

The International Open Access Movement and Its Status in Pakistan

Arslan Sheikh

abstract: The objective of this study is to analyze the present status of the open access movement in Pakistan, identify challenges, and make recommendations for the effective use of this publishing model. The article looks primarily at the open access movement in Asia, with special reference to Pakistan, India, and China. Findings show that, since the emergence of the Budapest Open Access Initiative in 2001, the open access movement has developed rapidly at the international level. From the Pakistani perspective, gold open access, in which articles or monographs are freely available in their original form on publishers' websites, developed quickly. However, green open access, which relies on authors to self-archive their articles in institutional or subject repositories, has been relatively slow to develop. A lack of support from educational institutions, libraries, library associations, and funding bodies may explain the slow growth of green open access in Pakistan. The author recommends that Pakistani universities, research institutions, and funding agencies develop open access policies, set up institutional repositories, and encourage publishing in open access journals and self-archiving in institutional repositories.

Background

The advent of the Internet and information communication technologies in the 1990s entirely transformed the scholarly communication system¹ and resulted in a large increase in the number of scholarly and scientific journals.² However, because of rising subscription costs and declining library funds, many libraries had difficulty keeping up journal subscriptions.³ Some institutions were forced to unsubscribe to a large number of journals, which ultimately restricted researchers' access to the scientific literature.⁴ In this scenario, open access has emerged as a workable alternative to the traditional subscription-based publishing model.⁵ Open access (OA)

Open access (OA) publishing, which provides legal and free access for readers to scientific research, has gained attention throughout the world ...

publishing, which provides legal and free access for readers to scientific research, has gained attention throughout the world,⁶ and publishers have begun to utilize this new publishing model.⁷ Peter Suber, a strong advocate of OA, describes open access literature as “digital, online, free of charge, and free of most copyright and licensing restrictions. What makes it possible is the internet and the consent of the author or copyright-holder.”⁸

Objectives

The objectives of this paper are to provide background for the open access movement within an international context, focusing especially on Asia; to review, analyze, and critique the present status of the OA movement in Pakistan; and to make comparisons with two other major open access stakeholders in Asia, China and India.

The Open Access Movement in Asia

Development of Open Access Journals in Asia

Research journals are the most venerable source of scientific information.⁹ The acceptance of OA in any country can be examined and analyzed, at least in part, through its number of OA journals and repositories. The Directory of Open Access Journals (DOAJ), a website that provides a crowdsourced list of OA journals, identifies 3,271 open access journals in the Asian region. Figure 1 demonstrates that in Asian countries, Indonesia leads with 1,372 open access journals. Iran holds second position with 442 journals, and Turkey and Russia secure the third and fourth positions, respectively. Pakistan has progressed less far in the development of gold open access journals and holds the ninth position, with 50 such journals (see Figure 1).

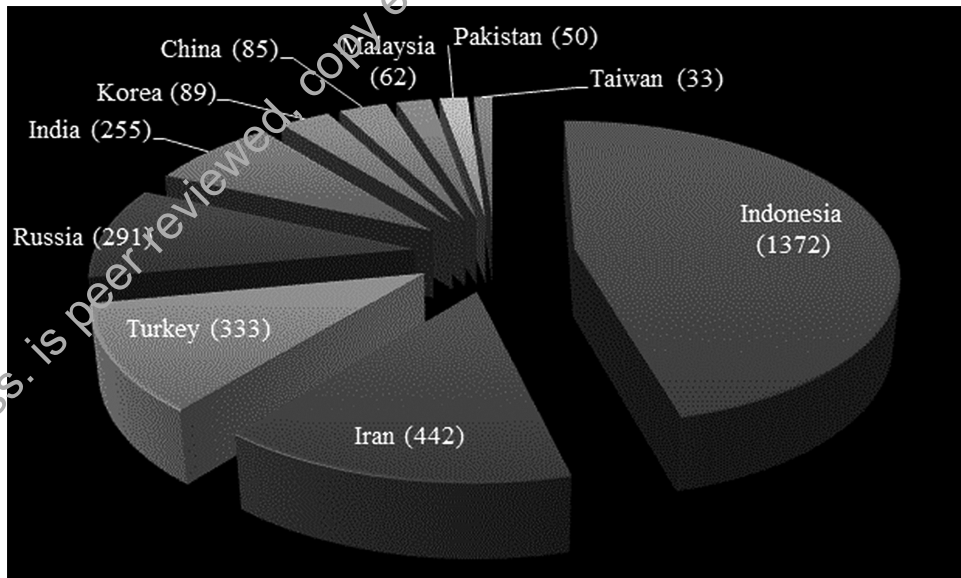


Figure 1. The top 10 Asian countries according to the Directory of Open Access Journals, a website that lists OA journals, as of December 2018. Indonesia, Iran, Turkey, and Russia have the most such journals. Source: Directory of Open Access Journals, <https://doaj.org/>.

Development of Institutional Repositories in Asia

Apart from open access journals, the growth of digital repositories is another indication of OA development.¹⁰ Jing Zhong and Shuyong Jiang define institutional repositories as “online archives for collecting, organizing and making available electronic versions of scholarly materials.”¹¹ Many research funding bodies and universities worldwide are anxious to maximize the impact of research that they fund through OA. Institutional repositories play a key role in achieving this goal. Thus, universities and research institutions have begun to develop such repositories, and over the past few years, the number of repositories has increased enormously worldwide.¹² The Registry of Open Access Repositories (ROAR) is a directory of institutional and subject repositories from all over the world. As of December 2018, ROAR reported 846 institutional and subject repositories in Asia. Among Asian countries, Japan leads with 190 repositories, while Indonesia, India, and China hold the second, third, and fourth positions, respectively (see Figure 2). The standing of Pakistan in institutional repository development is not displayed in Figure 2 because Pakistan lags far behind other Asian countries. A great deal of effort from all open access stakeholders in Pakistan is needed to overcome this deficiency.

