

(Source: Author's own calculation using Advanced Excel; Data source: Scopus)

Figure 7 is the graphical representation of Table 2. Here it can be depicted that in recent years from 2019 onwards till date, the journal has obtained low figures concerning published documents and journals. However, the past trends emphasize the potential of this journal. Overall, the average number of citations for the Journal has been 8 citations per year approximately taking into account the average citation per year from 2022 to 2022.

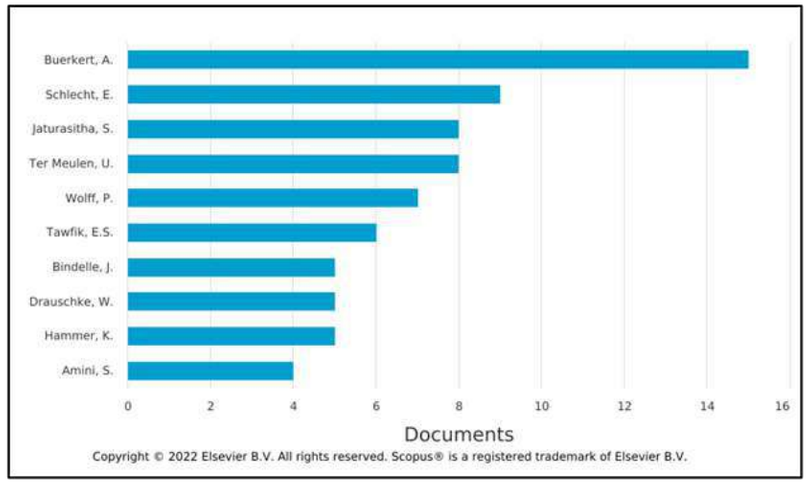


Figure 8. Chart showing the top 10 contributors to the J. Agric. Rural Dev. Trop. Subtrop.

(Data Source: Google Scholar)

Figure 8 highlight the top 10 contributors to J. Agric. Rural Dev. Trop. Subtrop. Andreas Buerkert and Eva Schlecht from the University of Kassel, Germany are the top contributors to the journal with 15 and 9 documents respectively. There is a huge scope of the J. Agric. Rural Dev. Trop. Subtrop. as few of the majorly cited documents of this journal have covered diverse subject areas, ranging from agriculture, biodiversity, Water and Sanitation, and Wage structure and Development programmes. Thus, the scope of the J. Agric. Rural Dev. Trop. Subtrop. has attracted authors from diverse genres with diverse interests, encasing its expanded dimension.

Authors	Affiliations of the authors	Country	NTP	NCP	NTC	NACP	NACCP	h-index
Andreas Buerkert	University of Kassel	Germany	400	313	10484	26.21	33.49	54
Eva Schlecht	University of Kassel	Germany	202	147	3362	16.64	22.87	29
Sanchai Jaturasitha	Chiang Mai University	Thailand	101	73	1386	13.72	18.98	21
Jereme Bindelle	University of Belgium	Germany	355	149	3639	10.25	24.42	35
Karl Hammer	University of Kassel	Germany	283	227	4833	17.07	21.29	38

Abbreviations explained: NTP-total number of publications, NCP-total number of publications that are cited, NTC-Total number of citations, NACP-Average number of citations for every publication, NACCP-Average number of citations per cited publication Table 3b. Eminent authors associated with the J. Agric. Rural Dev. Trop. Subtrop. (Source: Author's own calculation using Advanced Excel; Data Source: Google Scholar)

The above Table 3b enumerates the details of a few of the eminent contributors who have their documents published in the J. Agric. Rural Dev. Trop. Subtrop. Authors like Andreas Buerkert and Eva Schlecht have major total citations of 10484 and 3362 respectively, despite such reach, they have shown due interest in the J. Agric. Rural Dev. Trop. Subtrop. This showcases the potential of this journal and the scope it lays. Further, authors hailing from Indonesia such as Sanchai Jaturasitha have shown due interest in the journal and thus, add up to the reach and acceptability of the journal.

