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# EIGHT YEARS OF RESEARCH IN RELIABILITY: THEORY AND APPLICATIONS (2017–2024): A SCOPUS BASED BIBLIOMETRIC ANALYSIS

Sajad Hussain*[1], Vilayat Ali Bhat[2]

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*[1]School of Business (SOB), University of Petroleum & Energy Studies, Dehradun, India - 248013
[2]Department of CSE – AI, ML & DS, Marwadi University, Rajkot, Gujarat, India - 360003
sajad.stat321@gmail.com*[1]
vilayat.stat@gmail.com[2]

**Abstract**

*This study looks at the SCOPUS research published in the journal Reliability: Theory and Applications from 2017 to 2024. The main goal is to understand how the journal has grown, how influential it is, and how researchers are working together. The data shows that the number of papers published has increased steadily, especially after 2020, showing that the journal is becoming more important in the academic world. Most of the research came from countries like India, the Russian Federation, and Azerbaijan. Universities such as Kadyrov Chechen State University and Azerbaijan State Oil and Industry University were among the top contributors. The study also used network analysis to examine how authors collaborate, which keywords are used together, and which papers are cited the most. It was found that a few researchers, like Yusuf Ibrahim and Rather Aafaq A., are very active and well-connected in the author network. Citation analysis showed which authors, institutions, and countries had the most influence. This study provides helpful information for researchers, universities, and funding agencies interested in working with or contributing to this journal.*

**Keywords:** Bibliometric Analysis, Citation analysis, Network analysis, Statistical Analysis, Research clusters

## I. Introduction

The online journal Reliability: Theory & Applications (ISSN 1932-2321) has been published by the Gnedenko Forum since January 2006. By December 2024, it had published 81 volumes with a total of 1,322 SCOPUS indexed papers. The journal has been indexed in SCOPUS since 2017. It focuses on different topics related to risk analysis, such as reliability, safety, security, survivability, quality control, reliability testing, queuing models, and other similar subjects. It is a peer-reviewed journal, which means that experts check and approve the articles before they are published. The journal is meant for both researchers and professionals working in risk and reliability engineering. It publishes high quality papers that deal with theory, methods, and real-world problems related to the safe and reliable design and use of systems in different industries. The types of papers it accepts include research papers, reviews, case studies, and bibliographic articles. The journal prefers papers that show clear real-world applications and case studies. Submitted papers are reviewed by the Editorial Board. However, if a paper is submitted by an Associate Editor, they may recommend it for publication directly.



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Bibliometric analysis is a way for researchers to understand how a subject or field has changed and grown over time. It uses numbers and patterns, like how many times a paper has been cited, how authors work together, and which keywords are used the most. This helps show which authors, papers, journals, and universities are the most important in that area. It also helps find new or popular topics that are becoming important. In short, bibliometric analysis helps researchers see how research has developed and what direction it might take in the future. Many researchers have used this method to study how different journals have helped their fields. For example, the Journal of Finance was studied by [9], fifteen years of the Journal of Consumer Research looked by [10], the Journal of Advertising from 1986 to 1997 studied by [23], 20 years of the Journal of Public Policy & Marketing looked by [18], the Strategic Management Journal from 1980 to 2000 studied by [17], 21 years of the International Marketing Review studied by [14], 25 years of the journal Technovation studied by [7], 20 years of the Journal of Product Innovation Management looked by [1] and the journal Total Quality Management & Business Excellence from 1995 to 2008 studied by [5]. In India, similar studies were done viz. the Ethnobotany journal studied by [6], the Indian Forester studied by [8], the journal Library Philosophy and Practice studied by [19], the Library Herald (for the years 2006 to 2010) studied by [20], the DESIDOC Journal of Library and Information Technology looked by [12], the journal Webology studied by [22] and the Journal of Oral Research studied by [4]. These examples show that bibliometric analysis is a helpful way to understand how journals and research areas have improved, what topics are popular, and which studies have had the most influence.

In recent years, many researchers have used bibliometric analysis to study different academic journals. For example, research published in the Journal of Business Research from 1973 to 2014 looked by [16], 25 years of the journal Knowledge-Based Systems studied by [3], International Journal of Intelligent Systems examined by [15], 30 years of Journal of Business & Industrial Marketing reviewed by [21], 40 years of Journal Computers & Industrial Engineering analysed by [2] and 40 years of the European Journal of Operational Research studied by [13]. More recently, 10 years of research in the journal Genetic Resources and Crop Evolution was studied by [11]. These studies show that bibliometric analysis is a useful method to understand how research in different journals has grown, what topics are popular, and which studies have had the most impact.

## II. Results

In this paper, the data for the bibliometric analysis was taken from SCOPUS, one of the most widely used research databases. The data collected covers the period from 2017 to December 2024. Two types of analysis were done (i) Statistical Analysis – This was done using the built-in SCOPUS analyzer. (ii) Network Analysis – This was done using a software tool called VOSviewer (Version 1.6.15). The results from both types of analysis are presented in the following sections

### I. Statistical Analysis

The statistical analysis in this study looks at different parts of the published research to understand trends and patterns. Here are the main points viz. Documents by Year: This shows how the number of publications has changed over time—whether research in the field is growing or slowing down. Documents by Author: This highlights the most active researchers who have published the most work. Documents by Affiliation: This shows which universities or institutions are publishing the most research. Documents by Country or Territory: This maps out which countries are contributing the most to the research. Documents by Type: This groups the papers into categories, like research articles, reviews, etc. Documents by Funding Sponsors: This identifies the organizations that are providing financial support for the research. Altogether, this analysis

gives a clear picture of the research field and the main people, places, and organizations driving it.

**Document analysis by year**

Table-1 and Figure-1 show how many research papers were published each year from 2017 to 2024. The data clearly shows that the number of publications has gone up over time. In 2017, there were 30 papers published. The numbers stayed about the same in 2018 (29 papers) and 2019 (23 papers). Then, in 2020, the number started to rise with 40 papers. In 2021, it jumped to 151 papers. This growth continued in 2022 with 236 papers, and even more in 2023 and 2024, with 333 and 480 papers published.

Overall, from 2017 to 2024, the journal's publications increased a lot. It had steady output until 2019, then grew quickly from 2020 onward. This shows that the journal has become more visible, is receiving more submissions, and is becoming more important in its field.

