



## Bibliometric Analysis of Sustainable Development Goals (SDGs) Research in India: Trends, Contribution, and Impact

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### ABSTRACT

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#### Keywords:

*Sustainability Development Goals (SDGs), sustainability, India, bibliometric analysis, bibliometric review*

This study focuses upon the current scenario of SDGs implementation by reviewing the articles published since 2012 to present. There have been a number of studies being performed by various researchers. So it becomes important to analyze the available studies to get insights about when, where, by whom and how these researches evolved over the years. However, the main area of this study has been limited to India only to check the evolution of Sustainability Development Goals. Bibliometric analysis has been used to analyze 580 articles which have been extracted out of 37,700 articles by following a rigorous process. For which the systematic review of literature has been adopted which is followed by the bibliometric analysis. The findings of the study reveal that India has adopted SDGs but the pace of adoption is comparatively slow and India need more policies and awareness program to achieve sustainability goals.

## 1. INTRODUCTION

Sustainability has always been an important concept but it was out of focus previously. In the last few years, it has drawn the attention of the world due to the depletion of resources. Now, we know that development is incomplete until and unless it is not sustainable [1]. In its initial stages, “Our Common Future” was a report that drew the attention of the outside world towards depleting resources and potential associated risks [2]. This made the world aware of the dangerous situation and the importance of sustainability [3]. Even three directions were also suggested by Pierrri [4] in this regard- the strong, moderate and weak sustainability. With time, this concept associated with globalization and led researchers to explore a clear understanding and find out solution to this problem. Then, 17 SDGs were being adopted by the United Nations in the year 2015. These include the removal of poverty, protecting the resources of Earth and other agendas such as ensuring prosperity [5]. While it comes to sustainable development, the United Nations focuses not only on environmental issues but also on the economic and social factors also. These factors are covered through 17 different goals (Table 1), subdivided into 169 targets and 243 indicators [6]. These are on the agenda of the United Nations and are to be achieved till 2030 [7]. Previously, these goals were available in the form of MDGs- Millennium Development Goals which were being modified and extended into SDGs [8]. With every nation, India also started following these to achieve levels of success and raise its standard of living.

Through this bibliometric analysis (Figure 1), the following

research questions will be entertained specifically:

RQ1-What is the trend of publication (number of yearly publications) of SDG researches in India?

RQ2-Which are the top most institutions published about SDGs in India?

RQ3-Who are among the top most authors on SDGs in India?

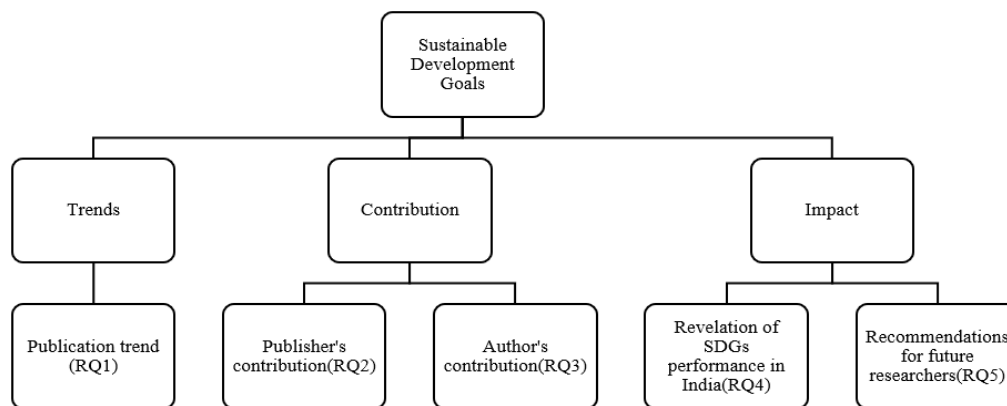
RQ4-What does the available articles reveal about SDGs performance in India?

RQ5-Where can the future researches been performed about SDGs in India?

