OPEN ACCESS INITIATIVES: A STUDY OF NATIONAL RESEARCH CENTRE LIBRARIES OF ICAR

Thesis

Submitted for the Award of the Degree of

Doctor of Philosophy

in

Library and Information Science

Submitted by

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Under the Supervision of

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BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY

LUCKNOW

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ESTABLISHED 1996

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Enrolment No.756/13 **Year 2017**

DECLARATION

I hereby declare that this thesis entitled **"OPEN ACCESS INITIATIVES: A STUDY OF NATIONAL RESEARCH CENTRE LIBRARIES OF ICAR"** submitted by me for the award of the Degree of Doctor of Philosophy in Library and Information Science to the Department of Library and Information Science, Babasaheb Bhimrao Ambedkar Central University, Lucknow is an outcome of my own efforts and is an original work. The contents of this thesis did not form a basis for the award of any previous degree to anyone else.

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Ph.D. Course Work Certificate

This is to certify that **Mr. Sumit Ranjan**, Enrollment No. 756/13 Ph.D. Research Scholar, Department of Library and Information Science of this University has successfully completed his Ph.D. Course work in the examination held during May, 2014.

(A.K. Maurya)

Deputy Registrar (Exam.)

CERTIFICATE

This is to certify that the thesis **"OPEN ACCESS INITIATIVES : A STUDY OF NATIONAL RESEARCH CENTRE LIBRARIES OF ICAR"** submitted by **Mr. Sumit Ranjan** is an original research work and has not been previously submitted in part or full for the award of any other degree or diploma to this or any other university.

The thesis submitted to Babasaheb Bhimrao Ambedkar University Lucknow satisfies all the requirements as stipulated in the *Doctor of Philosophy (PhD) resgulations – 1999 as amended in 2008/2010/2013*and it is fit for submission and evaluation for the award of the degree of Doctor of Philosophy of the University.

Date: **Supervisor**

Head of Department

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PREFACE

Open access to information and knowledge is an innovative mode of scholarly communication aimed at the achievement of universal access to information and knowledge. While open access helps digital inclusion of citizens in developing countries by bringing within easy reach full-text contents and development related literature, the Digital Library remains a knowledge repository of such citizens, indigenous people, communities and institutions.

This study will intend to evaluate the steps taken and available infrastructure for open access initiative by selected national research centre libraries of ICAR. It also discusses difficulties faced in open access initiatives and also various opportunities for open access initiative by the selected national research centre libraries of ICAR. This study will help to know the different open access services provided by the libraries, it will also help to know various factors affecting open access process. National Research Centre of ICAR is very prominent institute and plays a vital role in the field of research and development. National Research Centre libraries have very special and rich collection.

The first chapter is introductory of the whole study. Starting from the role of libraries in research to the methodology adopted for this study was discussed in this chapter in detail. In between functions and features of the special library, open access, open access initiatives in India, about ICAR, statement of the problem, need and significance of the study were discussed.

The second chapter is presented the literature review related to the study. It is subdivided into the concept of open access, open access in different countries, trends in open access initiatives and models for open access.

The third chapter is Methodolgy which incorporates the various steps that are adopted by researcher to solve his research problems. This chapter deals with objectives, hypothesis, scope and limitations of the study, sample used for the study, data collection method and data collection procedure and statistical methods used.

The Fourth chapter of this thesis consist theoretical part of Open Access Initiatives. In this chapter, the introduction of open access, open access practices, history of open access is discussed. Major open access initiatives which are landmarks of open access initiatives are also presented in this chapter. This chapter also explains ways of delivering open access, salient features of open access literature, impact on libraries, OA application tools, Open source software used in libraries.

The fifth chapter presents tabulation, statistical analysis, interpretation, and graphical representation of the collected data from libraries.

In the sixth chapter the result derived in the previous chapter “analysis of data and interpretation” is being discussed in the light of analysis and observations made by the researcher. This chapter contains the discussion of the results. Based on the analysis, it has been discussed in detail.

The seventh chapter presents the major findings and conclusion of the study. It deals with recommendations of the study and suggestion for further future research.

CONTENTS

List of Tables

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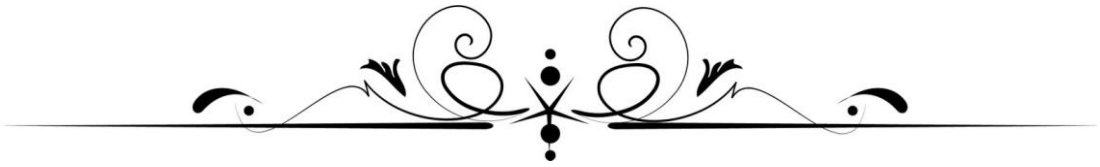
List of Abbreviations

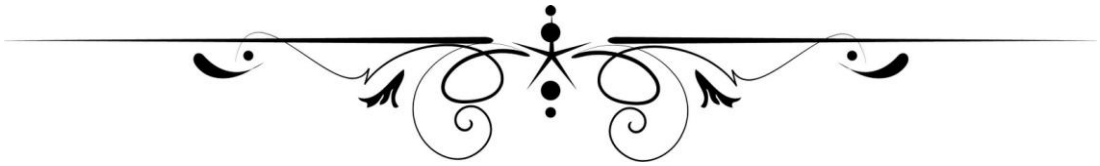
AGRICOLA	-	Agricultural Online Access
AGRIS	-	International System for Agricultural Science and Technology
AICRP	-	All India Coordinated Research Project Reports
APA	-	American Psychological Association
BOAI	-	Budapest Open Access Initiative
CABI	-	Centre for Agriculture and Biosciences International
CeRA	-	Consortium for e-resources in Agriculture
CGIAR	-	Consultancy Group of International Agricultural Research
DARE	-	Department of Agricultural Research and Education
DOAJ	-	Directory of Open Access Journal
DOAR	-	Directory of Open Access Journals
ETD	-	Electronic Theses & Dissertations
FOSS	-	Free and Open Source Software
GLAM	-	galleries, libraries, archives and museums
GNU	-	General Public License
GSDL	-	Greenstone digital library software
IAS	-	Indian Academy of Sciences
ICAR	-	Indian Council of Agricultural Research
ICT	-	Information and Communication Technologies
IDR	-	institutional digital repositories
IFLA	-	International Federation of Library Associations and Institutions
ILL	-	Interlibrary Loan
INSA	-	Indian National Science Academy

IR	-	Institutional Repositories
KVK	-	Krishi Vigyan Kendras
MH	-	Maharashtra
NAARM	-	National Academy of Agricultural Research Management
NAIP	-	National Agricultural Innovation Project
NRC	-	National Research Center
NRCB	-	National Research Centre for Banana
NRCC	-	National Research Centre on Camel
NRCCt	-	National Research Centre for Citrus
NRCE	-	National Research Centre on Equines
NRCG	-	National Research Centre for Grapes
NRCL	-	National Research Centre for Litchi
NRCM	-	National Research Centre on Mithun
NRCMt	-	National Research Centre on Meat
NRCP	-	National Research Centre for Pomegranate
NRCPB	-	National Research Centre on Plant Biotechnology
NRCPM	-	National Centre for Integrated Pest Management
OA	-	Open Access
OAIR	-	Open Access Institutional Repository
OAM	-	Open Access Movement
OJS	-	Open Journal System
TN	-	Tamil Nadu



Chapter 1

Introduction



Chapter-1

Introduction

1.1 Introduction

Ranganathan definition of library helps us to recognize the position of a library in the people. He entitles the library as a public institution. This status itself sets goals and objectives for a library. Being a public body, it has the responsibility to serve the public without any reservation or biases. Ranganathan says that care of collection of books which refers to the organization, maintenance and preservation aspects of the library materials so that it can serve the society or community for a longer period. The final and the most important factor in his definition is 'making them accessible'. This aspect of the definition sets an agenda to provide service to the society. The library should be made available to the public for use or consultation.

The key objective of a library is to provide the right information to the right user at the right time. To meet this objective library have to provide access to information irrespective of their form, format and location. Advances in Information and Communication Technologies (ICT) have drastically transformed the perspective of libraries and information centers to meet their objectives. Applications of Computers, Telecommunication Networks and the advent of the World Wide Web have radically changed the way in which Information is acquired, stored, processed, organized, retrieved, and disseminated. This increases the amount of literature created and published.

But, most of the present day libraries are facing various problems such as ever-growing user requirements, shrinking budget, increasing cost of books and subscription to journals, exceptional technological advancement especially in the field of information storage and retrieval etc. It has thus become very difficult for a library to satisfy patrons with its own resources. It was in the light of this, the term Open Access emerged.

