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Mapping the Landscape of Open Access Publications on Indian Knowledge System: A Two-Decade Analysis

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This study explores the development of Open Access (OA) publications in the Indian Knowledge System (IKS) between 2005 and 2024, highlighting trends in access models, citation impact, licensing, and research themes. The data from OpenAlex, 9,326 records, were analyzed to assess the growing role of OA in disseminating India's traditional knowledge, encompassing disciplines such as Ayurveda, Yoga, Indigenous sciences, and Indian philosophy. Findings indicate that over the past 20 years, there has been a notable shift towards OA publishing, with Gold and Bronze OA becoming the most popular and frequently cited models. While licensed OA content, primarily under Creative Commons, has increased—especially CC-BY-NC—many Bronze OA articles remain without clear licensing, raising issues of reuse and legal clarity. Compared to closed access, authorship patterns in OA works demonstrate greater collaboration. Thematic analysis reveals a dynamic convergence of traditional knowledge with modern fields such as satellite imaging, AI in agriculture, and alternative medicine. Productive journals and publishers demonstrate varied OA strategies, influencing impact and visibility. Thus, the OA has been essential in increasing the visibility of IKS research worldwide. However, standardisation, licensing clarity, and inclusive access continue to be issued, necessitating deliberate efforts to promote sustainable OA practices in this vital field.

Keywords: Indian Knowledge System, Open Access, Scholarly Communication, Institutional Repositories, OpenAlex, India

Introduction

The Indian Knowledge System (IKS) encompasses a vast and rich repository of ancient wisdom, philosophies, practices, and traditions that have shaped India's cultural, scientific, and spiritual landscape for centuries. It encompasses diverse fields such as Ayurveda, Yoga, the Vedas, traditional arts, and indigenous sciences, each providing unique insights into health, nature, and human well-being[1].

In recent years, IKS has been recognized as a valuable resource for addressing contemporary challenges related to health, sustainability, and holistic living[2]. This has led to increased efforts in documenting and preserving IKS through open-access (OA) publications, ensuring this knowledge is widely accessible. OA publications promote scholarly communication, democratize knowledge, and foster interdisciplinary collaboration[3].

This study explores the landscape of OA publications on IKS over the past two decades, leveraging OpenAlex, a comprehensive database of academic publications. By analysing the trends, themes, and authorship patterns, this study provides insights into the evolution and impact of OA research on IKS. The findings provide a detailed overview of how OA platforms have contributed to the dissemination and global recognition of India's intellectual heritage. Through this analysis, the study highlights the role of OA in advancing the visibility of IKS, identifies research gaps, and suggests future directions for scholars and institutions. The mapping of OA publications will serve as a vital resource for understanding the dynamics of knowledge sharing within and outside India.

Literature Review

The IKS has steadily increased, reflecting growing scholarly interest in indigenous knowledge frameworks, traditional sciences, and cultural heritage[4]. Publications within this domain span diverse fields such as philosophy, medicine, agriculture, and environmental studies, demonstrating a multidisciplinary approach that highlights the richness of India's intellectual traditions[5]. Analysis of

research trends indicates a gradual expansion in the volume of scholarly output, coupled with an increasing emphasis on integrating traditional knowledge with contemporary scientific inquiry. This evolving landscape is further influenced by governmental and institutional initiatives to preserve and promote indigenous knowledge through academic research and documentation.

Parallel to the developments in IKS research, the OA publishing movement has gained significant momentum globally and within India. Internationally, OA has evolved from early advocacy in the late 1990s to a widely accepted model that promotes unrestricted access to scholarly outputs, thereby enhancing the dissemination and democratization of knowledge[6]. In the Indian context, OA adoption has been propelled by national policies and initiatives such as the OA India movement, institutional repositories, and mandates by funding agencies encouraging the free availability of research outputs[7]. The publication growth in India is marked by increased journals, digital archives, and repositories that facilitate broader access to scholarly literature, including indigenous[8] and traditional knowledge systems[9].

Several studies have examined the growth of OA publishing across various specific knowledge domains, including science, technology, medicine, social sciences, and humanities. These investigations typically highlight domain-specific patterns in OA adoption, the impact of OA on research visibility and citation[10], and the challenges faced in implementing OA policies[11]. However, while these studies provide valuable insights into the dynamics of OA within particular fields, research focusing specifically on OA trends in the IKS is limited. This gap suggests a need for targeted analysis to understand how OA practices shape the dissemination of IKS-related research and identify the unique opportunities and challenges in this niche area.