**Table 1.** The 17 SDGs by the United Nations

SDGs	Title
1	No poverty
2	Zero hunger
3	Good health and well-being
4	Quality education
5	Gender equality
6	Clean water and sanitation
7	Affordable and clean energy
8	Decent work and economic growth
9	Industry, innovation and infrastructure
10	Reduced inequalities
11	Sustainable cities and communities
12	Responsible consumption and production
13	Climate action
14	Life below water
15	Life on land
16	Peace, justice and strong institutions
17	Partnership for the goals

Source: Literature review



**Figure 1.** Conceptual framework for bibliometric analysis in reference to the research questions

Every single goal in SDGs (as adopted by United Nations in Agenda 2030), is further directed towards concrete targets that are subdivided into 169 targets and more than 200 indicators that are adopted and can be modified by different adopting nations and regions [5]. To achieve different levels of sustainability, different nations have joined hands to protect the planet Earth and its resources for future generations [9, 10]. Each and every country understands this scenario very well that without protecting environment and securing resources, the success cannot be achieved.

Moving beyond, there are differences in the researches being made by various researchers. Some have completely focused on SDGs as a whole but other researchers are also there who have studied its aspects separately such as poverty alleviation or climate change etc. However, the present study considers only those studies that are taking SDGs on the whole for performing bibliometric analysis.

The current research article is a contribution to assess the current stage of studies on SDGs in India and has the potential to collaborate for achieving success towards the goals achievement. India is a developing country having been involved in activities where from starting it is important to target the ways so that the environment is not harmed. For this purpose, bibliometric analysis has been chosen because it is important to make use of available knowledge for further knowledge production [5]. Moreover, no such review has been published in this regard till date and it has been also validated through the search process made on Scopus database with the keywords “sustainable development goals” and “bibliometric analysis” and “India” but no such review has ever been performed. However, it is significant for the scholars and the researchers to reveal bibliometric results to get information about research themes [11, 12]. Bibliometric analysis is a way through which the identification of top authors, sources, countries, institutions, articles and other related information can be derived. That is why; the current research article has been performed to get an idea about the state of sustainable development goals in India.

The main aim of the current research is achieved by dividing the whole work on the basis of two criterions: Descriptive analysis and Graphical representation. First of all, an overview of the SDGs literature performed in India has been presented and then a descriptive analysis has been performed for the related review articles and then these are presented in the form of visualized representation. In the last, an agenda has been presented to enrich the domain of SDGs performance in India.

## 2. LITERATURE REVIEW

The first paper on SDGs was performed in the year 2012 in India. In this seminal paper entitled “Tupperware: Achieving sustainable development goals through elevating socio-economic status of women in India”, the researcher suggested about programs to uplift the woman’s socio economic status. The study provides its observations on the socio-economic status of women in India. As per the study, India was working for the upliftment of socio-economic status of women. But while they entered into Indian markets they faced a lot of challenges. Then this corporation modified its marketing strategies after which also includes 100% females as sales force currently [13].

Initially, the researchers focused on the achievement of SDGs through the rise in the socio-economic standards [13, 14].

Then it was connected with human moral obligations where the study focusses on the eradication of poverty and other principles to be followed under SDGs [15]. Not only this, but some complex interactions were also being made between 17 SDGs by using structural modeling approach [16, 17]. In the last few years, since digitalization has taken place, new concepts such as e-waste management has emerged and their relation with SDGs has created an opportunity for businesses [18]. As the current study is performed for the bibliometric articles where the main focus is made on the business activities and contribution for the SDGs. That is why the previous study [19] provides base for the connection between corporate social responsibilities and their alignment with in the boundary of Indian region. As businesses are parts of society so they have direct responsibility and legal obligation at the same time which is why they need to align with sustainable goals [20]. The achievement level of SDGs adopted by India specifically [21]. This study further explains the challenges being faced by India while adopting these goals.

Traditionally, the SDGs talked about three core aspects-economic, environmental and social [22]. He also suggested that every country needs to maintain a balance between these three. But as the world is dynamic, new innovations take place every second. If innovative ideas are linked to sustainability, then they would have a greater chance to be succeeded for a long period of time. New entrepreneurs are being transformed into social entrepreneurs for ensuring sustainability because they are directed to achieve the social aspects of SDGs [23]. To achieve SDGs, studies also suggest the STI (Science, technology and innovation) interaction to policy makers [24] in India and other emerging countries.