1.1.1 Role of Libraries in Research

Supporting research is an important role of the library. Access to existing knowledge and information is essential for research. The knowledge that is newly created is primarily communicated through research reports, journals and other similar publications: Every library attached to an institution engaged in research should have a strong collection of such publications to support research programs. The libraries attached to universities, research organizations and research and development wings of industrial establishments play the key role in this respect. However, no library is without a research function in some form. Even public libraries have a research role, especially in the social sciences and humanities.

1.1.2 Special Library

Special Library is defined as a collection of books and other printed, graphics or with a restricted field of knowledge and provided by a learned society, research organization, industrial or commercial undertaking, government department or even a learning institution. It may be a special branch of a public library serving certain interests or occupational groups such as a technical library or a special subject library, meeting the requirements of all queries on that given subject such as a music library. Another expert

Broad Field defined that a special library is neither academic, commercial, national nor public but it intends to serve the needs of a portion of a community requiring detailed information on a limited subject field. So that a special library as one serving a group, having an extralibrary existence, whose members direct at least some of their activities towards a common purpose.

1.1.2.1 Meaning and purpose of special library

While other types of libraries serve multiple objectives such as education, research, recreation, cultural and social activities, the major and perhaps only objective of a special library, is the provision of information, in support of the objectives of its parent organization.

Table 1.1

Distinguishing Aspects	**Special Library**
Special user groups	Libraries for the Doctors, Entrepreneurs, Industrialists, scientists, etc.
Kind of activity	Agricultural Research (the Library of the National Research Centres of ICAR).
Specializing in a group of subjects	Agricultural science (the libraries of ICAR)
Type of documents	A film library; a video cassette Library; a manuscript library.

1.1.2.2 Functions of Special Libraries

A special Library is a powerhouse for the generation, storage and use of information: It performs the following functions:

- collects, maintains, stores and retrieves information and data keeping in view the evolving needs of its parent organization;

- analyzes, synthesizes and evaluates information and data;
- provides critical reviews, monographs, reports and collections;
- provides critical compilations;
- provides state-of-the-art reports;
- provides replies to queries;
- provides reprints, bibliographies and references;
- performs literature searches and translation services;
- provides abstracts, indexes and extracts;
- prepares accession lists, bulletins, newsletters; summaries, handbooks or manuals;
- disseminates current information and SDI and thus does stimulates research.

1.1.2.3 Features of Special Libraries

All the activities of a special library are derived from two basic types of information services that are provided by them. The first service is provided in response to users' requests for information covering reference and literature search. The second is information service in anticipation of need and includes indexing, abstracting services which are designed to keep the users updated with new and current information.

(i) Collection Development

(ii) Processing and Organization

(iii) Services

(a) Reference Services

(b) Current Awareness and Routing Services

(c) Anticipatory Service

(d) **Retrieval Services**

(e) **Publication of Bulletins**

(f) **Personnel and Staff**

1.2 Open Access

Open access is a term used to define a new method of access to the literature. That is any reader has access to literature on the internet at zero cost. Open access, means its freely accessible on the open internet,allowing any users to search, print copy, read, download, distribute, search, or link tothe full texts of these articles. No library can afford to subscribe to every scientific publication, and most can only afford a small fraction of them. The open access movement believes it can solve this problem to a great extent. Open access literature can be communicated through open access journals, open access archives or repositories, and open courseware. To be "open access" means to remove the price tag and permission barriers to some extent. The single limitation is on reproduction and distribution, and the only role for copyright in this domain should be to give authors control over theintegrity of their work and the right to beproperly acknowledged and cited.

Moed however, recognized that open access comes in many forms, either through open access journals, or electronic publication that freely make available academic resources irrespective of if they have been published before, that are deposited through self-archiving, by the authors or their representatives in personal home pages, institutional repositories and subject-based repositories.

The term "Open Access" (OA) is officially accepted and began to be used with the signing of the first OA initiative in Budapest. Under OA to scientific publications, in

general, is understood free, open and free of charge access to online journals, articles, conference papers, technical reports, theses and dissertations, reports and reprints. Publishers of OA publications refer to the movement "open access" (OA). The international movement for OA is an initiative for immediate and free access to online resources, unrestricted access and frequency of use imposed by the copyright and agreements with publishers.

OA is the free online content available on the internet. OA is a well-known and applicable to: (a) public viewing on a topic; (b) reviews of scientific articles; and (c) comments and reports for important research results that researchers and scientists published without expecting payment for it.

Research literature are accessible freely in the form of open access journals, institutional repositories (IRs) or open archives, open courseware, self-posting on author's homepages and so on. The two main sources of open access are:

1. Open Access journals- Open access journals are those journals which provide access to full-text articles published in that journal to the reader without any financial charges. The open access journal may be author paid, financed by external grants, or use voluntary work.

2. Institutional repository- The Institutional repository gathers and preserves the intellectual output of the institution's faculty and students, researchers and scientists in digitized form, and makes it available toendusers. It includes materials such as research journal articles, preprints, post-prints, articles undergoing peer review, and theses and dissertations.

1.2.1 Major declarations and statements regarding 'Open Access.'

1.2.1.1 Budapest Open Access Initiatives

In OA development Budapest Open Access Initiative (BOAI) is one of the most important events. This arises at a meeting held in Budapest, organized by Open Society Institute on December 1-2, 2001. The prime motto of this meeting was to bring together the international effort in order, research articles in all scientific fields to become available online free.

1.2.1.2 Bethesda Open Access Initiatives

Bethesda Statement on OA Publishing is another important initiative, which was established on April 11, 2003, in Howard Hughes Medical Institute in Chevy Chase, Maryland. The purpose of this statement is to encourage discussion in the biomedical research community on how to progress as quickly as possible to provide free access to the primary scientific literature in the field.

1.2.1.3 Berlin Declaration on Open Access

This is the third important initiative deals with OA to Knowledge in the Sciences and Humanities from 2003. The statement comes as a result of a Conference held in Berlin in October 2003 on open access to Knowledge in the Sciences and Humanities, organized by Max Planck Society and Project ECHO (European Cultural Heritage Online).

1.2.1.4 IFLA Statement on Open Access

In the field of Open Access, IFLA (the International Federation of Library Associations and Institutions) is dedicated to ensuring the widest possible access to information for all peoples in accordance with the codes expressed in the Glasgow Declaration on Libraries, Information Services and Intellectual Freedom.

1.3 Open Access Initiatives in India

1.3.1 Indian Academy of Sciences

The Indian Academy of Sciences (IAS) was founded on 31 July 1934 by Sir C. V. Raman who publishes 11 journals with the basic philosophy that no journal published by the Academy is in competition with another journal published in the country.

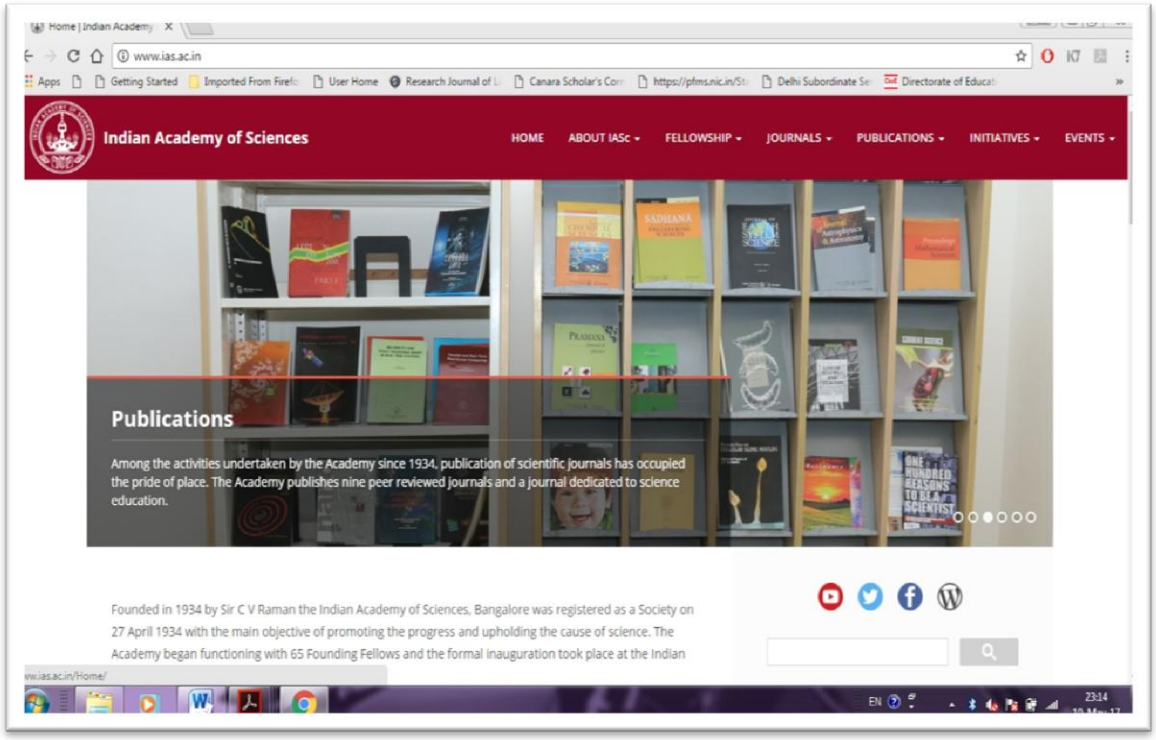


Fig. 1.1 Website Indian Academy of Sciences
(Source: http://www.ias.ac.in/)

Current Science is published by Current Science Association in association with the IAS. It has entire back volumes from 1932 online in PDF format and has been online since 1999. Many other journals are also here including the Journal of Biosciences, Sadhana, and Pramana also have the back volumes online. Major activities include publication of scientific journals, organizing meetings of the fellowship and discussions on important topics, identifying scientific talent, improvement of science education, and taking up other issues of concern to the scientific community.