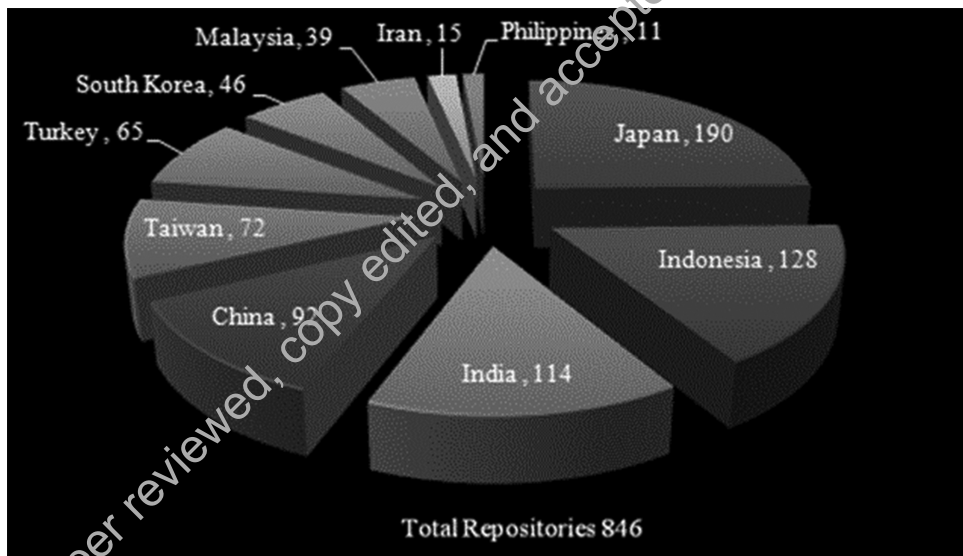


Figure 2. The top 10 Asian countries according to the Registry of Open Access Repositories, a worldwide directory of institutional and subject repositories, as of December 2018. Japan has the most repositories. (Source: Registry of Open Access Repositories, <http://roar.eprints.org/view/geoname/geoname=5F1=5FAS.html>).

The Open Access Movement in Pakistan

Published literature on open access in Pakistan is scarce. Only two significant studies discuss the OA movement in Pakistan. In 2008, Saima Qutab conducted the first study to analyze the status of OA in Pakistan, highlighting efforts there in support of open access.¹³

Qutab determined that the concept of open access in Pakistan was new in comparison with other countries of the world. She identified 135 full-text open access journals in Pakistan, of which the majority were published by universities in the medical sciences. A lack of governmental support for open access and the absence of a directory or list that identify OA resources in Pakistan were also reported in the study. Consequently, open access resources remained mostly unknown to the populace. Some Pakistani literature, in the form of newspapers, medical and university journals, Urdu poetry, and Islamic literature, was freely available online. These initiatives were undertaken on a personal and institutional basis. The study emphasized the need for the government to play its part in promoting open access. A 2017 study by Arslan Sheikh reports positive opinions from Pakistani faculty members about the OA movement.¹⁴ The study revealed that a majority of Pakistani faculty (71.5 percent) knew about open access. They used OA content in their research work, but a lack of awareness of opportunities to publish in open access venues as well as publication fees charged by some OA journals were hurdles to overcome.

Open Access Journals in Pakistan

In examining the present status of open access movement in Pakistan, the reviewed literature and browsing on the Internet discloses that progress has not been uniform. The development of gold open access in Pakistan has been fast. The DOAJ identifies 50 open

The development of gold open access in Pakistan has been fast.

access journals published in Pakistan. In addition, of the 259 national journals in Pakistan recognized by the Higher Education Commission (HEC), the body that funds, oversees, regulates, and accredits institutions of higher education in Pakistan, 201 journals (77.6 percent) are available through open access.¹⁵ These 201 HEC-recognized open access national journals are published by different Pakistani universities, associations, and societies. Similarly, around 79 Pakistani medical journals are available in full-text versions through PakMediNet, a database of articles published in Pakistani medical journals.¹⁶ The Clarivate Analytics Web of Science identifies a total of 82,616 research articles of Pakistani origin published from 1974 to 2016, of which 9,136 (11 percent) were open access.¹⁷ It shows that the trend of publishing in OA journals in Pakistan is gradually increasing.

Institutional Repositories in Pakistan

In contrast to gold open access, the pace of green open access (or the “green road,” referring to the archiving of material in institutional and subject repositories) in Pakistan

In contrast to gold open access, the pace of green open access (or the “green road,” referring to the archiving of material in institutional and subject repositories) in Pakistan has been slow.

has been slow. Only four institutional and subject repositories are indexed and identified through the two leading OA directories worldwide, OpenDOAR (Directory of Open Access Repositories) and ROAR, both based in the United Kingdom. A

survey conducted in 2017 by the Confederation of Open Access Repositories (COAR) reports that 20 percent of the universities in Pakistan have an institutional repository,¹⁸ but these are neither accessible through the World Wide Web nor indexed in OpenDOAR or ROAR. Thus, there is a need to concentrate on the development of institutional and subject repositories at a national level in Pakistan. Moreover, university administrations should take steps to properly index the existing repositories into OpenDOAR or ROAR and provide access to users worldwide. An overview of the four institutional repositories of Pakistani origin follows.