**Table 1:** *Publications per year*

| Year | Number of documents |
|---|---|
| 2024 | 480 |
| 2023 | 333 |
| 2022 | 236 |
| 2021 | 151 |
| 2020 | 40 |
| 2019 | 23 |
| 2018 | 29 |
| 2017 | 30 |

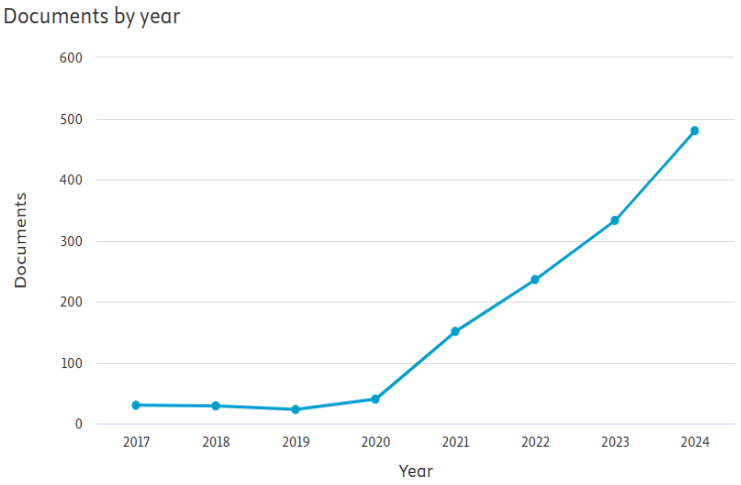


**Figure 1:** *Documents published per year*

**Document analysis by author**

Table-2 and Figure-2 show the authors who have published the most papers in this research area. The top author is Rather, A.A., with 20 publications. He is followed by Yusuf, I. with 18 publications and Ayyappan, G. with 17. Other active authors include Chacko, V.M. and Shanker, R., each with 12 publications, and Aliyev, V. with 11. There are also four authors — Gakaev, R., Shukla, D., Shukla, K.K., and Timashev, S. — who have each published 10 papers. These authors are the leading contributors in this research field.

**Table 2:** *Publications by author*

| Author | Number of documents |
|---|---|
| Rather, A.A. | 20 |
| Yusuf, I. | 18 |
| Ayyappan, G. | 17 |
| Chacko, V.M. | 12 |
| Shanker, R. | 12 |
| Aliyev, V. | 11 |
| Gakaev, R. | 10 |
| Shukla, D. | 10 |
| Shukla, K.K. | 10 |
| Timashev, S. | 10 |

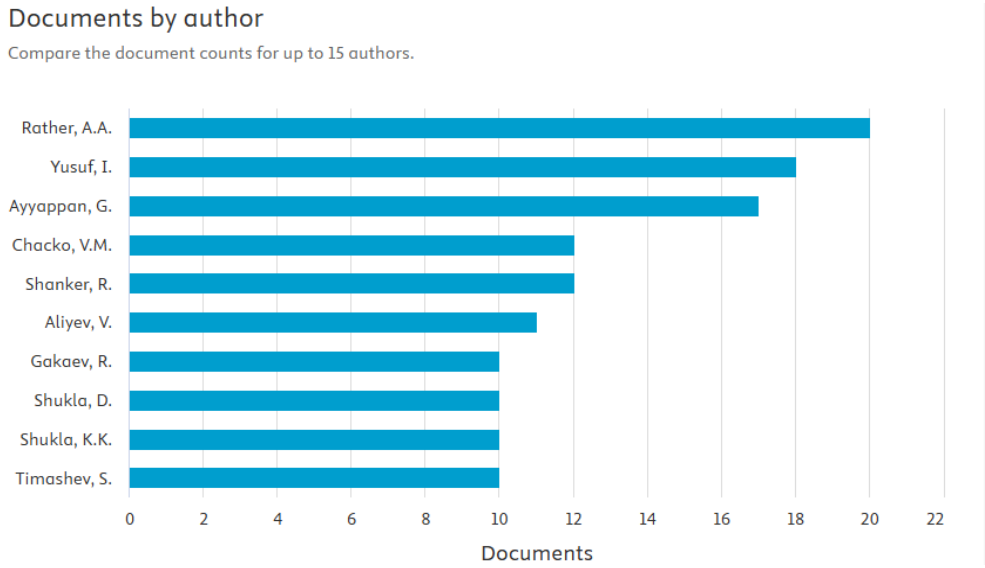


**Figure 2:** *Top 10 contributing authors*

**Document analysis by affiliation**

Table-3 and Figure-3 show which universities and institutions have published the most research in this field. Kadyrov Chechen State University is the top contributor with 100 publications, followed by Azerbaijan State Oil and Industry University with 89. Other major contributors include North-Ossetian State University – 40 publications, Russian Academy of Sciences – 33, Bharathiar University – 32, Azerbaijan Technical University and Azerbaijan University of Architecture and Construction – 29 each. University of Kashmir – 26, Maharshi Dayanand University – 24 and Vellore Institute of Technology – 23.

This shows that the journal has attracted interest from many countries, especially from Russia, Azerbaijan, and India. A few universities have published a lot of papers, which suggests they are leading research centres in this area and are helping to shape the future of the field.

**Table 3:** *Documents by affiliation*

| Affiliation | Documents |
|---|---|
| Kadyrov Chechen State University | 100 |
| Azerbaijan State Oil and Industry University | 89 |
| North-Ossetian State University | 40 |
| Russian Academy of Sciences | 33 |

| | |
|---|---|
| Bharathiar University | 32 |
| Azerbaijan Technical University | 29 |
| Azerbaijan University of Architecture and Construction | 29 |
| University of Kashmir | 26 |
| Maharshi Dayanand University | 24 |
| Vellore Institute of Technology | 23 |

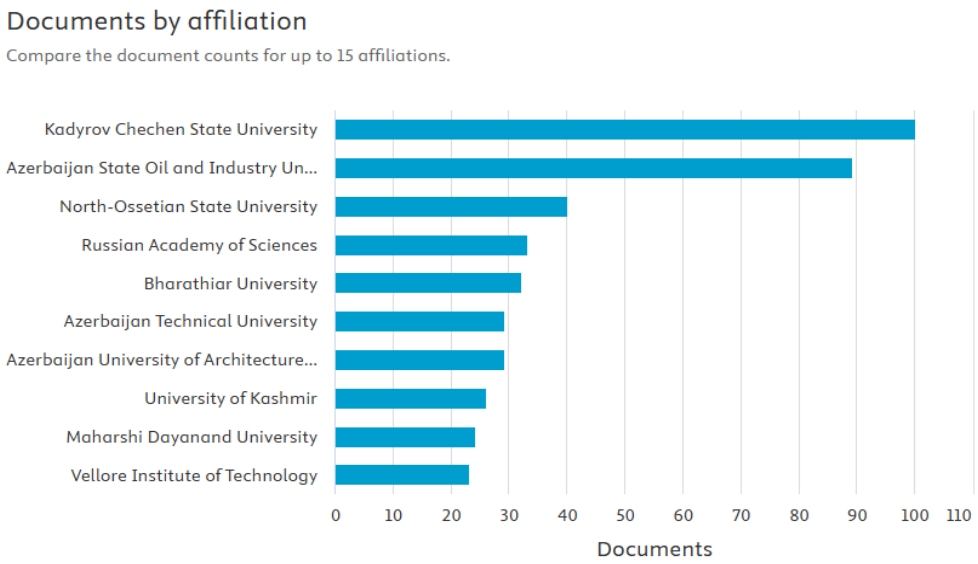


**Figure 3:** *Documents by affiliation*

**Analysis of publications by country or territory**

Table-4 and Figure-4 show the number of research papers published by different countries, giving a clear picture of where the research is coming from. India is the top contributor with 626 publications, showing its strong involvement in this field. The Russian Federation is next with 330 publications, followed by Azerbaijan with 169, showing active participation from Central and South Asia. Nigeria is also showing progress with 81 publications. Other countries contributing include Georgia with 21, the United States with 16, Egypt and Kazakhstan with 14 each, Ukraine with 11, and Iran with 9 publications.