Despite the expanding body of literature on IKS and OA publishing, a comprehensive study that intersects these two fields remains underexplored. Existing research tends to either focus on broad OA trends or the general growth of IKS research without delving into the growth of OA availability within this knowledge domain. Addressing this gap is crucial for informing policies and strategies to enhance the visibility, accessibility, and impact of IKS scholarship in an increasingly digital and open research environment.

Objectives

The objectives of the study are:

- Analyse the year-wise growth of publications and citations
- Assess the productivity of journals and the leading publishers
- Examine the licensing trends and patterns in OA publications
- Analyse authorship patterns in scholarship output
- Determine key research areas based on scholarly contributions

Methodology

This study collects data from the OpenAlex database[12], a comprehensive OA source of scholarly metadata that provides extensive coverage across various disciplines. OpenAlex was chosen for its thorough and freely accessible data, which supports reproducible research and aligns with the open science movement. The database provides rich metadata on publications, including abstracts, publication dates, access types, and author affiliations. On February 10, 2025, the search query "Indian Knowledge System" was executed within OpenAlex, limited to works published between 2005 and 2024. The search yielded 9,352 records, which were then exported in CSV format for further processing. Data from OpenAlex was downloaded through its user-friendly web interface and API, which enables researchers to access large-scale bibliographic datasets without proprietary restrictions.

Data was cleaned using OpenRefine[13], a powerful open-source tool for handling messy datasets. OpenRefine was explicitly employed to remove duplicate entries and incomplete records, ensuring the integrity and reliability of the dataset. A total of 26 records were identified and removed during the cleaning process, resulting in a final dataset of 9,326 valid records. This refinement step was necessary to eliminate redundancies and inaccuracies that could compromise the validity of the analysis. The cleaned dataset revealed that 54.59% of the publications were OA, while 45.41% remained under closed access, highlighting the growing but still partial shift toward open dissemination of knowledge in this field. The final stage of the methodology involved data analysis using Microsoft Excel, chosen for its accessibility and effectiveness in handling structured data for descriptive analysis and visualization. Figure 1 illustrates the flowchart of the data collection and cleaning workflow.

Analysis

Year-Wise Assessment of OA Availability

Table 1 presents the distribution and growth trends of access types for scholarly publications across four time periods from 2005 to 2024. The number of publications steadily increased from 787 in 2005-09 to 4,847 in 2020-24, reflecting a growing volume of research outputs. This upward trend is mirrored in the growth percentages, with notable spikes during 2010–2014 (67.22%) and 2020–2024 (66.86%). A closer look at the "Closed" and "Open" categories shows a consistent shift toward openness; while closed entities were dominant in the earlier periods (596 in 2005–09 vs. 191 open), this pattern reverses over time, culminating in 3453 open entities versus 1394 closed in 2020–24.

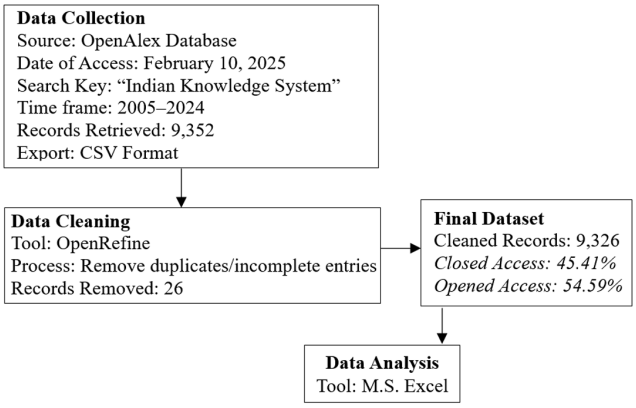

Fig. 1 — Flowchart of data collection and cleaning workflow

Each classification type—Green, Gold, Hybrid, Bronze, and Diamond—also reflects unique growth patterns. Green shows dramatic growth from 50 in 2005–09 to 159 in 2020–24, and gold shows from 18 in 2005-09 to 2118 in 2020-24, suggesting increasing emphasis or preference for this category. Hybrid and Bronze categories expand steadily but with differing intensity, reaching 486 and 373 by the final period. Diamond categories show moderate growth in absolute numbers but represent a smaller portion of the overall dataset, with 11.20% total.