Pakistan Research Repository

According to Ahsan Ullah and Muhammad Rafiq, "Among different models being used for archiving research data; Pakistan has adopted the national model approach by forming a research repository."¹⁹ The Pakistan Research Repository was created on March 28, 2006.²⁰ It is a project of the HEC that works as an open-access national digital repository for research publications produced in the country (see Figure 3). Its purpose is to preserve and disseminate research materials produced by Pakistani students, staff, and faculty members in the form of research articles, conference papers, and monographs as well as MPhil theses and PhD dissertations. As of December 2018, this repository provides free, single-search, full-text access to 8,890 PhD dissertations, 1 MPhil thesis, 14 monographs, and 10 textbooks from different Pakistani universities. EPrints software has been used to manage the contents of this repository.²¹

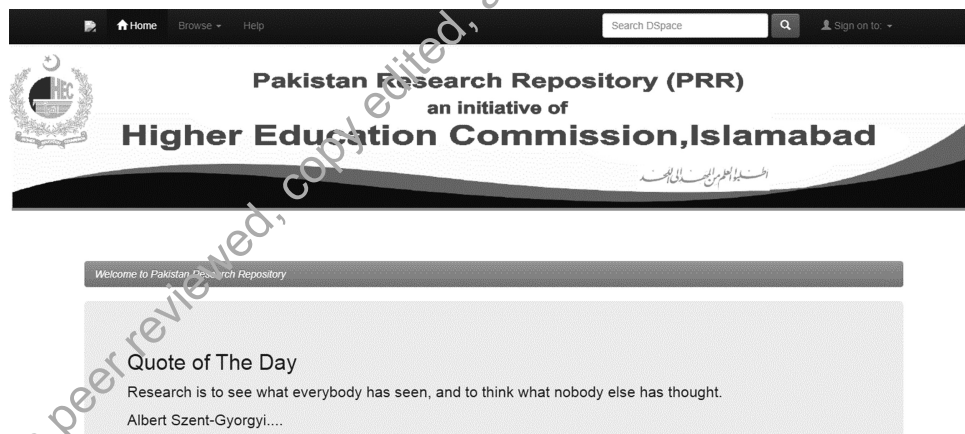


Figure 3. The home page of the Pakistan Research Repository (<http://prr.hec.gov.pk/jspui/>), a project of the Higher Education Commission of Pakistan that serves as an open-access national digital repository for research publications produced in the country.

eCommons@AKU

eCommons@AKU is a digital service maintained by the Aga Khan University Libraries, a network of nine libraries in South Asia and East Africa (see Figure 4). The service officially launched as an institutional repository in February 2014. It offers free full-text access to

around 8,669 items, including theses, books, research articles, and other publications of the Aga Khan University community. The purpose of this archive is to preserve and promote free access to AKU publications. Digital Commons software is used to manage the contents of this repository.²²

The screenshot shows the home page of eCommons@AKU. At the top left is the Aga Khan University logo and name. To the right is the eCommons@AKU logo and 'AKU Institutional Repository'. Below this is a navigation bar with 'Home', 'About', 'FAQ', and 'My Account'. A search box is on the left with a dropdown menu for 'in this collection'. Below the search box are sections for 'Browse' (Departments, Disciplines, Authors) and 'Links' (Aga Khan University, Aga Khan University Libraries, SAFARI). The main content area displays 'Browse the AKU-Pakistan Collections:' with links to 'Examination Board' and 'Faculty of Health Sciences'. Under 'Faculty of Health Sciences', there is a list of departments including Medical College, Pakistan, Department for Educational Development, Department of Anaesthesia, Department of Biological & Biomedical Sciences, Department of Community Health Sciences, Department of Continuing Professional Education, Department of Emergency Medicine, Department of Family Medicine, and Department of Medicine.

Figure 4. The home page of eCommons@AKU (<http://ecommons.aku.edu/pakistan/>), an institutional repository maintained by the Aga Khan University Libraries, a network of nine libraries in South Asia and East Africa.

Akhter Hameed Khan Digital Library

The Akhter Hameed Khan Digital Library launched on December 19, 2010. It is a joint project of the Institute of Rural Management and the National Rural Support Programme Pakistan. This repository provides free full-text access to a variety of collections related to agriculture, food, veterinary medicine, ecology, environment, and rural development in Pakistan. The repository has two main archives: the Akhtar Hameed Khan Archive and the Shoaib Sultan Khan Archive, named for two pioneers of rural development in Pakistan. Greenstone software is used to manage the contents of this repository.²³

CUI Lahore Repository

The Institutional Repository of the Lahore Campus of COMSATS University Islamabad is another indigenous digital repository developed by a public-sector university in Pakistan. The library team from the Lahore Campus of COMSATS University Islamabad developed

and managed this repository, which launched as an institutional repository on March 28, 2016. This repository offers free full-text access to the theses, books, research articles, and other publications of the Lahore Campus of COMSATS University Islamabad. DSpace software is used to manage the contents of this repository.²⁴

Other Open Access Initiatives in Pakistan

Pakistan also has several smaller open access initiatives. They include:

- PakMediNet is a resource of Pakistani-based medical research journals. This website lists around 79 Pakistani medical journals, which are available full-text and free of charge to the user. This resource aims to promote medical research journals of Pakistani origin.²⁵
- Allama Iqbal Cyber Library is a project of Iqbal Academy Pakistan in Lahore that provides an online digital library of Urdu books. The aim of this library is to promote the works and teachings of Allama Iqbal, a well-known poet in Pakistan. This library is one of the oldest and richest collections on Iqbal studies.
- Pakistan is an Islamic republic, and several Islamic organizations function in the country to spread the teachings of Islam on a voluntary basis. Some organizations have developed their own websites to disseminate their publications to the public through open access. The websites of these organizations include an Islamic library founded by Minhaj-ul-Quran International, a nongovernmental organization that works to promote peace, interfaith dialogue, and religious moderation.
- Newspapers are a major source of information to keep the public up to date about current affairs. One hundred seven online Pakistani newspapers are accessible to the users through open access, of which 37 are in English and 70 in the Urdu language.
- The HEC of Pakistan has developed a directory of "Open Access Resources" that lists and provides details of many internationally published OA books and journals (see Figure 5).²⁶

Findings and Discussion

This paper has presented an overview of the current status of the open access movement within scholarly communication at both the international level in Asia and more specifically in Pakistan. Since the Budapest Open Access Initiative (<https://www.budapestopenaccessinitiative.org/>) in 2001, the global OA movement has developed rapidly.²⁷ A number of declarations and initiatives have emerged and been implemented all over the world, which have contributed to a significant increase in the amount of scholarly content available via open access.²⁸ Some well-known declarations include the Bethesda Statement on Open Access Publishing (<http://legacy.earlham.edu/~peters/fos/bethesda.htm>), the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (<https://openaccess.mpg.de/Berlin-Declaration>), the Scottish Declaration on Open Access (<http://scur.ac.uk/wp-content/uploads/2013/07/ScottishDeclarationOnOpenAccess.pdf>), the IFLA Statement on Open Access (<https://www.ifla.org/>

