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Research Article

Tracking Scientific Attention on Kaziranga National Park: A Bibliometric Study

Pranjal Deka[1,*], **Mukut Sarmah**[2]

[1]Government Model College, Kaziranga, Assam, INDIA.
[2]Department of Library and Information Science, Assam University, Silchar, Assam, INDIA.

ABSTRACT

Kaziranga National Park, a UNESCO World Heritage Site in Assam, India, is renowned for its rich biodiversity. The park plays a significant role in wildlife conservation in Assam and India. The national park is divided into four ranges: Kohora, Bagori, Agaratoli, and Burhapahar. This park is home to a diverse range of wildlife. This study employs a bibliometric analysis of publications from 1993 to 2025, retrieved from the Web of Science database, to examine research trends, key contributors, and the thematic diversity of research on Kaziranga. The analysis reveals steady scholarly growth, with 44 documents authored by 156 researchers affiliated with leading institutions, including Tezpur University, the CSIR, India, and the University of Edinburgh. The research areas encompass local conservation efforts focused on the Big 5 species and ecological risks, as well as interdisciplinary themes such as paleoecology, geochemistry, and environmental history. Thematic mapping effectively highlights well-developed major themes, such as biodiversity and megafaunal extinction, niche-specialized topics, and emerging areas, indicating a dynamic and evolving research landscape in Kaziranga. The analysis emphasises Kaziranga's importance for ecological conservation and provides an overview of scholarly engagement with its exceptional environment across multiple contexts.

Keywords: Assam, Authorship, Bibliometrics, India, Institutions, Kaziranga, Keywords, Research Trends.

Correspondence:
Mr. Pranjal Deka
Librarian, Government Model College, Kaziranga, Assam, INDIA.
Email: pranjalpriya3@gmail.com

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INTRODUCTION

Kaziranga National Park, a renowned national park of the world situated in Assam, the North Eastern State of India, is globally recognised for its exceptional biodiversity and conservation efforts, especially as the primary habitat for the one-horned rhinoceros (*Rhinoceros unicornis*) (Gogoi and Gogoi, 2022; Baruah, 2024; Nath *et al*., 2023). The park is divided into four administrative ranges: Kohora, Bagari, Burhapahar, and Agaratoli. All four ranges have their own unique locations and diversity. It plays a vital role in conserving the Big 5 (One-horned rhinoceros, Royal Bengal tiger, Asian elephant, Wild Water Buffalo, and Swamp Deer) and other wildlife. Kaziranga has been designated a UNESCO World Heritage Site and a Tiger Reserve (Fanari, 2024; Hazarika and Kalita, 2019; Patnaik, 2019). The park supports substantial populations of the Big 5 and various bird species, many of which are threatened globally (Heinen and Shrivastava, 2009; Das, 2017). The Kaziranga National Park, which covers grasslands and wetlands along the Brahmaputra River floodplain, is shaped by annual flooding, which enriches the ecosystem but also presents challenges for wildlife management (Janardhan *et al*., 2024; Nath *et al*., 2023).

The Kaziranga locality is engaged in conservation efforts through its day-to-day practices, and its conservation achievements are linked to social, political, and economic factors. The expansion of protected areas has sometimes led to the displacement of local people and restrictions on traditional resource use (Fanari, 2024; Hazarika and Kalita, 2019; Smadja, 2018; Gogoi and Gogoi, 2022). Human-wildlife conflict, such as crop damage and livestock losses from wild animals, can cause economic hardships for residents from time to time (Pandey *et al*., 2022; Das, 2017). The Kaziranga National Park is a global tourist attraction. Tourism offers economic advantages, but these benefits are often unevenly shared, and expanding tourism infrastructure must be carefully balanced with ecological conservation (Chakrabarty *et al*., 2019; Bharali, 2023). It is important to consider participatory approaches and community involvement in conservation, emphasising that sustainable management requires balancing biodiversity preservation with the rights and well-being of local populations (Fanari, 2024; Heinen and Shrivastava, 2009; Das, 2017; Gogoi and Gogoi, 2022). The park has faced challenges such as habitat destruction, climate change, and land conversion for

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tourism purposes, which require adaptive management strategies to maintain the park's ecological health and support surrounding communities (Gogoi and Gogoi, 2022; Janardhan *et al.*, 2024; Nath *et al.*, 2023).

