

## Mapping of Indigenous Knowledge Research in India: A Review of Growth, Emerging Topics and Future Research Directions based on Scientometric Tools

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**Abstract:** The study of indigenous knowledge in India has evolved over the years and gained significant importance as a vital area of research. This study aimed to explore the evolution of the research landscape on indigenous knowledge in India over the last twenty years (2003-2022), focusing on growth trends and knowledge mapping through Scientometric tools. The study collected 1,980 data from the Scopus database, indexed between 2003 and 2022. Initially, the analysis focused on measuring the research growth and performance of the key players. Then, the study performed scientific knowledge mapping, visualizing the relationships between different concepts and topics within the field. The findings reveal a significant growth in indigenous knowledge research in India. The study also identified key research themes, including traditional medicine, agriculture, biodiversity conservation, etc. In the early two decades, research was conducted on natural resource management, ethnoveterinary practices, ethnomedicine, biodiversity, tribal communities, and traditional healers, etc. The most recent research topics were COVID-19, sustainability, livelihood, ethnopharmacology, climate change, herbal drugs, etc. Research on medicinal plants and ethnobotany was the most influential in the last two decades. Furthermore, the study revealed a highly interconnected network of authors and institutions, with a few key players dominating the field. The study concludes by highlighting the need for further research on indigenous knowledge in India, particularly in areas such as intellectual property rights, geographical identification, preservation, and the role of indigenous knowledge in sustainable development.

**Keywords:** Indigenous knowledge, traditional knowledge, scientometrics, Indian research, research growth, knowledge mapping

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It is prudent to foreground this study by acknowledging that Indigenous knowledge represents Indigenous communities' wisdom, which has been passed down from generation to generation. It is the knowledge, skills, and practices developed by communities over generations. Indigenous knowledge has witnessed significant growth and recognition in India, a land rich in cultural diversity and tradition-based practices (Dasgupta et al., 2023; Majumdar, 2023; Panda & Kaur, 2023). Current technologies, research, and development in India increasingly draw upon indigenous knowledge to enhance innovation and sustainability. Indigenous knowledge systems have influenced various sectors, including agriculture (Duddigan et al., 2022), healthcare (Devi et al., 2022), biodiversity conservation, climate change adaptation (Pradhan & Patra, 2023), traditional handicrafts (Ambasta & Viswanathan, 2023; B. Das & Gohain, 2023), education (Kaul & Bharadwaj, 2023), and architecture (Chowdhoree & Das, 2022).

By integrating traditional wisdom into modern practices, India benefits from a deeper understanding of local ecosystems, sustainable farming techniques, herbal remedies, community-based resilience, traditional crafts, cultural heritage preservation, and eco-friendly construction methods (Sanskritimagazine, 2023). Incorporating Indigenous knowledge not only enhances the effectiveness and relevance of current technologies but also respects and preserves Indigenous communities' rich cultural heritage and rights, fostering a more inclusive and sustainable approach to development (Bhalerao, 2022; A. Das et al., 2021; Priyadarshini & Abhilash, 2019; Sabar & Midya, 2022).

### **Theoretical Approach and Previous Studies**

Researching Indian indigenous knowledge is essential as it preserves and safeguards invaluable cultural heritage, offers alternative and sustainable solutions to modern challenges, promotes social justice and empowerment for marginalized communities, enhances understanding and appreciation of diverse cultural perspectives, contributes to innovation and adaptation in various fields, supports biodiversity conservation efforts, enriches educational curricula and awareness programs, improves health outcomes through holistic approaches, fosters cultural exchange and dialogue, and ultimately leads to a more inclusive and diverse society (Asefa et al., 2022; Mirivel et al., 2023; Negi et al., 2023; Pradhan & Patra, 2023; Zidny et al., 2023). As a result, several studies have been conducted on indigenous knowledge in India.

The present study aimed to systematically review the tremendous growth of research in the field of indigenous knowledge in India to identify the key scientific players, research collaboration patterns, trending and emerging topics, and future research opportunities using Scientometric tools. Scientometric analysis of the published literature of a particular domain helps understand the status of research, growth trends, and any other aspects of the research, which is crucial information for the researchers, practitioners, policy planners, decision-makers, and other key stakeholders of the relevant field. Scientometric is a multidisciplinary quantitative research method widely used in various subject areas to evaluate the multiple aspects of research publications. Many research evaluations have been conducted on various topics in agriculture, science and technology, health and medical sciences, library and information science, and many more. For example- agricultural wastes (Ganasen et al., 2023), agricultural pollution (W. Li et al., 2022), aquaponics (Basumatary et al., 2022), artificial intelligence in agriculture (Maulana et al., 2022), internet of things (Basumatary, Yuvaraj & Verma, 2023), IoT in healthcare (Belfiore et al., 2022), smart home (B. Li et al., 2022), cardiovascular research (Noubiap et al., 2023), Orthopaedic research (Vaishya et al., 2022), COVID-19 and Dentistry (Mayta-Tovalino et al., 2022), Spine Surgery (Zárate-Kalfópulos et al., 2022), MRI in Neuro-Oncology (Deora et al., 2022), research productivity in library and information science (Bisaria, 2022), Genomics research (Basumatary, Maurya & Verma, 2023), etc.

A few studies have analyzed the publication pattern, research trends, and impact of indigenous knowledge literature in recent decades. A systematic literature review was conducted to identify the impacts of traditional ecological knowledge on indigenous peoples. It revealed that traditional ecological knowledge has expanded in both diversity and scope. There has been an increase in the number of Indigenous researchers committed to ensuring that information is organized and presented in a culturally beneficial way (Mohd Salim et al., 2023). A citation analysis was conducted based on scholarly publications on indigenous knowledge from 2015 to 2019. Study results indicated that an anonymous author was the most frequently cited author, and the “Indian Journal of Traditional Knowledge” was the most frequently cited journal (Sarkar et al., 2020, p. 8). In a recent study using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) protocol to examine Indigenous knowledge from an African perspective, it was found that there is a growing interest in the field and a need for more research on Indigenous knowledge in Africa (Malapane et al., 2022). Mubako (2023) analyzed indigenous and scientific knowledge for socio-ecological systems, found an exponential trend in citation statistics and published journal articles, and skewed spatial distribution toward developed Western countries. In addition, a research assessment was conducted on the Ethnobiological research publications (Albuquerque et al., 2013), Ethnomycology (da Cunha et al., 2020), herbal medicines (Tabatabaei-Malazy et al., 2020).