This shows that the journal is gaining attention from both developed and developing countries. It is especially popular in emerging economies. Overall, the data suggests that the journal is globally important and is attracting researchers from many different regions and backgrounds.

**Table 4:** *Documents by country*

| Country | Documents |
|---|---|
| India | 626 |
| Russian Federation | 330 |
| Azerbaijan | 169 |
| Nigeria | 81 |
| Georgia | 21 |
| United States | 16 |
| Egypt | 14 |
| Kazakhstan | 14 |
| Ukraine | 11 |
| Iran | 9 |

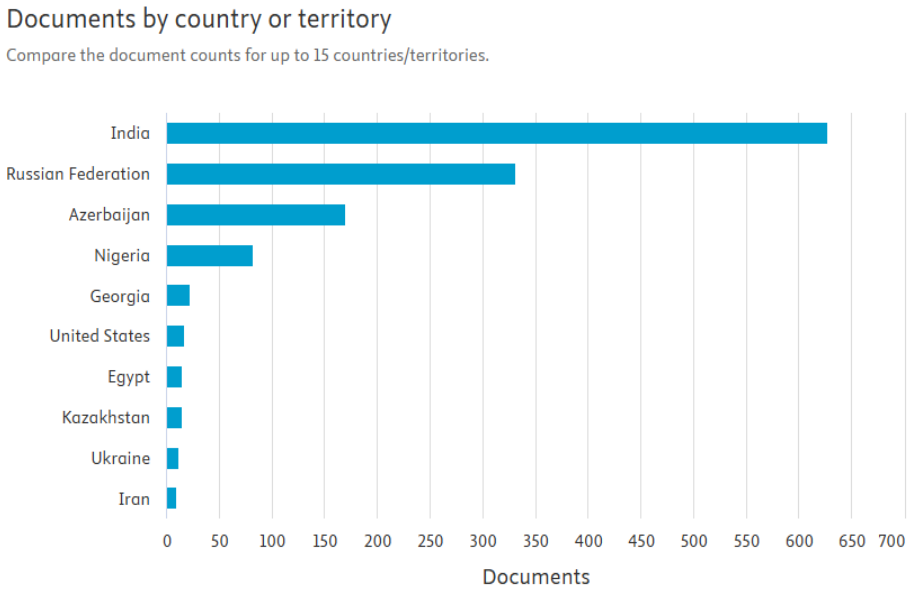


**Figure 4:** *Document published by top 10 countries*

**Documents by type**

Table-5 and Figure-5 show the different types of documents published in this research area. Most of the publications are research articles, with 1308 papers, which makes up about 98.94% of the total. This shows that the focus is mainly on original studies and new research. There are only 13 review papers, making up 0.98%, and just one conference paper, which is 0.07% of the total.

This means that the journal mainly publishes original research rather than reviews or conference papers. The high number of peer-reviewed articles also shows the seriousness and quality of the research being published in this field.

**Table 5:** *Documents by type*

| Document type | Publications | % |
|---|---|---|
| Article | 1308 | 98.94 |
| Review | 13 | 0.98 |
| Conference Paper | 1 | 0.07 |

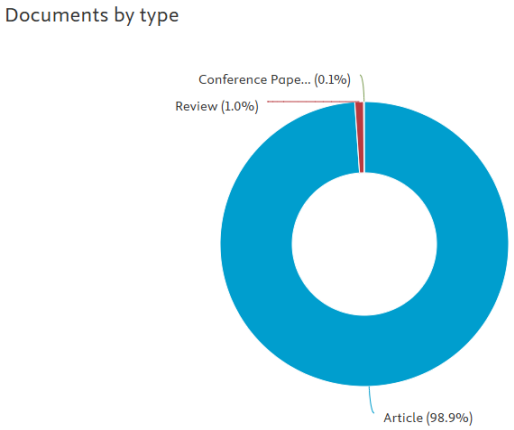


**Figure 5:** *Publication type*

**Analysis by funding sponsors**

Table-6 and Figure-6 show the main funding agencies that support research in this field. The Ministry of Education and Science of the Russian Federation is the top funder with 28 supported publications. Next is the Russian Science Foundation with 15 funded papers. From India, the Department of Science and Technology, Ministry of Science and Technology has funded 11 papers. The University Grants Commission (UGC) supported 9 publications, and the Council of Scientific and Industrial Research (CSIR) funded 3. Other organizations that have supported research include the Russian Foundation for Basic Research with 9 papers, the Shota Rustaveli National Science Foundation and the University Grants Committee with 4 each, and both the Bulgarian Academy of Sciences and the Far East Branch of the Russian Academy of Sciences with 3 publications each.

This shows that national-level science and education ministries, especially in Russia and India, are playing a big role in supporting research. It also shows that funding is coming from various countries, which highlights the global importance and collaborative nature of the research in this field.

**Table 6:** *Documents by Funding sponsor*

| Funding sponsor | Number of documents |
|---|---|
| Ministry of Education and Science of the Russian Federation | 28 |
| Russian Science Foundation | 15 |
| Department of Science and Technology, Ministry of Science and Technology, India | 11 |
| Russian Foundation for Basic Research | 9 |
| University Grants Commission | 9 |
| Shota Rustaveli National Science Foundation | 4 |
| University Grants Committee | 4 |
| Bulgarian Academy of Sciences | 3 |
| Council of Scientific and Industrial Research, India | 3 |
| Far East Branch, Russian Academy of Sciences | 3 |

