A-1

# OPEN ACCESS TO SCIENTIFIC INFORMATION IN CONTEXT WITH IPR ISSUES

*Mohd. Furqan Ullah and Tanvear Ahmad*

*National Institute of Hydrology, Jal Vigyan Bhawan, Roorkee*

## ABSTRACT

Scientific information, which is the most important resource should be openly accessible and free from pricing and licensing restrictions. It is very essential for the worldwide information flow and socio-economic development. The open access movement in the domain of output of scientific research has come into existence globally because of continuous rising of prices of subscriptions of journals resulting restricted access to scholarly articles. This forced to the scholars and researchers to look for the alternate ways for sustaining sharing of information and knowledge. The open access is possible only due to willingness of scientists, scholars and organisations to share information and knowledge produced by them. The recent advances in Information and Communication Technology (ICT), specially the Internet and web has revolutionized the concept and playing a very important role in collecting, organising, storing, sharing and communicating the information in digital form. In India, many organisations took initiatives for participating actively in Open Access Movement. There are several Open Access Repositories such as institutional repositories have been developed in India by collecting and organising research documents in digital form for the benefit of scientists and researchers. The open access facility available in the form of full text articles and books has played major role in providing services to the users of the libraries without involving any extra burden on the budget of the libraries. But simultaneously when we move faster towards OA initiatives, the chances of violation of Intellectual Property Rights are also increased. The paper advocates open access to

scientific information and argues the sharing of knowledge and building partnerships for optimal utilisation and benefiting from existing scientific information, but the Rights of Intellectual Property of individuals and organisations should be safeguard.

## 1.0 INTRODUCTION

Information is an important key resource of any organisation, community, society or nation and plays an important role in every sphere of life, be it in business or economy or the day today social life. It is the most democratic source of power. According to Alvin Toffler, Force and Wealth continue to be the property of the strong and rich. But information and knowledge has changed the scenario. In this democratic society, country's intellectual advancements are more dependent on independent learners and critical thinkers. Information and knowledge play a vital role in creation of such intellectuals (1). Before the invention of art of writing, the information was kept stored in human brain, but later on traditional knowledge recorded in the form of manuscripts, inscriptions, scriptures and books etc. The invention of printing press and developments in printing technology lead to the information explosion. The information revolution and the continuous increase in the spread of knowledge have given birth to new era of knowledge and information which effects directly economic, social, cultural and political activities of all over the world. The recent advances in Information and Communication Technology (ICT) including Internet and web technology have revolutionized the concept of access to information. Before the invention of the printing press, a writing, once created, could only be physically multiplied by the highly laborious and error-prone process of manual copying by scribes. Printing allowed for multiple exact copies of a work, leading to a more rapid and widespread circulation of ideas and information. Gradually, the trade of printing and publishing grown up very fast and simultaneously monopolized by the commercial publishers all over the world and it was very difficult for scholars, scientists and

libraries for getting access to scholarly journals which were essential in communicating new information and research with out paying the cost of the document containing particular piece of information. The concept of Open Access was originated due to the increasing cost of printed peer-reviewed journals, information explosion, growth of literature and above all the change of policies among the publishers could hardly meet the ever mounting demands of information by the scholars. The open source initiatives provide many open source information, software, e-journals, e-books etc. freely accessible for use subject to certain conditions.

## 2.0 MEANING OF OPEN ACCESS AND ITS IMPLEMENTATION

Open access means online access to scholarly publications on the Internet, particularly peer-reviewed journal articles, without access charge to individual researcher or libraries. Implementing 'Open Access' means dispensing with the financial, technical, and legal barriers that are designed to limit access to scientific research articles, to only paying customers. The second key characteristics of Open Access is that the researcher retains the copy right to his/her research article, but consents in advance to its unrestricted reading, downloading, copying and sharing by any other user (2).

According to Budapest Open access Initiative (BOAI), open access would allow the users to read, download, copy, distribute, print, search or link to the full texts of works or use them for any other lawful purpose without financial, legal or technical barriers other than those inseparable from gaining access to the Internet (3). The only constraint on reproduction and distribution, and the only role for copyright in this domain should be to give the authors control over the integrity of the work and the right to be properly acknowledged and cited.

