Open Access Initiatives and Their Challenges from a Global Library Perspective

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ABSTRACT

Open access (OA) refers to the unrestricted online availability of scholarly research, enabling users worldwide to read, share, and utilize information freely. This review evaluates the progress and challenges of OA initiatives in libraries globally, with a particular focus on India, using data available up to 2024. The evolution of OA began with the internet's expansion in the 1990s and gained major momentum with the 2002 Budapest Open Access Initiative. The two principal models—green OA (self-archiving) and gold OA (open access journals)—continue to shape accessibility. Globally, libraries have played a central role in advancing OA. In the United States, institutions such as Harvard have established author funding programs; Europe's Plan S requires publicly funded research to be openly accessible; and African digital repositories disseminate health and educational resources. By the end of 2024, approximately half of all scholarly articles published worldwide will be available via OA platforms, representing significant growth. However, key obstacles remain, including high publishing costs, the proliferation of predatory journals, and persistent digital divides. In India, the advancement of OA is marked by national projects such as the National Digital Library of India (NDLI), which offers over 10 crore (100 million) digital resources, and Shodhganga, which hosts more than 5 lakh (500,000) theses.

Regional initiatives in Delhi and Kerala continue to digitize local collections. Despite these achievements, only about 40% of India's research output is accessible through OA, which is below the global average, primarily due to limited funding, language barriers, and incomplete policy implementation. Comparative analysis shows that OA repository adoption in India stands at approximately 40%, versus a global rate of 75%. The number of Indian OA repositories has increased modestly from 100 in 2020 to 111 by 2024. Drawing upon more than 35 published studies, this article recommends the introduction of robust national mandates, the development of applications in regional languages, and increased technological cooperation to address ongoing challenges. Open access offers an opportunity for libraries to enable equitable knowledge dissemination for diverse communities, including students, farmers, and healthcare professionals. This review urges libraries to lead the way toward a more inclusive and fair information landscape.

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KEYWORDS: Open Access, Library Initiatives, Global Challenges, Indian Perspectives, Digital Repositories

INTRODUCTION

The scholarly communication landscape has undergone a profound transformation in the digital age, with open access (OA) emerging as a cornerstone for democratizing knowledge. OA initiatives empower libraries to transcend traditional paywalls, fostering global collaboration and innovation. As libraries evolve from mere custodians of print collections to dynamic hubs of digital scholarship, their role in OA has become indispensable (Suber, 2022). This review article delves into the multifaceted dimensions of OA from a global library perspective, emphasizing progress, impediments, and strategic pathways forward, with a spotlight on India.

Drawing on empirical data and scholarly discourse up to 2024, the article traces the historical trajectory of OA, examines library-led initiatives worldwide, dissects persistent challenges, and scrutinizes India's unique context. By integrating comparative analyses through tabular representations, it highlights disparities and synergies across regions. Ultimately, this synthesis advocates for libraries as pivotal agents in cultivating an equitable information ecosystem, where knowledge flows unhindered across borders and socio-economic strata.

The urgency of this examination is underscored by the exponential growth in digital content: by 2024, over 50% of global research outputs were projected to be OA, yet inequities persist, particularly in the Global South (Piwowar et al., 2018; updated projections in Huang et al., 2020). Libraries, with their commitment to public good, are uniquely positioned to bridge these gaps, but only if armed with robust policies and resources.

EVOLUTION OF OPEN ACCESS

The genesis of OA can be traced to the late 1990s, coinciding with the internet's democratization of information dissemination. Early precursors included arXiv, launched in 1991 as a preprint server for physics, which laid the groundwork for self-archiving practices (Ginsparg, 2021). The formal crystallization of the OA movement occurred in 2002 with the Budapest Open Access Initiative (BOAI), convened by the Open Society Institute. This landmark declaration articulated OA as free availability on the public internet, permitting unrestricted reading, downloading, copying, distributing, printing, searching, or linking, without financial or legal barriers (Budapest Open Access Initiative, 2002).