1.3.2 Indian National Science Academy

The Indian National Science Academy (INSA), established in 1935, publishes four journals. The first one is Proceedings of INSA. Under the project named 'Building Digital Resources: Creating Facilities at INSA for hosting science & technology Journals on Online', INSA launched the OA version of these journals in December 2003. Indian National Science Academy is a leading Science Academy in the country, plays essential role in promoting, recognizing and rewarding excellence.

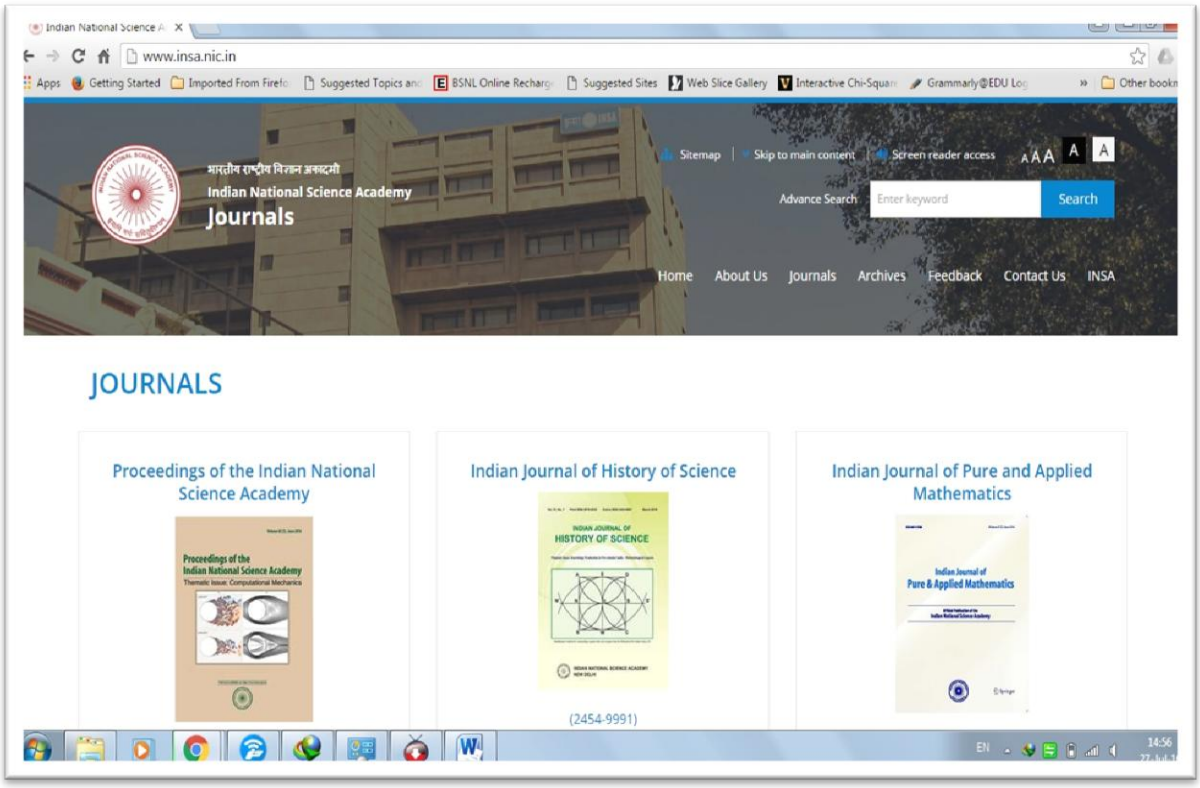


Fig. 1.2 Website of Indian National Science Academy (INSA)
(Source: http://insaindia.res.in/journal.php)

Apart from journal publication INSA organise scientific discussions and also birng out proceedings and monographs for the academy.

1.3.3 The National Academy of Sciences, India

Founded in the year 1930, the National Academy of Sciences, India is the oldest Science Academy of the country.

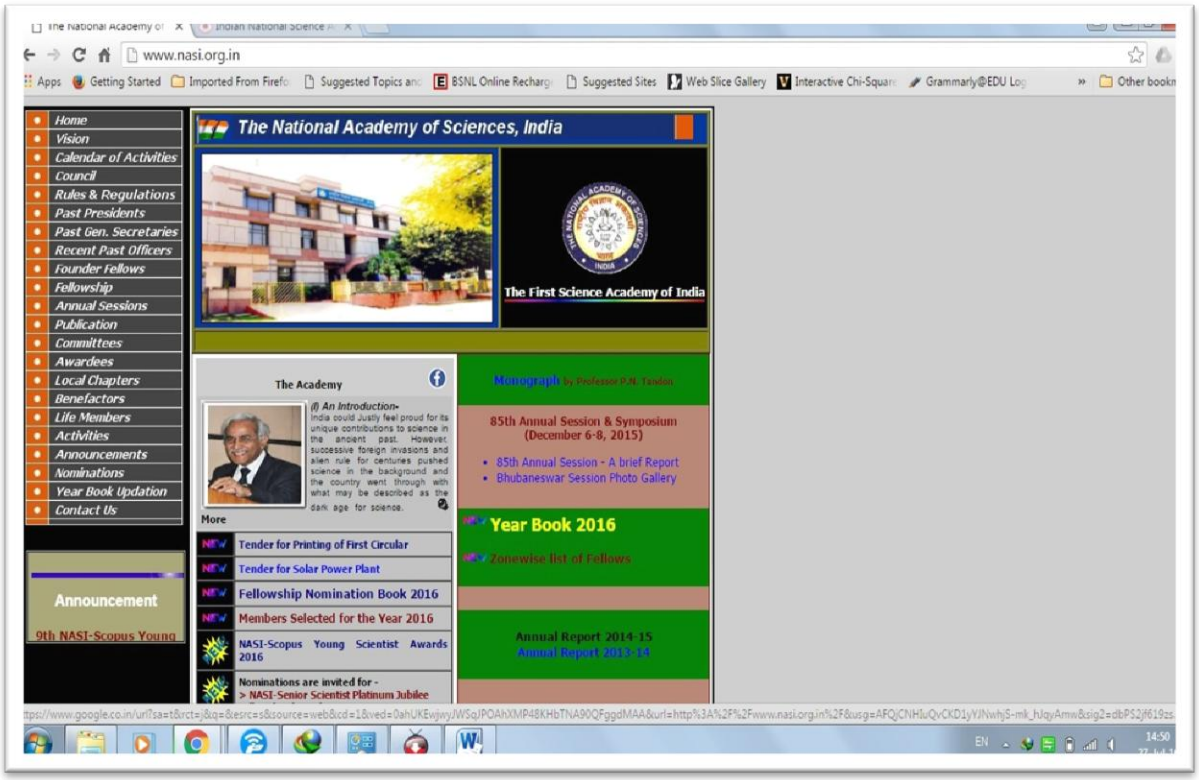


Fig. 1.3 Website of National Academy of Sciences
(Source: www.nasi.org.in)

To provide a national forum for the publication of research work carried out by Indian scientists and to provide opportunities for exchange of views among them was the main objective of the Academy

1.3.4 Bioline International

Bioline International is the non-profit collaborative effort of the University of Torento libraries, University of Toronto Libraries, Canada, the Reference Center on Environmental Information, Brazil, and Bioline, UK. It provides electronic publishing services to journals published in developing countries.