The contributions in Open Access must satisfy two conditions - a) the authors and right holders of such contributions grant to all users free world wide right of access and a licence to copy, use and distribute the work publicly in any digital medium for any responsible purpose, subject to proper attribution of authorship and b) a complete version of the work and all supplemental materials including a copy of the permission, is deposited in an appropriate electronic format in an online repository using suitable technical standards (4).

## 3.0 OPEN ACCESS INFORMATION SOURCES

The organised information sources in digital form, available on the web and free from any type of pricing and legal restrictions for accessing to use are called open access information sources. Latest information sources are always required for research activities of the individuals, groups or organisations. These information sources may be primary scientific periodicals, research papers, research reports, proceedings of symposia and seminars, standards, maps, thesis and software etc. Some of the organisations were already providing these sources to the researchers free of cost for scientific activities. Open Access movement has brought a drastic change in the communication of information system throughout the world. In providing the open access, information sources for scientific and scholarly purposes may be classified broadly as under:

1. Open access journals and e-prints.
2. Open access archives and repositories.
3. Open source software.

## 3.1 Open access journals and e-prints :

Open access journals are scholarly journals that are available online to the reader without financial, legal, or technical barriers other than those inseparable from gaining

access to the internet itself. Some are subsidized, and some require payment on behalf of the author. Subsidized journals are financed by an academic institution, learned society or a government information centre, those requiring payments are typically financed by money made available to researchers for the purpose from a public or private funding agency, as part of a research grant. There have also been several modifications of open access journals that have considerably different natures : hybrid open access journals and delayed open access journals (5).

According to Warner (6) the E-Prints include journal articles, pre prints, technical reports, books, theses and dissertations.

The open access journals and e-prints are very widely used popular and effective information sources for research, academic and scientific community in providing free scholarly information. Open access makes their articles more visible, discoverable, retrievable, and useful. The publication process of an article in Open Access journal is same as in print journal but much faster then print model. In Western countries some OA journals charge fee directly from the author for e-publication of the article. That fee is known as APC or Article Processing Charges, include charges of peer reviewing, manuscript preparation and server space.

At international level many learned bodies, societies, institutions, and publishers contributed in Open Access Journals. Directory of Open Access Journals (http://www.doj.org) lists 7537 free, full text, quality controlled, scientific and scholarly journals, covering all subjects and many languages, out of them 3650 journals are searchable at the article level. Besides these 7,63,719 articles (7) are available in open access electronic form.

## 3.2 Open access archives and repositories

Open Access Archives or Repositories do not perform peer review, but simply make their contents freely available to users around the world. They may include post prints (published articles), pre-prints (pre-published articles), research reports, pamphlets on specialised topics, case studies, manuals, theses and dissertations, teaching materials or other e-literature that the authors or organisations wish to make publicly available without financial or other access barriers. Among the open access repositories, Institutional Repositories (IRs) is becoming one of the most popular tool for self-archival and administration of an organisation's intellectual or scholarly output. IR's are the databases with sets of services to capture, store, index, preserve and redistribute an institution's research output in digital formats. The primary objective of an Institutional Repository is to preserve or change the scholarly communication process and to highlight the institutions research output to the outside community. An Institutional Repository may contains work of which the author or institution owns copy right, or for which permission has been obtained to include a copy of the work in the repository. Directory of Open Access Repositories (http://www.opendoar.org) has so far registered 2176 repositories (8) all over the world.