In the past few decades, there has been a noticeable increase in research activities focusing on indigenous knowledge in India. Scholars from various disciplines have actively contributed to expanding the understanding of indigenous knowledge. One such study analyzed the Indian research on indigenous knowledge literature published between 1994 and 2021 and found that the number of indigenous knowledge publications has increased over the years (Gayan et al., 2023). Similarly, the literature published between 2014 and 2020 in the “Indian Journal of Traditional Knowledge (IJTK)” was analyzed and found significant growth in the IK research in India (Gupta & Sahu, 2021, p. 6). India was the top contributor to indigenous knowledge research among the SAARC countries (Basumatary, Verma & Sinha, 2023). Apart from that, some studies focused on specific knowledge domains, such as Ethnopharmacology research in India (Chaman Sab et al., 2022), Ethnobotany (Pathak & Bharati, 2020), medicinal plant (Rahaman et al., 2022; Rohit, 2022; Senthamilselvi et al., 2021). However, no research was focused on analyzing research growth forecasting, recent trends, an emerging area of research, and future research directions in the field. That makes the present study unique from previous research.

## Research Questions

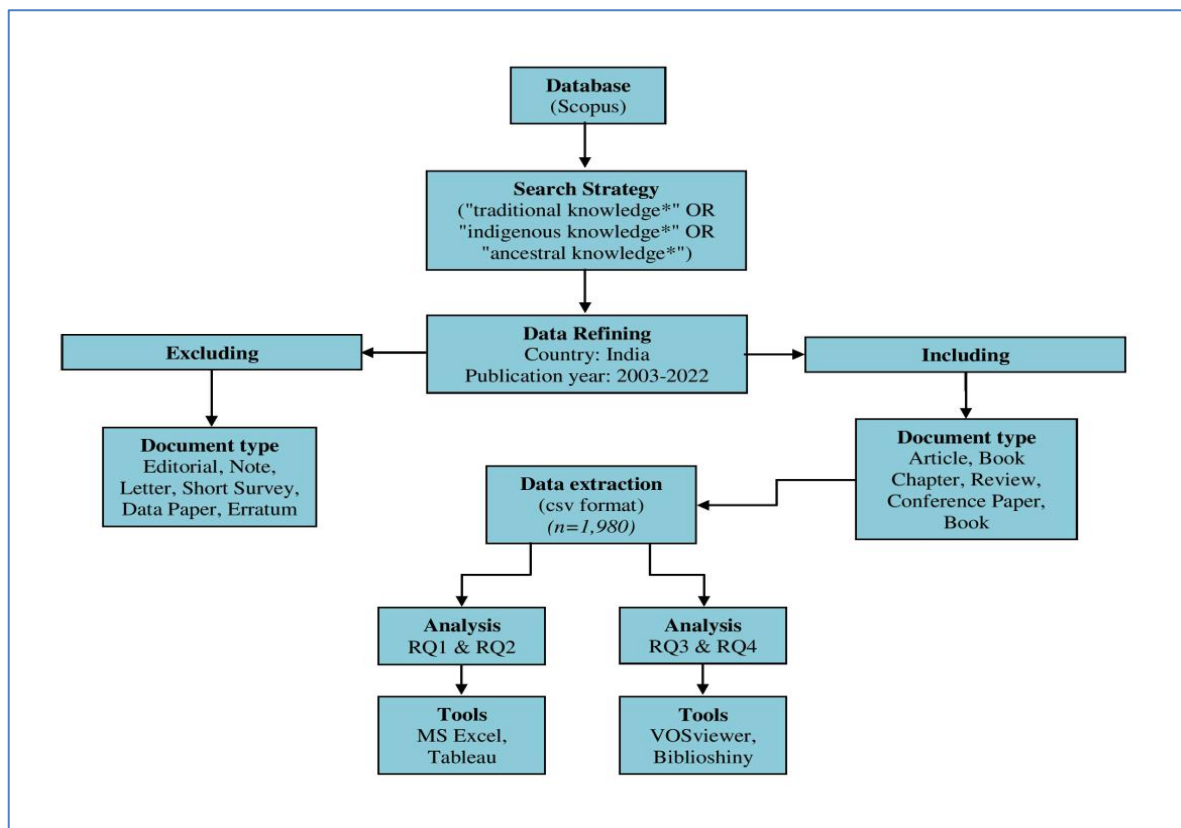
- RQ1. What is the chronological progress, citation trends and projected growth of research on indigenous knowledge in India?
- RQ2. Which researchers, journals, and organizations exhibit the highest productivity and influence in the domain of Indigenous Knowledge research in India?
- RQ3. What is the social and conceptual structure of the research publications on Indigenous Knowledge in India?
- RQ4. What is the historical evolution of research topics on Indigenous Knowledge in India, and what are the current emerging areas and future directions in this field?

## Materials and Methods

The study employed standard Scientometric tools to analyze the research on Indian Indigenous knowledge. It is an established method for research evaluation that has been adopted by many scholars for decades (Bornmann & Leydesdorff, 2014). The scientometric analysis provides an objective and quantitative means to measure academic publications' growth, impact, and interconnectedness. By utilizing these tools, we aim to generate visual representations of publication trends, collaboration networks, performance of scientific players, and trending topics within the field of Indigenous Knowledge research in India. Furthermore, it provides an evidence-based basis for proposing future research directions that will help facilitate informed decision-making in developing and preserving Indigenous knowledge. This methodological choice is well-suited to unravel the complex dynamics of Indigenous Knowledge research, offering valuable insights into its evolution, current state, and budding opportunity for further exploration.