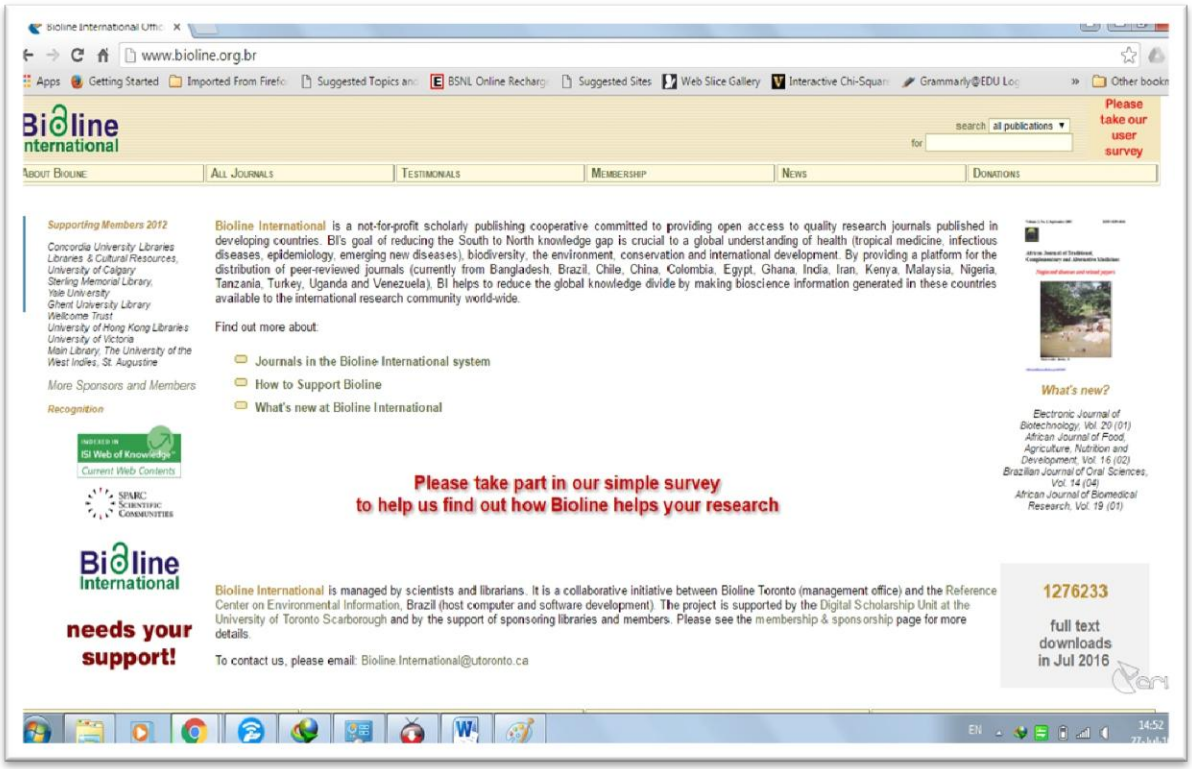


Fig. 1.4 Website of Bioline
(Source: www.bioline.org.br)

Bioline provides archives of 14 indian journals at the Bioline EPrints Archive and access of these 14 Indian journals on their primary site.

1.3.5 Medknow Publications

Medknow Publications is a commercial publisher providing publishing services to over 30 biomedical journals. These journals provide immediate free access and do not charge the author or author's institution for publication of the articles.

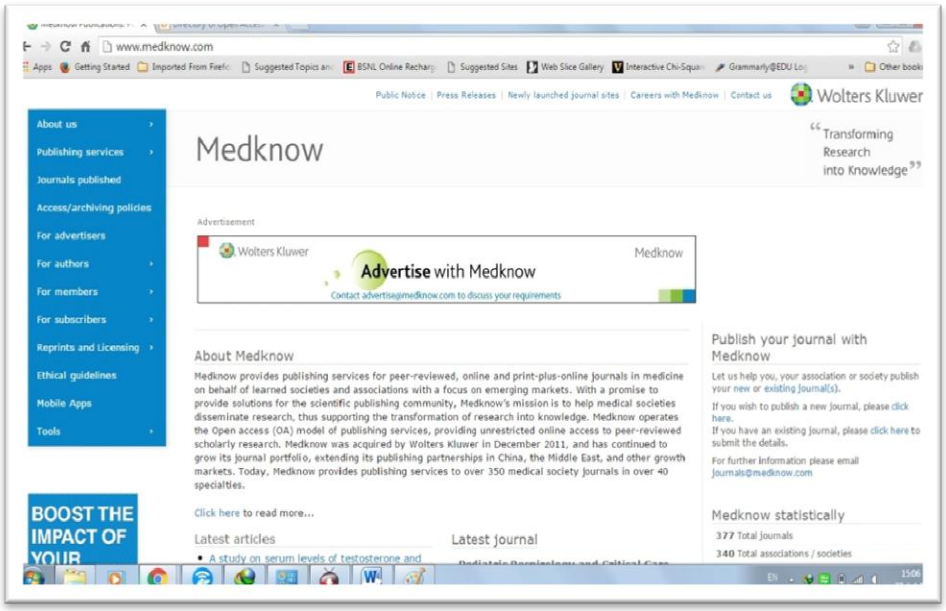


Fig. 1.5 Website of Medknow
(Source: www.medknow.com)

The journals also permit authors' self-archiving. Most of the journals published are archived at multiple places including interoperable repositories, Bioline International and MedInd, ensuring the long-term archiving and accessibility of the published content.

1.3.6 Directory of Open Access Journal

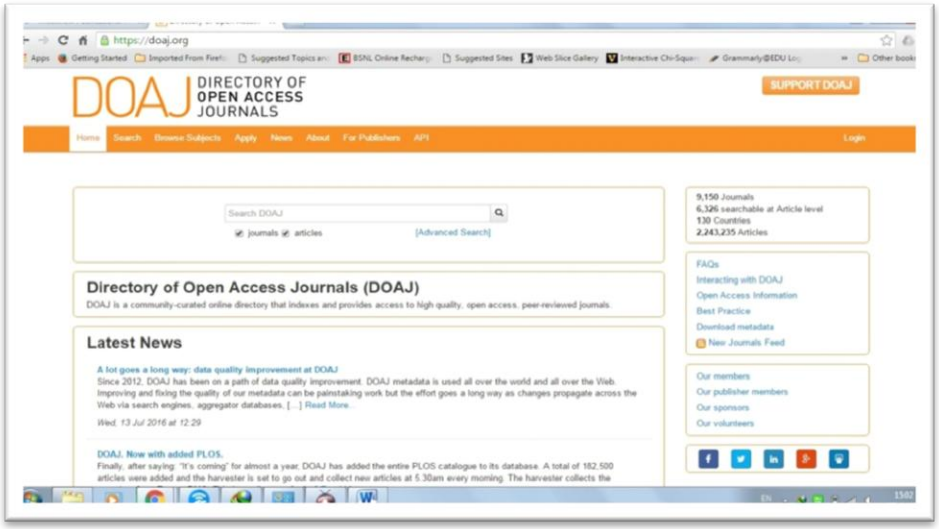


Fig. 1.6 Website of DOAJ
(Source: https://doaj.org)

DOAJ provides free, full text, quality controlled scientific and scholarly journals, covering all subjects and many languages. India is contributing journals to this initiative since 2003.

1.3.7 Indian Journals .com

IndianJournals.com is a vast collection of interdisciplinary Indian Journals and Research Publications, providing: A pan-global web exposure for your Journals,

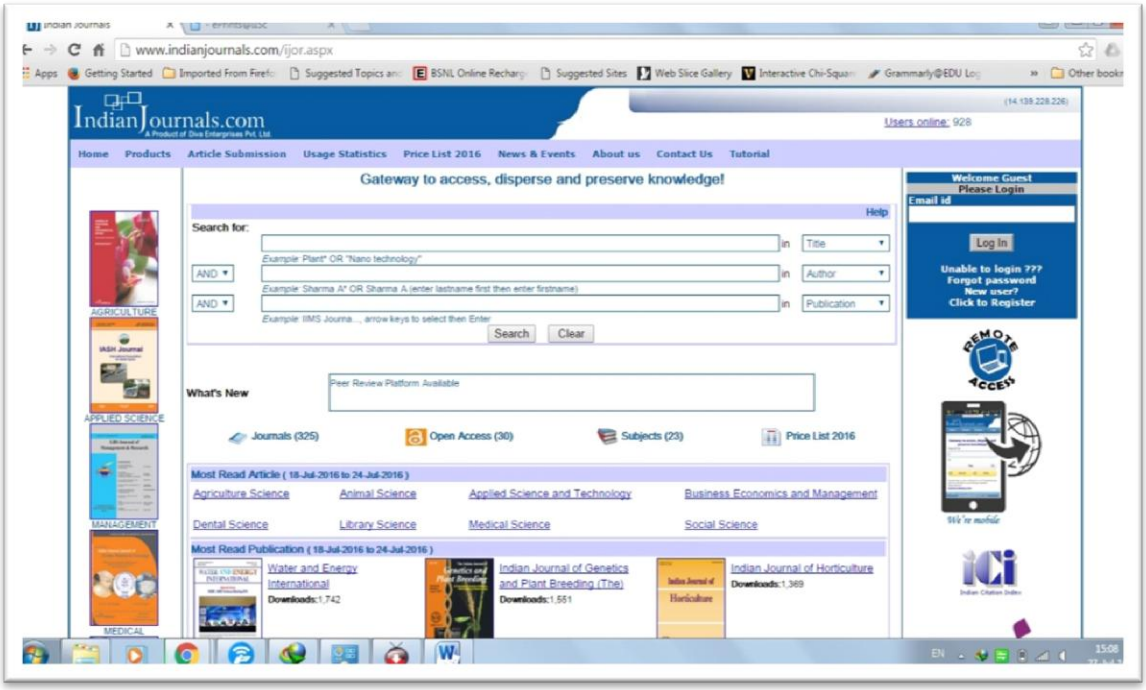


Fig. 1.7 Website of IndianJournals.com
(Source: www.indianjournals.com/ijor.aspx)

It provides a chance to preserve our research online, an international door to knowledge-sharing, a mode to generate interest in your field.

