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Bibliometrics of Indian Knowledge Systems Research: A Co-Authorship and Co-Occurrence Analysis

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Abstract

This study aims to examine research on Indian Knowledge Systems (IKS), with a particular focus on co-authorship and co-occurrence networks. A bibliometric analysis was conducted on 34 articles extracted from the Scopus database using the search strategy TITLE-ABS-KEY("Indian Knowledge Systems"). The data were analysed using Biblioshiny (version 4.2.3) and VOSviewer (version 1.6.20). The findings reveal that Paranjpe, A.C. ranks first with two publications, while Amity University, Noida and the University of Delhi each lead with five publications. India emerges as the primary hub, with the United States identified as a key collaborator. Thematic co-occurrence analyses highlight interdisciplinary clusters in philosophy, education, sustainability and technology, alongside traditional concepts such as Dharma and Consciousness, which are integrated with modern scientific terms such as neurotransmitter and computational methods).

Keywords: *Indian Knowledge Systems, Bibliometric Analysis, Biblioshiny, VOSviewer.*

Introduction

The Indian Knowledge System (IKS) represents a vast and multifaceted intellectual tradition that has evolved over millennia, encompassing a variety of disciplines such as philosophy, medicine, astronomy, mathematics, linguistics, and the arts. Rooted in ancient scriptures such as the *Vedas*, *Upanishads,* and *Puranas*, as well as treatises such as the *Arthashastra*, *Charaka Samhita* and *Aryabhatiya.* IKS is one of the oldest knowledge systems in the world and has influenced numerous philosophers and scientists globally. Albert Einstein once remarked, “We owe a lot to the ancient Indians, teaching us how to count. Without which most modern scientific discoveries would have been impossible” (Thapliyal, 2023, p. 3296). Unlike the knowledge structures of modern academia, IKS emphasises on an integrated understanding of the world, where disciplines such as Ayurveda (medicine), Jyotisha

(astronomy) and Vastu Shastra (architecture) are interconnected with philosophical and spiritual traditions (Nath, 2024).

In recent years, there has been a renewed interest in Indian Knowledge Systems (IKS), both in academic disciplines and policy discussions, driven by the recognition of its potential contributions to contemporary challenges. The integration of IKS into formal education systems, sustainable development initiatives and interdisciplinary research has been gaining momentum (Bhatnagar et al., 2024). Various scientific studies have been conducted on IKS; for instance, Gupta (2024) studied its historical aspects. The system emphasises a scientific approach through observation and experimentation, contributing significantly to global scientific knowledge. Khare and Kumar (2025) reviewed IKS by highlighting its relevance in addressing global challenges regarding sustainability, health and education, highlighting its potential to offer alternative solutions and promote holistic well-being in the context of globalisation. Baidya and Das (2024) emphasised the need to incorporate indigenous concepts into courses such as polity, administration and governance. Badoni et al. (2024) examined IKS by highlighting the scientific foundations in ancient Vedic texts, particularly in physics. Nath and Sahu (2024) conducted a bibliometric analysis on indigenous knowledge, with special reference to studies conducted at the national and global level. Gondo (2025) performed another bibliometric analysis of IKS and climate change adaptation literature.

However, despite its significance, scholarly research on IKS that systematically analyses its evolution, impact and global academic engagement remains limited. This calls for a structured approach to understand the intellectual trajectory of IKS research, identifying its key contributors, thematic trends and knowledge dissemination patterns. By applying bibliometric methods to the study of IKS, this research aims to provide a quantitative and qualitative overview of the existing literature, shedding light on the academic discourse surrounding IKS. Additionally, this analysis seeks to identify gaps in research, emerging trends and potential future directions in the field.