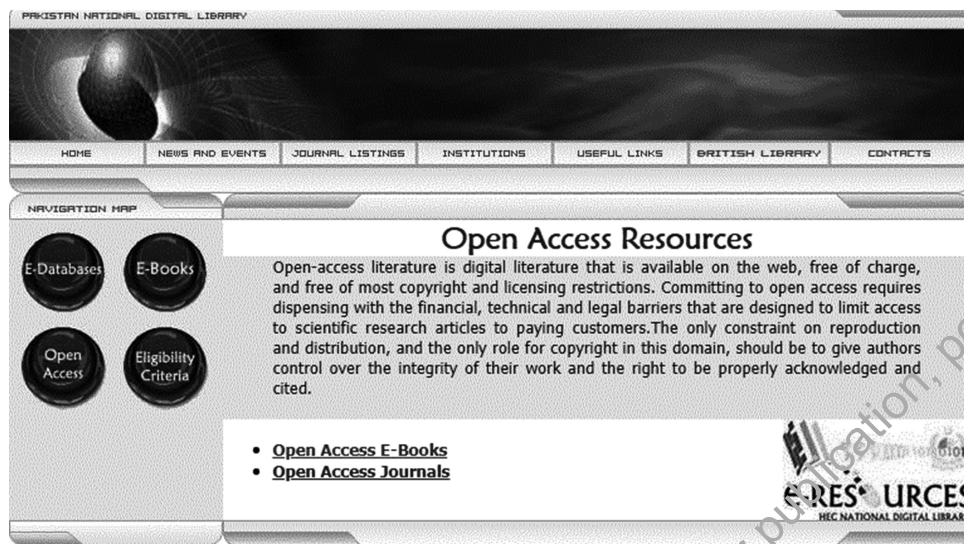


Figure 5. The directory of “Open Access Resources” maintained by the Higher Education Commission of Pakistan, which lists many internationally published open access books and journals (<http://www.digitallibrary.edu.pk/Open.htm>).

files/assets/hq/news/documents/ifla-statement-on-open-access.pdf), and the Messina Declaration (<http://www.pasteur4oa.eu/news/95#.XZuYdCdOnw4>).²⁹ The major open access initiatives have contributed a great deal to the growth of OA movement. For gold OA, the DOAJ is a major resource for researchers to search and access over 11,000 high-quality, peer-reviewed OA research journals. For green OA, OpenDOAR and ROAR are two major resources. Both have over 3,000 institutional and subject repositories indexed in their respective databases and a representation of 119 countries.

The rise of the OA movement has forced commercial publishers to incorporate open access models into their traditional scholarly publishing model.³⁰ Consequently, at present, several commercial publishers, including Elsevier, Springer, Emerald, and SAGE, have incorporated hundreds of gold open access journals into their databases. Moreover, a huge number of journals from these publishers have converted to hybrid OA journals, which offer the authors a choice to publish their articles as open access by paying article processing charges (APCs).³¹

The credibility and quality of open access journals have always been debated in scholarly circles.³² However, the environment seems to have improved; renowned indexing and abstracting services of journal impact metrics, for example, Web of Science and Scopus, have hundreds of open access journals indexed in their databases.³³ The

The rise of the OA movement has forced commercial publishers to incorporate open access models into their traditional scholarly publishing model.

This manuscript is pre-reviewed, accepted for publication, portal 20.1.



2017 edition of Journal Citation Reports published by the Web of Science reports 1,299 open access journals with impact factors.³⁴ Likewise, 3,468 gold open access journals are indexed in Scopus.³⁵ Besides these databases, the DOAJ is a major index of gold open access journals. The quality and credibility of OA journals are increasingly recognized by international indexing services.³⁶

The analysis of the reviewed literature and data retrieved from the DOAJ also reveals that the pace of the gold OA movement in Pakistan has been fast. The directory identifies 3,271 OA journals published in Asia, of which 50 are published in Pakistan. In the DOAJ, Pakistan stands fifth in open access journals published in Asia. In addition, of the total 259 HEC-recognized Pakistani journals, 201 (77.6 percent) are available open access. These journals are published by various Pakistani universities, associations, and societies.³⁷ Moreover, PakMediNet lists almost 80 Pakistani medical journals.³⁸ Mohammad Ghane and Mohammad Niazmand reported that in the D-8, an organization for economic cooperation among eight developing countries, the open access journals of Pakistan had the highest mean journal impact factor.³⁹ However, in terms of green open access, the pace has been slow, as only four institutional and subject repositories are indexed and identified through OpenDOAR. A survey conducted by the Confederation of Open Access Repositories (COAR) in 2017 reports that 20 percent of the universities in Pakistan have an institutional repository,⁴⁰ but these are not always accessible through the World Wide Web nor indexed in OpenDOAR or ROAR. As a

result, there is an urgent need to concentrate on the development of institutional and subject repositories at a national level in Pakistan. The HEC has made a national effort to preserve and disseminate the research of Pakistani academic scholarship,⁴¹ but this work needs more attention. Few materials other than PhD dissertations, including MPhil theses, monographs, and textbooks, are available in the repository. Moreover, even after 11 years, many research articles written by Pakistani authors are still missing. The Pakistan Research Repository is a useful initiative, but it needs to be properly managed, and materials should be added to it on a regular basis to make it a comprehensive resource.⁴²

In any country, government support is necessary for the success of a nationwide movement. The development of the open access movement in Pakistan is no exception. The HEC is a regulatory body for universities and higher education institutions in Pakistan. HEC allocates funds to universities and other academic institutions for their educational and research activities.⁴³ All HEC-recognized open access journals are published in Pakistan through HEC funding to cover the publishing costs. Since universities and other academic institutions get money from the HEC, a government body, they have a responsibility to apportion funds for open access. At present, many universities and other educational institutions in Pakistan support publishing in open access journals

The quality and credibility of OA journals are increasingly recognized by international indexing services.