Notably, while all categories grow over time, their proportional representation fluctuates, indicating shifts in focus or strategic priority. These trends suggest a dynamic transformation in classification distribution over the years, marked by increasing total volume and changing preferences for certain categories.

Year-wise Growth of Citations

Table 2 illustrates the evolution of citation trends and OA models over four time periods between 2005

Table 1 — Year-wise Growth of Publications

Year	Total (%)	Growth (%)	Closed (%)	Open (%)	Green (%)	Gold (%)	Hybrid (%)	Bronze (%)	Diamond (%)
2005-09	787 (8.44%)	55.60%	596 (380.57%)	191 (119.43%)	50 (141.69%)	18 (43.22%)	21 (48.89%)	74 (186.43%)	28 (79.77%)
2010-14	1537 (16.48%)	67.22%	1116 (362.70%)	421 (137.30%)	80 (93.24%)	67 (76.07%)	50 (62.53%)	146 (174.23%)	78 (93.93%)
2015-19	2155 (23.11%)	35.95%	1129 (267.35%)	1026 (232.65%)	65 (36.38%)	552 (249.24%)	111 (61.98%)	151 (80.43%)	147 (71.97%)
2020-24	4847 (51.97%)	66.86%	1394 (151.41%)	3453 (348.59%)	159 (24.24%)	2118 (294.74%)	486 (73.09%)	373 (57.94%)	317 (49.96%)
Total	9326 (100.00%)	11.28%	4235 (45.41%)	5091 (54.59%)	354 (6.95%)	2755 (54.12%)	668 (13.12%)	744 (14.61%)	570 (11.20%)

Table 2 — Year-wise Growth of Citations Analysis

Year	Total Cit. (%)	Closed (%)	Open (%)	Green (%)	Gold (%)	Hybrid (%)	Bronze (%)	Diamond (%)
2005-09	25452 (28.01%)	15596 (61.28%)	9856 (38.72%)	3547 (35.99%)	676 (6.86%)	826 (8.38%)	4486 (45.52%)	321 (3.26%)
2010-14	27444 (30.20%)	15939 (58.08%)	11505 (41.92%)	5501 (47.81%)	1172 (10.19%)	945 (8.21%)	2377 (20.66%)	1510 (13.12%)
2015-19	24895 (27.39%)	7426 (29.83%)	17469 (70.17%)	838 (4.80%)	6592 (37.74%)	1225 (7.01%)	7256 (41.54%)	1558 (8.92%)
2020-24	13084 (14.40%)	3355 (25.64%)	9729 (74.36%)	2562 (26.33%)	2911 (29.92%)	2469 (25.38%)	484 (4.97%)	1303 (13.39%)
Total	90875 (100.00%)	42316 (46.57%)	48559 (53.43%)	12448 (25.63%)	11351 (23.38%)	5465 (11.25%)	14603 (30.07%)	4692 (9.66%)

and 2024. In the early period of 2005–2009, total citations accounted for 28.01% of the dataset, with a clear dominance of closed access publications (61.28%). OA represented only 38.72%, largely composed of Bronze (45.52%) and Green OA (35.99%), while Gold and Hybrid access types were relatively minor.

In the 2010–2014 period, the share of total citations slightly increased to 30.20%, and there was a modest rise in OA to 41.92%. Green OA became more prominent at 47.81% of the OA citations, while Diamond OA dropped significantly to 13.12%. Gold OA showed a near doubling from the previous period, indicating a growing interest in this model.

A more notable shift occurred during 2015–2019, where OA citations surged to 70.17%, reversing the previous dominance of closed access (29.83%). Gold and Bronze OA both showed strong growth, contributing 37.74% and 41.54%, respectively, while Green OA declined sharply to 4.80%. Between 2020–2024, although the total number of citations dropped to 14.40%, the proportion of OA reached a peak of 74.36%. Hybrid OA gained significant ground, representing 25.38% of OA citations—more than tripling its share from the previous period. Gold OA stabilized near 30%, and Diamond OA grew modestly to 13.39%. Meanwhile, Green OA rebounded to 26.33%, suggesting a renewed interest in self-archiving and repository-based access.Across the entire period, the cumulative trend indicates a gradual but steady increase in OA adoption, from 38.72% in the earliest interval to over 74% in the most recent.