Methodology

The study employed a bibliometric analysis using the Scopus database and identified 34 documents with the search strategy TITLE-ABS-KEY("Indian Knowledge Systems"). The data were exported in .csv format and analysed with Biblioshiny (version 4.2.3) and VOSviewer (version 1.6.20) using co-authorship and co-occurrence analysis. The inclusion criteria for this study required articles related to IKS, written in the English language and published in journals. Meanwhile, the exclusion criteria eliminated editorials, book reviews

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and notes, as well as works that were in languages other than English and were not journal articles.

Results

Co-Authorship Analysis:

Fig. 1 Most productive authors

Figure 1 presents the most productive authors in the field of Indian Knowledge Systems (IKS), in terms of the number of documents published. The analysis reveals that most of these authors have contributed equally, with each publishing at least one document. A. C. Paranjpe ranks first with two publications, while V. Adinarayanan, R. R. Babu, N. L. Balasudarsun, and others have each published one document. This contribution reflects the interdisciplinary and emerging nature of research in IKS.

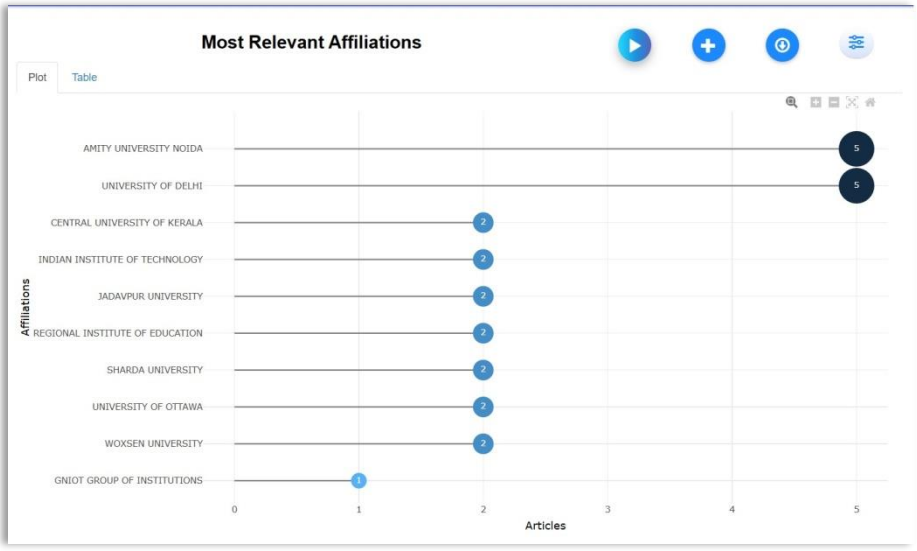

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Fig. 2 Most productive institutions

Figure 2 illustrates the most productive institutions contributing to research on IKS, as determined by the number of documents published. The results indicate that Amity University, Noida and the University of Delhi lead the list with five publications each, which shows their significant role in advancing scholarship in this field. Following these institutions, the Central University of Kerala, Indian Institute of Technology, Jadavpur University, Regional Institute of Education, Sharda University, University of Ottawa, and Woxsen University have contributed two publications each. The GNIOT Group of Institutions appears last with a single publication.

Fig. 3 International collaboration

Figure 3 presents the countries' collaboration world map, illustrating global research partnerships in the domain of the IKS. The visualisation highlights the strong research collaboration between India and the United States, as indicated by the connecting line between the two nations. India (dark blue) serves as the central hub of research output in this domain, whereas the United States (light blue) emerges as a key international collaborator; this connection reflects active scholarly exchanges, joint publications, and co-authored works between researchers from both countries.