1.3.8 ePrints@IISc

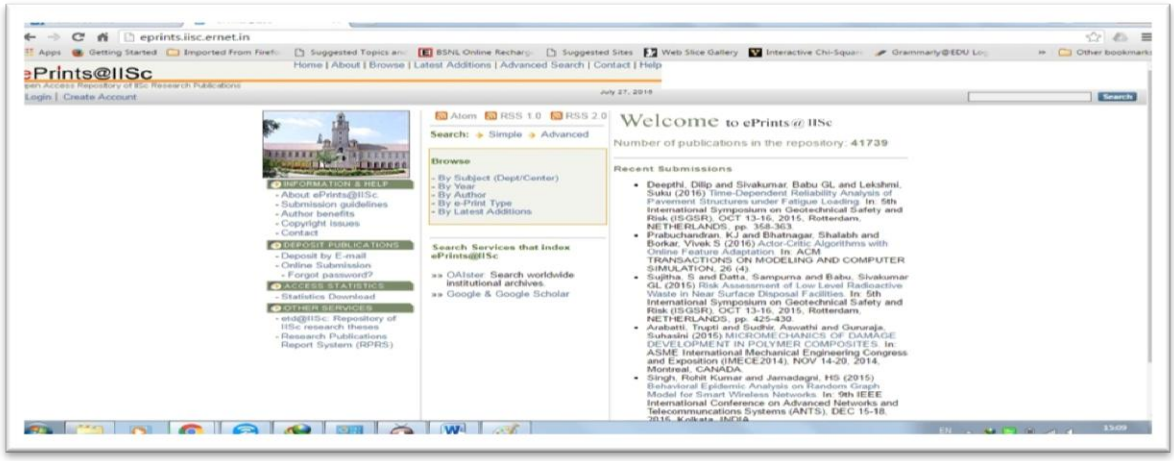


Fig. 1.8 Website of ePrints@IISc
(Source: eprints.iisc.ernet.in)

ePrints@IISc repository collects, preserves and disseminates in digital format the research output created by the IISc research community.

1.3.9 Indian Statistical institute

The ISI Bangalore center library was established in the year 1976 to meet the academic and research interests of the students, scholar, teachers and others.

Fig. 1.9 Website of Indian Statistical Institute
(Source: www.isical.ac.in)

It has one of the best collections of literature on Statistics, Mathematics, Quality Engineering/ Management and Library & Information Science in India.

1.3.10 Open J-Gate Informatics (India) Limited

Open J-Gate is a free database of open access journals, launched in February 2006, hosted by Informatics (India) Ltd.

Open J-Gate currently aggregates metadata from more than 4,000 OA journals published in the English language around the globe.

1.3.11 Open DOAR

Open DOAR is an authoritative directory of academic open access repositories. Each Open-DOAR repository has been visited by project staff to check the information that is recorded here.

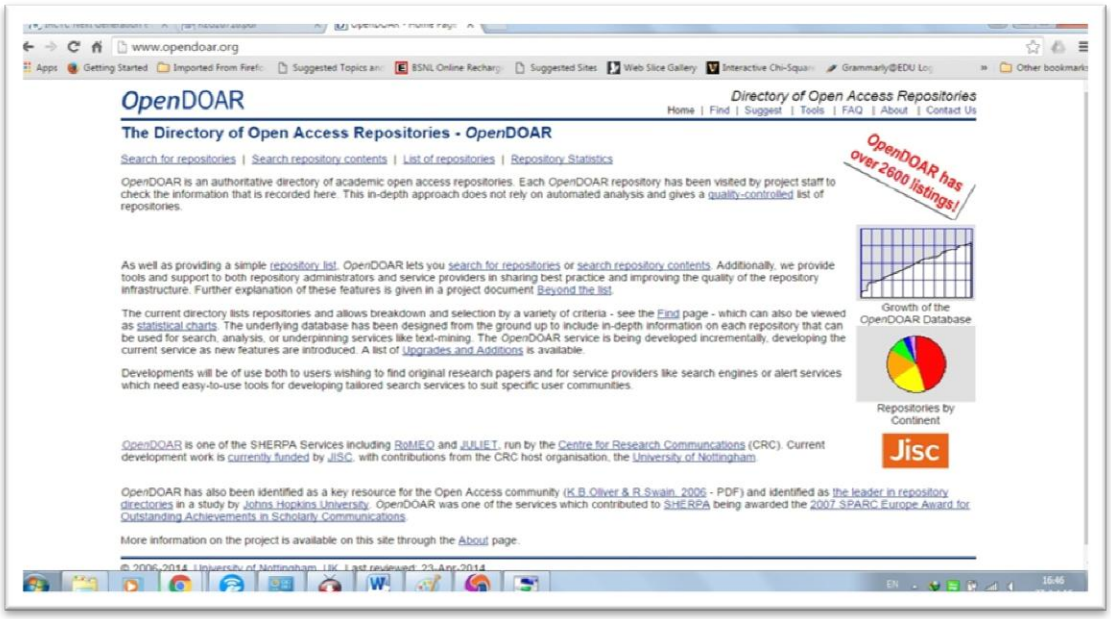


Fig. 1.10 Website of Open DOAR
(Source: www.opendoar.org)

This in-depth approach does not rely on automated analysis and gives a quality-controlled list of repositories.

1.4 Indian Council of Agriculture Research

The Indian Council of Agricultural Research (ICAR) is an apex organization for conducting and co-ordinating agricultural research. It has been at the forefront to lead agricultural revolutions in the country, making India not only self-sufficient in food but also with a surplus. The Indian Council of Agricultural Research (ICAR) is under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture is an autonomous organization, formerly known as Imperial Council of Agricultural Research. It was established on 16 July 1929 as a registered society under the Societies Registration Act, 1860 in theenactment of the report of the Royal Commission on Agriculture. The ICAR has its headquarters at New Delhi. The Council is the apex body for co-coordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. With 99 ICAR institutes and 53 agricultural universities spread across the country, this is one of the largest national agricultural systems in the world. Under the aegis of the ICAR, there are 28 state agricultural universities, four deemed-to-be universities and one central agricultural university, 261 Krishi Vigyan Kendras (KVKs: farm clinics) in the rural districts of the country for transfer of technology, and eight trainers training centres. For staff training and addressing research management issues, it has established an institute for human resource development called the National Academy of Agricultural Research Management (NAARM).

As a forward looking organization, fully realizing the emerging complex challenges, ICAR has set a vision to attain “Rainbow Revolution” covering the entire

spectrum of activities in agriculture which will make India a developed nation free of poverty, hunger, malnutrition, and environmental safety.

1.4.1 Research Centre

A research institute is an establishment endowed for doing research. Research institutes may specialize in basic research or may be oriented to applied research. Although the term often implies natural science research, there are also many research institutes in the social sciences as well, especially for sociological and historical research purposes. The establishment of Research Centers and Institutes are signs of entrepreneurial activities of faculty and academic units. Centers/Institutes are established for different reasons and bring different benefits.

1.4.2 Open Access Initiatives at ICAR

Open access momentum to research information has gained significance because the researchers and authors normally give away their intellectual property rights (copyright) to commercial publishers along with their research papers, technical bulletins, books etc., in return for recognition of their work but not the commercial income from it. Their interest is to widely disseminate the research output but publishers restrict the circulation often by putting high subscriptions to fulfill their commercial interests, creating an "impact barrier". On the other hand, researchers and scientific workers look for easy access to literature but most of the time, many of us do not have easy access to the majority of the literature created by our own community for lack of funds required to be paid to publishers, thus creating an "access barrier". These structural problems with

scholarly publishing have been addressed to some extent by KrishiKosh - a digital repository with Open Access mandate.

The Institutional Repository 'Krishi Kosh' is a collaborative project under the National Agricultural Innovation Project (NAIP) is an important step towards providing online access to the Indian agricultural information to researchers and scientists all over the world. It also culminated in launching of an Indian agricultural knowledge portal over the Internet for sharing its research information including Electronic Theses & Dissertations (ETD) with the rest of the world using the latest information and communication technologies.