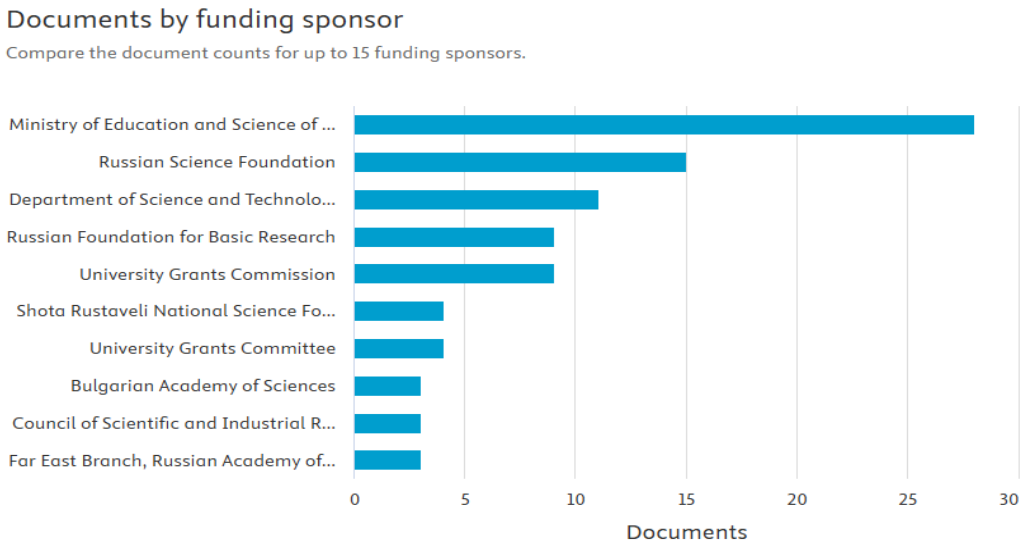


**Figure 6:** *Top ten funding sponsors*

## II. Network Analysis

In Bibliometric analysis, network analysis is a crucial tool for understanding the relationships and collaborations between authors, institutions, countries, and even research topics. It involves mapping and analyzing the connections within a dataset, such as co-authorships, co-citations, or keyword co-occurrences, to reveal the structure of research networks.

**(A) Co-authorship analysis**

Co-authorship analysis is a method used in Bibliometric studies to explore and evaluate collaboration patterns among researchers, institutions, or countries. By examining the co-authorship of publications, this analysis reveals how often two or more authors work together on research papers, highlighting the strength of their collaborative ties.

**Co-authorship in terms of authors**

In this analysis, documents with too many authors were not included. Only papers with 25 or fewer authors were considered. To be part of the study, each author had to have written at least one paper and received at least one citation. Out of 2,311 authors checked, only 694 met these conditions. For each of these 694 authors, the strength of their co-authorship connections with others was measured. Yusuf Ibrahim had the highest total link strength of 24. He also had 25 citations from 18 documents, showing that he is an active researcher with strong collaborations. Among all the authors, the biggest connected group of co-authors included 21 people. These 21 authors were divided into 5 different groups or clusters. Together, they had a total link strength of 56. Figure-7 shows this network using different colours for each group, and the size of each circle shows how strong the author's links are. This analysis helps us understand how researchers work together. It shows that authors like Yusuf Ibrahim are at the centre of these networks, leading strong research collaborations.

Table-7 shows the top 10 most connected authors in this field, based on the number of papers they published, the number of citations they received, and how strong their co-authorship links are. Yusuf Ibrahim stands out with 18 papers, 25 citations, and the highest link strength of 24. Rather Aafaq A. comes next with 20 papers and a link strength of 23, even though he has fewer citations. Kumar Rakesh has the highest number of citations (45), even though he has only 8 papers, showing that his work is highly impactful. Other authors like Aliyev Vugar, Farhadzadeh E.M., and Shanker Rama also show strong collaboration through their link strengths. This table highlights the key researchers who are well-connected and influential in this academic field.

**Table 7:** *Top 10 Linked Authors*

| Author | Documents | Citations | Total link Strength |
|---|---|---|---|
| Yusuf, Ibrahim | 18 | 25 | 24 |
| Rather, Aafaq A. | 20 | 2 | 23 |
| Kumar, Rakesh | 8 | 45 | 18 |
| Aliyev, Vugar | 11 | 1 | 16 |
| Farhadzadeh, E.M. | 9 | 2 | 15 |
| Shanker, Rama | 12 | 23 | 15 |
| Akimov, Valery | 6 | 3 | 14 |
| Laxmi, P. Vijaya | 8 | 24 | 13 |
| Muradaliyev, A.Z. | 7 | 2 | 13 |
| Ayyappan, G. | 17 | 9 | 11 |

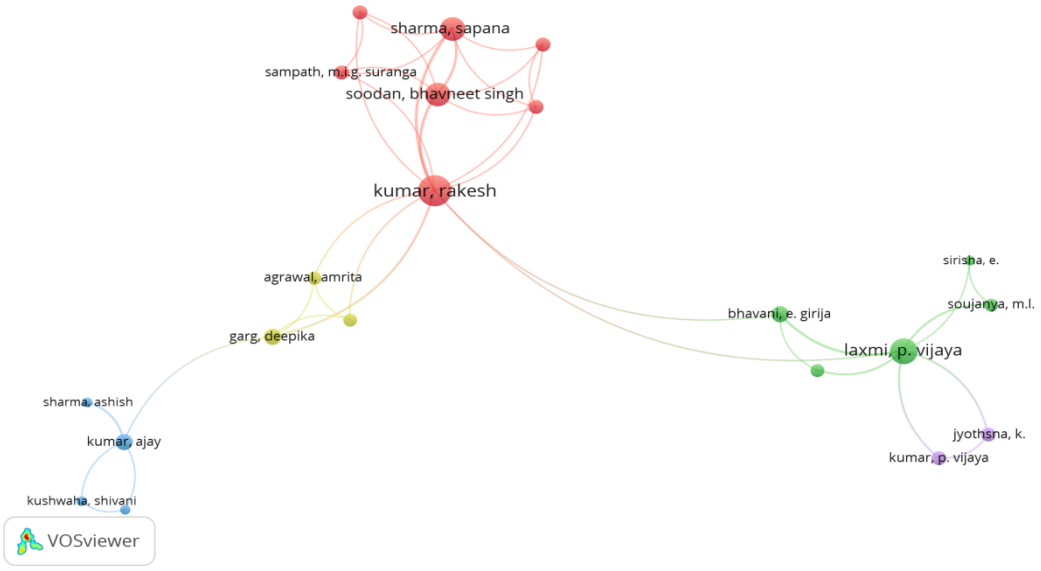


**Figure 7:** *Co-authorship in terms of author's network analysis*

**CO-authorship in terms of organizations**

In this analysis, documents with more than 25 authors were left out to keep the co-authorship patterns clear. To be included, an organization had to have at least one publication and one citation. Out of 1,544 organizations checked, 490 met these requirements. For each of these 490 institutions, the total strength of their co-authorship connections with other organizations was calculated. Kadyrov Chechen State University in the Russian Federation had the highest total link strength of 22. It also received 14 citations from 57 documents, making it the top organization in terms of collaboration. Among the included organizations, the largest connected group consisted of 33 institutions. These were divided into nine clusters, with a combined total link strength of 87. Figure-8 shows this network visually, using different colours for each cluster. The size of the circles in the figure shows how strong each organization's collaborations are. This analysis highlights how important teamwork between research institutions is. It shows that leading organizations are forming strong networks that help push scientific progress forward.

