

A Bibliometric Analysis for Mapping the Landscape of Agricultural Export Research

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ABSTRACT

The study used methods like co-occurrence analysis, bibliographic coupling and various trends of publication. Through the use of bibliometric analysis top journals, authors, countries, articles and institutions have been identified. Along with that this article also contains a detailed content analysis of selected publications. Diverse studies have been conducted on trade agreements, environmental conflicts, employment issues, trade regulations etc.; however, the primary objective of the study is to explore and map the literature on 'agricultural export' in Scopus database. This will help in clarifying the main idea and guiding the researchers towards potential future research. Additionally, this research will also intend to provide academicians, policy-makers and regulatory authorities in gaining clear understanding of the essential concepts of agricultural export and highlighting the key areas that require further study.

Keywords: Agriculture, Export, GDP, Employment, Trend, Bibliometric Analysis, Scientific Mapping.

Introduction

Agriculture plays a significant role in global market, providing livelihood, employment, economic stability to billions worldwide. India is one of the largest producer and exporter of agricultural products in the world. Bibliometric analysis is an essential tool for analyzing the agricultural export research context. Bibliometric study is a quantitative research methodology that provides insight into the trending publication, citations, co-authorship, keywords and journals etc. Understanding the dynamics of agriculture export, bibliometric study will put light on the key areas, research gaps, popular topics in this field.

The purpose of this paper is to undertake a comprehensive bibliometric analysis of global agricultural export research, with an emphasis on publishing patterns, keywords, and collaboration networks. The findings are likely to help academics, policymakers, and practitioners understand the fundamental of agricultural export research and shape future directions in this sector.

Numerous studies on Agriculture have been carried out in fields like productivity, problems, organic farming, export and import etc. however, present study look into and analyse the global export trends of agriculture. The study focus on following research questions:

- Which journals have published the most cited documents related to this topic?
- Who are the most productive authors in this research field?
- Which article on "agriculture export" is most frequently cited?

- Which region and institution are most productive in this sector?
- What is the bibliometric mapping of "agriculture export" in terms of keywords, nations, journals, and documents?

Research Methodology

The data for this study were collected from the Scopus database, which is a widely recognized and authoritative source for scholarly publications. The Initial search was conducted using relevant keywords related to agricultural trade, i.e., "agricultural products," "exports," and "imports,,"; due to a very limited number of search results, the time period was not specified and all types of scholarly publications like peer-reviewed journal articles, conference papers, and meeting abstracts available on the database were included; and non-English articles were not considered due to their limited audience reach.

To collect the required data for a bibliometric analysis focused on the trade of agricultural products, the authors utilized a search string that initially yielded a vast number of results. To refine the search and obtain specific articles related to the import and export of agricultural products in the disciplines of business, finance, economics, social sciences, and agriculture, the authors combined two different search strings. The final search string employed in the study was "#1agricultural products (Title) AND export (Title) NOT water (Title) OR #2agricultural products (Title) AND import (Title) NOT water (Title)". This refined search strategy enabled the researchers to access relevant literature pertaining to the import and export of agricultural products within their targeted disciplines. Bibliometric analysis techniques were applied to the collected data using software tools namely VOSviewer. Additionally, keyword co-occurrence analysis was utilized to visualize the relationships between frequently used terms, aiming to explore trends and identify thematic streams within the domain.

Interpretation of Data

For the purpose of bibliometric study 100 documents were taken into account. The extraction of data has been conducted in June, 2024. The researcher has examined various aspects of data covering the publications trend; the most productive journals; the most frequently cited articles, the most influential authors. Additionally, the study also covered the contribution made by various countries and institutions; the co-occurrence of all keywords; and the bibliographic coupling of countries, journals and documents.