... there is an urgent need to concentrate on the development of institutional and subject repositories at a national level in Pakistan.

This mss. is peer reviewed, copy edited and accepted for publication, portal 20.1.



by financing their authors' article processing charges, but there is no unanimous policy in this regard. There is no support from the Ministry of Science and Technology for OA projects in Pakistan.⁴⁴ Moreover, there is no explicit requirement from the research funding

LIS professionals and library associations in Pakistan have done little to create awareness and promote the open access movement.

bodies for scientists in Pakistan to publish research outputs in OA journals and institutional repositories. LIS professionals and library associations in Pakistan have done little to create awareness and promote the open access movement. To date, not a single conference on OA publishing and archiving has been hosted by a Pakistani library association. Pakistan has not signed any of the international open access declarations to support the open access movement.⁴⁵ These factors are a major setback for OA in the country. Educational institutions, libraries, library associations, and funding bodies in Pakistan need to take measures and establish policies regarding open access publishing.

As discussed in this study, the development of both institutional and subject repositories in Pakistan is significantly lower than that in many other parts of the world, including other countries in Asia. The countries neighboring Pakistan, including China, India, and Iran, are comparatively ahead in the development of the open access movement. Thus, efforts are needed in Pakistan to compete with other Asian countries. Moreover, a lack of support for open access from university administrators, library professionals, library associations, and funding bodies is also apparent in Pakistan. When compared to such countries as India and China, Pakistan appears to lag.

India leads the developing world in publishing scholarly literature, especially among South Asian countries.⁴⁶ Government funding agencies, research and development organizations, scientific institutions, learned societies, and associations in India have taken positive measures to support open access publishing.⁴⁷ Publishers in India have also joined this movement and adopted OA models.⁴⁸ Many efforts have been made across India to create awareness of the advantages of OA throughout society.⁴⁹ Librarians and other LIS professionals in India have also realized the value of scholarly open access and actively engage in developing institutional repositories.⁵⁰

The National Knowledge Commission of India has formulated policies that would improve access to research through its open and wider dissemination.⁵¹ Umbrella institutions in India, such as the Council of Scientific and Industrial Research, the Department of Biotechnology (DBT), the Department of Science and Technology (DST), and the Indian Council of Agricultural Research, have OA policies that allow depositing research papers in institutional repositories.⁵² The Ministry of Human Resource Development has significantly supported the development of subject repositories in India. Workshops are regularly conducted all over India for the implementation of repositories.⁵³ The Indian National Science Academy, an organization of scientists representing all branches of science and technology, is a signatory to the Berlin Declaration and holds seminars in its annual meetings to promote open access publishing across India. Several open access initiatives have been undertaken in India.⁵⁴ Shodhganga, a repository of theses and dissertations submitted to Indian universities, is one such initiative. It was developed



by the INFLIBNET Centre (Information and Library Network Centre) and holds a collection of more than 3,350 theses. The Open J-Gate is another Indian resource for open access journals which was established in 2006.⁵⁵ Other Indian OA initiatives include Open Access India, LOADB (Listing of Open Access Databases), DST, DBT, ePrints@IISc (Indian Institute of Science), National Digital Library of India, and TKDL (Traditional Knowledge Digital Library).⁵⁶

India is a major contributor to the development of institutional repositories among SAARC (South Asian Association for Regional Cooperation) countries.⁵⁷ In India, the number of repositories has increased from 14 to 76 during the years 2008 to 2016. A huge number of research institutions disseminate their research materials through these institutional repositories. Around 23 publishers produce 535 journals to support open access in India.⁵⁸ The DOAJ reports a regular yearly increase of 46 OA journals in India, and this trend will likely continue. The reasons for this rise may include the emphasis of various national donor agencies and governing bodies of the major research councils on the dissemination of publicly funded research through self-archiving and OA journals. Indian open access journals use government funds and subscription charges to cover the publishing costs of their print versions.⁵⁹ Indian researchers publish more research papers in open access journals than do researchers in most other countries of the world, including the United States, the United Kingdom, and China.⁶⁰ The role of the Indian Institute of Science at Bengaluru, INFLIBNET Centre at Gandhinagar, and the Documentation Research and Training Centre at Bengaluru have helped the OA movement succeed in India.⁶¹

All of this has greatly contributed to the development of the open access movement in India.⁶² At present, 76 institutional repositories in India are listed in OpenDOAR. India's position in the DOAJ is third in Asia, and India ranks second in the list of Asian countries with registered interoperable archives in OpenDOAR.⁶³ While individuals from various groups, professional associations, and government organizations support the OA movement in India, India still lacks a national OA policy.⁶⁴

China, as a developing country, is also progressively engaged in promoting its research through open access.⁶⁵ Compared to the Western world, the open access movement in China has moved slowly but grows day by day.⁶⁶ The OA movement started in China in 2004 when the president of the Chinese Academy of Sciences signed the Berlin Declaration. The Chinese government officially endorsed OA when the director of the Committee of the National

Natural Science Foundation of China also signed the Berlin Declaration.⁶⁷ In past years, national funding agencies in China supported some research projects to investigate the OA phenomena, but they did not stipulate any mandated policies. For example,

Indian researchers publish more research papers in open access journals than do researchers in most other countries of the world, including the United States, the United Kingdom, and China.

Compared to the Western world, the open access movement in China has moved slowly but grows day by day.