Productive Journals

Table 3 presents the highly productive journals that reveal key trends in OA publishing. The *Indian Journal of Psychiatry* leads with 92.86% diamond OA publications, followed closely by the *Indian Journal of Ophthalmology* (97.92%) and the *Indian Journal of Medical Research* (93.33%). Notably, *M/C Journal* exhibits a 100% diamond OA model. In contrast, journals like the *Journal of Family Medicine and Primary Care* (96.77% gold OA) and the *International Journal for Research in Applied Science and Engineering Technology* (95.24% gold OA) favorthe Gold OA model. Meanwhile, the *International Journal for Multidisciplinary Research* operates solely under the Hybrid OA model (100%). Interestingly, *American Anthropologist* stands out for its mixed hybrid (64.29%) and bronze (35.71%) OA approach. Despite high productivity, citation counts

Table 3 — Top 10 Productive Journals

Journal	Types of Open Access					Total	Citation
	Diamond (%)	Green (%)	Gold (%)	Hybrid (%)	Bronze (%)		
Indian Journal of Psychiatry	91 (92.86%)	7 (7.14%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	98	1648
Indian Journal of Ophthalmology	47 (97.92%)	1 (2.08%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	48	180
International Journal for Multidisciplinary Research	0 (0.00%)	0 (0.00%)	0 (0.00%)	40 (100.00%)	0 (0.00%)	40	9
Journal of Family Medicine and Primary Care	0 (0.00%)	1 (3.23%)	30 (96.77%)	0 (0.00%)	0 (0.00%)	31	148
The Indian Journal of Medical Research	28 (93.33%)	2 (6.67%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	30	75
M/C Journal	26 (100.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	26	79
International Journal for Research in Applied Science and Engineering Technology	0 (0.00%)	0 (0.00%)	20 (95.24%)	0 (0.00%)	1 (4.76%)	21	16
International Journal of Advanced Research in Science Communication and Technology	0 (0.00%)	0 (0.00%)	17 (100.00%)	0 (0.00%)	0 (0.00%)	17	3
Academic Medicine	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	15 (100.00%)	15	26
American Anthropologist	0 (0.00%)	0 (0.00%)	0 (0.00%)	9 (64.29%)	5 (35.71%)	14	68

vary significantly, with the *Indian Journal of Psychiatry* securing 1,648 citations, the highest among all. This highlights the impact of OA choices on citation influence.

Leading Publishers

Table 4 highlights the distribution of publications across different publishers, categorized by whether they were published with or without a license, and the associated citations[14]. Medknow leads in total publications (27.94%) and a high proportion of license publications (60.73%). Wiley, while publishing fewer works (17.48%), has a significant portion of publications without a license (21.14%). However, a much smaller fraction with a license (10.53%). Taylor & Francis show a high number of publications without a license (17.71%), with only 2.16% of publications licensed. Emerald Publishing Limited has a similar pattern, with the majority (14.65%) published without a license and just 1.89% licensed.

On the other hand, Elsevier BV has a higher percentage of publications with a license (20.51%) despite having fewer total publications (7.76%). Informa shows a nearly exclusive pattern of publications without a license (10.71%). Lippincott Williams & Wilkins has the most citations (35.54%) but comparatively fewer publications (4.11%). Oxford University Press and Routledge exhibit fewer licensed publications and modest citation percentages. These reveal the diverse licensing and citation patterns among these publishers, with some showing a stronger preference of OA while others maintain a more significant share of licensed content.

OA License Patterns

Table 5 reveals key insights into different OA categories and their licensing distributions. Figure 2 presents that overall, 70.97% (3613) of OA articles are under the "With License (WL)" category, while 29.03% (1478) lack specific licensing ("Without License" - WOL). Gold OA dominates with 80.29% WL among the various OA categories, followed by Hybrid OA (99.85%) and Diamond OA (93.16%). Green OA exhibits a more balanced distribution, with 44.35% WOL and55.65% WL. Bronze OA has the highest proportion of WOL (99.19%), making it the most freely accessible category.