## 3.3 Open source software

Among the open sources available, open source software is very popular in providing and using free software. Open Source software (OSS) is computer software that is available in source code form. The source code and certain other rights normally reserved for copyright holders are provided under a free software license that permits users to study, change, improve and at times also to distribute the software. Open source software is very often developed in a public, collaborative manner (9). There are various licensing models to which to which the OSS label has been applied, but the

basic idea is that the software's license may not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs and the working software must either be distributed along with its source code or have a well-publicized means of downloading the source code, without charge, via the Internet. That is, anyone can access and manipulate the code that was used to write a program, as long as anything that person comes up with using that code is also offered to the public as OSS. This allows those who use the software to contribute to its further development. This contrasted with proprietary software, which is distributed as compiled object code or machine code, leaving the source code solely under the control of the individual software vender (10). LINUX is the very popular example of the open source software.

## 4.0 MAJOR OPEN ACCESS INITIATIVES AT INTERNATIONAL LEVEL

### 4.1 Budapest Open Access Initiative (BOAI)

The Budapest Open Access Initiative arises from a meeting convened in Budapest by the Open Society Institute (OSI) on December 1-2, 2001. The purpose of the meeting was to accelerate progress in the international effort to make research articles in all academic fields freely available on the internet. The initiative has been signed by the Budapest participants and a growing number of individuals and organizations from around the world who represent researchers, universities, laboratories, libraries, foundations, journals, publishers, learned societies, and kindred open-access initiatives (11). The BOAI recommends using two complementary strategies : self-archiving in institutional/disciplinary repositories and open access journals.

## 4.2 Scholarly Publishing and Academic Resources Coalition (SPARC)

As stated in its e-brochure, Scholarly Publishing and Academic Resources Coalition, is an international alliance of academic and research libraries working to correct imbalances in the scholarly publishing system. Developed by the Association of Research Libraries, SPARC has become a catalyst for change. Its pragmatic focus is to stimulate the emergence of new scholarly communication models that expand the dissemination of scholarly research and reduce financial pressures on libraries. SPARC's role in stimulating change focuses on: **Educating** stakeholders about the problems facing scholarly communication and the opportunities for change; **Advocating** policy changes that advance the potential of technology to advance scholarly communication and that explicitly recognize that dissemination is an essential, inseparable component of the research process ; **Incubating** real-world demonstrations of business and publishing models that advance changes benefiting scholarship and academe. Membership in SPARC numbers nearly 800 institutions in North America, Europe, Japan, China, and Australia. SPARC worked with the Ligue des Bibliothèques Européennes de Recherche (LIBER) and other European organizations to establish SPARC Europe in 2001. SPARC also is affiliated with major library organizations in Australia, Canada, Denmark, New Zealand, the UK and Ireland, and North America (12).

## 4.3 Public Library of Science (PLoS) :

Public Library of Science (PLoS) is a nonprofit publisher, membership, and advocacy organization with a mission to accelerate progress in science and medicine by leading a transformation in research communication. The core objectives of PLoS are : to provide ways to overcome unnecessary barriers to immediate availability, access, and use of research ; to Pursue a publishing strategy that optimizes the openness, quality,

and integrity of the publication process ; and to develop innovative approaches to the assessment, organization, and reuse of ideas and data (13). The PLoS is committed to provide world scientific and medical literature freely available online, without restrictions on use or further distribution, free from private or government control. All works published in PLoS are open access, licensed under the Creative Common Attribution License.

## 5. 0 OPEN ACCESS INITIATIVES IN INDIA

Scientific and technological activities in India are carried out carried out under a wide set up of central government organisations, national research laboratories, higher educational institutions, state government establishments, independent government and public funded projects and NGOs, etc. These agencies produce large amount of scientific out put. Open access enables a global platform for their research and collaboration and reciprocates the information flow among the countries.

India's Challenge is to reciprocate the information flow and improve access and thereby the impact of Indian research. To meet their challenge and to generate a national research and development base, an open access approach in line the Budapest Open Access initiatives is being promoted. To achieve open access to scholarly journal literature, the initiative recommends the complementary strategies of self archiving and open access journals (14). At present, Directory of Open Access Journals lists 7537 journals out of them 383 journals of various disciplines are contributed from India. Various scientific, technological and higher educational and learning organisations in India has taken initiatives for developing Open Access Repositories or Institutional repositories. Directory of Open Access Repositories lists total number of 2176 repositories all over the world out of them 46 OARs are registered from India. These repositories are developed by Central Drug Research Institute (CDRI), Lucknow ; Central Marine Fisheries Research Institute (CMFRI), Kochi ; Cochin University of Science & Technology (CUSAT), Kochi ; Delhi College of Engineering ; Gokhale