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Co-Occurrence Analysis:

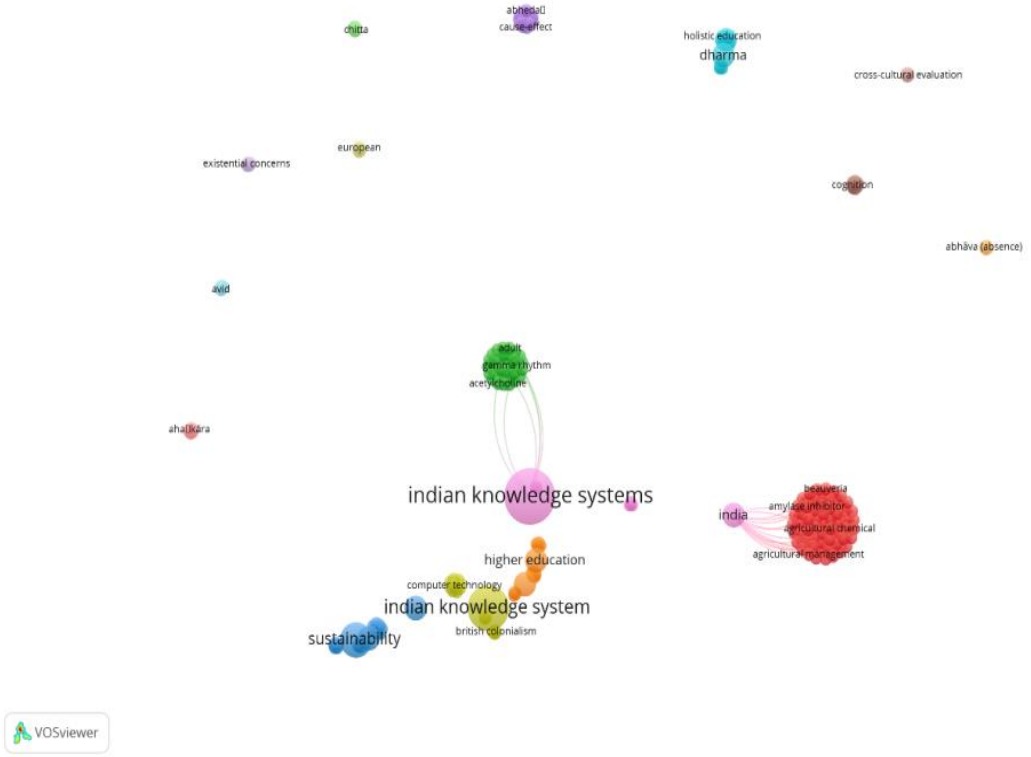

Fig. 4 Co-occurrence analysis (threshold, minimum no of occurrence 1, showing 230)

Figure 4 represents the interconnections among 230 keywords related to IKS. The visualisation helps identify thematic clusters, showing how various concepts within IKS are interrelated. At the centre of the network, the terms “Indian Knowledge Systems” and “Indian Knowledge System” appear prominently, indicating their foundational role in the research field.

Several key thematic clusters emerge from the analysis. One major cluster revolves around philosophy and education, with keywords such as “Dharma”, “Holistic Education”, “Higher Education”, and “Pedagogy”. Another significant cluster pertains to science and technology, featuring terms such as “Acetylcholine”, “Gamma Rhythm”, and “Computer Technology”.

In addition, the network highlights research on sustainability and colonial influences, with keywords such as “British Colonialism” and “Sustainability”. A separate yet interconnected cluster relates to agriculture and chemistry, including the terms “India”, “Agricultural Chemicals”, and “Amylase Inhibitor”.