1.5 Statement of the Problem

The problem chosen for the present study is entitled, "*OPEN ACCESS INITIATIVES: A STUDY OF NATIONAL RESEARCH CENTRE LIBRARIES OF ICAR".* The present study focuses on status, plans and policies of open access initiatives in selected national research centre libraries of ICAR. The study aims to find out the main purpose of open access and ascertain the availability of infrastructure and budget for open access initiatives in the libraries of National Research Centre of ICAR. The study also finds out the various challenges and hurdles in open access.

1.6 Need and Significance of the Study

Indian council of agricultural research is a prominent research institute in the agriculture field. This study will intend to evaluate the steps taken and available infrastructure for open access initiative by selected national research centre libraries of ICAR. It also discusses difficulties faced in open access initiatives and also various

opportunities for open access initiative by the selected national research centre libraries of ICAR. This study will help to know the different open access services provided by the libraries, it will also help to know various factors affecting open access process. National Research Centres of ICAR are very prominent institute and plays a vital role in the field of research and development. National Research Centre libraries have very special and rich collection.

After going through an extensive survey on available literatures it is found that there is no such kind of study has been conducted yet on libraries of National Research Centres of ICAR so this study is totally significant and relevant in the context of Open Access Initiatives. The result of this research reveals whether the librarians are aware of open access initiatives and assess the status of open access initiatives. It also reveals the main purpose of open access initiatives and documents which are open accessed.

1.7 Structure of the Thesis

There are seven chapters in this thesis arranged under the following chapters.

Chapter 1. Introduction: This chapter is introductory of the whole study. Starting from the role of libraries in research to the methodology adopted for this study was discussed in this chapter in detail. In between functions and features of the special library, open access, open access initiatives in India, about ICAR, statement of the problem, need and significance of the study were discussed.

Chapter 2. Review of Related Literature: The second chapter is presented the literature review related to the study. In this chapter, an attempt is made to review important

studies on open access and consortia of libraries to (or "intending to") justifying the need and relevance of the present study.

Chapter 3. Methodology: The third chapter is methodology which incorporates the various steps that was adopted by researcher to solve his research problems. This chapter is also divided into sub titles like introduction, objectives of study, hypothesis, scope and limitations of the study, sample selection and data collection.

Chapter 4. Open Access Initiatives: The Fourth chapter of this thesis consist theoretical part of Open Access Initiatives. In this chapter, the introduction of open access, open access practices, and history of open access is discussed. Major open access initiatives which are landmarks of open access initiatives are also presented in this chapter. This chapter also explains ways of delivering open access, salient features of open access literature, impact on libraries, OA application tools, and Open source software used in libraries.

Chapter 5. Analysis of Data and Interpretation: Tabulation, statistical analysis, interpretation, and graphical representation of the collected data from libraries are presented in this chapter.

Chapter 6. Discussion of Results: The result derived in the chapter "analysis of data and interpretation" is being discussed in this chapter in the light of analysis and observations made by the researcher.

Chapter 7. Findings, Conclusion and Suggestions: Presents the major findings and conclusion of the study. It deals with recommendations of the study and suggestion for further future research.

1.8 Conclusion

The present study provides a wide picture regarding the steps taken and availability of infrastructure for providing open access initiatives in National Research Centre Libraries of ICAR. It has become very difficult for a library to satisfy patrons with its own resources. It was in the light of this, the term Open Access emerged.

In this chapter researcher presents detail introduction of open access and various open access declarations and statements like Budapest Open Access Initiatives, Bethesda Open Access Initiatives and many more conducted in the world. Various open access initiatives in India like Indian Academy of Sciences, Indian National Science Academy etc were also discussed in this chapter. This chapter also contains statement of problem, need and significance of the study and structure of the thesis.

The next chapter is review of related literature which provides a clear picture of what has been thought and done previously and what remains to be done on the topic of research.

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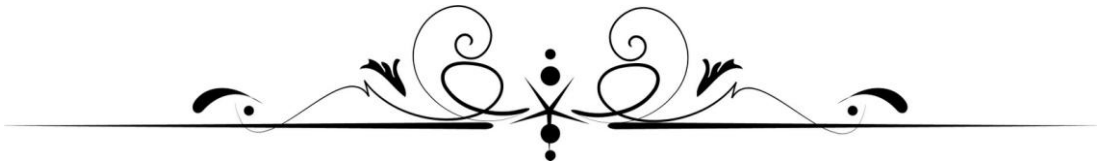
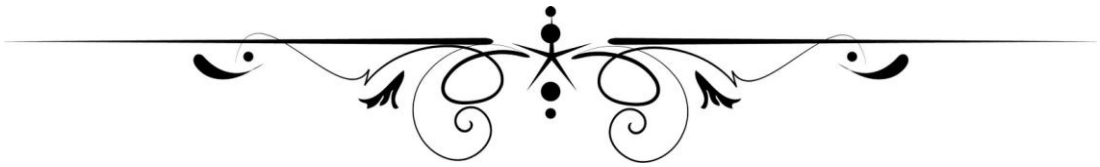


Chapter 2

Review of Literature



Chapter-2

Review of Related Literature

2.1 Introduction

A literature review is defined as an attempt to identify, locate and synthesize completed research reports, articles, books and other relevant materials. Review of related literature provides a clear understanding of what has been thought and done previously and what remains to be done on the topic of research. In this chapter, an attempt is made to review important studies on consortia of libraries to (or "intending to") justifying the need and relevance of the present study.

A literature review is a textual content of a scholarly paper, which entails the present expertise including significant findings, as well as theoretical and methodological contributions to a detailed topic. Literature reviews use secondary sources and don't report new or long-established experimental work. A tremendous amount of literature is on hand on 'Open Access Initiatives' in distinctive forms. It is not feasible to study all the available literature. However, selected books, as well as good journal's articles, have appropriate to the study been reviewed below. On the topic open access, many studies have been conducted worldwide. They have examined various difficulties, the process of open access and initiatives in addition to its particular elements and identified its importance with broad implications in the new information technology environment. Even as exploring and analyzing the repute of free and open access to scholarly literature, sources had been identified, which serve as a useful and practical tenet for open access.

Baich (2015) in his paper examine interlibrary loan requests for open access materials submitted during fiscal years 2012 and 2013 and to consider the implications of

open access for resource sharing. Borrowing requests for open access materials were quantitatively analyzed and compared to total borrowing requests and open access borrowing requests from the previous two fiscal years.

During the period studied, borrowing requests for open access materials increased, while overall requests held steady. The difficulty users have in navigating the online information environment makes it unlikely that ILL requests will decrease significantly due to the growing amount of open access material available.

This paper presents an update on previous research and provides contradictory evidence that the number of borrowing requests for open access documents continues to grow. Open access should be embraced as a help to resource sharing. This article is of great value for understanding the difficulties while sharing of open access materials.

Eve (2015) in his paper presents an overview of the current state of debates surrounding Open Access (OA) in non-STEM disciplines. This paper uses a selective literature review and discussion methodology to give a representative summary of the state of the art. Non-STEM disciplines persistently lag behind scientific disciplines in their approach to OA, if the teleology towards open dissemination is accepted. This can be attributed to a variety of economic and cultural factors that centre on the problem of resource allocation with respect to quality.

This paper will be of value to researchers, policymakers, funders, academics and publishers. The original aspect of the paper pertains to the identification of an anxiety of irrelevance in the humanities disciplines and a focus on "quality" in Open-Access publishing debates.

The work of **Fabian (2015)** gives a complex description and evaluation of open access adoption in the environment of the Czech Republic, from both the green road and golden road points of view. Data and conclusions in this paper are numerically supported by quantitative analyses from several relevant databases. The issue of open access has not been given appropriate attention in the Czech Republic. Therefore, most of the important activities have only recently been implemented, or are still underway. It is observed in this study that open access is still being completely ignored at the level of Czech state offices and funding agencies, which leads to scientific institutions learning of this phenomenon individually.

Compared to other Central European countries, the Czech Republic can be classified as average in certain respects, but it is no competition for developed West European and North American countries in terms of awareness, infrastructure and open access adoption.

This paper discussed open access phenomena in a developed country like Czech Republic and it helps to understand the open access adaptation process.

Fox and Hanlon (2015) in their paper explores the extent of visibility of researchers in African countries in the Open Access (OA) arena and aims to identify main causes of reduced uptake in OA in Africa. In this study extent of visibility is explored by quantitative analysis of institutional repository and OA journals data sets followed by qualitative analysis of OA foundation documents and literature on OA in Africa published mainly between 2003 and 2013.

In this study it is found that visibility in institutional repositories or OA journals for African researchers remains low. Causes include insufficient educational support for

librarians and administrators in required new roles; inability of national, organisational and technological infrastructures to support OA; impracticality of western-based and costly publishing models; and disincentives relating to intellectual property and researcher perceptions. Complex language and literacy issues also inhibit engagement. Recommendations include strong OA advocacy, development of support initiatives, integration of international knowledge for local conditions and vice versa, sensitive preservation of indigenous knowledge and development of mechanisms of funding and research assessment mechanisms, which are economically and technically viable.