### 3. RESEARCH METHODOLOGY

#### 3.1 Bibliometric database search

The Scopus database was searched to make this study possible by using the keyword “Sustainability Development Goals” then a rigorous process was followed to extract the final list of articles out of 36,037 articles on 15<sup>th</sup> January, 2024 at 10.26 AM. Further, the searched articles went through the filtration process at five stages (shown in Figure 2).

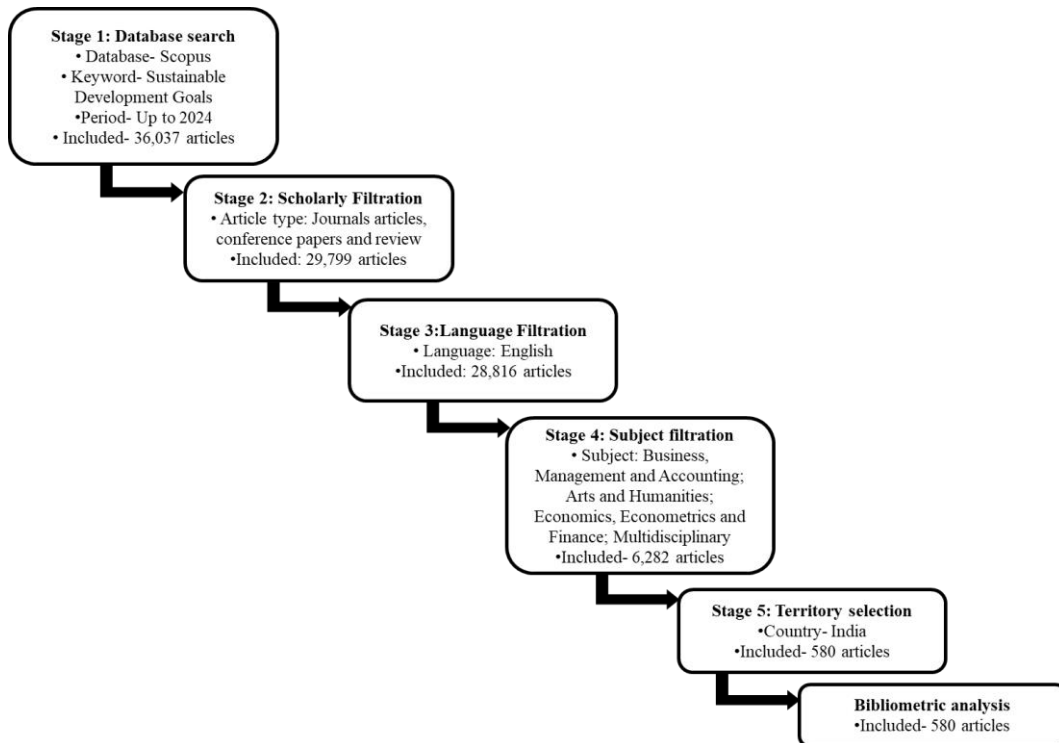
Figure 2 clearly depicts all the stages through which the final data selection process has gone through. At stage 1, the Scopus database was searched and included 36,037 articles. Scopus database is specifically chosen as it covers a large range of data; it is also considered to be one of the best in meeting the required specifications; with this, the data files of Scopus database are properly organized and managed that are easily accessible in analysis software to draw conclusions [25]. Moreover, Scopus provides scientific database that is useful for bibliometric reviews [11]. Not only this, but Scopus provides high quality articles specially recommended for bibliometric analysis [26]. The articles of Scopus are being searched by using the keyword “Sustainable Development Goals” and then these 36,037 articles were extracted.

At level 2, the article types- journal articles; conference papers and review articles were included and then reached 29,799 articles by excluding 6,238 articles. The main reason

for choosing these types of articles was that these kinds of articles generally provide novel work and follow a rigorous peer review and both these attributes are significant. That is why; book articles and others do not complete this so these have not been included.