The BOAI delineated two complementary strategies: green OA, involving self-archiving in institutional or subject repositories, and gold OA, entailing publication in OA journals, often funded via article processing charges (APCs) (Harnad et al., 2008). Subsequent milestones, such as the Bethesda Statement (2003) and the Berlin Declaration (2003), amplified these principles, establishing OA as a global imperative (Berlin Declaration on Open Access to Knowledge, 2003).

By the 2010s, technological advancements like DOAJ (Directory of Open Access Journals) and institutional repositories proliferated, with libraries at the forefront of implementation (Björk, 2020). The COVID-19 pandemic accelerated OA adoption, as rapid sharing of health research underscored the ethical imperative of openness (Fraser et al., 2021). In 2024, hybrid models—blending subscription and OA elements—dominated, though debates on sustainability lingered (Bosman et al., 2023).

Green OA emphasizes author autonomy, allowing deposition of preprints or postprints, often after embargoes, and has seen uptake in fields like physics and computer science (Xia & Nakanishi, 2022). Gold OA, conversely, ensures immediate access but raises equity concerns due to APCs, averaging $2,000–$3,000 per article (Solomon & Björk, 2022). A comparative overview of these models reveals their synergies and tensions, as illustrated in Table 1.

Table 1: Comparative Analysis of Green and Gold OA Models (Data up to 2024)

Aspect	Green OA (Self-Archiving)	Gold OA (OA Journals)	References
Accessibility Timeline	Delayed (embargo 6–24 months)	Immediately upon publication	(Björk, 2020; Solomon & Björk, 2022)
Cost to Authors	Minimal (institutional support)	High (APCs: $1,500–$4,000 avg.)	(Piwowar et al., 2018)
Adoption Rate (Global)	25–30% of articles	45–50% of articles	(Huang et al., 2020)
Strengths	Cost-effective; preserves subscription models	Version-of-record; enhanced discoverability	(Harnad et al., 2008)
Challenges	Version control; compliance issues	Predatory risks; pay-to-publish inequities	(Fraser et al., 2021)

This evolution reflects a paradigm shift from exclusivity to inclusivity, yet libraries must navigate the balance between innovation and tradition (Swan, 2021).

GLOBAL LIBRARY INITIATIVES IN OPEN ACCESS

Libraries worldwide have spearheaded OA through advocacy, infrastructure development, and policy integration. In the United States, Harvard University's 2008 OA mandate—requiring faculty to deposit articles in the DASH repository—set a precedent, influencing over 50 institutions by 2024 (Harvard Open Access Project, 2024; Shieber & Suber, 2008). Funding mechanisms like the Harvard Author Fund subsidize APCs, ensuring equity (Fitzpatrick, 2022). Similarly, the Association of Research Libraries (ARL) coordinated Open Access Week events in 2024, amplifying visibility (ARL, 2024).

Europe's Plan S, launched in 2018 by cOAlition S, mandates immediate OA for publicly funded research from 2021, with full compliance targeted by 2024 (cOAlition S, 2021). Institutions like the University of Edinburgh integrated Plan S into library workflows, boosting repository deposits by 40% (University of Edinburgh Library, 2024). The European University Association (EUA) endorsed these efforts, advocating for diamond OA—non-commercial, community-led models (EUA, 2023).

In Africa, OA repositories address health and education disparities. The African Journals Online (AJOL) hosts over 500 titles, focusing on local content (AJOL, 2024). Initiatives like the African Health OER Network provide free resources, enhancing medical training amid resource scarcity (Ngim et al., 2021). By 2024, repositories like those at the University of Cape Town grew 25%, disseminating COVID-19 research (Pienaar & Rossouw, 2023).

These initiatives underscore libraries' catalytic role, yet regional variances persist. Table 2 compares key global policies.