Scientometric evaluates research publications through two main approaches, i.e., performance analysis and scientific mapping (Basumatary et al., 2022, p. 4; Donthu et al., 2021, p. 287). The performance analysis examines the activity of researchers, countries, organizations, and departments and their impact. Likewise, science mapping analyses provide insights into a scientific field's cognitive structure, evolution, and leading actors (Noyons et al., 1999). This study collected bibliographic data for twenty years (2003-22) from the Scopus database using the defined search terms - "traditional knowledge\*" or "Indigenous knowledge" or "ancestral knowledge\*." In the search term, the truncation symbol asterisk (\*) was used to create searches with unknown characters, multiple spellings, or various endings of the same keywords. A total of 1,980 data was exported from the database limiting country (India), publications year (2003-22), and considering the document types, i.e., article, book chapter, review, conference paper, and books (Figure 1). The data collected was analyzed according to the defined research questions using statistical tools MS Excel and Tableau, and data visualization was performed using the tools VOSviewer and Biblioshiny (Bibliometrix R Package).

**Figure 1**  
*Workflow Process of Data Collection and Analysis*



*Note.* Figure designed by the authors

## Analysis and Results

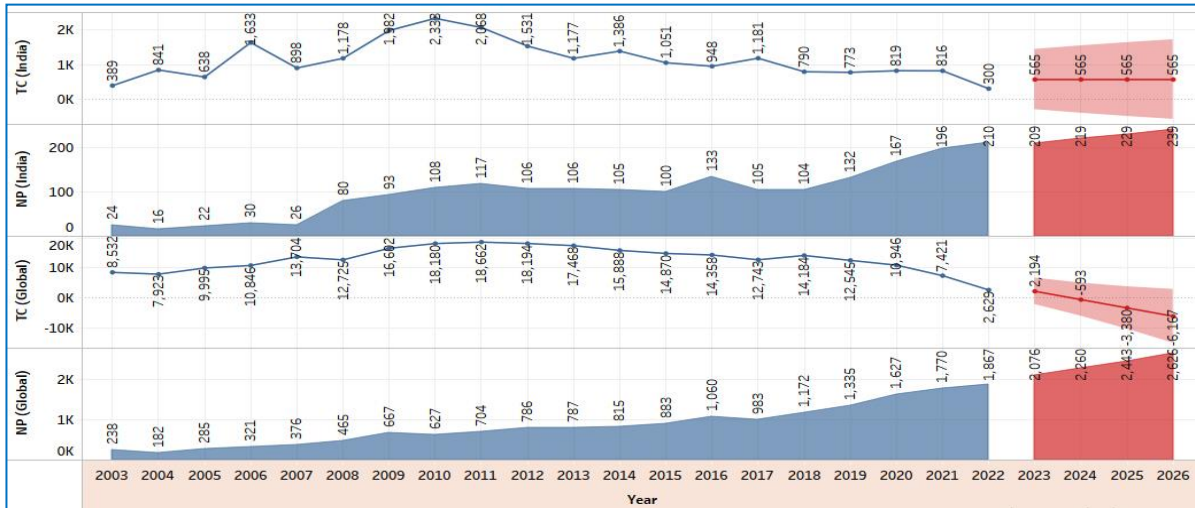
### Chronological Progress, Citation Trends, and Projected Growth of Research

The growth of publications and citations is an essential indicator of the impact of research on a particular domain. It provides insight into the overall development of the scientific community. The number of research publications on indigenous knowledge has been increasing steadily in India and globally, and this trend is expected to increase further. This is a positive sign for the progress of science and research, as it implies that the community is becoming increasingly collaborative, and more individuals are engaging in the scientific process. During the study period, Indian research publications grew by 12.09% Annual Growth Rate (AGR), sharing 8.56% of global publications. The publication grew gradually at the beginning of the last two decades, and the growth has accelerated since 2008. Throughout 2015, 2017, and 2018, it has been observed that research publications were growing but had fluctuated and exhibited negative growth. Again, from 2019, the publication was proliferating without any curb line. Similarly, the growth of publications at the global level was growing exponentially without any curb, and it is expected to grow with the same trend in the future (Figure 2).

In terms of citations received for Indian Indigenous knowledge publications, the research published in 2010 (NP=108) received the most citations. The result shows that the publications published at least five years ago received the most citations. However, it has been seen that the citations on Indigenous knowledge are decreasing in global research publications. It signifies that the publications need adequate time to be recognized by academia and cited by

other researchers. There has been negative citation growth in global-level research publications on indigenous knowledge. In contrast, the citation growth in India will remain the same.

**Figure 2**  
*Year-Wise Growth of Publications, Citations and Forecast Growth of Research*



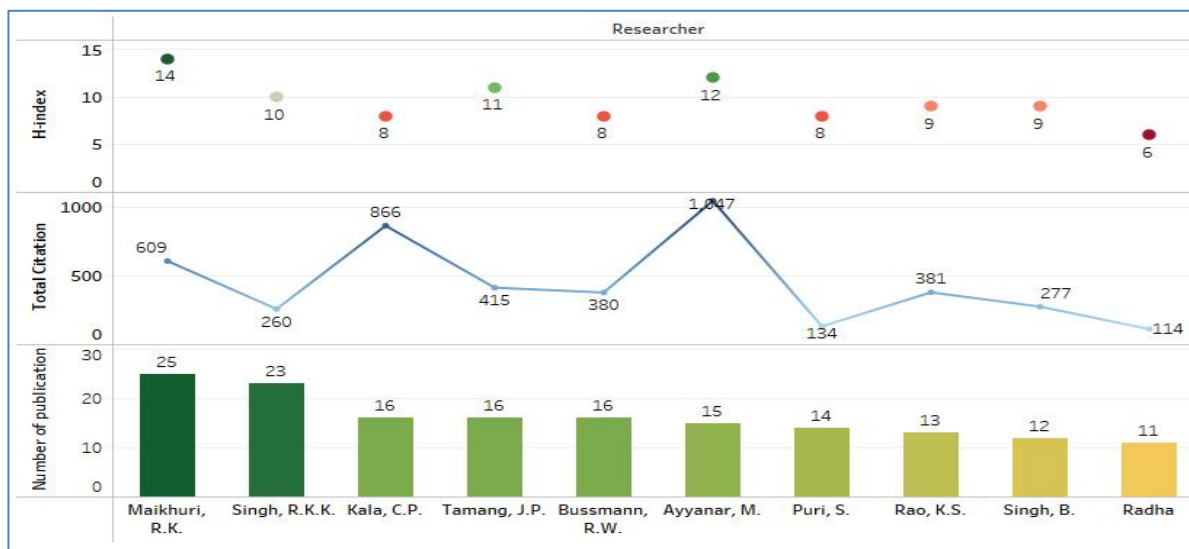
*Note.* Figure designed by the authors. In it, the red area chart represents the projected growth of research, while the trend line represents the projected growth of citations.