In this study it is find that earlier attempts were made to raise awareness about the lack of uptake of OA in Africa. This paper shows that the situation has hardly changed and now requires urgent attention. Otherwise OA will not "become the default method for distributing new peer-reviewed research in every field and country" by 2022.

This study helps to understand the situation of Open Access in African countries and also shows the hurdles came in front of open access.

Kitchin, Collins and Frost (2015) The purpose of this paper is to examine funding models for Open Access (OA) digital data repositories whose costs are not wholly core funded. Whilst such repositories are free to access, they are not without significant cost to build and maintain and the lack of both full core costs and a direct funding stream through payment-for-use poses a considerable financial challenge, placing their future and the digital collections they hold at risk.

The authors document 14 different potential funding streams for OA digital data repositories, grouped into six classes (institutional, philanthropy, research, audience,

service, volunteer), drawing on the ongoing experiences of seeking a sustainable funding for the Digital Repository of Ireland (DRI).

There is no straightforward solution to funding OA digital data repositories that are not wholly core funded, with a number of general and specific challenges facing each repository, and each funding model having strengths and weaknesses. The proposed DRI solution is the adoption of a blended approach that seeks to ameliorate cyclical effects across funding streams by generating income from a number of sources rather than overly relying on a single one, though it is still reliant on significant state core funding to be viable. The detailing of potential funding streams offers practical financial solutions to other OA digital data repositories which are seeking a means to become financially sustainable in the absence of full core funding.

The review assesses and provides concrete advice with respect to potential funding streams in order to help repository owners address the financing conundrum they face.

Pinfield (2015) in his paper provide an overview of one of the most important and controversial areas of scholarly communication: Open Access publishing and dissemination of research outputs. It identifies and discusses recent trends and future challenges for various stakeholders in delivering Open Access (OA) to the scholarly literature. The study is based on a number of interrelated strands of evidence which make up the current discourse on OA, comprising the peer-reviewed literature, grey literature and other forms of communication (including blogs and e-mail discussion lists). It uses a large-scale textual analysis of the peer-reviewed literature since 2010 (carried out using the VOS viewer tool) as a basis for discussion of issues raised in the OA discourse. A

number of key themes are identified, including the relationship between "Green" OA (deposit in repositories) and "Gold" OA (OA journal publication), the developing evidence base associated with OA, researcher attitudes and behaviours, policy directions, management of repositories, development of journals, institutional responses and issues around impact and scholarly communication futures. It suggests that current challenges now focus on how OA can be made to work in practice, having moved on from the discussion of whether it should happen at all.

The paper provides a structured evidence-based review of major issues in the OA field and suggests key areas for future research and policy development.

Terras (2015) The purpose of this paper is to situate the activity of digitisation to increase access to cultural and heritage content alongside the objectives of the Open Access Movement (OAM). It demonstrates that increasingly open licensing of digital cultural heritage content is creating opportunities for researchers in the arts and humanities for both access to and analysis of cultural heritage materials.

The paper is primarily a literature and scoping review of the current digitisation licensing climate, using and embedding examples from ongoing research projects and recent writings on Open Access (OA) and digitisation to highlight both opportunities and barriers to the creation and use of digital heritage content from galleries, libraries, archives and museums (GLAM).

The digital information environment in which digitised content is created and delivered has changed phenomenally, allowing the sharing and reuse of digital data and encouraging new advances in research across the sector, although issues of licensing persist. There remain further opportunities for understanding how to: study use and users

of openly available cultural and heritage content; disseminate and encourage the uptake of open cultural data; persuade other institutions to contribute their data into the commons in an open and accessible manner; build aggregation and search facilities to link across information sources to allow resource discovery; and how best to use high-performance computing facilities to analyse and process the large amounts of data the author is now seeing being made available throughout the sector.

It is hoped that by pulling together this discussion, the benefits to making material openly available have been made clear, encouraging others in the GLAM sector to consider making their collections openly available for reuse and repurposing.

This paper will encourage others in the GLAM sector to consider licensing their collections in an open and reusable fashion. By spelling out the range of opportunities for researchers in using open cultural and heritage materials it makes a contribution to the discussion in this area.

This paper has pulled together, for the first time, an overview of the current state of affairs of digitisation in the cultural and heritage sector seen through the context of the OAM. It has highlighted opportunities for researchers in the arts, humanities and social and historical sciences in the embedding of open cultural data into both their research and teaching, whilst scoping the wave of cultural heritage content which is being created from institutional repositories which are now available for research and use. As such, it is a position paper that encourages the open data agenda within the cultural and heritage sector, showing the potentials that exists for the study of culture and society when data are made open.

Burns (2014) in his paper "academic libraries and open access strategies" state that academic libraries exist in competition with Google Scholar and other open access content. As a result, these alternate services with the patrons who use them may be disintermediated from the scholarly information seeking and retrieval process. For this study, bibliographic data was collected in 2010 from a systematic random sample of references on CiteULike.org and analyzed with three years of bibliometric data collected from Google Scholar. In his findings, he suggests that although scholars may choose to bypass libraries when they seek scholarly information, academic libraries continue to provide a majority of scholarly documentation needs through open access and institutional repositories. The results indicate that academic librarians are playing the scholarly communication game competitively.

This study of Burns helps to know disintermediated from the scholarly information seeking and retrieval process.

Farida, Tjakraatmadja and Firman (2014) The purpose of this paper is to attempt to build a conceptual model of Open Access Institutional Repositories (OAIR) in Indonesia academic libraries, viewed from knowledge management (KM) perspective. Literature-based conceptual analysis of previous studies related to open access, institutional repositories viewed from KM perspective.

The conceptual model of OAIR emphasizes three variables – people collaboration, process, and technology functions. These variables, with their many elements, are integrated together in orderto help the university or Higher Education (HE) institution in capturing its own scholarship produced as a whole. Besides, that integration aims at facilitating knowledge sharing so as to enrich knowledge content and to enhance

global access. A process chart of OAIR based on the conceptual model is built to illustrate knowledge content recruitment in Indonesia academic libraries.

The conceptual model proposed in this paper is not yet formally tested. It needs more research to understand the Indonesian context of OAIR to build a more accurate model, based on the experiences in developing and implementing OAIR in Indonesia HE institutions. Many academic libraries in Indonesia develop OAIR to increase the visibility of the scholarship of the parent HE institution. It is significant to view the practice of OAIR in the academic library from the KM perspective. KM implementation is almost unheard of in Indonesia universities. However, The OAIR phenomenon in Indonesia academic libraries can be viewed as a KM initiative.

The study of **Gul, Shah and Nisa (2014)** aims to focus on the application of Web 2.0 tools in Agriculture and Food Sciences open access journals. The changing trends in scholarly publishing processes have revolutionised the academic world. The shifting of academic journals to open access mode has been on the rise because of the numerous benefits associated with it. The high level of profitability reaped from open access titles has forced them to experiment with new and innovative technologies, including Web 2.0. The new shift in the form of Web 2.0 has siftedin to the open access journal world. Open access journals in the field of Agriculture and Food Sciences are growing and so are the features and functionalities within them. Because of these new innovative tools there is an urgent need to focus on their adoption.

Directory of Open Access Journals, being one of the growing open access journal directories, was selected for the purpose of data gathering. The journals selected for the study included those titles which were currently active.

The open access journal landscape in the field of Agriculture and Food Sciences is influenced by the Web 2.0 revolution. The degree of experimenting with Web 2.0 in open access journals in Agriculture and Food Sciences is evident and can prove an excellent platform for the dissemination of agricultural information in a more advanced mode.

The study will be helpful for journal administrators who belong to the field of Agriculture and Food Sciences to know the actual status of Web 2.0 adoption by the journals in their field. The study can also be helpful for journal administrators for the adoption of Web 2.0 tools to achieve a better, more innovative and interactive scholarly platform. It will also enable us to know how the new pioneering technology – Web 2.0 – can help to explore new innovative ways of managing information in the scholarly world in general and the Agriculture and Food Sciences discipline in particular.

This paper helps to understand the use of Web 2.0 in Agriculture and Food Sciences Open Access Journals which helps to achieve a better, more innovative and interactive scholarly platform.

Kaba and Said (2014) The purpose of this paper is to report the findings of a survey undertaken at Al Ain University of Science and Technology (AAU) to investigate and understand faculty awareness, use and perception of Open Access (OA) resources.

Design/methodology/approach – Using a Web-based survey questionnaire, data were collected from full-time faculty members teaching at AAU, United Arab Emirates (UAE).