Table-8 lists the top 10 institutions based on how many papers they published, how many citations they received, and how strong their collaboration links are. Kadyrov Chechen State University leads with 57 documents and a link strength of 22, showing it is both active and well connected. Next is the Department of Mathematical Sciences at Bayero University in Nigeria, which published 17 papers but received the highest citation count of 25 and had a strong link strength of 19, showing both impact and collaboration. Several Russian universities, including Khetagurov North Ossetian State University, North Caucasus Federal University, and Dagestan State University, are also major contributors, showing strong research activity in the region. Azerbaijan State Oil and Industry University published the most papers at 66 and had 32 citations, but its link strength was only 10, which suggests it contributed a lot individually but had fewer collaborations. Institutions like Bhagwant University in India and Moscow Technical University of Communications and Informatics also played important roles, showing international collaboration. Overall, this analysis points out the most important research organizations in the field and shows how much they are contributing and collaborating with others.

**Table 8:** *Top 10 Co-authorship Linked Organizations*

| Organization | Documents | Citations | Total Link Strength |
|---|---|---|---|
| Kadyrov Chechen State University, Russian Federation | 57 | 14 | 22 |
| Department of Mathematical Sciences, Bayero University, Kano, Nigeria | 17 | 25 | 19 |
| Khetagurov North Ossetian State University, Russian Federation | 10 | 1 | 13 |
| North Caucasus Federal University, Russian Federation | 9 | 3 | 12 |
| Azerbaijan Technical University, Azerbaijan | 22 | 3 | 11 |
| Azerbaijan State Oil and Industry University, Azerbaijan | 66 | 32 | 10 |
| Financial University under the Government of the Russian Federation, Russia | 14 | 10 | 9 |
| Dagestan State University, Russian Federation | 8 | 1 | 8 |
| Department of Mathematics, Bhagwant University, Ajmer, India | 6 | 1 | 8 |
| Moscow Technical University of Communications and Informatics, Russia | 7 | 4 | 8 |

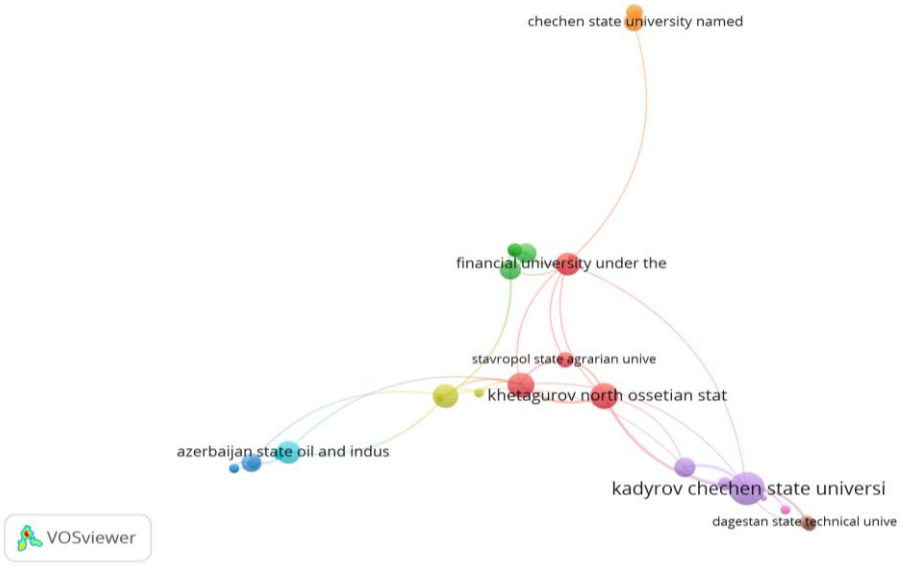


**Figure 8:** *Network analysis of co-authorship analysis in terms of organizations*

**Co-authorship in terms of country**

In this analysis, documents with more than 25 authors were excluded to keep the co-authorship patterns clear. A country was included only if it had published at least one paper and received at least one citation. Out of 85 countries reviewed, 51 met these conditions. For each of these 51 countries, the total strength of co-authorship links with other countries was measured. The Russian Federation had the highest link strength of 45, along with 142 citations from 330 publications, showing strong international collaboration. Among the 51 selected countries, 38 formed a connected co-authorship network. These 38 countries were divided into 15 different groups or

clusters, with a total link strength of 109. Figure-9 shows this network using different colours for each group, and the size of the circles represents how strong a country's connections are.

Table-9 lists the top 10 countries based on how many papers they published, how many citations they received, and how strong their international research collaborations are. India stands out as the top contributor with 630 papers and 630 citations, showing both a high number of publications and strong impact. Although the Russian Federation published fewer papers, its link strength of 45 was the highest, showing its strong international partnerships. Other countries like Azerbaijan and Nigeria also show strong participation, with good numbers of papers and solid collaboration networks. Countries such as Egypt, China, and the United States had a moderate number of papers and still showed active international cooperation. Germany, Kyrgyzstan, and Iraq published fewer papers but had clear international ties, showing that they are becoming more involved in global research. Overall, this analysis shows that many countries around the world are taking part in this research field. It highlights the importance of international collaboration and how these partnerships help drive global scientific progress.

**Table 9:** *Top 10 Co-authorship Linked Countries*

| Country | Documents | Citations | Total Link Strength |
|---|---|---|---|
| Russian Federation | 330 | 142 | 45 |
| India | 630 | 630 | 40 |
| Azerbaijan | 169 | 55 | 27 |
| Nigeria | 81 | 65 | 18 |
| Egypt | 14 | 8 | 8 |
| China | 6 | 6 | 7 |
| United States | 16 | 27 | 6 |
| Germany | 7 | 2 | 5 |
| Kyrgyzstan | 5 | 1 | 5 |
| Iraq | 4 | 5 | 4 |

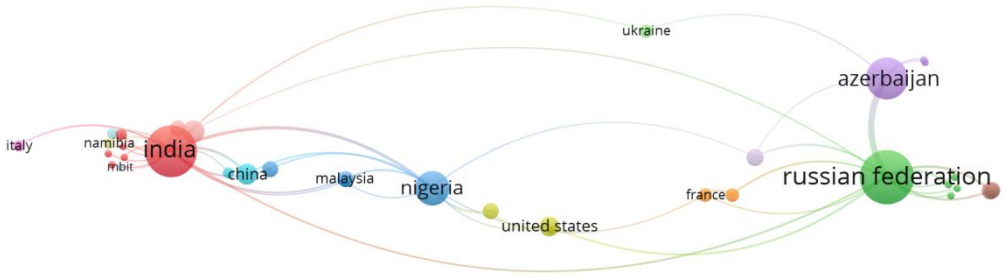


**Figure 9:** *Network analysis of co-authorships in terms of country*

### B) Network analysis of co-occurrences

Network analysis of co-occurrences is a technique used to study relationships between entities like keywords, authors, or institutions that frequently appear together in documents. It helps visualize patterns, identify research trends, and highlight key themes or collaborations within a field, offering insights into the structure of a research area.