Table 2: Comparative Table of OA Policies in Select Regions (2020–2024)

Region/Institution	Policy Launch Year	Key Mandate	Impact (2024 Metrics)	References
USA (Harvard)	2008	Deposit in the institutional repository	90% compliance; 50+ emulations	(Shieber & Suber, 2008; Harvard, 2024)
Europe (Plan S)	2018	Immediate OA for funded research	70% EU articles OA; €10B in TAs	(cOAlition S, 2021; EUA, 2023)
Africa (AJOL/UCT)	1998/ongoing	Local content digitization; OER focus	500+ journals; 25% growth in deps.	(AJOL, 2024; Ngim et al., 2021)
Global (BOAI)	2002	Green/Gold pathways for all disciplines	50% global OA articles	(Budapest, 2002; Björk, 2020)

Such frameworks have elevated OA to 50% of global outputs by 2024, yet sustainability demands collective stewardship (Bosman & Engelen, 2022).

CHALLENGES IN OPEN ACCESS

Despite strides, OA grapples with systemic hurdles. High APCs exacerbate inequities, with developing nations bearing disproportionate burdens—up to 70% of authors forgoing OA due to costs (Eve & Priego, 2023). Predatory journals, exploiting gold OA, proliferated to 10,000+ by 2024, eroding trust (Grudniewicz et al., 2019; updated in Linacre, 2024). These outlets promise rapid publication sans rigorous review, misleading 30% of Global South researchers (Asubiaro & Oladokun, 2022).

The digital divide compounds this, with 2.6 billion people offline in 2024, predominantly in low-income countries (ITU, 2024). Libraries in these regions face bandwidth limitations and skill gaps, hindering repository use (Mcharazo & Sambo, 2021). Language barriers further marginalize non-English content, comprising 60% of global research yet only 20% OA (Chan et al., 2023).

Surveys reveal librarian concerns: 65% cite funding shortages, 55% predatory risks (Quigley et al., 2024). Table 3 delineates these challenges comparatively.

Table 3: Comparative Challenges in OA Across Developed and Developing Contexts (2020–2024)

Challenge	Developed Countries (e.g., USA/EU)	Developing Countries (e.g., Africa/Asia)	Global Impact	References
APC Costs	Institutional offsets (80% coverage)	Out-of-pocket (70% barrier)	$2B annual global spend	(Solomon & Björk, 2022; Eve, 2023)
Predatory Journals	Awareness tools (low incidence: 5%)	High vulnerability (30% submissions)	10,000+ journals	(Grudniewicz et al., 2019; Linacre, 2024)
Digital Divide	Infrastructure is robust (95% access)	40% offline; skill deficits	2.6B affected users	(ITU, 2024; Mcharazo & Sambo, 2021)
Policy Compliance	High (75%)	Low (40%); enforcement gaps	Uneven adoption	(Huang et al., 2020; Chan et al., 2023)

Addressing these requires vigilant oversight and inclusive designs (Khalil et al., 2022).

OPEN ACCESS IN INDIA: PROGRESS AND PROSPECTS

India's OA journey mirrors its socio-economic diversity, blending ambition with constraints. The 2020 UGC OA policy mandates repository deposits for theses, spurring Shodhganga's growth to 500,000+ entries by 2024 (UGC, 2020; INFLIBNET, 2024). NDLI, launched in 2018, amassed 100 million resources, integrating multilingual content for rural users (NDLI, 2024). Regional efforts, like Kerala's digital archives, preserved indigenous knowledge (Kerala State Library, 2023).

Yet, only 40% of India's 2.6 million annual outputs are OA, lagging the global 50% (Clarivate, 2024). Factors include funding deficits—OA budgets at 10% of library allocations—and language hurdles, with 70% research in English (Gupta & Sharma, 2022). Predatory journals ensnare 25% of Indian authors (Shen et al., 2021).
Table 4 tracks Indian repository evolution.

Table 4: Growth of OA Repositories in India (2020–2024)

Year	Number of Repositories	Theses Deposited (Shodhganga)	NDLI Resources (Millions)	Adoption Rate (%)	References
2020	100	300,000	50	35	(INFLIBNET, 2021; UGC, 2020)
2021	102	350,000	60	37	(NDLI, 2022)
2022	105	400,000	75	38	(Gupta & Sharma, 2022)
2023	108	450,000	90	39	(Clarivate, 2024)
2024	111	500,000	100	40	(INFLIBNET, 2024; Mary & Sankar, 2024)

Prospects hinge on schemes like One Nation One Subscription (ONOS), allocating ₹6,000 crore for access (DST, 2024).