• Top Contributing Journals

The study examined the leading journals in the field of agriculture. The study highlighted the top 10 journals in the field of study discussed earlier. With a total of 185 citations, the economic and political weekly was found to be the most prominent journal worldwide. The resources, conservation and recycling, food policy, journal of cleaner production, world development. Published by Elsevier, agricultural economics, competitiveness review published by Emerald, journal of economic structures published by Springer, followed this.

Table 1: Top 10 Journals

Journals	Documents	Citations	Publisher
Economic and political weekly	6	185	Economic and Political Weekly
Resources, conservation and recycling	1	63	Elsevier
Agricultural economics	1	45	Agricultural Economics
Food policy	1	41	Elsevier
Competitiveness review	1	39	Emerald
Journal of economic structures	2	38	Springer Open
Journal of cleaner production	3	29	Elsevier Ltd
World development	1	26	Elsevier
International journal of applied business and economic research	3	25	Serials

• Key Contributing Authors

After identifying the most contributing journals, the researchers identified the most inventive authors who have major contributed to the research in the area of agriculture export. The study revealed that Gandhi, Ankita, Mehrotra, Santosh, Parida, Jajati, Sinha, Sharmistha contributed the most to the field of agriculture export.

Table 2 presents the list of the top10 most contributing writers.

Table 2: Top 10 authors

S. No.	Author	Author ID	Affiliation	
1	Gandhi, Ankita	54974862400	Institute of Applied Manpower Research, Delhi, India	96
2	Mehrotra, Santosh	55242532900	National Institute of Labour Economics Research and Development, New Delhi, India;	96
3	Parida, Jajati	56338021400	School of Economics, University of Hyderabad, India	96
4	Sinha, Sharmistha	57208006379	National Institute of Labour Economics Research and Development, New Delhi, India	96
5	Bateman, Anna	53866121500	Department of Civil Engineering, University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom	63
6	Boardman, David	7004731149	Department of Civil Engineering, University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom	63
7	Carliell-Marquet, Cynthia	6505797307	Department of Civil Engineering, University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom	63
8	Kansal, Arun	7004164076	Department of Natural Resources, TERI University, New Delhi 110 070, India	63
9	Van Der Horst, Dan	8260210200	Department of Geography, Earth and Environmental Science, University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom	63
10	Kar, Saibal	7202157611	Department of Economics, Calcutta University, India; IZA, Bonn, Germany	47

• Most Cited Documents

According to our research, 'Explaining employment trends in the Indian economy: 1993-94 to 2011-12' by Mehrotra (2014) had a total of 96 citations, making it the most referenced work in this field. This was followed by 'Closing the phosphorus loop in England: The spatio-temporal balance of phosphorus capture from manure versus crop demand for fertilizer' by Bateman (2011), 'Spillovers from high-value agriculture for exports on land use in developing countries: Evidence from Madagascar by Minten (2007)', 'Instability in Indian agriculture-a challenge to the Green Revolution technology' by Larson (2004)) and 'Analyzing competitiveness of clothing export sector of India and Bangladesh: Dynamic revealed comparative advantage approach' by Kathuria (2013).

Table 3 lists the top 10 most cited documents.

Table 3: Top 10 Documents

Document	Title	Citations
Mehrotra (2014)	Explaining employment trends in the Indian economy: 1993-94 to 2011-12	96
Bateman (2011)	Closing the phosphorus loop in England: The spatio-temporal balance of phosphorus capture from manure versus crop demand for fertilizer	63
Minten (2007)	Spillovers from high-value agriculture for exports on land use in developing countries: Evidence from Madagascar	45
Larson (2004)	Instability in Indian agriculture-a challenge to the Green Revolution technology	41
Kathuria (2013)	Analyzing competitiveness of clothing export sector of India and Bangladesh: Dynamic revealed comparative advantage approach	39
Mukhopadhyay (2018a)	The impact of Trans-Pacific Partnership agreement on the Canadian economy	37
Veeramani (2012)	Anatomy of India's merchandise export growth, 1993-94 to 2010-11	29
Marjit (2009)	A contemporary perspective on the informal labour market: Theory, policy and the Indian experience	26
Damodaran (2002)	Conflict of trade-facilitating environmental regulations with biodiversity concerns: The case of coffee-farming units in India	26
R.L. (2021)	Does investment in innovation impact firm performance in emerging economies? An empirical investigation of the Indian food and agricultural manufacturing industry	24