**Co-occurrence analysis in terms of all keywords**

In the keyword co-occurrence analysis, only keywords that appeared at least 10 times were included. Out of a total of 4,557 keywords, 46 met this requirement. For each of these 46 keywords, the total strength of their connections with other keywords was calculated. The keyword "Reliability" appeared the most, with 120 occurrences, and had the highest total link strength of

104. Among the 46 keywords, 42 were found to be connected with each other and formed a co-occurrence network, shown in Figure-10. These 42 keywords were grouped into six clusters with a total link strength of 461. In the network graph, each cluster is shown in a different color, and the size of each circle represents how often a keyword appeared.

Table-10 lists the top 10 most frequent keywords and their total link strength, showing the main topics and how they are related to each other in this research area. The keyword "Reliability" is the most common and most connected, which shows it is the central theme of most studies. Other important keywords like "Availability" and "Maximum Likelihood Estimation" also appear frequently, showing that system performance and statistical methods are key areas of focus. Many technical terms such as Order Statistics, Moments, MTSF (Mean Time to System Failure), Mean Sojourn Time, and Transition Probabilities also appear often, showing that the field involves detailed statistical and mathematical analysis. At the same time, broader topics like Sustainable Development and Climate Change are also becoming more common, showing that researchers are linking theoretical methods with real-world issues. Overall, the keyword analysis shows that the research in this field combines strong theoretical and mathematical foundations with practical applications, reflecting both academic depth and real-world relevance.

**Table 10:** *Co-occurrence analysis of Top 10 keywords*

| Keyword | Occurrences | Total Link Strength |
|---|---|---|
| Reliability | 120 | 104 |
| Availability | 60 | 87 |
| Maximum Likelihood Estimation | 62 | 69 |
| Order Statistics | 27 | 41 |
| Moments | 27 | 39 |
| MTSF | 16 | 37 |
| Mean Sojourn Time | 11 | 35 |
| Transition Probabilities | 11 | 33 |
| Sustainable Development | 41 | 28 |
| Climate Change | 36 | 26 |

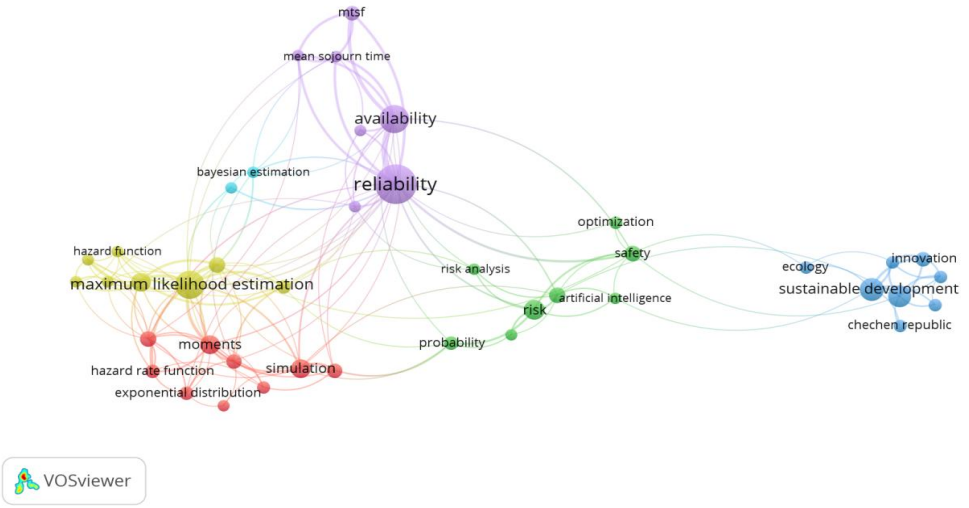


**Figure 10:** *Network analysis of co-authorship's in terms of all keywords*

**Co-occurrence analysis in terms of author keywords**

In this analysis of author keywords, only those that appeared at least 5 times were included. Out of 4,557 keywords provided by authors, 159 met this condition. For each of these 159 keywords, the total strength of their connections with other keywords was calculated. The keyword "Reliability" appeared the most, with 120 occurrences, and had the highest total link strength of 180. All 159 keywords were connected to each other, forming a network shown in Figure-11. This network is made up of 10 clusters and has a combined total link strength of 1295.

Table-11 shows the top 10 most frequently used keywords based on how often they appeared and how strongly they are linked with other keywords. "Reliability" comes first with 120 appearances and the highest total link strength, showing that it is the main theme in this area of research. "Availability" and "Maximum Likelihood Estimation" are also used often, appearing 60 and 62 times, with strong link strengths of 133 and 101. This shows that many research studies focus on using statistical methods and how they can be applied in real life. Keywords like MTSF (Mean Time to System Failure), Climate Change, and Transition Probabilities are often used and strongly connected to other topics. This means that the research combines statistical modeling with real-world issues like the environment and how systems work. Other common keywords include Order Statistics, Sustainable Development, Moments, and Mean Sojourn Time. These show that both theory and practical use are important in this research field. Overall, the keyword study shows that this area uses strong statistical methods while also dealing with big global problems like sustainability and climate change.

**Table 11:** *Co-occurrence analysis of Top 10 author keywords*

| Keyword | Occurrences | Total Link Strength |
|---|---|---|
| Reliability | 120 | 180 |
| Availability | 60 | 133 |
| Maximum Likelihood Estimation | 62 | 101 |
| MTSF | 16 | 60 |
| Climate Change | 36 | 59 |
| Transition Probabilities | 11 | 56 |
| Order Statistics | 27 | 55 |
| Sustainable Development | 41 | 55 |
| Moments | 27 | 54 |
| Mean Sojourn Time | 11 | 53 |