Institute of Politics and Economics (GIPE), Pune ; Guru Gobind Singh Indraprastha University, Delhi ; ICFAI Business School, Hyderabad ; Indian Academy of Sciences, Bengalore ; Indian Agricultural Research Institute (IARI) , New Delhi ; Indian Institute of Technology, Bombay ; Indian Institute of Technology, Roorkee ; Indian Institute of Technology, Kanpur ; Indian Institute of Technology, Delhi ; Indian Institute of Astrophysics, Bengalore, Indian Institute of Horticultural Research (IIHR), Bengalore ; Indian Institute of Management, Kozhikode ; Indian Institute of Petroleum, Dehradun ; Indian Institute of Science, Bangalore ; Indian Statistical Institute, Bangalore Centre ; Indira Gandhi Institute of Development Research, (IGIDR), Mumbai ; Indira Gandhi National Open University (IGNOU), New Delhi ; Information and Library Network Centre, Ahmedabad ; Information Centre for Aerospace Science and Technology, Bangalore ; Institute of Mathematical Sciences, Chennai ; International Crops Research Institute for the Semi Arid Tropics (ICRISAT), Patancheru (AP) ; Madurai Kamaraj University (MKU), Madurai ; Mahatma Gandhi University, Management Development Institute (MDI), Gurgaon ; National Centre for Catalysis Research, IIT Madras, Chennai; National Informatics Centre (NIC), New Delhi ; National Institute of Immunology (NII), New Delhi ; National Institute of Oceanography (NIO), Goa ; National Institute of Science Communication and Information Resources (NISCAIR), New Delhi ; National Institute of Technology, Rourkela ; National Metallurgical Laboratory, Jamshedpur ; Pandit Deendayal Petroleum Univeristy (PDPU), Gandhinagar ; Raman Research Institute (RRI), Bengalore ; Sardar Vallabhbai National Institute of Technology (SVNIT), Surat ; Saurashtra University, Rajkot ; SDM College of Engineering and Technology, Dharwad ; Thapar University (TU), Patiala ; University of Delhi ; University of Kashmir, Srinagar ; University of Mysore ; and Vidya Prasarak Mandal, Mumbai. Besides these organizations, many other organizations in India are also engaged in developing their institutional repositories. It is hoped that in future, Indian contribution in Open Access will be meritorious.

## 6.0 INTELLECTUAL PROPERTY RIGHTS

Intellectual property is equally valuable property than any other property or physical asset. Intellectual property may be described as creation or record or output of human intellect. It relates to the products of ideas, information and knowledge. It may be inventions, literary and artistic works, and symbols, names, images, and designs used in commerce.

In law, intellectual property is an umbrella term for legal entitlements which attach to certain types of information, ideas, or other intangible in their expressed form. The holder of this legal asset is generally entitled to exercise various exclusive rights in relation to the subject matter of the IP. The term Intellectual property reflects the idea that this subject matter is the product of mind or the intellect, and that IP rights may be protected at law in the same way as any other form of property.

Intellectual property laws vary from jurisdiction to jurisdiction such that the acquisition, registration or enforcement of IP rights must be pursued or obtained separately in each territory of interest. However, these laws are becoming increasingly harmonized through the effects of international treaties such as the 1994 World Trade Organisation (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), while other treaties may facilitate registration in more than one jurisdiction at a time. Certain forms of IP rights do not require registration in order to be enforced.(15). Intellectual property rights covers copyright, patterns, registered designs and trademarks. It also covers lay out designs of integrated circuits, geographical indicators and anti-competitive policies in contractual licences. As R&D or artistic work involves a lot of effort and resources, inventors, authors or creators resort to legal remedies when the IPRs of their work are infringed. Developments in modern digital technology have led to a review of the provisions of IPRs both at international and

national levels by many countries. The developing countries are also catching up with this trend as the value of IPRs is increasingly felt (16).