- **Leading Nation**

The analysis revealed that India emerged as most contributing country with total of 8 articles and 716 citations in this field of study. The United Kingdom ranked second with a total of 66 citations. Other notable contributing Belgium and Madagascar each with 45 citations, followed by United States, Canada with 41, 38 citations respectively.

Table 4 presents the top 10 contributing nation with the total number of citations and documents

Table 4: Top 10 Countries

Country	Documents	Citations
India	96	716
United Kingdom	2	66
Belgium	1	45
Madagascar	1	45
United States	2	41
Canada	2	38
China	1	37
Germany	1	21
Spain	1	9
Japan	1	6

- **Leading Institutions**

Ministry of finance, India has emerged as the most influential organization in this research area with total citations of 96. This institution was followed by National Institute of Labour Economics Research and Development, New Delhi, India. Department of Civil Engineering, University of Birmingham, Edgbaston, Birmingham, United Kingdom; Department of Geography, Earth and Environmental Science, University of Birmingham, Edgbaston, Birmingham, United Kingdom; Department of Natural Resources, Teri University, New Delhi, India; and Indira Gandhi Institute of Development Research, Mumbai, India, with a total of 96, 96, 63, 63, 63 and 63 citations, respectively. As shown in Table 5, the majority of the leading institutions are located in India, which makes India the most contributing country in this research field (as shown in Table 4). The detailed list of the top 10 institutions is shown in Table 5.

Table 5: Top 10 Institutions

Institutions	Documents	Citations
Ministry of Finance, India	1	96
National Institute of Labour Economics Research and Development, New Delhi, India	1	96
Department of Civil Engineering, University of Birmingham, Edgbaston, Birmingham B15 2tt, United Kingdom	1	63
Department of Geography, Earth and Environmental Science, University of Birmingham, Edgbaston, Birmingham B15 2tt, United Kingdom	1	63
Department of Natural Resources, Teri University, New Delhi 110 070, India	1	63
Indira Gandhi Institute of Development Research, Mumbai, India	4	63
Centre for Studies in Social Sciences, Calcutta, India	2	47
International Food Policy Research Institute (Ifpri), NASC Complex, Pusa, New Delhi 110 012, Cg Block, Dps Marg, India	1	45
Licos Centre for Institutions and Economic Performance, K.U. Leuven, 3000 Leuven, Debériotstraat 34, Bus 3511, Belgium	1	45
World Wildlife Fund (WWF), 101 Antananarivo, BP 738, Madagascar	1	45