Bibliometrics and Scientometrics provide visual representations of scholarly content within a specific domain. The Bibliometrics study was also conducted with a specific focus on highlighting research on National Parks (Wilgen *et al.*, 2016). This kind of study can reveal the scholarly focus on the national park (Baisong and Tingting, 2024). It is an important task to study protected areas (Hasana *et al.*, 2022). VOSviewer and Biblioshiny are significant tools for visualising the research landscape (Arruda *et al.*, 2022; Wong, 2018; Bukar *et al.*, 2023; Aria and Cuccurullo, 2021). In this study, an attempt has been made to visualise the scholarly landscape of Kaziranga using the Web of Science Database.

Objectives of the Study

The study aims to identify the distribution of research areas on Kaziranga. It mainly focuses on highlighting the author, organisation, and research area.

METHODOLOGY

The required data were collected from the Web of Science database. Using the search term Title = Kaziranga. The collected data were analysed using the bibliometric tools Biblioshiny and Vosviewer.

Limitations of the study

The study is limited to the Web of Science database. No other database was used in this study.

RESULTS AND DISCUSSION

Main Information about the Data

The data from 1993 to 2025 (June) reveal steady, consistent growth in scholarly output, with an annual growth rate of 2.19%. Over the past 32 years, 44 documents have been published across 36 sources, indicating a broad and diverse range of scholarly communication. The average age of the documents is 7.57 years, suggesting that most of the research is relatively recent and remains relevant. The citation pattern indicates a moderate impact, with an average of 8.114 citations per document and a total of 1,702 references cited, reflecting significant engagement with the existing literature in this domain.

The documents' content is rich and thematically diverse, featuring 177 Keywords Plus and 150 author-defined keywords. Regarding authorship, the dataset includes 156 contributing authors, with only 8 documents being single-authored, highlighting a culture of collaboration. On average, each document had 4.32 co-authors, and international co-authorship stood at 22.73%, indicating a significant level of global academic cooperation.

Regarding document types, most are peer-reviewed research articles (39 out of 44), supplemented by an early access article, two editorial materials, one news item, and one note. This distribution underscores the publication's scholarly focus while reflecting timely discussions and updates through other formats. The data reflect productive, collaborative, and moderately influential academic work with strong international linkages and a broad thematic scope.

Prolific Authors in this field

Figure 1 presents a detailed view of author contributions based on the number of documents published between 1993 and 2025 on the theme of Kaziranga National Park. The figure highlights nine top authors: Gogoi N, Goswami J, Hopker A, Hopker S, Pandey N, Saikia D, Saikia R, Sargison N, and Sharma, each with three documents. These individuals represent the most prolific contributors in this field. Another group of authors, including Ahmad W, Baniyamuddin M, Basumatary SK, Bora PJ, Burman PKD, Ghosh S, Joseph J, Kamal A, Kumar CG, Kundu S, and Marsland R, has contributed two documents each. This tier of contributors likely includes authors from various domains. The figure reflects a balanced authorship landscape in the field, which indicates a healthy collaborative environment. Overall, the figure highlighted the distribution pattern of academic contributions, underscoring the collaborative and multidisciplinary nature of the research represented.

The Organisation Engaged in Research on Kaziranga National Park

Figure 2 illustrates the institutional affiliations of publications on Kaziranga National Park from 1993 to 2025 in the Web of Science database. At the top of the list is Tezpur University, with six articles, making it the most prolific institution in this period. Following closely are three institutions tied with five articles each: the Council of Scientific and Industrial Research (CSIR), the University of Edinburgh, and the World Wildlife Fund (WWF). Their representation highlights their collaborative, interdisciplinary research, likely in the fields of science, technology, the environment, and conservation. Institutions such as Gauhati University and Savitribai Phule Pune University have contributed 4 and 3 articles, respectively, along with other notable research entities like the Birbal Sahni Institute of Palaeobotany (BSIP), CSIR-Indian Institute of Chemical Technology (IICT), the Department of Science and Technology (India), and the Indian Institute of Technology System (IIT System), each with three articles. These contributions suggest a broad geographical and thematic spread, ranging from palaeobotany and climate science to technology and policy research. Several institutions contributed two articles each, indicating either emerging involvement or focused collaboration on specific projects. These include Aligarh Muslim University, Assam Agricultural University, the Centre for Climate Change Research (India), the

Indian Institute of Tropical Meteorology (IITM), and others, including international entities such as the University of Bristol and specialised organisations like the Zoological Survey of India. The figure reveals a balanced mix of national and international affiliations of Indian institutions, reflecting a strong regional research focus complemented by global collaboration. It highlights the importance of interdisciplinary partnerships and institutional backing in sustaining scholarly output over time.