This manuscript has been peer-reviewed and accepted for publication, portal 20.1.

no mandates called for papers originating from the agencies' funds to be deposited in institutional repositories within a reasonable time.⁶⁸ However, in 2014, the Chinese Academy of Sciences and the National Natural Science Foundation of China released an OA policy statement requiring that their funded research papers be made available in institutional repositories within 12 months after publication.⁶⁹

The Chinese government, along with public and research communities, actively supports the OA movement in China.⁷⁰ The Ministry of Science and Technology, the Chinese Academy of Sciences, and the National Natural Science Foundation of China work together to formulate policies for open access.⁷¹ The China Institutional Repository Implementation Group promotes the development of institutional repositories in China. Consequently, institutional repositories have gained momentum and attracted attention from libraries.⁷² The first Chinese institutional repository was developed in 2005 by the Xiamen University Library in Xiamen.⁷³ Support for authors to publish in OA journals is also available in China. All research funders in China allow authors to utilize research grants for publishing in OA journals. The Chinese Academy of Sciences, Science Press, and the National Science Library have jointly established a national academic open access journal platform. Chinese academic libraries have also actively engaged in organizing many international conferences to discuss and promote the strategies and policies of open access.⁷⁴ Dehua Hu, Biyun Huang, and Wenqi Zhou have identified 685 Chinese OA journals listed in the China National Knowledge Infrastructure, a full-text database for over 8,114 Chinese journals.⁷⁵ At present, 92 institutional repositories in China are listed in OpenDOAR. With 85 open access journals, China's position in the DOAJ is seventh in Asia.

All of this presents a good picture of the open access movement in China and India in comparison to that of Pakistan. Pakistani universities, as beneficiaries and potential contributors of open access, should learn from the experiences of its neighboring countries and actively participate to drive the development of open access in Pakistan.

The development of institutional repositories with appropriate quality standards is one of the most viable ways to advance the OA movement in any country.

The development of institutional repositories with appropriate quality standards is one of the most viable ways to advance the OA movement in any country. Given the international success of discipline-based and institutional repositories in increasing the availability of OA research outputs, attention should be focused on the development

within Pakistan of these types of repositories. A concerted effort by all stakeholders would be an important first step in ensuring that important national research outputs are accessible and reusable without restrictions.

Conclusions and Recommendations

The study concludes that the OA movement has developed rapidly at a global level. However, despite the focus by the HEC of Pakistan on the importance of research in assisting the nation to achieve a range of socioeconomic goals, Pakistan has done little to leverage



the comprehensive benefits of open access to bolster national strategies. The success of the open access movement in any country depends heavily on all stakeholders in scholarly communication, including publishers, academics, libraries, governments, funding agencies, and university administrators. University administrators, for example, formulate policy and guidelines; as such, they have a crucial role in the success of the OA movement at their universities. It is important that Pakistani university administrators understand the

The success of the open access movement in any country depends heavily on all stakeholders in scholarly communication, including publishers, academics, libraries, governments, funding agencies, and university administrators.

benefits of OA, not only for their institution but also for the wider educational community. Likewise, libraries in Pakistan have an excellent opportunity to play an active role in creating awareness about OA among university administrators, academics, and researchers.

The library already plays an important role within the academy. In examining the role of the academic research library in supporting research, libraries are “the microcosm of the university” when it comes to expanding roles and developing new types of partnerships. The library is one of the primary authorities in the university regarding how knowledge is generated and transmitted. Thus, it should leverage its position to lead through vision and strategic initiative. Through proactive outreach and engagement, Pakistani university libraries can take on an active role as conveners among the different stakeholders within their institution. This will assist in informed decision-making regarding the potential benefits of institutional repositories as well as the formulation of policies for OA publishing.

Proactive initiatives could be developed to support open access in Pakistan. For example, a declaration or statement would serve as a framework for developing OA literature in Pakistan. An institutional OA fund could be established in all universities and other higher educational institutions in Pakistan. The HEC could establish an OA fund to support OA publishing in the country. In addition, a national OA repository could be developed for the identification of OA resources within the nation. The government, HEC, and universities in Pakistan need to formulate policies in support of open access. All Pakistani universities and higher education institutions need to concentrate on publishing open access journals and developing institutional repositories. In this way, they can collaborate with those local universities that have already developed repositories.

Pakistani LIS professionals should educate their users about the benefits of open access and how to effectively use these resources. They should also educate and encourage faculty members, researchers, university administrators, and students to publish and archive their works in OA journals and

Pakistani LIS professionals should educate their users about the benefits of open access and how to effectively use these resources.

This mss is peer reviewed copy edited and accepted for publication, Portal 20.1.



institutional repositories. Funding agencies should mandate that papers originating from their funds or grants be deposited in institutional repositories within a reasonable time. The Pakistan Research Repository, which mostly holds PhD dissertations, should begin to emphasize the preservation of other materials, including BS honors theses, MPhil theses, books, monographs, and research articles. The DOAJ identifies 50 journals of Pakistani origin, whereas 201 HEC-recognized national journals are available to users through open access. All 201 HEC-recognized local journals should apply to be indexed by the DOAJ. This will expand the readership of local Pakistani journals at a global level. A portal of Pakistani open access journals needs to be developed to trace and access the locally published literature. Local and indigenous research is a critical aspect of science that is often neglected by large international publishers. The growth of open access in Pakistan will benefit not only Pakistan but also the rest of Asia and the entire international community.

Arslan Sheikh is an assistant librarian in the Junaid Zaidi Library at COMSATS University Islamabad in Pakistan; he may be reached by e-mail at: arslan_sheikh@comsats.edu.pk.