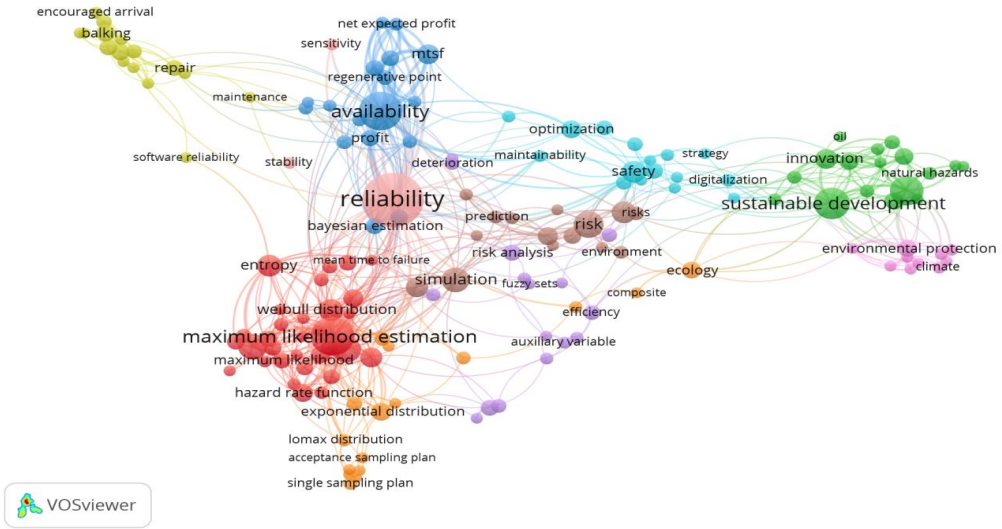


**Figure 11:** *Network analysis of co-authorship's in terms of Author keywords*

### C) Network Analysis of Citations

Network analysis of citations is a method used to examine how frequently documents, authors, or institutions cite each other. This analysis helps identify influential works, key research areas, and the interconnectedness of knowledge in a field. Units of analysis typically include documents, sources, authors, countries and organizations, revealing collaboration patterns and intellectual structures within a research domain. By mapping citation networks, it becomes possible to trace the development of ideas and highlight leading contributors or regions in specific research areas.

**Citation Analysis of Documents**

Out of a total of 1,322 documents with no citation bar, the document written by Samal in 2023 received the highest number of citations, which is 19. From these 1,322 documents, only 45 were connected to each other, and this connection is shown in Figure-12. In the network graph, the size of each circle shows how many citations a document has received.

Table-12 lists the top 10 most cited documents in this research area. Samal's 2023 paper has the most citations, but it has no co-authorship links, meaning it had a strong impact even though it was not written in collaboration with others. The papers by Alam (2021) and Agrawal (2021) follow, with 16 and 14 citations. Agrawal's paper also has the most links, which shows it was a collaborative effort. Other papers, such as those by Lone (2022), Kumar (2019), and Sachdeva (2022), each received 13 citations and have different levels of collaboration with other authors. The rest of the documents in the top 10—written by Kozyrev (2018), Rahul (2024), Saxena (2021a), and Shiledar (2021)—each have 12 citations. Some of these papers have co-authorship links, while others do not, showing that citation success can come from both individual work and team efforts. Overall, this analysis shows that highly cited research can be produced through solo work or collaboration. Both types of contributions play an important role in the academic field.

**Table 12:** *Analysis of top 10 cited documents*

| Document | Citations | Links |
|---|---|---|
| Samal (2023) | 19 | 0 |
| Alam (2021) | 16 | 1 |
| Agrawal (2021) | 14 | 4 |
| Lone (2022) | 13 | 3 |
| Kumar (2019) | 13 | 3 |
| Sachdeva (2022) | 13 | 2 |
| Kozyrev (2018) | 12 | 2 |
| Rahul (2024) | 12 | 1 |
| Saxena (2021a) | 12 | 0 |
| Shiledar (2021) | 12 | 0 |

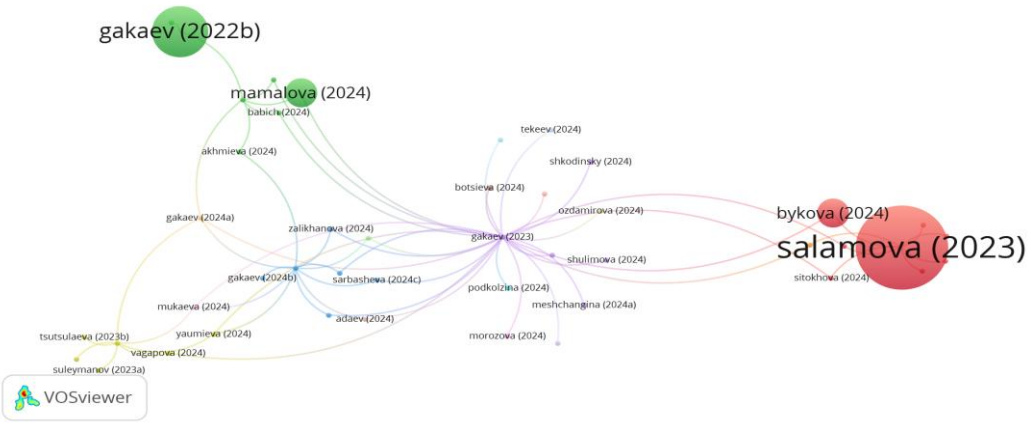


**Figure 12:** *Network analysis of Citation Analysis of Documents*

**Citation analysis by Authors**

In this analysis, documents that had more than 25 authors were not included, as the goal was to keep authorship meaningful. To be part of the study, each author had to have written at least one document and received at least one citation. Out of 2,311 authors, 694 met these requirements. For each of these authors, the total strength of their co-authorship links with other authors was calculated. Kumar Rakesh had the highest number of citations, with 45 citations from 8 documents, and a link strength of 19. Among the 694 authors, 81 were found to be connected with each other, forming a network shown in Figure-13. These 81 authors were divided into twelve groups or clusters. Together, they had a total link strength of 279. In the network diagram, different colors show different clusters, and the size of each circle represents how many citations an author has received.

Table-13 gives a list of the top authors based on their citations and co-authorship connections. Kumar Rakesh appears at the top with 45 citations and strong collaboration, as shown by his link strength of 19. Ahmed Aquil and Kumar Vijay have 34 and 28 citations, but their lower link strengths suggest they work more independently. Other authors like Ram Mangey, Shanker Rama, and Soodan Bhavneet Singh show a balance between citations and collaboration, with moderate to high link strengths starting from 8. Yusuf Ibrahim has the most documents (18) and a link strength of 9, showing he is both productive and well-connected with other researchers. This analysis shows that while citations reflect an author's impact in the field, the link strength reveals how much they collaborate with others. Together, these two measures give a clearer picture of each author's role in the research community.