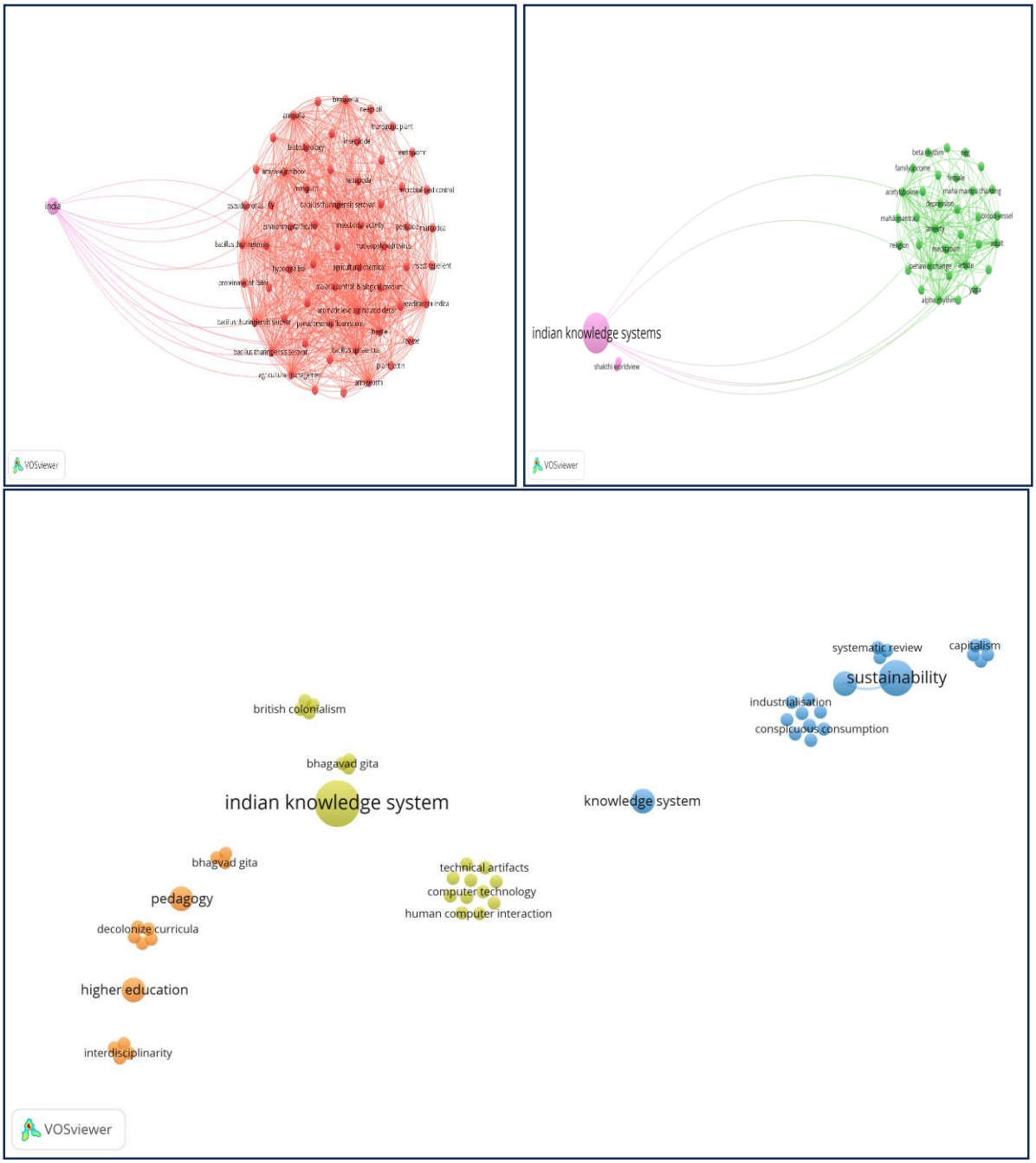

Fig. 5 Breakdown of co-occurrence network

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Table 1. Thematic analysis

Theme	Keywords
Indian Knowledge System & Philosophy	Indian knowledge system, Indian knowledge systems (IKS), Vedic philosophy, Vedic mathematics, Bhagavad Gita, Mahabharata and Ramayana, Yoga, Yoga Sutras, Vyakarana, Navya-Nyaya, Śiva sutra, Dharma, Vidya, Sastra, Sadhya, Raga, Triguṇa, Pratyahara, Asakti, Anasakti, Dveṣa, Ahamkara, Consciousness, Transcendence, Self, Universal psychology
Education & Pedagogy	Pedagogy, Curriculum development, Pedagogical strategies, Inclusive education, National education policy, Holistic education, Value-based education, educational reform, Higher education, Moral education
Science & Technology	Biotechnology, Biomedical technology assessment, Computer technology, Interactive computer graphics, Electroencephalography, Human-computer interaction, technical artifacts, Neurotransmitter, Electrodermal response
Health & Psychology	Mental health, psychological well-being, Anxiety, Depression, Cognition, Meditation, Maha Mantra chanting, Rhythms (Alpha, Beta, Delta, Theta, Gamma), Somnolence, Mental stress, Well-being
Environmental & Agricultural Sciences	Environmental health, Environmental exposure, Agricultural management, Agricultural chemicals, Soil quality, Sustainable development, Sustainability, Sustainable future
Colonialism & Modernity	British colonialism, Colonialism, Decolonize curricula, Chintzes and calicos, Industrialisation, Modernity, Philology, Persian, Mughal, Textile heritage
Social & Cultural Studies	Social relevance, Media culture, Capitalism, Consumerism, Western consumer, Indian social work, Indigenization, Indigenous knowledge system, Indigenous perspectives, Evaluation capacity building
Ethics & Value Systems	Ethical development, Responsible management, Value systems, Traditional values, Ontological design, Rationality, Verifiability, Cause-effect relationships
Insect Control & Biological Studies	Insect control, Insecticide, Pesticide, Bacillus thuringiensis, Neem oil, Mosquito control, Malaria control, Microbial pest control, Nematode, Pseudomonas fluorescens, Trichoderma harzianum
Sustainability & Waste Management	Sustainability, Sustainable development, Sustainable future, Wasteful expenditure, Curbing wasteful expenditure
Mathematics & Logic	Mathematical instruction, Square of oppositions, Singular propositions, Ontology, Symbolic analysis, Scientific methodology

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Discussion and Conclusion

The analysis of the most productive authors reveals an interesting authorship pattern, with each listed author contributing only one publication. This suggests that research in the IKS domain is still new and developing, without clear dominance by a specific group of scholars. Such dispersion could indicate a wide interest across various disciplines, but also a lack of a consolidated academic community.