On the next level, the language filter was used and only those articles are included which are in English (refer Table 2). Due to this, 983 articles were excluded. This filter has been used as it is impractical to take those articles that we are not able to understand.

After language filtration, subject filtration took place in which we considered-Business, Accounting and Management; Arts and Humanities; Economics, Econometrics and Finance; Multidisciplinary (refer Table 2). We took these particular subject areas for covering the wider part related to business point of view. These criteria are taken to be in recommendation as per the studies [12, 25]. Under this filter, 6,282 articles were included and 22,534 articles got excluded. But as we want to study the SDGs trend, contribution and impact in India, we bound our study to India only. The main reason for choosing India is that it is one of the developing nations in the world and it is necessary to check the ways through which it is emerging in the world. For this, we used the territory or location filter and after applying this, we were left with 580 articles in the last. These 580 articles are the final articles that survived after following the filtration process for bibliometric analysis.



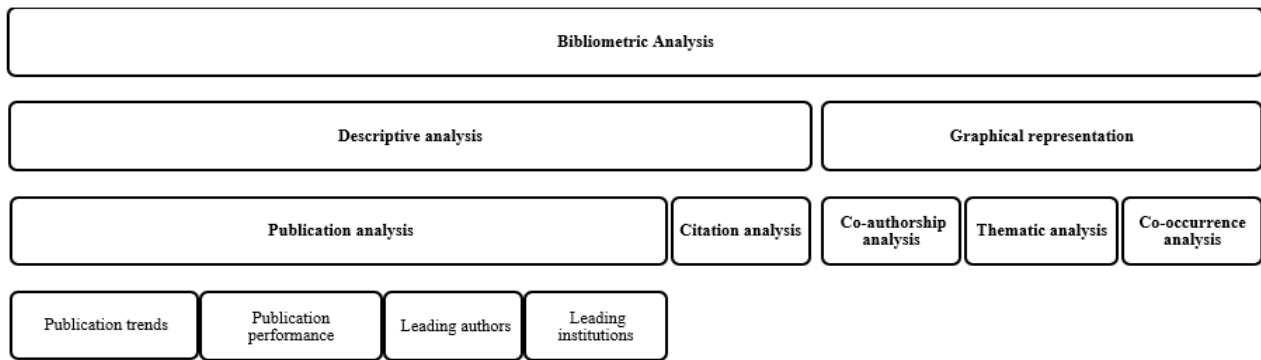
**Figure 2.** Database search and filtration strategy for bibliometric analysis

Source: Scopus database

**Table 2.** The inclusion and exclusion criteria during database search

Inclusion Criteria	Exclusion Criteria
Scopus Database	Other than English language
Journal articles, conference papers and review papers	Other than journal articles, conference papers and review articles
Subject filter specifies the specific areas - Business, Accounting and Management; Arts and Humanities; Economics, Econometrics and Finance; Multidisciplinary	Other than Business, Accounting and Management; Arts and Humanities; Economics, Econometrics and Finance; Multidisciplinary are excluded
Restricted the study to India only	Rest of the world has been excluded

Source: Author’s work



**Figure 3.** Analysis strategy for bibliometric analysis  
Source: R Studio

### 3.2 Bibliometric analysis

The current article uses the bibliometric analysis for studying the trend, contribution and impact of articles being performed on the topic “Sustainable Development Goals”. Using 580 articles from Scopus database, a number of bibliometric analyses are performed to show its trend, contribution and impact specifically in India. In the current article, the descriptive and graphical representations are being used to perform bibliometric analysis (Figure 3). In particular, the descriptive analysis covers the trend of publication (RQ1), the top most contributions of authors, institutions in Indian studies on SDGs (RQ2 and RQ3) and also what these articles reveal about SDGs performance in India by analyzing the findings part of top cited articles (RQ4). This study also reveals the gap that future researches can cover (RQ5), which is done through thematic and co-occurrence analysis.

So, the descriptive analysis includes publication and citation analysis whereas the graphical representation includes the co-authorship; thematic and co-occurrence analysis. All of this has been performed in consistency with the study assessing about transfer pricing [12].