In open access system, scientific or scholarly records are accessed, download, and utilised in digital medium through Internet. The legal rights of the owner of such types of intellectual property may be interpreted under the provisions of Copyright.

## 6.1 Copyright

The concept of copyright can be traced back to certain fundamental ideas about creativity and possession on the one hand, and to the invention to the printing press which made it possible to produce copies of an original material in large numbers at a low cost. Perhaps the, objective of copyright is to create exclusive rights to the author, creator, etc over what they have created which would give them fame / name as well as economic / monetary gains. Copy right is, as its name suggests, a right to prevent copying of an original work. It comes into being upon the creation of an original artistic, musical, literary or dramatic work. Since copyright is the only right to prevent the illegal copying of the original work, there is no absolute legal monopoly and copyright cannot therefore be used to prevent the independent production of an identical or similar work, without reference to the original work (17). The copyright law governs the ownership of copy righted material. Open access scientific information at it is available in digital form, has different properties. Due to its digital nature there are chances for copyright infringement because it is not so permanent in nature and alterations, amendments, and modifications can be made in it easily, and desired numbers of copies can be reproduced, stored in different medium and transmitted. Sometimes the identity of the copyright owner is not known.

## 6.2 Infringement of copyright

Copyright gives the creator of the work the right to reproduce the work, make copies, translate, adapt, sell or give on hire and communicate the work to public. Any of these activities done without the consent of the author or his assignee is considered infringement of the copyright. There is a provision of 'fair use' in the law which allows copyrighted work to be used for teaching and research and development. In other words making one photocopy of a book for teaching students may not be considered an infringement, but making many copies for commercial purposes would be considered as infringement (18). The electronic transmission of copyrighted material, without the permission of its rightful owner, is an infringement. The online service providers will be held strictly liable for all user infringement irrespective of whether they knew it or taken any preventive steps against it (19).

## 6.3 Issues of ownership of copyright in scientific publication chain

Copyright ownership of scientific output is very important issue because most of the research and development activities are carried out in government funded establishments and government provides the funds, infrastructure and human resources for such activities. Normally the output of such R&D activities is published in scholarly periodicals which are proprietary products of commercial publishers. Most of the leading publishes get a copyright transfer form along with the manuscript of the research paper. This type of approach automatically transfers the ownership of copyright from authors of the papers and books to the commercial publishers who are the ultimate financial beneficiary of the final product. Because big financial gains are involve in such business, these commercial publishers do not allow even to the authors of the same papers and books for making multiple copies of their intellectual output and provide them to others in public interest. In other side, many authors do not bother

about the ownership of copyright, they satisfy themselves in getting their scientific output published by a reputed publisher.

### 6.4. Major obstacles in open access movement :

Open access is the only way for breaking the monopolisation and exploitation of wealth of knowledge and information. There are several obstacles in this way. One of the major obstacle in open access movement is the copyright polices of the commercial publishers who do not allow the accessibility of their copyrighted products freely to the public. Open access movement could not get a momentum due to such type of monopolised policies. Many institutions have developed their open access repositories but their major R&D work could not be highlighted and made freely accessible due to these policies. The psychology of authors for publication of their scientific output in paid scientific periodicals of high Impact Factor (IF) is another aspect that makes road block in open access.

## 7.0 CONCLUSION

Information and knowledge should be free as air and water. Continuous rising prices of scientific and scholarly publications by the monopolised commercial publishers gave birth to the alternate concept of open access. Advances in Information and Communication Technology (ICT) have made possible free access to scientific and scholarly information in digital form. Many important initiatives have taken place at the international and national level for providing open access of scientific and scholarly information to the users. In India some organisations, establishments and professional bodies have initiated participation in open access movement by providing open access journals and repositories. Simultaneously due to fast and easy availability of information in digital form, there are high chances of infringement of Intellectual Property Rights of the creators of the information. Various provisions of law are

available for protecting the rights of the intellectual property owners if suitable mechanism should be developed. Due to lack of exercise of the rights of the authors of scientific information sources, copy rights of the documents automatically transferred to the commercial publishers who exploit them in their own interest. It is needed that open access movement should be supported by governments, organisations and learned bodies both at international and national levels for developing a very strong alternate system of scientific communication, accessing and sharing of knowledge and information.