5. Discussion, Recommendations and Limitations

With 521 documents published to the Scopus database to date, the Journal of Agriculture and Rural Development in the Tropics and Subtropics' contributions, influence, and reach are steadily expanding. The journal contains 2317 references to 521 articles. The journal's citation score is 1.2

as on May 22, 2022, as per Scopus's official site, giving a great deal of room for interaction in the future. The J. Agric. Rural Dev. Trop. Subtrop.' global reach and influence are reflected in the breadth of its contributor base, which includes authors from Asia, Europe, and Africa. Using keywords from submitted articles, we can see that most research in the J. Agric. Rural Dev. Trop. Subtrop. focuses on rural development, however, there is some recognition of concerns related to the social sciences, biological sciences, food sciences and agriculture. The same holds true for the sources (journals) that the authors cite in their work. It may be gathered from this that the majority of articles submitted to the J. Agric. Rural Dev. Trop. Subtrop. focuses on issues pertinent to the agriculture industry and food sciences.

The J. Agric. Rural Dev. Trop. Subtrop. has a vast potential for assisting scholars by providing a highly reputable and influential venue for the submission and publication of their work. It may be necessary for researchers, entrepreneurs, customers, and policymakers to investigate and act on the most recent trends in a variety of industries as a result of this paradigm shift and the subsequent changes in the processes and standards adopted by businesses in understanding the dimensions of rural society. It is suggestible that the paper can publish a variety of industry-specific special issues to promote the interdisciplinary development of the notion of rural development. In terms of submissions, dissemination, and editorial contributions, the publisher the University of Kassel, Germany plays an unrivalled role in making the J. Agric. Rural Dev. Trop. Subtrop. is one of the most promising journals in its field.

Future researchers can build on the work of these notable figures by incorporating their suggestions into the planning of their own investigations. As with every research, this one has some limitations. The current effort used Scopus data on citations to the Journal of Rural Development for the aforementioned research. Researchers in the future could replicate this work by analyzing the bibliometric data of J. Agric. Rural Dev. Trop. Subtrop. between 2007 and 2011 to learn more about the revival scenario and the shifts in publication trends for keywords, authors, countries, and scope. This period has seen a significant fluctuation in the number of publications and thus, could be a useful study. Additional data sources (like WOS) may be considered in future studies to track any discrepancies in publication patterns.

6. Conclusion

Using the Scopus database, this research examines the citations published in the J. Agric. Rural Dev. Trop. Subtrop between 2002 and 2022. VOS viewer claims that the focus is on an examination of three factors: the nature of publications, key nations/regions/institutions, and a co-occurrence study of scientific literature distribution. The number of publications has varied over time, with 85 in 2005 being the highest and 9 in 2002 is the lowest. However, since it was the year when the

journal was first released. The publications it made were decent figures. The number of publications, however, has been on a sharp, erratic downward trend during the past years and from 2019 onwards. Many German writers have published in the J. Agric. Rural Dev. Trop. Subtrop.

When compared to other academic institutions, the University of Kassel in Germany has produced the most works (61), followed by the Georg August University of Gottingen in Germany (42) and the University of Hohenheim in Germany (23). These three educational institutions are found in Germany, making the contributions of German authors dominant with regard to J. Agric. Rural Dev. Trop. Subtrop. Andreas Buerkert, a professor at the University of Kassel, is a respected writer whose work has appeared in the J. Agric. Rural Dev. Trop. Subtrop.

We examine numerous challenges facing the article in the future based on the research offered above. It has been observed that authors outside Germany are also having a due interest in the journal which needs to be promoted specifically in Indonesia and Nigeria. The study presents a fair assessment of the J. Agric. Rural Dev. Trop. Subtrop. By using bibliometric analysis, is an essential and beneficial technique for academics to utilize in order to analyze patterns and gain a sense of some hot subjects in a journal or the direction research is headed. This is achieved through presenting a balanced and comprehensive view. To business and economics professors, consider this a gift. It could also encourage scientists to pay more attention to the journal, which could help advance scientific research topics.

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