**Most Prolific Researchers**

Analyzing the most prolific researchers of a particular domain can provide valuable insights into the scholarly output of a research area and guide future research. In addition, it can help to establish collaborations and networks within a research area, which can lead to further research and innovation. The most prolific researchers who contributed the most research in the field of Indian indigenous knowledge have been identified based on their research publications and citations (Figure 3). The study found that Maikhuri, R.K., affiliated with G.B. Pant National Institute of Himalayan Environment, Almora, India, published the most number of researches during the study period (NP=25, TC=609, h-index=14).

The researcher published a series of research on indigenous knowledge on the topic related to Essential Oil Crops, Aconitum Heterophyllum, Himalayan Region, Agroforestry, Climate Change, Allelopathy, Echinochloa Crus-Galli, etc. This is followed by Singh, R.K.K. (NP=23, TC=260, h-index=10), affiliated with I.C.A.R. - Central Soil Salinity Research Institute, Karnal, India, who researched the topics related to Weather Forecasting, Traditional Knowledge, Smallholder Farmers, Landraces, Plant Breeding, Farmers, Climate Change Adaptation, Urban Climate, Resilience, etc. Kala, C.P. (NP=16, TC=866, h-index=8), affiliated with the Indian Institute of Forest Management, Bhopal, India, researched the topics related to Essential Oil Crops, Aconitum Heterophyllum, Himalayan Region, Pinus Roxburghii, and livelihood, etc. Likewise, other top researchers, i.e., Tamang, J.P. (Sikkim University, Gangtok, India), Bussmann, R.W. (Ilia State University (ISU), Tbilisi, Georgia), Ayyanar, M. (A.V.V.M. Sri Pushpam College, Thanjavur, India), Puri, S. (Shoolini University, Solan, India), Rao, K.S. (University of Delhi, New Delhi, India), Singh, B. (National Botanical Research Institute India, Lucknow, India), Radha (Shoolini University, Solan, India), have contributed a significant number of publications on indigenous knowledge (Figure 3).

**Figure 3**  
*Most Prolific Researchers, Citations, and H-Index*



*Note.* Figure designed by the authors. Researchers are ranked based on the number of publications and total citations received.

### The Top Contributed Journals

Table 1 illustrates the most productive journals that published the most papers on Indigenous knowledge research affiliated with India during the last two decades. The International Standard Serial Number (ISSN) and CiteScore of the respective journals are also presented in the table. Moreover, the number of publications (NP), total citations (TC), and h-index of the top journals have been calculated based on the publications and citations received during the study period. A total of 760 sources of publications (journals, books, etc.) were found, and 1,980 research papers were published during the last decades. The “Indian Journal of Traditional Knowledge” an open-access journal published by the National Institute of Science Communication and Information Resources (NISCAIR), the government of India published the most number of research papers related to indigenous knowledge (NP=301), followed by “Journal of Ethnopharmacology” published by Elsevier (NP=70), and “Asian Agri-history” published by Asian Agri-History Foundation.

It is fascinating that the “Indian Journal of Traditional Knowledge” published 15.20% of publications among the total source journals and books. The table shows that other journals also had significant contributions in the domain. In terms of citations, “Journal of Ethnopharmacology” (Elsevier) was the most influential journal that received the most number of citations (TC=3450) for 70 publications.

**Table 1***The Journals that Have Published the Most Research Papers on Indigenous Knowledge*

3	Journal	Publisher	ISSN/E-ISSN	CiteScore (2021)	No. Publications	Total Citations	H-Index
1	Indian Journal of Traditional Knowledge*	NISCAIR	0972-5938 / 0975-1068	1.6	301	3314	27
2	Journal of Ethnopharmacology	Elsevier	0378-8741 / 1872-7573	6.9	70	3450	33
3	Asian Agri-history	Asian Agri-History Foundation	0971-7730	0.1	53	96	5
4	Ethnobotany Research and Applications	Ilia State University, Institute of Botany, Department of Ethnobotany	1547-3465	1.5	37	262	9
5	Indian Journal of Natural Products and Resources*	NISCAIR	0976-0504 / 0976-0512	0.8	33	343	11
6	Journal of Intellectual Property Rights*	NISCAIR	0971-7544 / 0975-1076	0.4	30	89	5
7	Journal of Ethnobiology and Ethnomedicine*	Springer Nature	1746-4269	5.7	27	2294	22
8	Current Science	Indian Academy of Sciences	0011-3891	1.6	26	1216	12
9	Medicinal Plants	IOS Press	0975-4261 / 0975-6892	0.5	26	66	5
10	Genetic Resources and Crop Evolution	Springer Nature	0925-9864 / 1573-5109	2.8	19	177	8

*Note.* Asterisk (\*) mark in the journal indicates open access journal.

### The Top Contributed Organizations/Institutions

A total of 160 organizations and institutions contributed to the research publications in the field of Indigenous knowledge in India during the study period. The most prolific organization indicates that it has produced a high volume of research being recognized and cited in the literature. It was found that the “G.B. Pant National Institute of Himalayan Environment,” located in Uttarakhand, was the most productive organization among 160 participating organizations in the field (NP=57, TC=1736, h-index=22). It was followed by the “Indian Council of Agricultural Research,” New Delhi (NP=52, TC=233, h-index=10), and the “The University of Delhi” (NP=52, TC=628, h-index=13). It has been observed that organizations and institutions located in the northern part of India are more active in the research of Indigenous knowledge. The research publications of “G.B. Pant National Institute of Himalayan Environment” received the most citations during the last two decades. It signifies that the publications are most influential and accepted by a large audience.