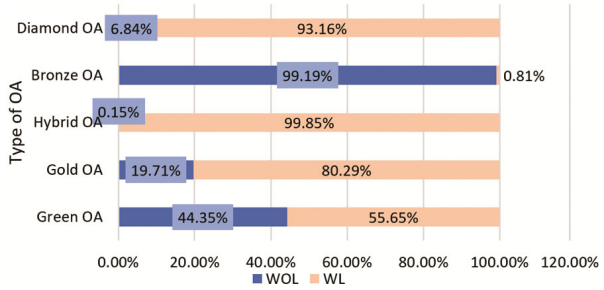

Fig. 2 — Licensing Patterns

Table 4 — Leading Publishers

Publishers	Total (%)	Without License (%)	With License (%)	Citations (%)
Medknow	598(27.94%)	148(10.57%)	450(60.73%)	3175(9.53%)
Wiley	374(17.48%)	296(21.14%)	78(10.53%)	5833(17.51%)
Taylor & Francis	264(12.34%)	248(17.71%)	16(2.16%)	4380(13.15%)
Emerald Publishing Limited	219(10.23%)	205(14.64%)	14(1.89%)	2453(7.37%)
Elsevier BV	166(7.76%)	14(1.00%)	152(20.51%)	3390(10.18%)
Informa	150(7.01%)	150(10.71%)	1(0.13%)	174(0.52%)
SAGE Publishing	128(5.98%)	116(8.29%)	12(1.62%)	568(1.71%)
Lippincott Williams & Wilkins	88(4.11%)	78(5.57%)	10(1.35%)	11838(35.54%)
Oxford University Press	85(3.97%)	78(5.57%)	7(0.94%)	93(2.80%)
Routledge	68(3.18%)	67(4.79%)	1(0.13%)	561(1.68%)
Total	2140(100.00%)	1400(100.00%)	741(100.00%)	33306(100.00%)

Table 5 — *OA LICENSE* Patterns

OA	CC-BY	CC-BY-NC	CC-BY-NC-ND	CC-BY-NC-SA	CC-BY-ND	CC-BY-SA	PUBLIC-DOMAIN	PUBLISH-ER SPE	MIT	other OA
Green OA	52.79%	3.05%	6.60%	7.61%	0.00%	0.00%	1.02%	0.00%	1.02%	27.92%
Gold OA	12.07%	79.61%	4.16%	3.93%	0.00%	0.05%	0.00%	0.09%	0.00%	0.09%
Hybrid OA	43.63%	12.29%	18.14%	10.94%	0.30%	7.35%	2.25%	0.60%	0.15%	4.35%
Bronze OA	33.33%	0.00%	16.67%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%
Diamond OA	16.95%	5.27%	8.85%	65.91%	1.13%	0.94%	0.19%	0.75%	0.00%	0.00%
Total	20.87%	51.95%	7.58%	14.53%	0.22%	1.52%	0.50%	0.36%	0.08%	2.38%

Regarding licensing (Table 4), CC-BY-NC (51.95%) is the most prevalent across all OA types, followed by CC-BY (20.87%) and CC-BY-NC-SA (14.53%), suggesting a strong preference for non-commercial restrictions. Notably, Diamond OA shows the highest percentage of CC-BY-ND (65.91%), while Hybrid OA has a significant share of CC-BY (43.63%) and CC-BY-NC-ND (18.14%). MIT articles remain extremely rare (0.08%), and only a small fraction (0.22%) falls under CC-BY-ND licensing. These findings highlight the variation in access levels and restrictions, with Gold OA being the most dominant but also largely paywalled, while Bronze OA provides the highest open accessibility but with unclear licensing terms.

Authorship Patterns

Table 6 highlights the distribution of closed and OA papers concerning the number of authors and citations. In Closed Access, single-author papers constitute the largest share (50.89%), followed by two-author papers (22.86%). The trend shows a decrease in the number of papers as the number of authors increases. Similarly, citations are highest for single-author papers (44.69%) and decline as authorship expands. OA follows a similar trend, with single-author papers accounting for the majority (60.05%) and receiving a notable proportion of citations (25.59%). However, OA shows a higher distribution of papers across multiple authorship categories, particularly for papers with 10+ authors (2.47%) compared to Closed Access (0.68%). OA citations are more evenly distributed across different authorship levels, with a significant citation percentage (14.04%) for papers with nine authors. This suggests that OA publications receive a broader citation impact across collaborative works compared to Closed Access.