Diversity of Research Areas in Kaziranga National Park

The two visualisations, Figures 3 and 4 (Author Keywords Network and Keywords Plus Network), present distinct research landscapes related to Kaziranga National Park and environmental studies. The Author Keywords Network places Kaziranga National Park at the core, with closely connected terms such as Assam, India, conservation, rhinoceros, and ecological risk. This network reflects a localised focus, emphasising regional biodiversity, conservation attitudes, and issues such as floods and energy consumption. It reveals thematic clusters that explore species-specific concerns (e.g., *Rhinoceros unicornis*), conservation policy (e.g., governmentality, compensation), and ecological threats. In contrast, the Keywords Plus Network offers a broader, conceptually driven map derived from the cited literature, featuring central themes such as diversity, sediments, megafaunal extinction, and water availability. This network demonstrates an interdisciplinary character with clusters linked to geochemistry, paleoecology (e.g., spores, pollen, proxies), and environmental history (e.g., land-use history, vegetation relationships). While the Author Keywords Network illustrates the authors' direct focus on Kaziranga's ecological and other contexts, the Keywords Plus Network reveals deeper methodological and global environmental connections. They offer a comprehensive view: the former emphasises field-based conservation and local biodiversity, and the latter highlights broader scientific inquiries into ecological processes, environmental change, and interdisciplinary integration.

Thematic Map of the Research Area in Kaziranga National Park

Figure 5 provides a thematic map that offers a comprehensive overview of research trends and diversity, categorising themes by relevance (centrality) and development (density). In the upper-right quadrant, labelled "Motor Themes," we find well-developed and highly relevant topics, such as diversity, megafaunal extinction, and water availability, indicating that these are central drivers of the research field. The Niche Themes in the upper-left quadrant, such as antibiotics, secondary metabolites, and taxonomy, are also well-developed but less connected to other themes, suggesting they are specialised areas with limited interdisciplinary influence. Interestingly, region-specific terms such as Assam, freedom, and space appear here, likely representing localised or socio-political studies with substantial standalone value. In the lower-left quadrant, Emerging or Declining Themes, topics such as decomposition, area, and forest show low centrality and density, indicating underdeveloped or waning academic focus. Finally, the lower-right quadrant features basic themes, such as sediments, which are relevant but not yet deeply explored, highlighting their foundational importance and potential for future research. Overall, the map offers insight into the structure and direction of the research field, emphasising areas of strength while identifying gaps and opportunities for further investigation.