**Table 2**

*The Organizations/Institutions that Have Published the Most Research on Indigenous Knowledge*

Rank	Organizations / Institutions	State/UT	NP	TC	H-Index
1	G.B. Pant National Institute of Himalayan Environment	Uttarakhand	57	1736	22
2	Indian Council of Agricultural Research	New Delhi	52	233	10
3	University of Delhi	New Delhi	52	628	13
4	Jawaharlal Nehru University	New Delhi	46	554	11
5	Assam University	Assam	36	421	11
6	Central Agriculture University, India	Manipur	36	320	10
7	H.N.B. Garhwal University	Uttarakhand	35	734	15
8	Banaras Hindu University	Uttar Pradesh	31	392	9
9	ICAR - National Bureau of Plant Genetic Resources, New Delhi	New Delhi	28	248	9
10	ICAR - Indian Agricultural Research Institute, New Delhi	New Delhi	28	159	8

*Note.* NP= No. of publications, TC= Total Citations

### Social Structure of Research Publications

Analyzing the social structure of research publications is crucial because it can reveal insights into the underlying dynamics and interactions within the scientific community. The collaboration among scientists in research activities signifies the social structure of the research (Akpan, 2020; Basumatary et al., 2022; Su et al., 2021). Co-authorship analysis helps to identify the collaboration and communication among the authors of the papers. Researchers can comprehensively understand how knowledge is disseminated and produced within a particular field by examining the relationships between authors, institutions, and collaborations. Social structure analysis allows for the identification of influential researchers, research networks, and knowledge hubs, enabling the identification of key contributors and their impact on the advancement of scientific knowledge. Additionally, it helps uncover collaboration patterns, scientific trends, and emerging research areas. Investigating the social structure of research publications provides valuable insights into the dynamics of scientific communities, aiding in policy-making, resource allocation, and decision-making processes in academia and beyond.

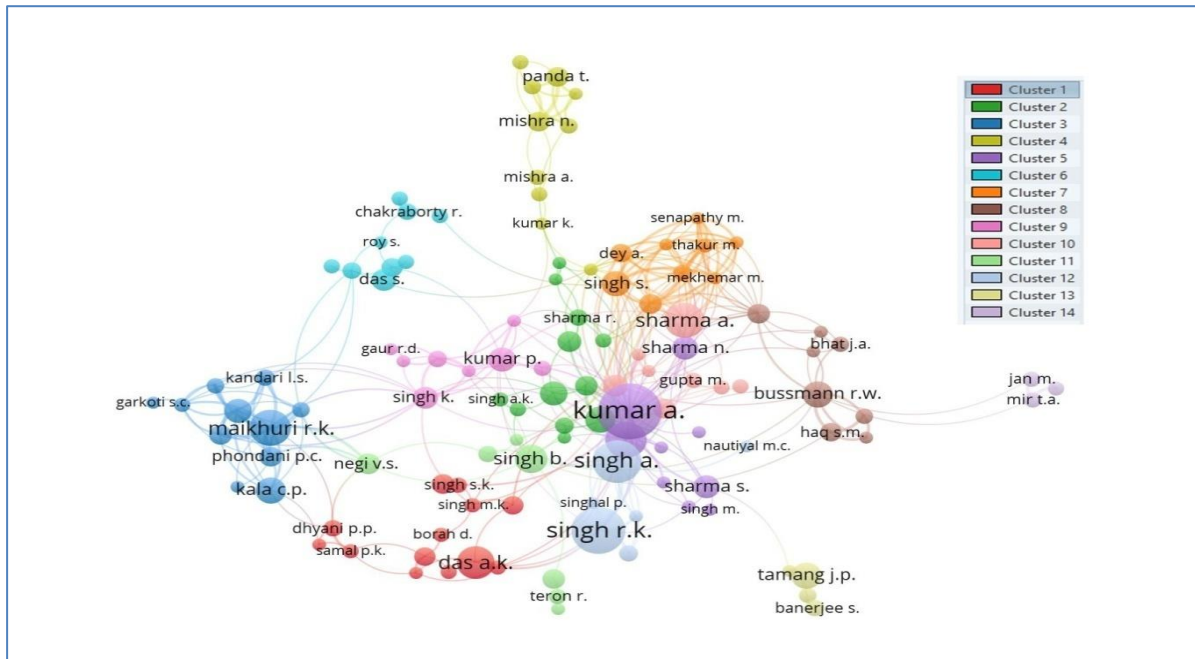
### Authorship Collaboration

Authorship collaborations in publications on Indian Indigenous knowledge often involve interdisciplinary approaches. Figure 4 visualizes the collaboration networks between authors or researchers. A total of 4,446 authors participated in the research on indigenous knowledge in India. The authors with at least five publication records have been considered for visualization to identify the most robust collaboration networks. It was found that 117 authors have the closest collaboration networks with each other. The connecting lines in the figure represent the associations between authors, while the circle nodes represent the authors themselves. The thickness of the connecting lines indicates the strength of the authorship collaboration relationship, and the circle nodes' size represents the collaboration's weight based on the number of publications. The clusters of the same color indicate that the researchers are collaborating in a similar field or the same laboratory.

It has been identified that Kumar, A. (NP=50, TC=426, TLS=62) is in the central zone and connected with most of the authors. That signifies that being a most productive author, this author was also the leading collaborator in the field. It was followed by Singh, R.K. (NP=38,

TC=344, TLS=39), Singh, A. (NP=33, TC=378, TLS=45), and Maikhuri, R.K. (NP=25, TC=609, TLS=68). There are 14 clusters of authors found in the network. Cluster-1 consists of 13 authors, Cluster-2 (12 authors), Cluster-3 (11 authors), Cluster-4 (10 authors), Cluster-5, 6 & 7 (9 authors), Cluster-8, 9 & 10 (8 authors), Cluster-11 (7 authors), Cluster-12 (6 authors) and Cluster-13 & 14 (3 authors). That indicates that the 117 authors were associated with the 14 most active groups of researchers conducting the most research in the field.