Research Areas

Figure 3 highlights the top research areas based on the study frequency. Satellite Image Processing and Photogrammetry emerged as the most dominant research focus, accounting for 187 (39.45%) studies, indicating a strong emphasis on technological applications in remote sensing and spatial analysis. Following this, Complementary and Alternative Medicine Studies received significant attention, with 80 (16.88%) reflecting a growing interest in traditional and integrative healthcare approaches.

Table 6 — Authorship Patterns

Authors	Closed Access			Open Access		
	Papers (%)	No of Authors (%)	Citations (%)	Papers (%)	No of Authors (%)	Citations (%)
1	2155 (50.89%)	2155 (24.01%)	15770 (44.69%)	3057 (60.05%)	3057 (26.53%)	12049 (25.59%)
2	968 (22.86%)	1936 (21.57%)	10609 (30.06%)	703 (13.81%)	1406 (12.20%)	9695 (20.59%)
3	490 (11.57%)	1470 (16.38%)	3931 (11.14%)	408 (8.01%)	1224 (10.62%)	6199 (13.17%)
4	255 (6.02%)	1020 (11.36%)	2344 (6.64%)	316 (6.21%)	1264 (10.97%)	3258 (6.92%)
5	158 (3.73%)	790 (8.80%)	833 (2.36%)	175 (3.44%)	875 (7.59%)	2433 (5.17%)
6	90 (2.13%)	540 (6.02%)	1110 (3.15%)	132 (2.59%)	792 (6.87%)	792 (1.68%)
7	35 (0.83%)	245 (2.73%)	174 (0.49%)	68 (1.34%)	476 (4.13%)	1773 (3.77%)
8	32 (0.76%)	256 (2.85%)	208 (0.59%)	54 (1.06%)	432 (3.75%)	1486 (3.16%)
9	14 (0.33%)	126 (1.40%)	167 (0.47%)	37 (0.73%)	333 (2.89%)	6611 (14.04%)
10	9 (0.21%)	90 (1.00%)	17 (0.05%)	15 (0.29%)	150 (1.30%)	233 (0.49%)
10+	29 (0.68%)	348 (3.88%)	127 (0.36%)	126 (2.47%)	1512 (13.12%)	2548 (5.41%)
Total	4235 (100.00%)	8976 (100.00%)	35290 (100.00%)	5091 (100.00%)	11521 (100.00%)	47077 (100.00%)

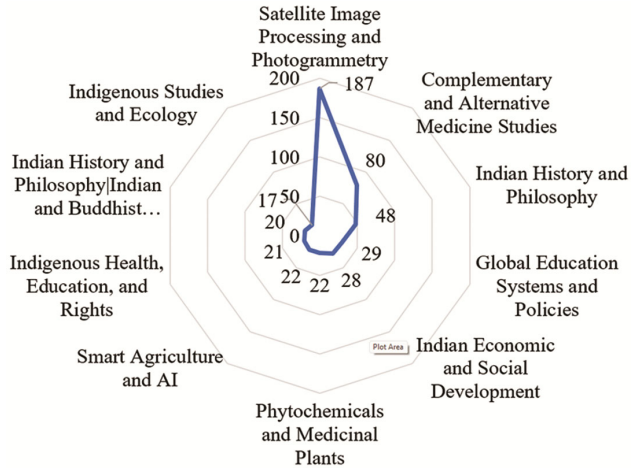

Fig. 3 — Top research area

Indian History and Philosophy stood third with 48 (10.13%), highlighting continued scholarly engagement with India's rich intellectual heritage. Other notable areas include Global Education Systems and Policies (6.12%) and Indian Economic and Social Development (5.91%), suggesting a moderate focus on educational reforms and socio-economic issues. Emerging areas such as phytochemicals and medicinal plants, smart agriculture, and AI each comprised 4.64%, indicating an intersection of science, technology, and sustainability. Indigenous Health, Education, and Rights (4.43%), as well as combined areas like Indian History and Philosophy | Indian and Buddhist Studies (4.22%), and Indigenous Studies and Ecology (3.59%), also reflect growing interdisciplinary interest in traditional knowledge systems and environmental concerns.