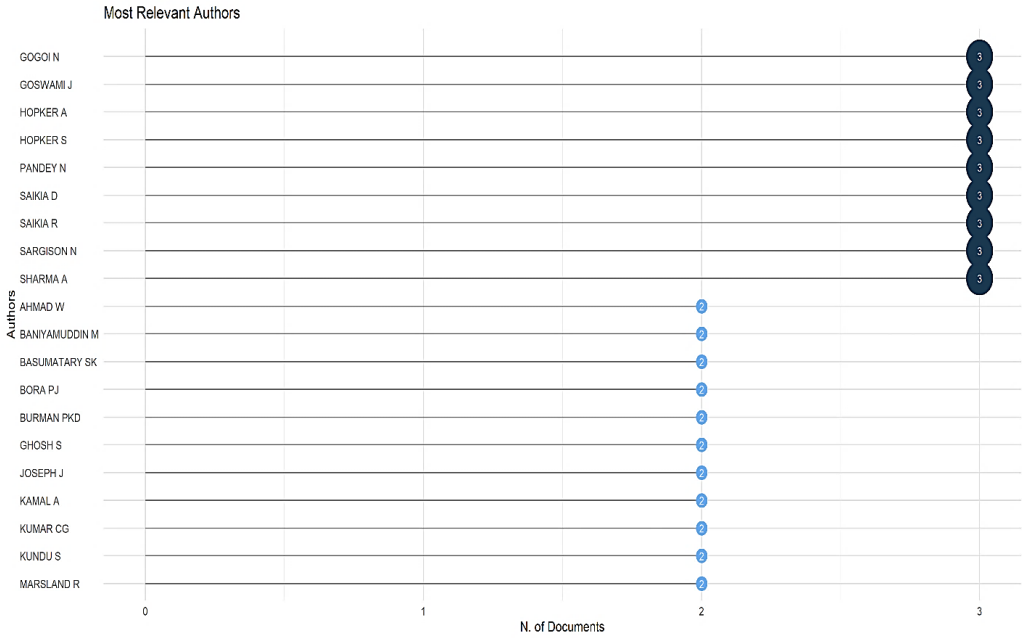

Figure 1: Most relevant authors in this field.

Author, affiliation, and keyword relationship in the field of research on Kaziranga National Park

Figure 6 illustrates a three-field map of the relationships among writers (AU), keywords (DE), and the institutions or organisations they work for (AU_UN). The names of individual authors who have worked in different study fields are listed on the left. These include Gogoi N, Basumatary S.K., Sharma A, Bora P.J., Kamal A, and Kumar C.G. The middle part of the diagram shows a variety of research topics, from "acetylcholinesterase inhibitors" and "alpha,beta-dehydrocurvularin" to ecological and environmental themes like "grassland," "*Rhinoceros unicornis*," "adaptive behavior," "conservation," and geographic indicators like "Kaziranga," "Assam," and "Brahmaputra River." These terms highlight a connection between interdisciplinary research that examines animal biology, ecology, biochemistry, and environmental issues in a specific area.

The right section lists the institutions and organisations that are connected to or support these research efforts. Some of the most important institutions are the CSIR Indian Institute of Chemical Technology (IICT), Tezpur University, the World Wildlife Fund, the Zoological Survey of India, Gauhati University, and Aligarh Muslim University. The figure shows that Gogoi, N., Basumatary,

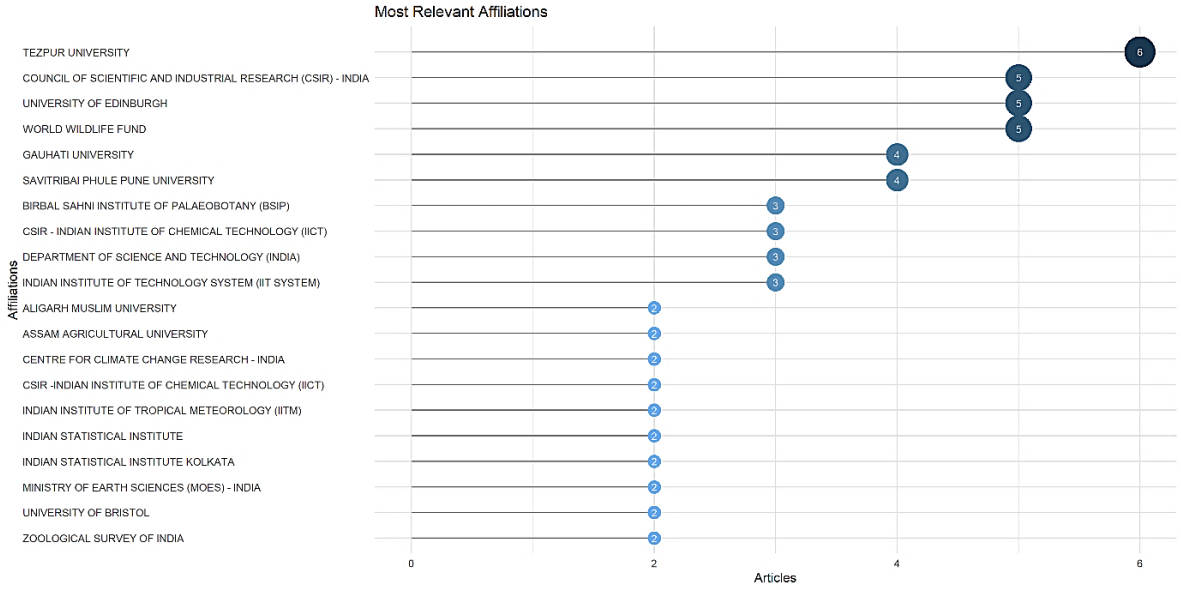

Figure 2: The Organisation Engaged in Research on Kaziranga National Park.