**Figure 4**  
*Network Visualization of Collaboration between Authors*



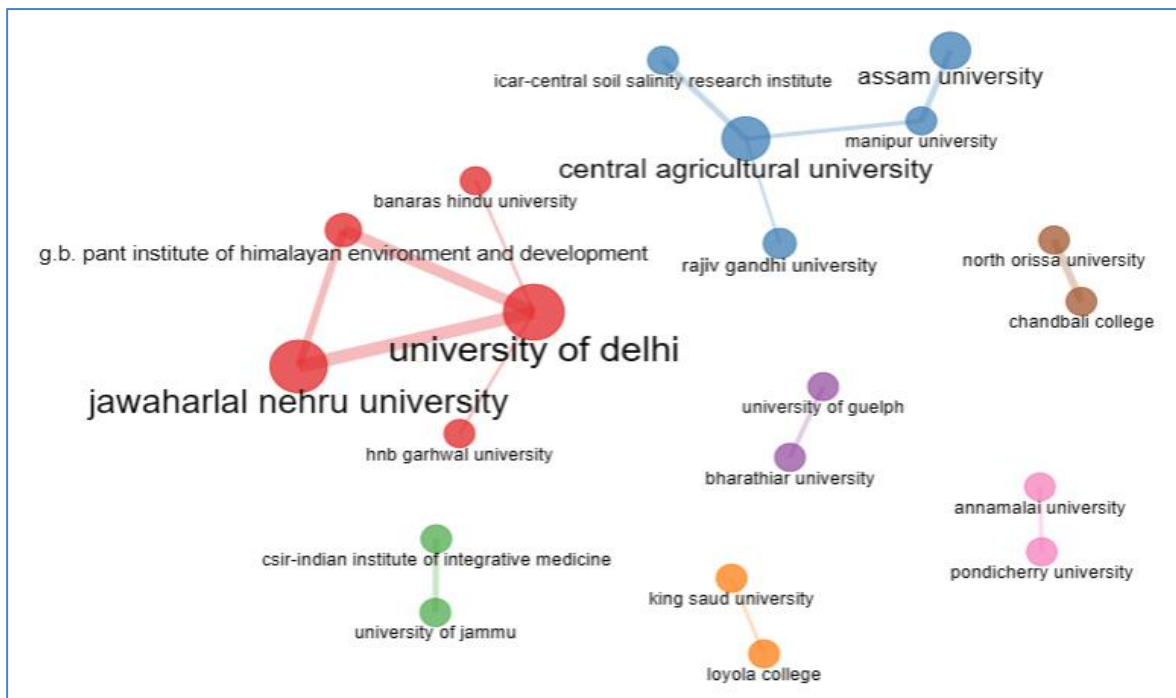
*Note.* Figure designed by the authors. This figure presents the authorship collaboration networks on the Indian indigenous knowledge research. Color of the cluster represents the group of associated authors, and the size of the circle nodes represents the number of publications.

**Collaboration Between Organizations/Institutions**

Figure 5 illustrates the networks of collaboration between different research organizations and institutions that jointly researched Indigenous knowledge in India. In the figure, the circle node represents the number of publications, and the colors represent the groups of research organizations or institutions that worked in a similar area of research. Likewise, the connecting line represents the association between research organizations or institutions. It is clear that the University of Delhi and Jawaharlal Nehru University are the leading institutions in Indian indigenous knowledge research, and they have a strong network with multiple organizations and institutions. Central Agricultural University followed it, and its collaborators also produced a series of research on different topics concerning indigenous knowledge. Apart from that, other organizations seen in the figure also collaboratively contributed significant research in the field. The research findings also highlight that the institutions funded by the central government make the largest contributions to the field of research.

**Figure 5**

*Network Visualization of Collaboration between Organizations/Institutions*



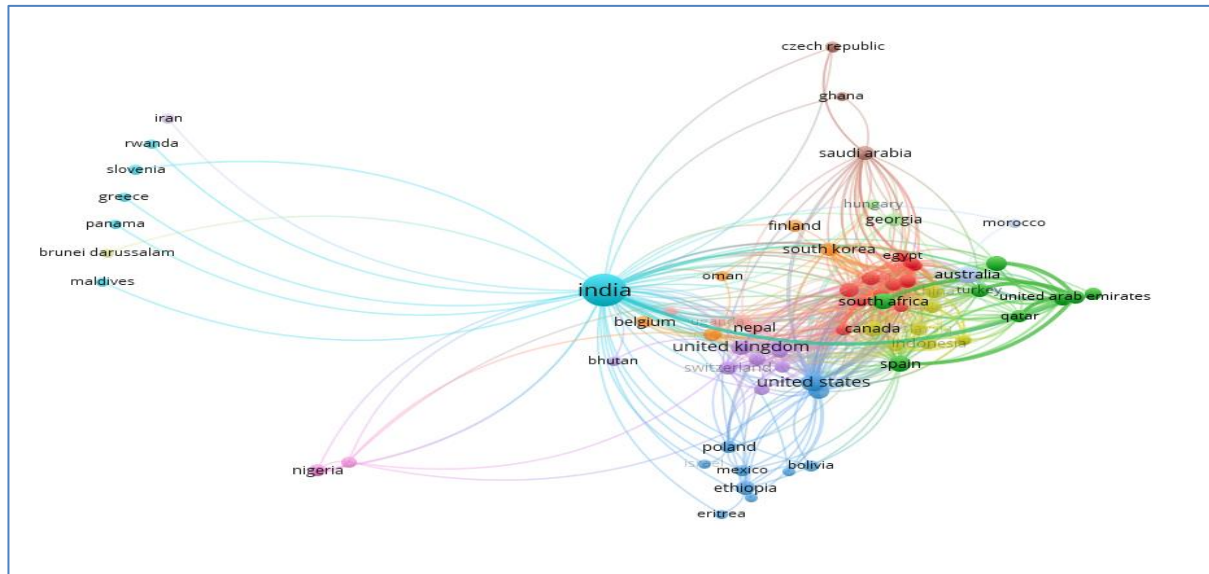
*Note.* Figure designed by the authors. This figure presents the research collaboration network among organizations/institutes on Indian indigenous knowledge research. The color of the cluster represents the group of associated organizations/institutions, and the size of the circle nodes represents the number of publications.