## Acknowledgements

Authors are grateful to Shri R. D. Singh, Director, National Institute of Hydrology, Roorkee for his kind support and permission for preparation of this manuscript for publication and presentation.

## REFERENCES

1. Shah, P.C. Information literacy to strengthen the democracy and national developments. DLIBCOM : Digital Library Communication Monthly, Vol. 4, No. 9, September, 2009, p. 1.
2. Singh, Digviajy, Prasad, R.V., Kumar, Pavan, V., Shiva Prakash and Jha, K.N.: Intitutional repository : An overview. *In* Open-source movement-Asian perspective : Papers XXII National Seminar of IASLIC & Special Interest Group (SIG) Meeting, 13-16 December, 2006, IIT, Roorkee, pp. 119-124.
3. Budapest Open Access Initiative. http://www.soros.org/openaccess/read.shtml accessed on March 3, 2012.
4. Das, Binod Bihari, Khan, Salil Chandra and Ghosh, Shrabana. Integrated collection development of non-digital and digital information sources along with institutional digital repository in a university library : A case study *In* Open-

source movement-Asian perspective : Papers XXII National Seminar of IASLIC & Special Interest Group (SIG) Meeting, 13-16 December, 2006, IIT, Roorkee, pp. 67-72.

5. http://en.wikipedia.org/wiki/Open_access_journal
6. Warner, S. E-Prints and the open archives initiatives. Library Hi-Tech. Vol. 21, No.2, 2003, pp. 151-158.
7. Directory of Open Access Journals (http://www.doj.org).
8. Directory of Open Access Repositories (http://www.opendoar.org).
9. http://en.wikipedia.org/wiki/Open-source_software.
10. Biswas, Goutam and Paul, Dibyendu. An evaluative study on the open source digital library software for institutional repository : Special reference to Dspace and greenstone digital library. International Journal of Library and Information Science, Vol, 21, No. 1, February, 2010, pp. 1-10.
11. Budapest Open Access Initiative (http://www.soros.org/openaccess).
12. http://www.arl.org/sparc/about/index.shtml.
13. http://www.plos.org/about/
14. Sinha, Prsanta Kumar and Paul, Gayatri. Open access : The future roadways of information for all-round development of the human and the society *In* Open-source movement-Asian perspective : Papers XXII National Seminar of IASLIC & Special Interest Group (SIG) Meeting, 13-16 December, 2006, IIT, Roorkee, pp. 209-214.
15. Sharma, Parul, Pankaj Kumar and Surender Kumar. IPR-Copyright : Concept and cases. *In* Faruqi, Khalid, K. and Pathak, Manish (eds.) Managing libraries in new information environment. New Delhi : Book Age Publications, 2011, pp. 490-499.
16. Moorthy, A. Lakshmana and Karisiddappa, C.R. Intellectual property rights and virtual libraries. *In* Malwad, N.M. et al (eds.). Towards the New Information Society of Tomorrow : Innovations, Challenges and Impact : Papers presented at

the 49th FID Conference and Congress, New Delhi, 11-17 October 1998, INSDOC (FID Publication No. 719), pp. IV-51-IV-61.

17. Seetharama, S. Intellectual Property Rights with special reference to Copyright in a digital environment. *In* Knowledge management in special libraries in digital environment : Papers XXIV All India Conference of IASLIC & Special Interest Group (SIG) Meetings, 15-18, December, 2003, pp. 220-234.
18. Saha, R. Management of Intellectual Property Rights in India, pp.1-29 (http.//www.pfc.org.in/workshop.pdf).
19. Moorthy, A. Lakshmana and Karisiddappa, C.R. Intellectual property rights and virtual libraries…