## 4. RESULTS

**Table 3.** The main information about data

Description	Results
Timespan	2012:2024
Sources (Journals, Books, etc.)	242
Documents	580
Annual Growth Rate %	30.32
Document Average Age	2.33
Average Citations per doc	16.79
Keywords Plus (ID)	2475
Author's Keywords (DE)	1887
Authors	2507
Authors of Single-Authored docs	58
<b>Authors Collaboration</b>	
Single-Authored docs	60
Co-Authors per doc	5.22
International Co-authorships %	40.86
<b>Document Types</b>	
Articles	500
Journal Articles	5
Conference Papers	22
Review Articles	53

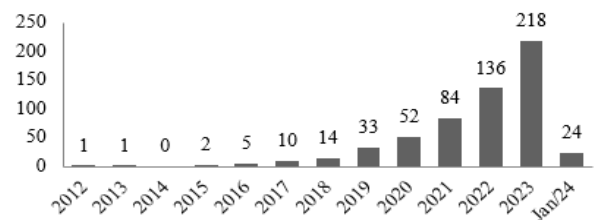
Source: R Studio

The current study indicates that the first article on SDGs

was published in the year 1990 but while we talk about India, the first publication was held in the year 2012. But after following the filtration process the final chosen articles are 580 that represent the studies being performed in India regarding SDGs. These studies have 242 sources and 2507 authors with an annual growth rate of 30.32% (Table 3).

### 4.1 Publication trend (RQ1)

To know the publication trend of SDG articles in India, the yearly publication rate is extracted by using the R Studio and MS Excel is used to draw conclusions diagrammatically (Figure 4). The spreading of publication articles on a yearly basis shows the trend that helps to know the interest of researchers. The results show that for the last few years, this topic has in the focus of researchers and scholars. Since 2021, this topic has shown a significant rise which led to 218 articles in 2023 and 24 articles in only January 2024. So, on this basis, it is very clear that in recent years the SDGs have been a centre of attraction for scholars and researchers in India.



**Figure 4.** The publication trend of research articles (per year)  
Source: R Studio

### 4.2 Top most institutions (RQ2)

Table 4 shows the list of top most contributing journals that have published about SDGs in India; we have taken twelve studies which have been chosen on the basis of the number of articles published. So, in the provided list it is clear that Journal of Cleaner Production (having A ranking as per ABDC rank list) has the highest number of publications made (n=63) that is related to SDGs in India. The follower of this journal is the journal named “Environment, Development and Sustainability” which has published 32 articles since January 2024. The following table also shows the ABDC and the ABS ranking but some columns are blank as they are not ranked in both these ranking lists. But have published a high number of articles in Scopus database and have different SCImago Journal Rank. This ultimately shows that the publication of SDGs in India is being welcomed by reputed journals.

**Table 4.** The list of top most contributing journals regarding SDGs in India

Sr. No.	Journal Title	ABDC Rank	ABS Rank	Number of Articles	SJR 2022
1	Journal of Cleaner Production	A	2	63	1.98
2	Environment, Development and Sustainability	-	-	32	0.84
3	PloS One	-	-	27	0.89
4	Economic and Political Weekly	B		22	0.33
5	Business Strategy and the Environment	A	3	11	2.87
6	Journal of Dharma	-	-	10	0.16
7	Resources Policy	B	2	10	1.87
8	Technological Forecasting and Social Change	A	3	10	2.64
9	Australasian Accounting, Business and Finance Journal	-	1	8	0.41
10	Current Science	-	4	8	0.25
11	Energy Economics	A*	3	8	3.04
12	Indian Journal of Human Development	-	-	8	0.22

Source: Author's work

### 4.3 Top authors (RQ3)

#### 4.3.1 Leading authors

Table 5 shows the list of top authors on the basis of number of articles written by them. In the given list, Sinha, A. is the leading author (n=25) followed by Kumar, A. (n=19), Kumar, S. (n=13), Kumar, P. (n=9), Mangla, S.K. (n=9) and other with eight and seven articles written on SDGs in India. As this study is associated with India that is why the list shows the Indian authors who have written about SDGs.