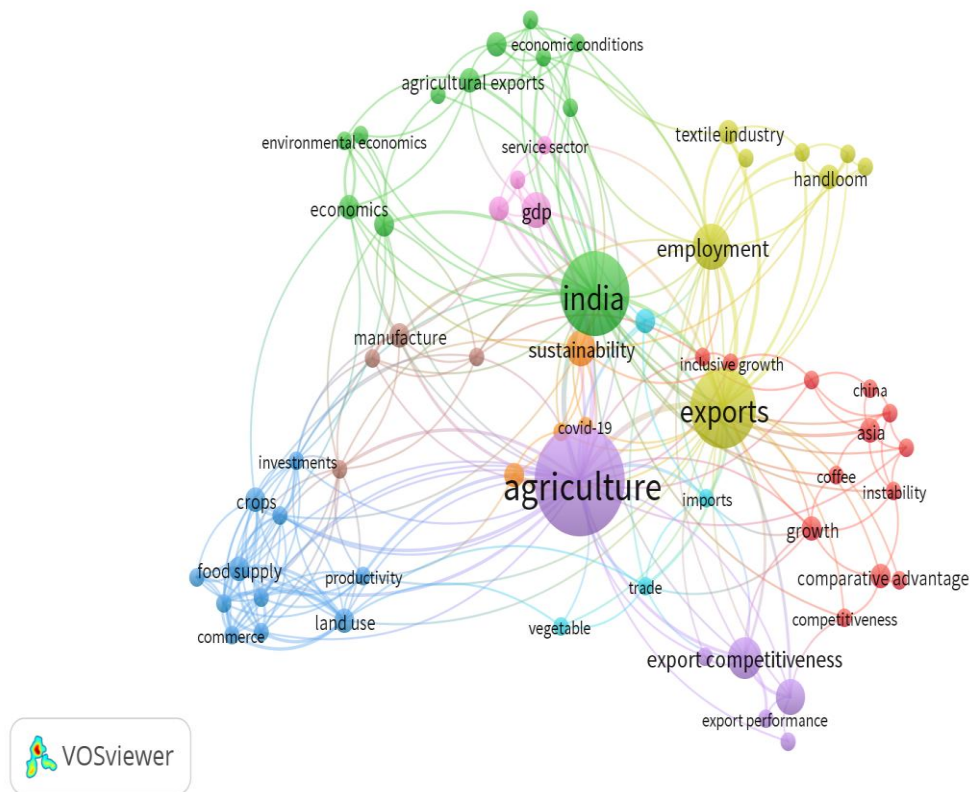
- **Most Relevant Keywords**

Table 5a lists the top 10 keywords along with their frequency and Total strength link. Since the research is prominently based on agriculture it is the most occurred key word with an occurrence of 23 times and a Total Link Strength (TLS) of 59. It was followed by India (occurrence 16, TLS 47), Exports (occurrence 15, TLS 43), Employment (occurrence 07, TLS 25) export competitiveness (occurrence 15, TLS 14).

Table 5a: Top 10 keywords

Keyword	Occurrences	Total link strength
Agriculture	23	59
India	16	47
Exports	15	43
Employment	7	25
Export Competitiveness	6	14
Gdp	5	8
Revealed Comparative Advantage	5	9
Sustainability	5	12
Agricultural Exports	3	11
Agricultural Trade	3	7

The largest collection of related objects, or keywords, is shown in Figure 1.

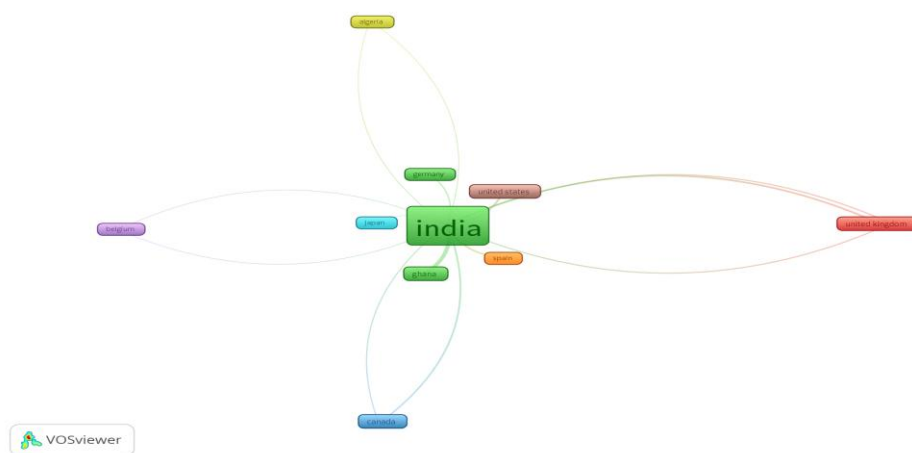
**Fig. 1: Co-occurrence of all keywords**