Notes

1. Bo-Christer Björk and David Solomon, "Open Access versus Subscription Journals: A Comparison of Scientific Impact," *BMC (BioMed Central) Medicine* 10, 1 (2012), doi:10.1186/1741-7015-10-73.
2. Ingrid Iton and Ardon Iton, "Open Access and the Caribbean Academic: An Exploratory Investigation of the Adoption of This Medium for Publishing among Science Faculty of the University of the West Indies," *IFLA (International Federation of Library Associations and Institutions) Journal* 42, 1 (2016): 2535, <https://doi.org/10.1177/0340035215616977>.
3. Stephen Pinfield, "Is Scholarly Publishing Going from Crisis to Crisis?" *Learned Publishing* 26, 2 (2013): 85–88; Eun-Ja Shin, "Scholarly Journal Publishing and Open Access in South Korea," *Serials Review* 38, 2 (2012): 99–104; Prema Singh, "Open Access Repositories in India: Characteristics and Future Potential," *IFLA Journal* 42, 1 (2016): 16–24, doi:10.1177/0340035215610131.
4. Elizabeth Gadd and Denise Troll Covey, "What Does 'Green' Open Access Mean? Tracking Twelve Years of Changes to Journal Publisher Self-Archiving Policies," *Journal of Librarianship and Information Science* 48, 2 (2016): 1–17.
5. Jonathan Pimm, "Open Access Publishing—A Quiet Revolution," *Psychiatric Bulletin* 38, 1 (2014): 1–2, doi:10.1192/pb.bp.114.046813.
6. Emma Cryer, "Incorporating Open Access into Libraries," *Serials Review* 37, 2 (2011): 103–7.
7. Simon Wakeling, Valérie Spezi, Claire Creaser, Jenny Fry, Stephen Pinfield, and Peter Willett, "Open Access Megajournals: The Publisher Perspective (Part 2: Operational Realities)," *Learned Publishing* 30, 4 (2017): 313–22, doi:10.1002/leap.1118.
8. Peter Suber, "A Very Brief Introduction to Open Access," 2004, <http://legacy.earlham.edu/~peters/fos/brief.htm>.
9. Williams E. Nwagwu, "Open Access Initiatives in Africa—Structure, Incentives and Disincentives," *Journal of Academic Librarianship* 39, 1 (2013): 3–10, <https://doi.org/10.1016/j.acalib.2012.11.024>.
10. Mohamed Majeed Mashroofa, "Open Access Revolution: Is It a Paradigm Shift of Scholarly Publishing Practices? A Literature Review of Global Scenario," *Journal of the University Librarians Association of Sri Lanka* 19, 1 (2016), doi:10.4038/jula.v19i1.7878.
11. Jing Zhong and Shuyong Jiang, "Institutional Repositories in Chinese Open Access Development: Status, Progress, and Challenges," *Journal of Academic Librarianship* 42, 6 (2016): 739–44, <https://doi.org/10.1016/j.acalib.2016.06.015>.

12. Jayshree Mamtora, Tina Yang, and Diljit Singh, "Open Access Repositories in the Asia-Oceania Region: Experiences and Guidelines from Three Academic Institutions," *IFLA Journal* 41, 2 (2015): 162–76, <https://doi.org/10.1177/0340035215582219>.
13. Saima Qutab, "Open Access Movement in Pakistan," *Trends in Information Management (TRIM)* 4, 1 (2008): 38–51.
14. Arslan Sheikh, "Faculty Awareness, Use and Attitudes towards Scholarly Open Access: A Pakistani Perspective," *Journal of Librarianship and Information Science* (2017), <https://doi.org/10.1177/0961000617742455>.
15. Higher Education Commission, Pakistan (HEC), National Digital Library, "Open Access Resources," <http://www.digitallibrary.edu.pk/Open.htm>.
16. PakMediNet, "Medical Journals of Pakistan," <http://www.pakmedinet.com/journal.php>.
17. Clarivate Analytics, Web of Science, 2019, <http://www.isiknowledge.com/>.
18. Kathleen Shearer, Kostas Repanas, and Kazu Yamaji, "Asian Open Access Regional Survey," 2017, <https://www.coar-repositories.org/files/Asia-OA-survey-results-June-15-2017.pdf>.
19. Ahsan Ullah and Muhammad Rafiq, "Pakistan Research Repository: A Showcase of Theses and Dissertations," *Library Hi Tech News* 31, 4 (2014): 17–20, here 17.
20. Registry of Open Access Repositories (ROAR), "About the Registry," <http://roar.eprints.org/information.html>.
21. Pakistan Research Repository, Higher Education Commission, Islamabad, <http://pr.hec.gov.pk/jspui/>.
22. Agha Khan University (AKU), eCommons @ AKU, AKU Institutional Repository, <http://ecommons.aku.edu/>.
23. Akhter Hameed Khan Digital Library, AHK Resource Center, <http://www.ahkrc.org/archives.html>.
24. COMSATS University Islamabad, Lahore Campus Institutional Repository, <https://lahore.comsats.edu.pk/library/subject-guide.aspx?id=13&pid=25>.
25. PakMediNet, "Medical Journals of Pakistan."
26. HEC, National Digital Library, "Open Access Resources."
27. Heather G. Morrison, "Dramatic Growth of Open Access," *Imaginary Journal of Poetic Economics* (blog), 2013, http://poeticconomics.blogspot.hk/2014_07_01_archive.html.
28. Ming Chen and Yunfei Du, "The Status Of Open Access Library and Information Science Journals in SSCI [Social Sciences Citation Index]," *Electronic Library* 34, 5, (2016): 722–39.
29. Charles W. Bailey Jr., "What Is Open Access?" 2006, <http://digital-scholarship.org/cwb/WhatIsOA.htm>.
30. Robert P. Holley, "Open Access: Current Overview and Future Prospects," *Library Trends* 67, 2 (2018): 214–40.
31. Walt Crawford, *Gold Open Access Journals, 2011–2015* (Livermore, CA: Cites & Insights Books, 2016).
32. Bo-Christer Björk, "Open Access to Scientific Articles: A Review of Benefits and Challenges," *Internal and Emergency Medicine* 12, 2 (2017): 247–53.
33. Sheikh, "Faculty Awareness, Use and Attitudes towards Scholarly Open Access."
34. Clarivate Analytics, Web of Science.
35. Elsevier, Scopus, <https://www.scopus.com/>.
36. Sheikh, "Faculty Awareness, Use and Attitudes towards Scholarly Open Access."
37. Qutab, "Open Access Movement in Pakistan."
38. PakMediNet, "Medical Journals of Pakistan."
39. Mohammad Reza Ghane and Mohammad Reza Niazmand, "Current Status of Open Access Journals Published in D8 Countries and Registered in the Directory of Open Access Journals (pre-2000 to 2014)," *Electronic Library* 34, 5 (2016): 740–56, <https://doi.org/10.1108/EL-06-2015-0107>.
40. Shearer, Repanas, and Yamaji, "Asian Open Access Regional Survey."
41. Pakistan Research Repository.
42. Ullah and Rafiq, "Pakistan Research Repository."