**Table 5.** The list of top most contributing authors regarding SDGs in India

Sr. No.	Author	Affiliation	No. of Articles
1	Sinha, A.	MDI, Gurgaon	25
2	Kumar, A.	IIM, Rohtak	19
3	Kumar, S.	NITIE, Mumbai	13
4	Kumar, P.	Ministry of Health and Family Welfare, New Delhi	9
5	Mangla, S.K.	OP Jindal Global University, India	9
6	Kumar, R.	ICAR- Research Complex for Eastern Region, Bihar	8
7	Raut, R.D.	IIM, Mumbai	8
8	Gupta, S.	ISRO, Telangana	7
9	Kumar, M.	NIT, Patna	7
10	Sharma, M.	Amity University, Noida	7

Source: R Studio

#### 4.3.2 Leading author collaborations

There are authors who have worked in collaboration on the topic and have published articles. The leading author collaboration is observed on the basis of citations. Table 6 clearly shows that the collaboration of Huges, I. and Dwivedi, Y.K. is at the top with the highest citation count of 478. They are being followed by Wilkinson and Boxall with 423 citation count. Whereas the author collaboration between Shahbaz and Balsalobre-Lorente is at place three with 405 citations. The main aim of these highly cited collaboration shows the way industry practices are contributing towards sustainable development goals. In the observed studies, the first study has provided insights on blockchain where as the study of Wilkinson and Boxall suggest the negative effects of active pharmaceutical products on our ecosystem. Whereas the study by Shahbaz and Balsalobre-Lorente suggests the ways through which safer policy making can be done by keeping the

safeguards of the environment in mind.

**Table 6.** The list of leading author collaborations regarding SDGs in India

Author 1	Author 2	Citation Count
Huges, I.	Dwivedi, Y.K.	478
Wilkinson, J.L.	Boxall, A.B.A.	423
Shahbaz, M.	Balsalobre-Lorente, D.	405
Sinha, A.	Sen Gupta, T.	262
Zafar, M.W.	Shahbaz, M.	232
Chien, F.	Anwar, A.	230
Chaudhary, R.	-	214
Sharma, R.	Sinha, A.	203

Note: Top author collaboration with minimum 200 citation count (only two authors per document have been reported)

Source: VOSviewer

### 4.4 Thematic analysis (RQ4)

Thematic analysis is a technique of identifying the level for showing the state of research. In thematic analysis, there are four sections- niche themes, motor themes, emerging themes and basic themes. These different sections represent different states of research. Niche or the specified theme shows 'article', 'human' and 'humans' keywords. Motor theme area shows important and well-developed articles for the structuring of this research field. In motor themes there is only a small part can be seen which means that there is a scope of this research and this can also be observed in the basic theme that depicts those articles that have potential for further research and here the study of SDG in relation to India, United Nations and Agriculture has a great scope which is in the basic theme showing the importance of this research (Figure 5).

### 4.5 Reflections and ways forward

The available literature was analyzed to perform bibliometric analysis and the knowledge structure of SDGs in India. Generally, the bibliometric analysis reveals the top authors, publishers, articles and themes of SDGs in India researches from 2012 to January 2024, which encompasses the research of twelve years. The current study enables us to answer four RQs and provide the following takeaways:

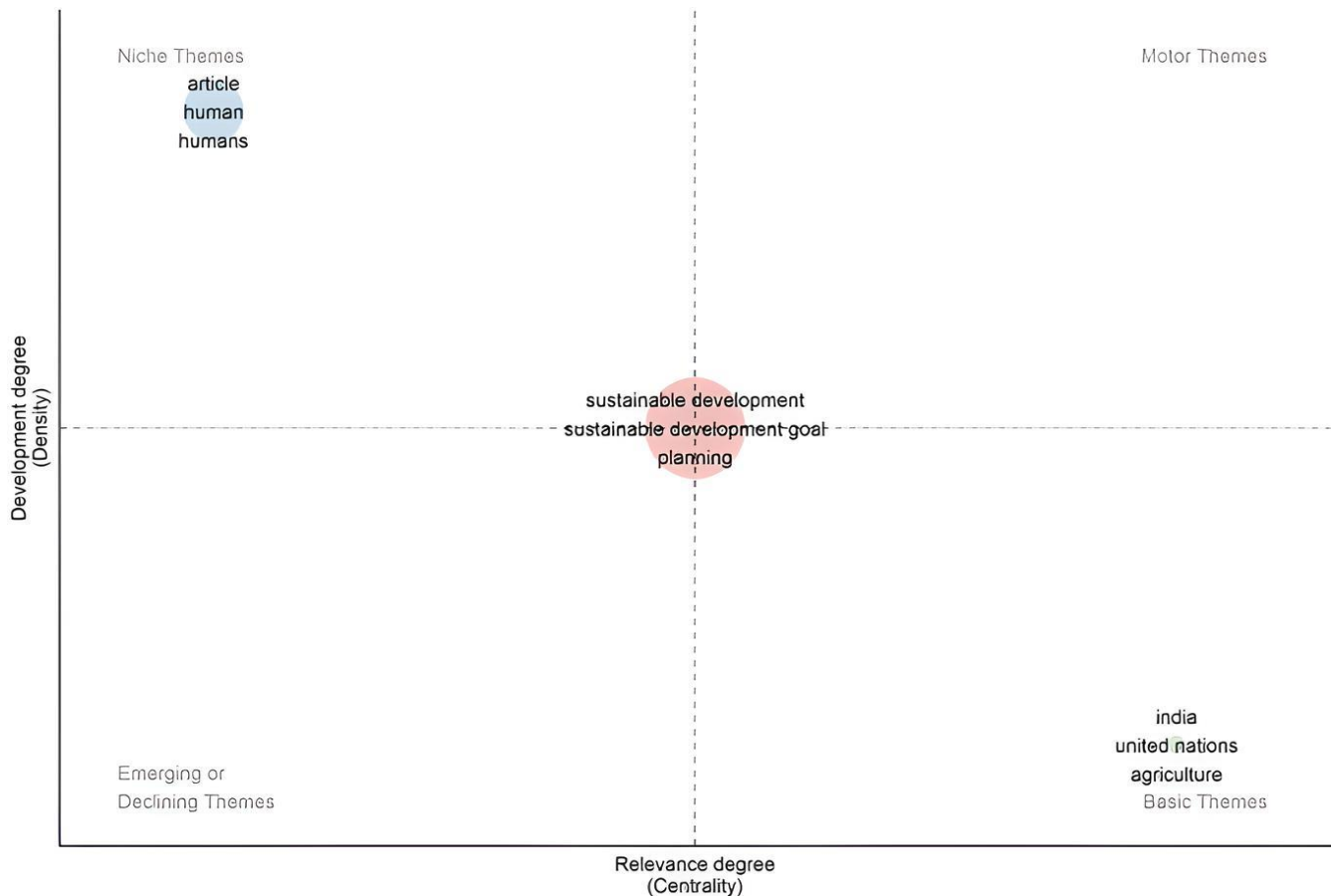
- 1) SDGs researches in India have risen drastically since 2019, Figure 3 shows the research articles published per year (RQ1);
- 2) Journal of Cleaner Production is the top most journal that has published the highest number of articles related to SDGs in India (RQ2);
- 3) Sinha A became the top leading author from MDI,

Gurgaon with 25 articles and he is followed by Kumar A, from IIM, Rohtak (RQ3);

- 4) The research articles develop over time and achieve different levels that can be observed in thematic map. This evolution shows that there is a scope in the articles of SDGs in relation to India; the United Nations and Agriculture (RQ4);
- 5) The current research reflects about the future implications where this research can work as a base for further researches related to SDGs in India (RQ5).