**Table 13:** *Citation analysis of top 10 authors*

| Author | Documents | Citations | Total Link Strength |
|---|---|---|---|
| Kumar, Rakesh | 8 | 45 | 19 |
| Ahmed, Aquil | 3 | 34 | 1 |
| Kumar, Vijay | 5 | 28 | 2 |
| Ram, Mangey | 7 | 27 | 8 |
| Alam, Intekhab | 5 | 27 | 2 |
| Yusuf, Ibrahim | 18 | 25 | 9 |
| Laxmi, P. Vijaya | 8 | 24 | 2 |
| Soodan, Bhavneet Singh | 4 | 23 | 8 |
| Shanker, Rama | 12 | 23 | 8 |
| Shukla, Kamlesh Kumar | 10 | 23 | 4 |

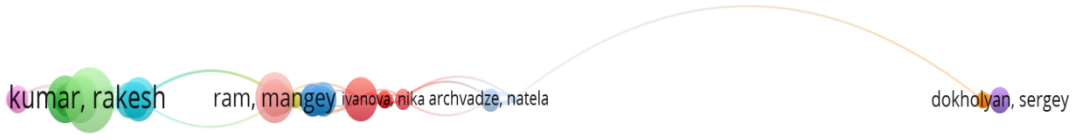


**Figure 13:** *Network analysis of Citation analysis by Authors*

**Citation analysis by organization**

In this analysis, documents with more than 25 authors were not included to keep authorship meaningful. Organizations needed to have at least 2 documents and 2 citations to be included. Out of 1,544 organizations, 102 met these conditions. For each of these, the total strength of their co-authorship links with other organizations was calculated. The "Azerbaijan State Oil and Industry

University" had the highest number of citations, with 32 citations across 66 documents. Out of the 102 organizations, only 8 were connected with each other, and this network is shown in Figure-14. These 8 organizations formed 3 different groups or clusters, and their total link strength was 11. In the figure, the size of each circle represents how many citations that organization received.

Table-14 lists the top organizations based on the number of documents they published and how much they collaborated with others. The Department of Mathematics at SRM Institute of Science and Technology (Delhi-NCR Campus, India) had the most documents (9) and the highest collaboration score with a link strength of 10. It was followed by the Department of Mathematics at Maharshi Dayanand University and the Azerbaijan State Oil and Industry University, with 7 and 4 documents respectively, both showing strong collaboration. Some institutions like ABV-IIITM Gwalior and Kadyrov Chechen State University had fewer documents (2 or 3) but still had high collaboration scores, each with a link strength of 9. Others, such as Bayero University and TITS Bhiwani, contributed only a few documents and did not show any collaboration links in the network. Overall, this analysis shows that different organizations are contributing to the research in different ways—some through strong partnerships, others more independently—while also highlighting the global reach and involvement in the field.

**Table 14:** *Citation analysis of top 10 organizations*

| Organization | Documents | Total Link Strength |
|---|---|---|
| Azerbaijan State Oil and Industry University, Azerbaijan | 4 | 10 |
| Department of Mathematical Sciences, Bayero University, Kano, Nigeria | 2 | 0 |
| Department of Applied Sciences, ABV-IIITM Gwalior, MP, Gwalior, 474015, India | 2 | 9 |
| Department of Mathematics, SRM Institute of Science and Technology, Delhi-NCR Campus, Ghaziabad, India | 9 | 10 |
| Department of Statistics, University of Kashmir, Srinagar, India | 3 | 3 |
| Department of Mathematics, Maharshi Dayanand University, Haryana, Rohtak, India | 7 | 9 |
| Department of Applied Sciences, TITS Bhiwani, Haryana, India | 3 | 0 |
| Kadyrov Chechen State University, Russian Federation | 3 | 9 |
| School of Engineering and Sciences, GD Goenka University, Gurugram, India | 2 | 4 |


**Figure 14:** *Network analysis of Citation analysis by organization*

**Citation analysis by country**

In this analysis, documents with more than 25 authors were excluded to keep the authorship

meaningful. Countries needed to have at least 2 documents and 2 citations to be included. Out of 85 countries, 29 met these conditions. For each of these 29 countries, their total strength of citation links with other countries was calculated. India had the highest number of citations, with 630 citations from 630 documents, and the strongest total link strength of 23. Out of the 29 countries that met the threshold, 15 were connected with each other, forming a network shown in Figure-15. These 15 countries were divided into seven groups, and their combined link strength was 40. Each group is shown in a different color, and the size of the circle for each country represents how many citations it received.

Table-15 shows how much each country contributed to the research field. India had the largest contribution with 630 documents and 630 citations, and it also had the strongest collaboration with a link strength of 23. The Russian Federation was next with 330 documents and 142 citations, along with a link strength of 14. Azerbaijan followed with 169 documents, 55 citations, and a link strength of 10. Other countries like Nigeria, Namibia, and the United States had a fair number of research papers and citations, which shows that they are actively involved in research and working with others. Countries like Brazil, Eritrea, Germany, and Oman had fewer papers, but they were still part of the research network. This means they also contributed to global research in their own way. This study helps us see how different countries are taking part and working together in this research area.

**Table 15:** *Citation analysis of top 10 countries*

| Country | Documents | Citations | Total Link Strength |
|---|---|---|---|
| India | 630 | 630 | 23 |
| Russian Federation | 330 | 142 | 14 |
| Azerbaijan | 169 | 55 | 10 |
| Namibia | 2 | 14 | 6 |
| Nigeria | 81 | 65 | 6 |
| United States | 16 | 27 | 6 |
| Brazil | 4 | 12 | 3 |
| Eritrea | 5 | 14 | 2 |
| Germany | 7 | 2 | 2 |
| Oman | 4 | 4 | 2 |

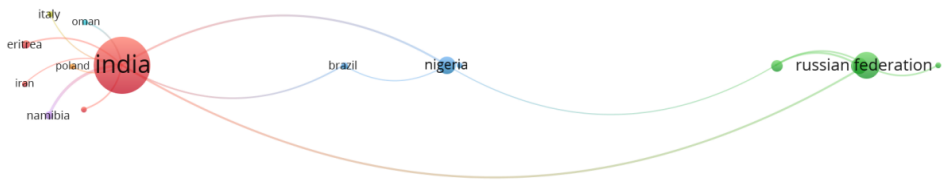


**Figure 15:** *Network analysis of Citation analysis by country*

## III. Conclusion

This study gives a clear and simple summary of the research published in the journal Reliability: Theory and Applications between 2017 and 2024. It shows that the number of papers published in the journal has gone up steadily, especially after 2020. This means the journal is becoming more popular and respected in the global research world. The study also highlights the countries that have contributed the most to the journal. India, the Russian Federation, and Azerbaijan are the top contributors. It mentions leading universities and researchers, such as Kadyrov Chechen State University, Azerbaijan State Oil and Industry University, Yusuf Ibrahim, and Rather Aafaq A.,

who have played important roles and worked closely with others in the field. By looking at how authors work together, the keywords they use, and how papers are cited, the study identifies the main topics covered by the journal. These topics include reliability, availability, and maximum likelihood estimation. This shows that the journal focuses on both detailed statistical techniques and real-world applications. The citation analysis shows which papers have been most influential, proving that the journal values both solo research and teamwork. Overall, the study shows that Reliability: Theory and Applications is a growing and active journal. It plays an important part in global research on reliability. The results of this study can help future researchers, institutions, and policymakers who want to publish in the journal or learn from it.

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