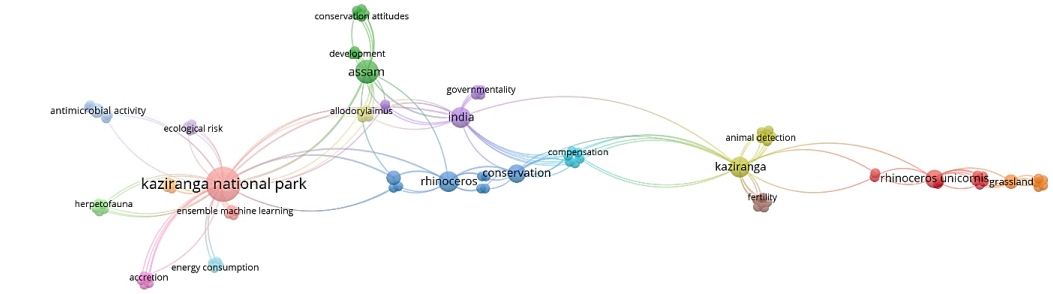

Figure 3: Diversity of Author Keywords in the research area of Kaziranga National Park.

S.K., and Bora, P.J. are primarily involved in studies on Kaziranga and biodiversity conservation. These studies are relevant to grasslands, rhinoceroses, and the adaptation of animals to their environments. On the other hand, Kamal A, Joseph J, and Kumar C.G. are more closely linked to biochemical research, as evidenced by their association with keywords such as acetylcholinesterase inhibitors and alpha,beta-dehydrocurvularin, as well as with organisations such as the CSIR and the World Wildlife Fund.

Figure 6 also illustrates how individuals from various fields collaborated to conduct research. It also demonstrates the institutions' support for the researchers and their interest in both scientific research and critical ecological issues in the region, particularly in Kaziranga National Park.

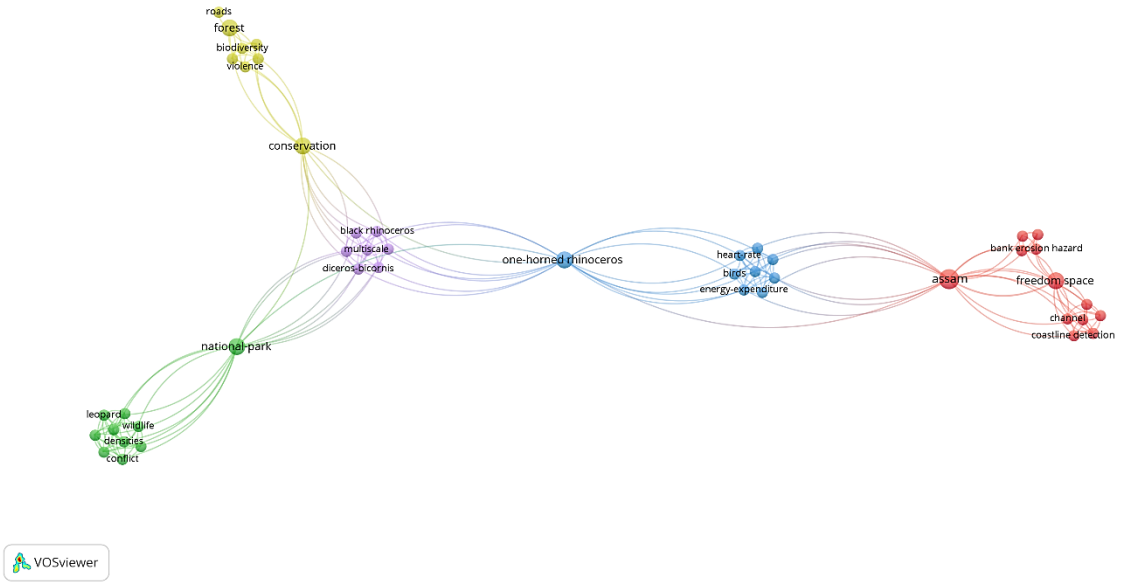

Figure 4: Diversity of Keywords Plus in the research area of Kaziranga National Park.