In particular, the current research suggests the involvement of researches for sustainable development goals and its implementation. It reveals that researchers are exploring this topic as an important area that is not only connected to academics only but is a part of our lives. Over the last few

years, the discussions about the environment and its concerns have become a serious issue and it is the responsibility of every human being to take care of it. We know that the resources are scarce and have alternative uses. So, it is important to use them wisely so that future generations could also use them like we are. This thought makes sustainability an important area for all of us. That is why the United Nations has provided us with 17 goals that are needed to be achieved by countries to have a healthy growth. In the same way, India also has to adopt these goals since 2030. So, it attracted researchers and scholars towards itself and many researches took place. But at the same time, the current study checks the level of SDGs researches being done in India. That is why, this study provides a bibliometric analysis for this topic.



**Figure 5.** The state of research through thematic map  
Source: R Studio

## 5. DISCUSSION AND LIMITATIONS

With the goal to achieve sustainability, the UN had fixed some goals (SDGs 17) which ensure prosperity and work on eradication of poverty and many more activities that play an important role in the development and success of any country. In the same way, in the current study, the implementation and adoption of SDGs have been checked to assess the contribution of India in the achievement of SDGs or the associated goals. In the current study, the bibliometric analysis has been used to check the current level (trend), contribution and impact through the already available articles and the associated publication, authors and other information. For assessing the required information, the Scopus database has

been used to extract the required information. While placing the keyword we got a huge list of articles but when narrowed down the process, we got only 580 articles being performed in India. Whereas the world outside is found to be more concerned about this issue. Where we have found a number of studies that are being performed at the international level. Not only this but the issue of sustainability is taken very seriously at their level.

In India, comparably there is a very small amount of articles being published on SDGs and it is the time to create awareness. So, this paper provides an insight on the emerging need of the research on SGDs in India where this study can become a basis for providing the trend, contribution of publishers and authors and also the impact where several

studies are targeting several issues related to SDGs such as poverty eradication, socio-economic status of women and many more.

While other countries are taking steps to achieve sustainable goals, it is important for India too to take steps, as it is a developing nation and needs to check the ways it is adopting for becoming successful.

This study has some limitations. This study has addressed the issues related to business and industry subject area where as the other areas also play an important role. Also, we have considered only the Scopus database where as other databases have their own importance but the current piece of research is limited to Scopus only. Also, the keyword “sustainable development goals” were searched during the search process but there may be several articles which might be regarding the SDGs but have not been covered. However, we have tried to cover the major part of the studies but still these things have been performed in a specific range.

## 6. CONCLUSION

The current study gives a bibliometric analysis of the available literature on SDGs performed in India. This study has been performed on the basis of the data extracted from Scopus database. The data that has been used for this study ranges from the period 2012 to 2024 as the first study took place in 2012 in India on the topic “Sustainable Development Goals”. The extracted studies extracted from various researchers have been chosen from different disciplines that contribute in a great manner. A growing trend in the research can be clearly observed which becomes helpful for knowing the level of SDGs research being performed in India. On the basis of the selected database, certain questions have been answered to draw meaningful conclusions. As India has been selected for which the state of SDGs has been performed but there were some other countries also available that have also done research work either as a co-author or as a single author. The extracted articles reveal about the theme from which this area belongs. Here the SDGs have the potential to be studied in collaboration with United Nations; India and Agriculture. We have taken the studies related to SDGs but the boundary of this study has been set to India only. So, the current state of research could be identified in India and the future steps could be provided a base with the help of this study.

## 7. PRACTICAL IMPLICATIONS

By identifying the level of SDGs in India, various subject areas have been used that will help potential practitioners of the concerned areas. This study provides a base to understand the state of understanding of SDGs in India. It indicates the wide variety of approaches that can be applied to understand the level of SDGs. Policy makers can use this information to frame new policies to be adopted in India. They can create a framework for applying to Indian regions and it can be helpful for implementing the goals. The organizations and professionals engagement can also be raised for raising the standards of living. This study fills the gap between the previous and the current understanding of SDGs. As this study is restricted to India, it helps to check the state of understanding at country level which is more reliable. While studying this country wise, it adds up to our existing

knowledge and helps to find ways to implement it effectively. In India, the study is helpful to find out the areas where other than top authors and institutions can be targeted to work on this so that the whole country could join hands to achieve it.

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