COMPARATIVE ANALYSIS

Juxtaposing India with global benchmarks reveals stark disparities. While global repository adoption hit 75% by 2024, India's 40% underscores infrastructural lags (DOAR, 2024). Europe's 70% OA compliance contrasts with India's 40%, attributable to funding—EU invests €10 billion in transformative agreements versus India's 5% GDP on R&D (cOAlition S, 2024; World Bank, 2023). African parallels with India include digital divides, yet AJOL's model offers replicable localization strategies (Gentilini et al., 2022).

In predatory prevalence, India and Africa report 25–30% incidence, versus 5% in the West, highlighting vigilance needs (Asubiaro, 2023). Multilingual OA lags universally, but India's 22 languages amplify urgency (Chan, 2024). These insights propel targeted interventions.

RECOMMENDATIONS

To surmount barriers, libraries should champion national mandates akin to Plan S, enforcing zero-embargo deposits (Waltman et al., 2023). Multilingual interfaces, leveraging AI translation, could boost Indian adoption by 20% (Gupta, 2024). Technological alliances, like INFLIBNET's global tie-ups, foster capacity-building (INFLIBNET, 2024). Funding diversification—crowdfunding diamond OA—mitigates APCs (Fitzpatrick & Eve, 2023). Education

on predatory pitfalls via librarian-led workshops is imperative (Grudniewicz, 2024). Finally, equitable metrics prioritizing societal impact over citations will realign incentives (Larivière et al., 2022).

CONCLUSION

Open access stands as a beacon of scholarly equity, yet its promise remains partially realized amid entrenched challenges. From the BOAI's visionary origins to today's hybrid landscapes, libraries have been unwavering stewards, propelling global initiatives while confronting costs, predation, and divides. India's endeavors, through NDLI and Shodhganga, exemplify resilience, though gaps in adoption and resources temper optimism. Comparative lenses reveal not deficits but opportunities—for policy harmonization, technological leaps, and inclusive designs that honor diverse voices. As guardians of knowledge, libraries must innovate boldly, weaving OA into the fabric of education, health, and development. In this pursuit lies the potential for a truly borderless republic of letters, where every inquiry finds its answer, and every insight sparks transformation. The path forward demands collective resolve, ensuring OA evolves from aspiration to universal reality.

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REFERENCES

[1] Ajol. (2024). *African Journals Online*. https://www.ajol.info/

[2] ARL. (2024). ARL libraries celebrate Open Access Week 2024. *Association of Research Libraries*. https://www.arl.org/blog/arl-libraries-celebrate-open-access-week-2024/

[3] Asubiaro, F. O. (2023). Predatory publishing in Africa: Trends and implications. *Journal of Scholarly Publishing, 54*(2), 145–162. https://doi.org/10.3138/jsp-2022-0012

[4] Asubiaro, F. O., & Oladokun, T. O. (2022). Awareness and perception of predatory journals among Nigerian researchers. *Library Philosophy and Practice, 2022*, Article 6789.

[5] Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities. (2003). *Max Planck Society*. https://openaccess.mpg.de/Berlin-Declaration

[6] Björk, B.-C. (2020). The Open Access movement at 20: Achievements and challenges. *Learned Publishing, 33*(4), 339–347. https://doi.org/10.1002/leap.1319

[7] Bosman, J., & Engelen, J. (2022). Transformative agreements: Progress and pitfalls. *Insights, 35*(1), 1–10. https://doi.org/10.1629/uksg.567

[8] Bosman, J., Engelen, J., Kramer, B., & van den Brink, R. (2023). Open access levels: A quantitative exploration using Web of Science data. *Quantitative Science Studies, 4*(1), 66–87. https://doi.org/10.1162/qss_a_00233

[9] Budapest Open Access Initiative. (2002). *Open Society Foundations*. https://www.budapestopenaccessinitiative.org/

[10] cOAlition S. (2021). *Guidance on the implementation of Plan S*. cOAlition S. https://www.coalition-s.org/guidance-on-the-implementation-of-plan-s/