Findings and Discussion

The analysis of OA publications on the IKS from 2005 to 2024 shows how scholarly communication in this domain has evolved. The findings demonstrate a strong and growing commitment to OA dissemination regarding volume and impact. Over two decades, the proportion of OA works increased from a minority to the dominant access mode, reflecting a significant cultural shift in academic publishing practices surrounding IKS.

The year-wise assessment indicates a steady increase in total publication count and a significant transition from closed to OA models. Particularly in the 2020–2024 period, OA publications accounted for the majority, reversing earlier trends. The Gold OA model emerged as the most favored, while the Green, Bronze, Hybrid, and Diamond models displayed unique growth increases. This diversity illustrates the multifaceted strategies employed by authors and institutions to share IKS research more openly. The sharp growth in Gold OA also suggests greater institutional investments and author willingness to pay for visibility, while the resurgence of Green OA in recent years reflects increased engagement with repositories and self-archiving practices.

Citations trends affirm the growing impact of OA, especially from 2015 onward, with OA articles receiving a larger share of citations than closed access ones. Notably, Bronze and Gold OA formats consistently performed well regarding citation count, likely due to their accessibility. The rising citation rates of Hybrid and Diamond OA in recent years suggest expanding recognition and usage. These patterns highlight OA's role in enhancing the visibility and scholarly influence of IKS research.

Journal-level analysis reveals a strong inclination toward Diamond and Gold OA in India-based journals, while international journals show more mixed models, including Hybrid and Bronze. High citation counts in certain journals, such as the *Indian Journal of Psychiatry*, correlate with their OA strategies, suggesting that licensing and access types significantly affect research impact. Publisher analysis echoes these trends, with Medknow and Elsevier demonstrating greater adoption of licensed OA models, whereas others like Wiley and Taylor & Francis still lean heavily on non-licensed content. This variability highlights the uneven pace of OA adoption among publishers, which may influence accessibility and reuse.

OA licensing patterns show that most OA content is shared with formal licenses, most commonly under CC-BY-NC, indicating a cautious approach favoring non-commercial use. However, the high prevalence of non-licensed Bronze OA content raises concerns about legal reuse and clarity in dissemination. The diversity of licenses—ranging from the permissive CC-BY to more restrictive types—demonstrates that while OA is advancing, it still faces challenges related to standardization and openness.

Authorship analysis reveals that while single-author publications dominate both OA and closed-access content, OA has a more distributed authorship pattern, including a greater share of multi-author and collaborative works. This suggests that OA may be

fostering greater interdisciplinary and collective research efforts. Moreover, citations in OA are more evenly spread across different levels of authorship, implying a broader impact for collaborative studies.

The distribution of research areas shows that IKS is being explored across a wide spectrum, from technologically intensive fields like Satellite Image Processing to traditional areas like Indian Philosophy and Complementary Medicine. The prominence of modern interdisciplinary domains—such as AI in agriculture and indigenous environmental studies—signals a strategic blending of ancient wisdom with contemporary scientific innovation. This diversification highlights the dynamic evolution of IKS research and its expanding relevance in addressing global challenges.

Conclusion

This study provides a comprehensive overview of the landscape of OA publications in the IKS from 2005 to 2024, providing critical insights into trends, impact, and dissemination practices. The findings reveal a transformative shift toward OA models, with a remarkable rise in publication volume, diversity in OA types, and increased citation influence. Gold and Bronze OA emerged as the most impactful models, while the growth of Green and Diamond OA reflects the expanding options for accessible scholarship.

The rise in licensed OA publishing, especially under Creative Commons, highlights a maturing OA environment, although the persistence of non-licensed Bronze content points to areas where clarity and standardization are needed. The correlation between access models and citation impact confirms that OA democratizes access and enhances research visibility and scholarly engagement.

The study also uncovers the evolving nature of IKS research, expanding the thematic breadth that connects traditional knowledge to modern technologies and global sustainability concerns. OA platforms have thus become essential in bridging ancient Indian knowledge with contemporary academic discourse, allowing broader participation and dissemination.

However, challenges remain in achieving universal openness, consistent licensing practices, and equitable representation across disciplines and geographies. Future efforts should strengthen institutional OA policies, encourage repository-based sharing, and promote interdisciplinary collaboration. By supporting OA publishing in the IKS domain, stakeholders can ensure that India's intellectual heritage is preserved, disseminated, and dynamically integrated into global knowledge systems.

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