Bibliographic Coupling of Countries

During analyzing the data using this software, the minimum threshold was set on one for number of documents for a country and zero for citations for a country. All the countries (17) met the criteria. The largest connected network included 15 countries, as illustrated in Figure 5, which shows the bibliographic coupling among them based on total link strength (TLS). India ranked highest, with a TLS of 850, supported by 96 documents and 716 total citations. The United Kingdom followed with a TLS of 202 and 66 citations. Ghana recorded a TLS of 177 from two documents and one citation. Chile and Ecuador each had a TLS of 174, based on one document and three citations each. Table 7 provides a detailed list of the top 10 countries, including their TLS values, document counts, and total citations.

Table 7: Coupling of countries

Country	Documents	Citations	Total link strength
India	96	716	850
United Kingdom	2	66	202
Ghana	2	1	177
Chile	1	3	174
Ecuador	1	3	174
Canada	2	38	112
China	1	37	89
United States	2	41	85
Spain	1	9	79
Belgium	1	45	62

**Fig. 2: Coupling of Countries****Bibliographic Coupling of Source**

For the bibliographic coupling analysis of sources, the minimum threshold was set at two documents per source and zero citations. Out of 53 sources (journals), 17 met these criteria. The largest connected group consisted of 12 sources, as illustrated in Figure 6, which depicts the bibliographic coupling among these sources based on total link strength (TLS). According to Table 8, the *Indian Journal of Economics and Development* recorded the highest TLS of 39, supported by 8 documents and 7 citations. It was followed by the *Asian Economic and Financial Review*, *Journal of Agribusiness in Developing and Emerging Economies*, *Economic Affairs*, and *Foreign Trade Review*, with TLS values of 18, 16, 15, and 15, respectively. These sources had 2, 4, 24, and 10 citations from 2, 1, 10, and 2 documents, respectively. A detailed list of the top 10 sources, along with their TLS, citation counts, and number of documents, is presented in Table 8.

Table 8: Top 10 coupling of sources

Source	Documents	Citations	Total Link Strength
Indian Journal of Economics and Development	8	7	39
Asian Economic and Financial Review	2	2	18
Journal of Agribusiness in Developing and Emerging Economies	1	4	16
Economic Affairs (New Delhi)	10	24	15
Foreign Trade Review	2	10	15
Cogent Economics and Finance	2	1	14

International Journal of Applied Business and Economic Research	3	25	12
Competitiveness Review	1	39	11
South Asia Economic Journal	2	3	9
Asia-Pacific Journal of Regional Science	1	0	6