### **India's International Collaboration Network**

Figure 6 represents India's collaboration with other countries in indigenous knowledge research. Being a host nation, India has the most publications that can be recognized with the size of the circle node that India is standing in the figure. India had diverse collaboration records with more than 80 countries across the globe during the study period (Figure 6). The USA was the closest international collaborator country to India, with a frequency of 60 times collaboration records. It was followed by the United Kingdom (23 times), Canada and Germany (21 times), Australia (20 times), etc. In order to advance indigenous knowledge research, India's international collaboration network is crucial. Collaboration with international organizations can broaden India's research scope, foster the exchange of ideas, and provide access to diverse perspectives and expertise. Researchers in India can explore indigenous knowledge systems from different cultures through collaboration. This enhances their understanding of indigenous practices and their applicability internationally. Furthermore, international collaboration allows Indian researchers to share resources, technologies, and funding, allowing them to conduct comprehensive studies and implement sustainable solutions. Building a robust international collaboration network can enable India to preserve and promote indigenous knowledge, resulting in cultural preservation, sustainable development, and the well-being of Indigenous communities worldwide.

**Figure 6**

*Network Visualization of India's Collaboration between Other Countries*



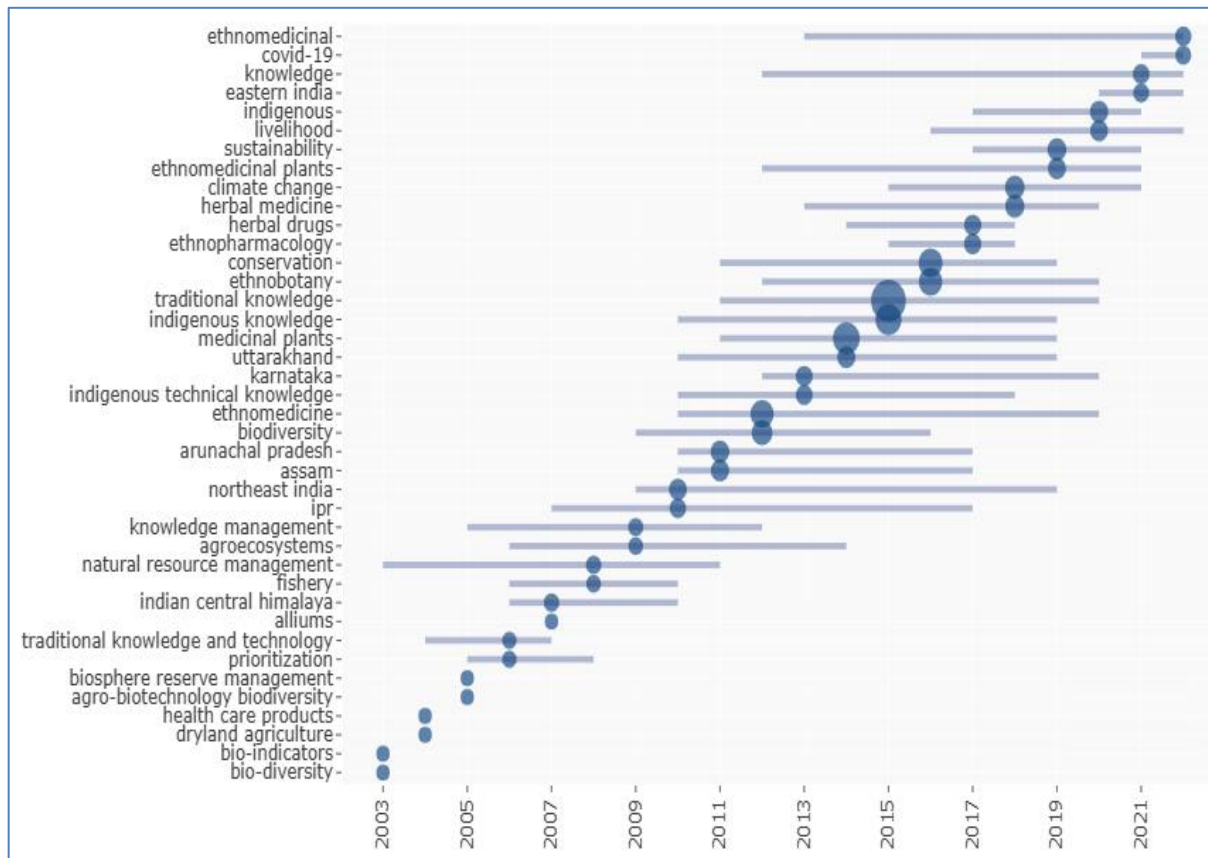
*Note.* Figure designed by the authors. This figure presents India's international research collaboration networks on indigenous knowledge research. The color of the cluster represents the group of associated countries, and the size of the circle nodes represents the number of publications.

### Conceptual Structure of the Research Publications

The conceptual structure of a research publication can be understood through the keywords assigned by the authors of the particular research paper. So, the most appropriate method to identify the conceptual structure of the research publication is the analysis of the authors' keywords of the research publications (Basumatary et al., 2022). In this study, the conceptual structure of Indian indigenous knowledge research focused on most repeatedly by the researchers is identified through the keyword co-occurrence visualization techniques using the data visualization tool VOSviewer. Between 2003 and 2022, the publications dataset contained 5,047 authors' assigned keywords. In order to identify the most prominent keywords, this study considered and visualized the keywords that appeared at least ten times in the research of Indian indigenous knowledge (Figure 7).

The keywords in the bigger font in the figure indicate the most frequently appearing keywords in the research publications. It has been seen that keywords such as "traditional knowledge" appeared in the largest font size and the central zone of the keywords. That indicates that it seemed the most number of times (410 times), followed by "medicinal plants" (165 times), "indigenous knowledge" (149 times), "conservation" (102 times), "ethnobotany" (93 times), "ethnomedicine" (88 times), "India" (85 times), "biodiversity" (51 times), "traditional medicine" (49 times), "ayurveda" (45 times), "climate change" (36 times), "herbal medicines" (32 times), "sustainability" (29 times), "Himalaya" (27 times), "Arunachal Pradesh" (26 times), "Assam" (23 times), "Uttarakhand" (22 times), and so on. It sheds a clear light on the fact that the research on Indian indigenous knowledge was primarily focused on these topics. It is also found that the research was focused on specific geographical regions, i.e., Assam, Arunachal Pradesh, Uttarakhand, the Himalayan region, etc.