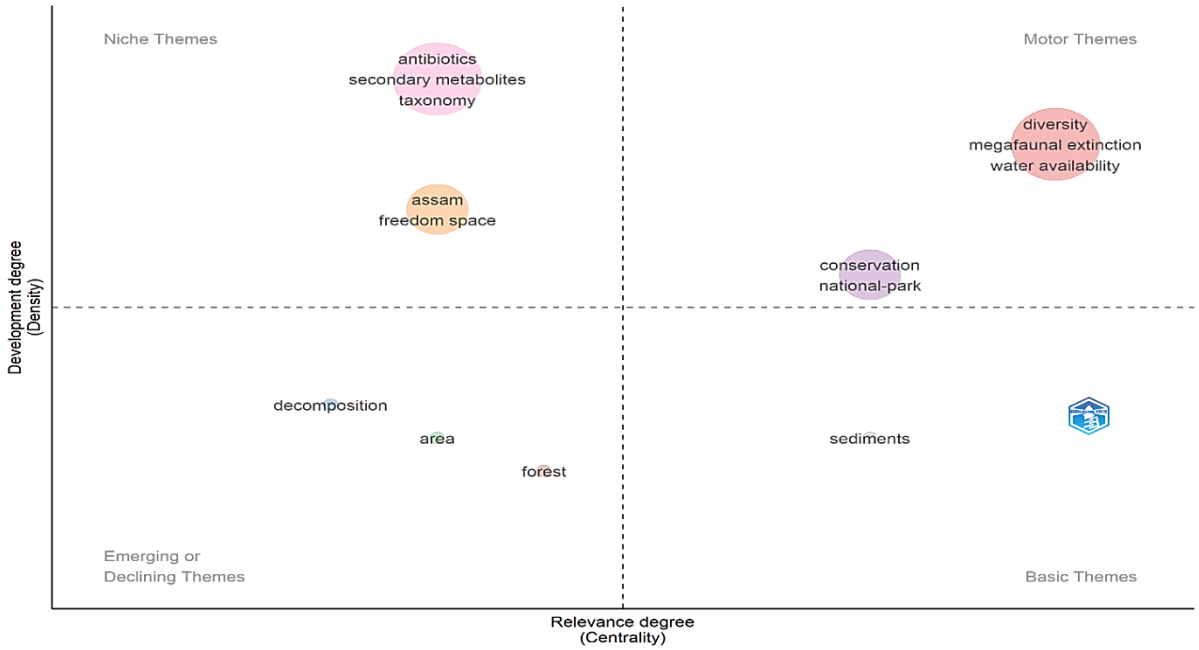

Figure 5: Thematic Map of the Research Area in Kaziranga National Park.