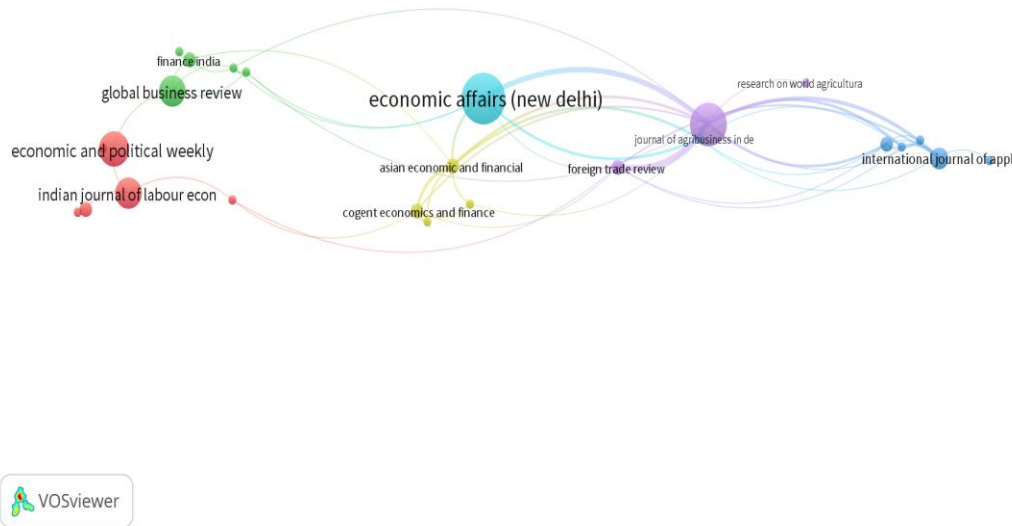


Fig. 3: Coupling of Source

Bibliographic Coupling of Documents

The software was configured to only include those documents that meets requirement of minimum of 02 citations. 56 of the 99 total documents satisfied the minimum requirements. Figure 4 represents the bibliographic coupling of 56 documents. It was based on the weight of the total link strength. The leading document titled “An Assessment of Agricultural Export Competitiveness of Commercial Crops: Pathways to Augment Indian Agricultural Exports” by Viswanatha Reddy (2022) had the greatest TLS of 17 with 2 citations, followed by “Examining export advantages in Indian horticulture: an approach based on product mapping and seasonality” by Saxena. (2024), “Consistency Test of Revealed Comparative Advantage Index: Evidence from India’s Agricultural Export” by Jagdambe. (2019), “Trade determinants and opportunities for Indian rice: a dynamic panel gravity model perspective” by Ravi kumar. (2024) and “Export competitiveness of Indian textile industry: Revealed comparative advantage analysis” by Dhiman (2017). Table 9 shows this information.

Table 9: Top 10 Coupling of Documents

Keyword	Occurrences	Total link strength
Viswanatha Reddy (2022)	2	17
Saxena (2024)	4	16
Jagdambe (2019)	7	13
Ravi Kumar (2024)	0	12
Dhiman (2017)	22	12
Kathuria (2013)	39	11
Anjum (2021)	1	10
Solanki (2022)	2	10
Ghosh (2019)	1	9
Gulnaz (2023)	0	9