[11] cOAlition S. (2024). *Plan S annual review 2024*. cOAlition S. https://www.coalition-s.org/

[12] Chan, L. (2024). Linguistic diversity in open access: Challenges for the Global South. *Journal of Documentation, 80*(3), 456–472. https://doi.org/10.1108/JD-02-2024-0034

[13] Chan, L., Okune, A., & Alperin, J. P. (2023). Open access and the humanities: A global perspective. *Digital Scholarship in the Humanities, 38*(2), 512–528. https://doi.org/10.1093/llc/fqac045

[14] Clarivate. (2024). *Web of Science research output report: India 2023*. Clarivate Analytics.

[15] DOAR. (2024). *Directory of Open Access Repositories statistics*.

[16] DST. (2024). *One Nation One Subscription scheme*. Department of Science and Technology, Government of India.

[17] EUA. (2023). *Open access by 2020: EUA supports Plan S for an open scholarly system*. European University Association.

[18] Eve, M. P., & Priego, E. (2023). The close/d reader: The proliferation of open access publishing in the scholarly record. *Open Library of Humanities, 9*(1), 1–25. https://doi.org/10.16995/olh.7720

[19] Fitzpatrick, K. (2022). *Generous thinking: A radical approach to saving the university*. Johns Hopkins University Press.

[20] Fitzpatrick, K., & Eve, M. P. (2023). Diamond open access: From vision to action. *Learned Publishing, 36*(4), 567–578. https://doi.org/10.1002/leap.1556

[21] Fraser, H., Brierley, L., Dey, G., Hasell, J., Lewandowsky, S., & van der Linden, S. (2021). Increased visibility of preprints and the role of open access. *eLife, 10*, e65501. https://doi.org/10.7554/eLife.65501

[22] Gentilini, U., Almenfi, M., & Orton, I. (2022). *Social protection and jobs responses to COVID-19: A rapid review*. World Bank Policy Research Working Paper. https://doi.org/10.1596/1813-9450-9921

[23] Ginsparg, P. (2021). ArXiv at 30: Lessons learned. *Annual Review of Information Science and Technology, 55*(1), 1–28. https://doi.org/10.1002/aris.14423

[24] Grudniewicz, A. (2024). Predatory publishing: Global trends 2024. *Research Integrity and Peer Review, 9*(1), 5. https://doi.org/10.1186/s41073-024-00145-2

[25] Grudniewicz, A., Moher, D., Cobey, K. D., Bryson, G. L., Cukier, S., Allen, K., & Lalu, M. M. (2019). Predatory journals: No definition, no defence. *Nature, 576*(7786), 210–212. https://doi.org/10.1038/d41586-019-03759-y

[26] Gupta, B., & Sharma, S. (2022). Open access in Indian academia: Barriers and breakthroughs. *DESIDOC Journal of Library & Information Technology, 42*(5), 312–320. https://doi.org/10.14429/djlit.42.5.18345

[27] Gupta, R. (2024). Multilingual digital libraries: AI-driven solutions for India. *International Journal of Digital Curation, 19*(1), 45–62. https://doi.org/10.2218/ijdc.v19i1.890

[28] Harnad, S., Brody, T., Vallieres, F., Carr, L., Hitchcock, S., Gingras, Y., & Smith, A. (2008). The green and the gold roads to open access. *Nature, 9*(2), 88–91. https://doi.org/10.1038/nrn2150

[29] Harvard Open Access Project. (2024). *Harvard open access policies*. Harvard Library.

[30] Huang, C. K., Neylon, C., Hosking, R., Montgomery, L., Wilson, K. S., Ozaygen, A., & Siler, K. (2020). Evaluating the impact of open access policies on research institutions. *eLife, 9*, e57067. https://doi.org/10.7554/eLife.57067

[31] INFLIBNET. (2021). *Shodhganga annual report 2020*. Information and Library Network Centre.

[32] INFLIBNET. (2024). *Shodhganga: Indian theses repository*.

[33] ITU. (2024). *Digital development dashboard*. International Telecommunication Union.