At the institutional level, the higher publication counts by Amity University, Noida and the University of Delhi shows institutional prioritisation and the dedication of faculties focusing on IKS research. The involvement of other institutions across India indicates a distributed and expanding network of engagement across higher education in the country. The presence of University of Ottawa further suggests international academic interest in the area.

Analysis of international collaboration underscores the dominant role of India as the primary hub of IKS research, with the United States emerging as a key partner. This collaboration highlights the growing global recognition of IKS, possibly facilitated by increasing academic partnerships, diaspora contributions and cross-cultural exchanges. Despite this, the lack of extensive global participation suggests that IKS research remains largely India-centric, necessitating broader international engagement for wider acknowledgment and impact.

A key finding from the co-occurrence and thematic analysis is the strong representation of traditional philosophical concepts such as Dharma, Pratyāhāra, Vyākaraṇa and consciousness, alongside modern scientific terms such as “neurotransmitter”, “gamma rhythm” and “computational technology”. This demonstrates the relevance of IKS beyond historical studies, extending into contemporary scientific and technological frameworks. However, while sustainability and decolonisation themes are gaining prominence, areas like IKS applications in emerging fields such as artificial intelligence and global policymaking remain underexplored.

The findings suggest that IKS research is in its nascent yet evolving stage. The current state of scholarship reflects a broad but shallow engagement, indicating potential for deeper academic consolidation and specialisation. For IKS to mature as a robust research domain, increased collaboration, longitudinal research efforts and institutional support will be critical. Future initiatives should thus aim to build cohesive research communities, encourage repeated contributions from key scholars and promote interdisciplinary dialogue both within India and internationally.

Overall, the findings provide valuable insights into the structure and development of IKS research, showcasing the diversity of themes and the evolving collaborative landscape. This study not only offers a baseline for future bibliometric evaluations in the field but also supports researchers, policymakers and institutions in understanding key trends and strategic directions for advancing Indian Knowledge Systems as a global research area.

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