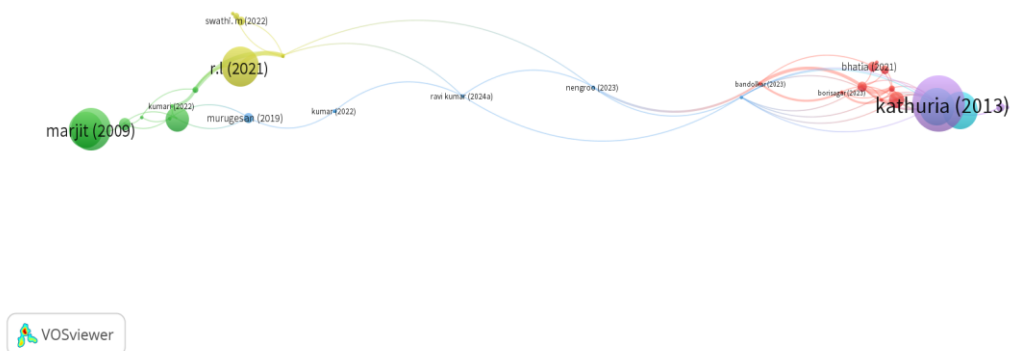


Fig. 4: Coupling of Documents

Review of Selected Studies

Appukkuttan & Damodaran (2002) advocates integration of national and global environmental concerns with trade-related environmental regulations in the larger interests of sustainable agriculture in developing countries. R.L. et al. (2002) aims to examine the effect of Research & Development (R&D) intensity on firm performance, specifically measured by sales growth, in emerging markets such as India. Innovation strategies and their results can vary significantly between developing and developed countries. Therefore, focusing on an emerging economy like India—where a large portion of the population relies on agriculture—is crucial for understanding firm performance in the food and agricultural manufacturing sector. The study will primarily concentrate on one widely acknowledged factor that may influence the growth rate of firms. According to Larson (2004) the Green Revolution technology succeeded in transforming India from a large food importer and large recipient of food aid in the 1950s and 1960s to a food secure country. During the 1980s and 1990s, India was occasionally able to export food. However, despite the advancements brought by Green Revolution technology, agricultural instability has persisted over the past two decades. This paper investigates the factors contributing to fluctuations in area, yield, and production of major crops in India from 1950-51 to 2001-02. The study period is divided into pre-Green Revolution and post-Green Revolution phases. Minten et al. (2007) highlights that high-value agriculture for exports is increasingly important in developing countries. A case study on contract farming for vegetable exports in Madagascar reveals significant spillover effects on land use. Using a matched plot sampling design, the study found that rice productivity—the country's primary staple food consumed domestically—was approximately two-thirds higher in fields that were contracted for off-season vegetable production. This yield improvement is attributed to enhanced soil fertility resulting from the application of fertilizers and compost, practices that farmers had not employed before entering into these contracts. Bateman et al. (2011) suggests that every year 90 million tonnes of housed livestock manures are produced in the UK. This is a valuable reservoir of global phosphorus (P) and a point in the cycle where it is vulnerable to being lost from the terrestrial system. Improved manure management for the effective reuse of phosphorus is vital to simultaneously tackle a major source of water pollution and reduce our dependence on imported fertilisers. Mehrotra et al. (2014) explores employment trends in India since the mid-1990s based on study of various rounds of National Sample Survey unit level data. The major findings are of a structural transformation with an absolute fall in agricultural employment and a rise in non-agricultural employment. Rahman et al. (2012) analysed bilateral agricultural trade between Bangladesh and India. The paper found that Bangladesh's export and import toward Indian market has shown robust growth over the years. To further promote trade in future between two countries policy improvisation and other duty free offers needs to be implemented. According to Kathuria (2013) The textiles and clothing sector ranks among India's most vital economic industries, second only to agriculture in terms of industrial output and employment, providing jobs to over 30 million people. While many studies forecast that India will capture a substantial portion of the global textiles and clothing market due to its advantage in low labor costs and other resource factors, India's comparatively slower growth relative to other low-cost competitors challenges this expectation. This paper aims to assess the comparative advantage of India and Bangladesh in the global clothing export market using Balassa's Revealed Comparative Advantage (RCA) index. The study examines shifts in comparative advantage between the two countries over different time periods. Additionally, it identifies

the barriers hindering India's export growth in the world market and offers policy recommendations to enhance India's share in global clothing trade. The methodology involves calculating RCA indices for various clothing product categories, classified up to the four-digit level under the Harmonized System, using Balassa's relative measure for both India and Bangladesh. Corresponding tables have been prepared to present the findings for each country. Mukhopadhyay & Thomassin (2018) aims that the Trans-Pacific Partnership is the most comprehensive trade agreement in the world. The TPP will help deepen Canada's trade ties in the dynamic and fast growing Asia-Pacific region while strengthening existing economic partnerships with NAFTA partners and across Americas. The TPP will eliminate tariffs on almost all of Canada's key exports and offer access to new opportunities in the Asia-Pacific region. Tariffs and other barriers on a wide range of Canadian products from various sectors will be reduced including in agriculture and agri-food fish and seafood forestry and wood products metals and mining and industrial goods. These benefits can only be derived if USA ratifies it. However the US president has already signed a presidential memorandum confirming the US withdrawal from the TPP agreement.

Conclusion

This bibliometric paper highlights the landscape of agricultural export trends, contribution of various authors, emerging focus areas. Over times, agriculture sector has emerged as significant sector experiencing steady growth, remarking its presence globally by increasing global collaborations. The findings of this paper highlights the importance interdisciplinary approach and need of further on emerging topics like sustainability, trade policy, value chain & supply chain etc. This study provides a fundamental understanding for policy makers and researchers about agriculture sector and pinpointing the pertinent areas for further research.

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