43. "HEC Recognised Universities and Degree Awarding Institutions," <http://www.hec.gov.pk/english/universities/pages/recognised.aspx>.
44. Qutab, "Open Access Movement in Pakistan."
45. Sheikh, "Faculty Awareness, Use and Attitudes towards Scholarly Open Access."
46. Mohamed Hanif Nashipudi and B. Ravi, "Indian Research Going Global: A Study on the Status of Open Access Publishing," *International Journal of Information Research* 3, 4 (2014): 380–90; Bhaskar Mukherjee, "Green and Gold Open Access in India," *Learned Publishing* 27, 1 (2014): 21–32.
47. Nashipudi and Ravi, "Indian Research Going Global."
48. Leena Shah, Vrushali Dandawate, and Sridar Gutam, "The Changing Landscape and Future of Open Access in India," paper presented at International Conference on Digital Libraries, Smart Future: Knowledge Trends That Will Change the World, New Delhi, India, December 14–16, 2016.
49. Sarika Sawant, "Past and Present Scenario of Open Access Movement in India," *Journal of Academic Librarianship* 39, 1 (2013): 108–9, <https://doi.org/10.1016/j.acalib.2012.11.007>.
50. Mohammad Nazim and Maya Devi, "Open Access Journals and Institutional Repositories: Practical Need and Present Trends in India," *Annals of Library and Information Studies* 55, 1 (2008): 201–8.
51. Nashipudi and Ravi, "Indian Research Going Global."
52. Vijendra Kumar and Gopalakrishnan Mahesh, "Open Access Repositories in India: A Lost Opportunity?" *Current Science* 112, 2 (2017): 210–12, here 211.
53. Sarika Sawant, "Institutional Repositories in India: A Preliminary Study," *Library Hi Tech News* 28, 10 (2011): 6–10, <https://doi.org/10.1108/07419051111202646>.
54. Nashipudi and Ravi, "Indian Research Going Global."
55. B. M. Meera and Rehana Ummer, "Open Access Journals: Development of a Web Portal at the Indian Statistical Institute," *Electronic Library* 28, 4 (2010): 540–54, <https://doi.org/10.1108/02640471011065364>.
56. S. Sudarshan Rao and N. Laxman Rao, "Open Access Policies and Mandates: A Study of Their Implementation in Academic Institutions in India," presentation at IFLA World Library and Information Congress (WLIC), Kuala Lumpur, Malaysia, August 24–30, 2018, <http://library.ifla.org/2128/1/092-rao-en.pdf>.
57. Sonia Bansal, "Contribution of SAARC [South Asian Association for Regional Cooperation] Countries to the Directory of Open Access Repositories (OpenDOAR)," *International Journal of Library Science* 14, 1 (2016): 51–55.
58. Sawant, "Past and Present Scenario of Open Access Movement in India."
59. Mukherjee, "Green and Gold Open Access in India."
60. Mohammad Nazim and Ashiya Ahmadi, "Open Access to Scholarly Communication in India: Current Status," in *2018 5th International Symposium on Emerging Trends and Technologies in Libraries and Information Services (ETTLIS)* (New York: Institute of Electrical and Electronics Engineers [IEEE], 2018), 202–8, doi:10.1109/ETTLIS.2018.8485196.
61. Nazim and Devi, "Open Access Journals and Institutional Repositories."
62. Nazim and Ahmadi, "Open Access to Scholarly Communication in India."
63. Jisc, OpenDOAR, "Directory of Open Access Repositories," 2018, <http://v2.sherpa.ac.uk/opendoar/>.
64. Rao and Rao, "Open Access Policies and Mandates."
65. Dehua Hu, Aijing Luo, and Haixia Liu, "Open Access in China and Its Effect on Academic Libraries," *Journal of Academic Librarianship*, 39, 1 (2013): 110–12, <https://doi.org/10.1016/j.acalib.2012.11.009>.
66. Zhong and Jiang, "Institutional Repositories in Chinese Open Access Development."
67. Martin Paul Eve, *Open Access and the Humanities: Contexts, Controversies and the Future* (Cambridge, U.K.: Cambridge University Press, 2014), 80.
68. Cantao Zhong, "Development of Institutional Repositories in Chinese Universities and the Open Access Movement in China," *ELPUB* (2009): 527–34.



69. Zhong and Jiang, "Institutional Repositories in Chinese Open Access Development."
70. Conghui Fang and Xiaochun Zhu, "The Open Access Movement in China," *Interlending & Document Supply* 34, 4 (2006): 186–93, <https://doi.org/10.1108/02641610610714777>.
71. Xiaolin Zhang, "Development of Open Access in China: Strategies, Practices, Challenges," *Insights* 27, 1 (2014).
72. Zhong and Jiang, "Institutional Repositories in Chinese Open Access Development."
73. Chu and Lin, "Recent Development of Open Access Abroad and in China."
74. Hu, Luo, and Liu, "Open Access in China and Its Effect on Academic Libraries."
75. Dehua Hu, Biyun Huang, and Wenqi Zhou, "Open Access Journals in China: The Current Situation and Development Strategies," *Serials Review* 38, 2 (2012): 86–92, <https://doi.org/10.1016/j.serrev.2012.03.001>.

This mss. is peer reviewed, copy edited, and accepted for publication, portal 20.1.

This mss. is peer reviewed, copy edited, and accepted for publication, portal 20.1.