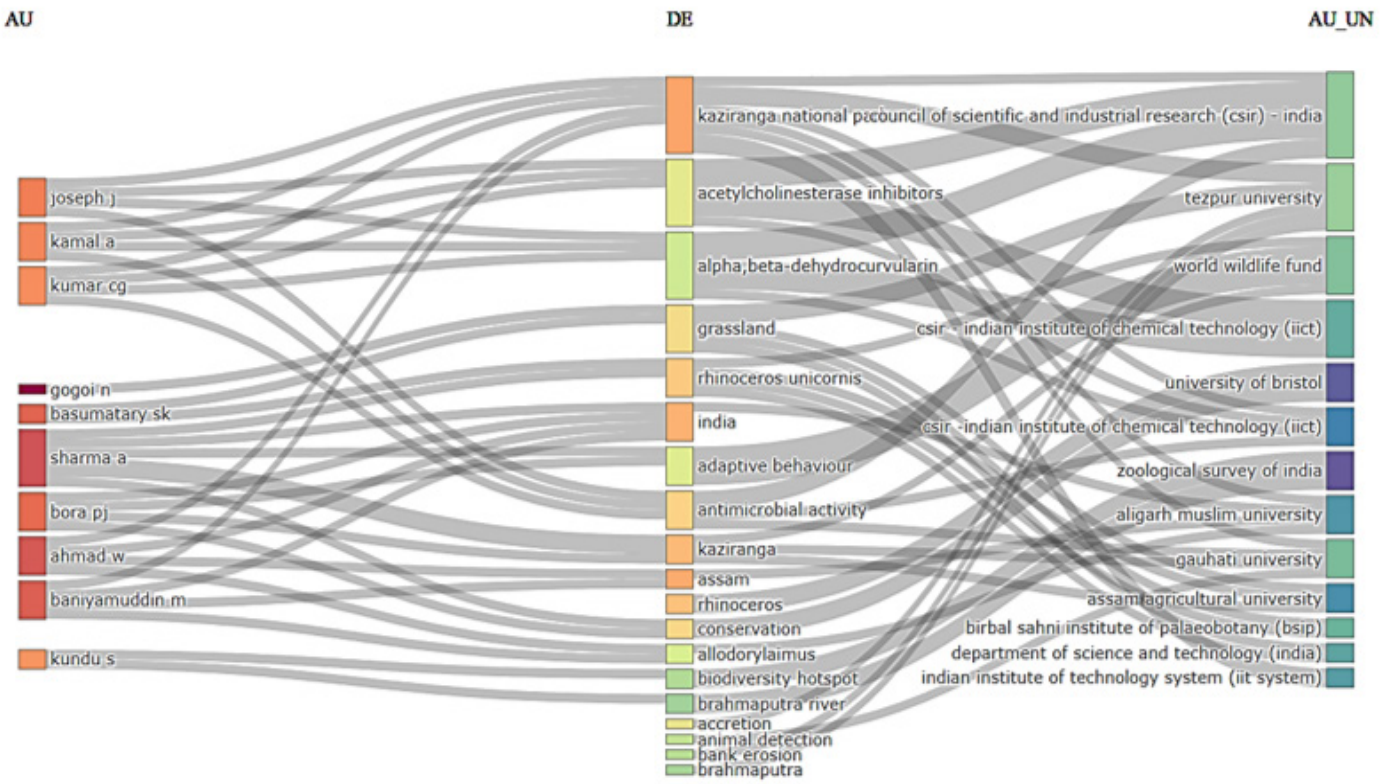

Figure 6: Author, affiliation, and keyword relationship in the field of research on Kaziranga National Park.

CONCLUSION

The study on research diversity of Kaziranga National Park from 1993 to 2025 reveals a gradually growing body of scholarly work characterised by thematic diversity, collaborative engagement, and increasing global relevance. The Web of Science database highlights a moderate but consistent annual growth rate and a rich distribution of keywords and author contributions. Analysing the prolific authors and their institutional affiliations indicates a balanced, multidisciplinary research environment. Tezpur University and CSIR institutions emerge as key contributors. At the same time, several other universities and research organisations play significant roles in advancing scientific knowledge about Kaziranga National Park and its ecosystems. Visualisations of Author Keywords and Keywords Plus in VOSviewer reveal distinct yet interconnected research areas. The Author Keywords Network emphasises region-specific conservation efforts, species protection, and ecological risks, whereas the Keywords Plus Network highlights broader, interdisciplinary themes, including paleoecology, environmental history, and geochemistry. Together, they present a comprehensive view of the research landscape surrounding Kaziranga, rooted in local conservation challenges but connected to global scientific inquiries. The thematic map further clarifies this understanding by distinguishing between well-established themes (such as biodiversity and water availability), niche and emerging areas (such as secondary metabolites and decomposition), and foundational topics (such as sediments). This perspective highlights the development of specific domains and suggests opportunities for future research. In conclusion, research on Kaziranga National Park is evolving in scope, scale, and impact. It reflects a vibrant academic ecosystem that values local ecological insights alongside global scientific paradigms, underscoring the park's significance as a biodiversity hotspot and a centre for interdisciplinary environmental research.

ABBREVIATIONS

CSIR: Council of Scientific and Industrial Research; **WWF:** World Wildlife Fund; **BSIP:** Birbal Sahni Institute of Palaeobotany; IIT System: Indian Institute of Technology System; **IITM:** Indian Institute of Tropical Meteorology; **AU:** Writers (Authors); **DE:** Keywords; **AU_UN:** Institutions or Organisations (Affiliations); **IICT:** CSIR Indian Institute of Chemical Technology

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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