**Figure 8***Visualization of Trending Research Themes*

*Note.* Figure designed by the authors. This figure presents the appearance of prominent keywords in Indian indigenous knowledge research over the years. Circle nodes represent keywords, and the size of the nodes represents the frequency of appearance.

## Discussion

In exploring indigenous knowledge research in India, this analysis reveals a dynamic landscape characterized by steady growth, diverse collaboration networks, and evolving thematic trends. The steady increase in research publications reflects a positive trajectory in the scientific community's engagement with indigenous knowledge. The 12.09% Annual Growth Rate (AGR) in Indian research publications, contributing 8.56% to global publications, highlights the growing importance and recognition of indigenous knowledge internationally. Notably, the peak in citations for publications from 2010 suggests a lag between publication and academic recognition, indicating that research in this domain requires time to permeate scholarly circles (Basumatary et al., 2023, p. 7). A negative citation growth trend on the global level suggests challenges in gaining recognition or impact. In contrast, India's citation growth remains consistent, indicating sustained influence and acknowledgment within the academic community.

Interestingly, researchers such as Maikhuri, Singh, Tamang, Ayyanar, and Rao were significant individual contributors in the field for almost the last three decades (Gayan et al., 2023, p. 27). In addition, institutions such as the G.B. Pant National Institute of Himalayan Environment, the Indian Council of Agricultural Research, and The University of Delhi continue to be top in the field, indicating regional and institutional strengths in Indigenous knowledge research (Gayan et al., 2023, p. 34). Journals like "The Indian Journal of Traditional

Knowledge and The Journal of Ethnopharmacology serve as prominent platforms for publishing research papers, fostering knowledge exchange, and shaping the discourse in the field.

Collaboration networks between authors and institutions within India and internationally highlight the importance of collective efforts in advancing indigenous knowledge research. The dominance of institutions from northern India suggests regional specialization and highlights the need for a more inclusive representation from diverse geographical areas.

The conceptual structure analysis based on keyword co-occurrence provides a comprehensive overview of the thematic focus in indigenous knowledge research. The prominence of keywords such as “traditional knowledge,” “medicinal plants,” and “conservation” indicates foundational topics. In contrast, the emergence of keywords like “sustainability,” “collaboration,” and “COVID-19” reflects evolving research priorities in India, including responses to global challenges like COVID-19. The Western world, on the other hand, has primarily explored themes of resilience, sustainability, and ecosystem services. The United States contributed the most significant number of journal articles, with Arizona State University being the most influential institution, emphasizing the importance of environmental concerns and ecosystem dynamics (Mubako, 2022). Similarly, the visualization of research trends over the years offers a dynamic perspective on the changing priorities within indigenous knowledge research in India. From an initial emphasis on natural resource management and ethnomedicine to contemporary themes like collaboration, sustainability, and responses to global challenges like COVID-19, the evolving research landscape mirrors the adaptability and responsiveness of the scientific community to emerging issues.

### **Future Research Directions**

This study explores various aspects of indigenous knowledge, including medicinal practices, sustainable agriculture, biodiversity conservation, and traditional technologies. The increasing attention and support for research on Indian Indigenous knowledge indicate a positive shift towards recognizing and celebrating the contributions of Indigenous communities in shaping a sustainable and inclusive future.

Researchers are increasingly focusing on interdisciplinary approaches that combine traditional knowledge with modern scientific methodologies. There is a need for in-depth investigations into the practical applications of indigenous knowledge in addressing current challenges, such as climate change, biodiversity loss, and sustainable development. Additionally, there is a growing recognition of the importance of cultural preservation and revitalization, leading to research endeavors that explore the role of Indigenous knowledge in language revitalization, cultural heritage preservation, and community empowerment. Furthermore, there is a need to address the ethical considerations surrounding indigenous knowledge research, including intellectual property rights issues, equitable benefit sharing, and respectful engagement with Indigenous communities. The future research directions regarding Indian indigenous knowledge will involve collaborative partnerships among academia, Indigenous communities, policymakers, and other stakeholders. The goal is to ensure the co-creation of knowledge and the integration of indigenous knowledge into mainstream practices. One of the foremost essential research areas in the contemporary era is digitalizing traditional knowledge and archiving community-based content. By embracing these directions, we can unlock the transformative potential of Indian indigenous knowledge for a more sustainable and inclusive future.

## Conclusion

The review of publications on Indian indigenous knowledge provides a valuable overview of the current state of research in this field. This information can inform future research and development efforts and identify opportunities for further research, policy development, and community-based initiatives. These initiatives aim to promote the preservation and utilization of indigenous knowledge for the benefit of society. The steady growth in publications and citations in India and globally reflects a positive trajectory for the scientific community's collaborative efforts. The most prolific researchers and research institutions can be potential collaborators for future researchers in this field. In addition, information professionals may select the most prolific journals for subscription in the library, or researchers may select journals to submit their manuscripts. Analysis of keywords and research trends reveals the most focused topics in the field, which future researchers can identify the gaps and continue to explore with trending topics or less focused topics in the field.

However, the present study is limited to the publications affiliated with India and indexed in the Scopus database for twenty years (2003–2022). Even though the insights gained from this research have broader implications and can benefit audiences beyond India's borders, readers from diverse regions can glean insights into Indigenous knowledge research's collaborative and evolving nature, fostering cross-cultural understanding and potentially inspiring similar endeavors in their respective contexts. While the initial focus is on a specific geographical region, the methodologies and findings of this study offer valuable contributions to the global discourse on indigenous knowledge and its representation in scholarly literature. Despite this, this study left ample room for further research. Research can be conducted using various databases such as Web of Science, Dimensions, and Google Scholar and by accessing the archives of relevant governments and private institutions. These may provide different results to guide future endeavors and give a deeper understanding of India's rich cultural heritage and scientific achievements.

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