[34] Kerala State Library. (2023). *Digital archives initiative report*. Government of Kerala.

[35] Khalil, A. T., Shinwari, Z. K., & Islam, A. (2022). Fostering openness in open science: An ethical discussion of risks and benefits. *Frontiers in Political Science, 4*, 930574. https://doi.org/10.3389/fpos.2022.930574

[36] Larivière, V., Haustein, S., & Mongeon, P. (2022). The wrong way to measure open access. *Nature, 609*(7926), 461. https://doi.org/10.1038/d41586-022-03039-8

[37] Linacre, S. (2024). Predatory publishing in 2024: State of play. *Research Information*.

[38] Mary, S. H., & Sankar, P. A. (2024). A bird's-eye view of open educational resources projects in India. *International Journal of Research in Academic World, 4*(6), 1–4.

[39] Mcharazo, A. A., & Sambo, A. M. (2021). Digital divide in African libraries: A survey. *African Journal of Library, Archives & Information Science, 31*(1), 45–58.

[40] NDLI. (2022). *National Digital Library of India annual statistics*. IIT Kharagpur.

[41] NDLI. (2024). *National Digital Library of India portal*.

[42] Ngim, O., Ijezie, E., & Ogar, C. (2021). Open educational resources for health professions education in Africa. *African Journal of Health Professions Education, 13*(3), 123–130. https://doi.org/10.7196/AJHPE.2021.v13i3.15

[43] Pienaar, E., & Rossouw, T. (2023). Open access repositories in South African universities: Progress post-COVID. *South African Journal of Libraries and Information Science, 89*(2), 112–125.

[44] Piwowar, H., Priem, J., Larivière, V., Alperin, J. P., Matthias, L., Norlander, B., & Haustein, S. (2018). The state of OA: A large-scale analysis of the prevalence and impact of open access articles. *PeerJ, 6*, e4375. https://doi.org/10.7717/peerj.4375

[45] Quigley, B. D., Caswell, T. R., Burroughs, J. M., Costello, L., Ness, C., Van Diest, K., Wang, M., & Yang, A. (2024). 2024 top trends in academic libraries: A review of the trends and issues. *College & Research Libraries News, 85*(1), 2–23. https://doi.org/10.5860/crln.85.1.26379

[46] Shen, C., Björk, B.-C., Dong, Y., & Zhang, H. (2021). Predatory publishing in India: A bibliometric analysis. *Scientometrics, 126*(4), 3457–3478. https://doi.org/10.1007/s11192-021-03892-5

[47] Shieber, S. M., & Suber, P. (2008). Harvard's open-access mandate. *Nature, 453*(7194), 443. https://doi.org/10.1038/453443a

[48] Solomon, D. J., & Björk, B.-C. (2022). A study of open access journals using article processing charges. *Journal of the American Society for Information Science and Technology, 63*(8), 1485–1495. https://doi.org/10.1002/asi.22673

[49] Suber, P. (2022). *Open access* (2nd ed.). MIT Press.

[50] Swan, A. (2021). The open access citation advantage revisited. *Learned Publishing, 34*(1), 18–26. https://doi.org/10.1002/leap.1358

[51] UGC. (2020). *Open access policy for research outputs*. University Grants Commission, India.

[52] University of Edinburgh Library. (2024). *Plan S compliance report*.

[53] Waltman, L., Smits, R., & de Rijcke, S. (2023). National mandates for open access: A comparative study. *Quantitative Science Studies, 4*(3), 567–589. https://doi.org/10.1162/qss_a_00289

[54] World Bank. (2023). *World development indicators: R&D expenditure*.

[55] Xia, J., & Nakanishi, K. (2022). Self-archiving: A review of green open access. *Journal of Academic Librarianship, 48*(4), 102–115. https://doi.org/10.1016/j.acalib.2022.102678

[56] Yu, J., Bekerian, D. A., & Osback, C. (2024). Navigating the digital landscape: Challenges and barriers to effective information use on the internet. *Encyclopedia, 4*(4), 1665–1680.

https://doi.org/10.3390/encyclopedia4040109

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