The study found that faculty members possess a good knowledge and a positive perception of OA resources. They frequently use OA resources for teaching, learning and

research activities. However, the findings indicate those female faculty members are more likely to use OA resources than male faculty members. Faculty members with a high level of awareness or use are found to have a highly positive perception of OA resources. Presenting research reports at conferences and seminars or publishing research papers is weakly associated with the level of awareness and use of OA resources. The study revealed no association between the faculty member and their use of OA resources.

It is essential for scientific communities to understand the importance of OA resources and how to use them effectively in teaching, learning and research activities.

This kind of research is new to the Gulf Cooperation Council countries in general and the UAE in particular. The findings of the study may help to improve the awareness and the use of OA resources among scientific communities not only in the Arab countries but also around the world.

McGrath (2014) The purpose of this paper is to identify the arguments for the survival of interlibrary lending (ILL) in an open access environment.

That ILL will survive! Originality/value – Useful in being one of the few (only?) articles to counter the widespread assumption 'that everything is free on the web', thus leading to the demise of ILL.

Schopfel (2014) in his paper aims to provide an overview and update of what one actually knows about the impact of open access on inter-lending and document supply. A review of recent papers, published after the Berlin Declaration on Open Access in 2003. Everything seems to oppose document supply and open access. Open access has contributed to the recent decline of interlibrary loan (ILL) and document supply requests

but is not the only reason and probably not the most important. Open repositories and open-access journals have the potential to substitute ILL and document supply; yet for different reasons, including legal compliance, this substitution remains of limited interest. ILL and document supply institutions have started to integrate open access into their workflow and service provision in different ways, and the paper provides a conceptual framework with some perspectives for further service development. Paradoxically, relatively few papers make the link between open access and document supply, with empirical and/or conceptual elements.

This paper proposes a synthesis and opens perspectives for future development and research. It helps to know the knowledge regarding impact of open access in library resource sharing.

Schopfel, et al. (2014) Print theses and dissertations have regularly been submitted together with complementary material, such as maps, tables, speech samples, photos or videos, in various formats and on different supports. In the digital environment of open repositories and open data, these research results could become a rich source of research results and data sets, for reuse and other exploitation. The paper aims to discuss these issues.

After introducing electronic theses and dissertations (ETD) into the context of eScience, the paper investigates some aspects that impact the availability and openness of data sets and other supplemental files related to ETD (system architecture, metadata and data retrieval, legal aspects).

These items are part of the so-called “small data” of eScience, with a wide range of contents and formats. Their heterogeneity and their link to ETD need specific

approaches to data curation and management, with specific metadata and identifiers and with specific services, workflows and systems. One size may not fit for all but it seems appropriate to separate text and data files. Regarding copyright and licensing, data sets must be evaluated carefully but should not be processed and disseminated under the same conditions as the related Ph.D. theses. Some examples are presented.

The paper concludes with recommendations for further investigation and development to foster open access to research results produced along with Ph.D. theses.

ETDs are an important part of the content of open repositories. Yet, their potential as a gateway to underlying research results has not really been explored so far.

Xiao and Askin (2014) The purpose of this paper is to examine academics' awareness of and attitudes towards Wikipedia and Open Access journals for academic publishing to better understand the perceived benefits and challenges of these models. Design/methodology/approach – Bases for analysis include a comparison of the models, enumeration of their advantages and disadvantages, and investigation of Wikipedia's web structure in terms of potential for academic publishing. A web survey was administered via department-based invitations and list serves.

The survey results show that: Wikipedia has perceived advantages and challenges in comparison to the Open Access model; the academic researchers' increased familiarity is associated with increased comfort with these models; and the academic researchers' attitudes towards these models are associated with their familiarity, academic environment, and professional status.

The major limitation of the study is sample size. The result of a power analysis with GPower shows that authors could only detect big effects in this study at statistical power 0.95. The authors call for larger sample studies that look further into this topic.

This study contributes to the increasing interest in adjusting methods of creating and disseminating academic knowledge by providing empirical evidence of the academics' experiences and attitudes towards the Open Access and Wikipedia publishing models. This paper provides a resource for researchers interested in scholarly communication and academic publishing, for research librarians, and for the academic community in general.

Anderson (2013) This paper presents the rationale, common practices, challenges, and some personal anecdotes from a journal editor on the production, use, and re-use of peer-reviewed scholarly articles as open educational resources (OER). The scholarly and professional discourse related to open educational resources has largely focused on open learning objects, courseware, and textbooks. However, especially in graduate education, articles published in scholarly journals are often a major component of the course content in formal education. In addition, open access journal articles are critical to expanding access to knowledge by scholars in the developing world and in fostering citizen science, by which everyone has access to the latest academic information and research results. In this article, I highlight some of the challenges, economic models, and evidence for the quality of open access journal content and look at new affordances provided by the Net for enhanced functionality, access, and distribution.

In the 17 years since I graduated with a doctorate degree, the climate and acceptance of open access publishing has almost reversed itself. I recall a conversation

with my Ph.D. supervisor in which he argued that publishing online was not a viable option as the product would not have permanency, scholarly recognition, or the prestige of a paper publication. His comments reflect the confusion between online resources and those described as open access, but as well illustrate the change in academic acceptance and use of open access products during the past decade. The evolution from paper to online production and consumption is a disruptive technology in which much lower cost and increased accessibility of online work opens the product to a completely new group of potential users. In the case of OER these consumers are primarily students, but certainly access to scholars from all parts of the globe and the availability to support citizen science (Silvertown, 2009) should not be underestimated.

Bowen, Mattaini and Groote (2013) in their study find out that Open access publishing is increasing across many fields as a means of facilitating timely and equitable access to knowledge. To examine the extent of open access in social work serials publishing the authors gathered information on the subscription costs and access policies of 81 peer-reviewed social work journals. Although some trends toward increased access is noted, such as publishers' acceptance of university archiving policies, the majority of journals provided no or minimal open access. Their review located 11 social work journals that are fully open access. From this perspective, research findings should be broadly available regardless of socio-economic advantage or development status. Much of this research has been supported by public funding, and knowledge important to human social welfare should not be withheld as proprietary

Gasparyan, Ayvazyan and Kitas *(2013)* The article reflects on open access as a strategy of changing the quality of science communication globally. Successful examples

of open-access journals are presented to highlight implications of archiving in open digital repositories for the quality and suitability of research output. Advantages and downsides of gold, green, and hybrid models of open access operating in diverse scientific environments are described. It is assumed that open access is a global trend which influences the workflow in scholarly journals, changing their quality, credibility, and index ability.

Islam and Akter (2013) The purpose of the present study is to discuss the situation of OA in the developing world, with a focus on Bangladesh. The study also addresses why OA is important for developing countries and which initiatives have been taken in Bangladesh. Finally, we discuss some challenging issues of OA and suggestions on how to overcome these issues. It is rather obvious that developing countries have always faced a lack of research information and were unable to afford sufficient subscriptions to journals. The other side of the picture is the poor dissemination of the research outcome in the developing world. In Bangladesh, only three organizations have their institutional repository and have a reasonable number of local OA journals. We will identify some problems that impede the process of building open access IR, or more generally an OA environment in Bangladesh. We are convinced, however, that we will witness in the near future a sustainable growth of open access initiatives, with more open access literature and digital repositories.

Obaje and Amkpa (2013) in their paper focus on the use of Open Access Institutional Repository (OAIR) by academic staff of the University of Jos, issues and challenges. This is of interest as OAIR is in consonant with advances in information storage, retrieval and effective service provision in academic institutions. The study is

guided by four objectives and four research questions. In order to meet its objectives, a questionnaire was designed and administered to a sample of 256 to collect data, out of which 192, representing 75%, were found useful.

Analysis revealed that the level of familiarity of staff with the concept of OAIR is still low. It was also revealed that the sensitization had little impact on staff self-archiving as many staff had not uploaded their articles onto the OAIR. The visibility of University is likely to be enhanced with the establishment of OAIR. The major issues and challenges in the use of OAIR are the non-recognition of research articles uploaded on OAIR for promotion and the copyright law. Researcher recommended among others, that, more seminar should be organised to educate staff more on the concept of OAIR and the benefits for both authors and the institution, mediating self-archiving method can be adopted pending the time staff are familiar with the use of OAIR and can confidently do self-archiving, the University of Jos should make a policy recognizing research articles staff upload on OAIR for promotion exercise as well as educate staff to publish articles in journals where they could have right to make same available on OAIR, that is, where alternative publishing agreement between the author and publisher is possible.

Pandita (2013) in his paper growing trend towards open access publishing at the global level he undertakes the view to assessing the growing trend towards the open access publishing. He finds out that authors and good writers gradually overlook conventional means of publishing. This study revolves around the data taken from Directory of Open Access Journals (DOAJ), it is one of the largest open access databases.

In his findings, he concluded that participation of more than 120 countries in the Open Access publishing constitutes almost two-third of the world countries, validates the

fact that the trend towards Open Access publishing has already grown by hikes and bounds and is still on to make it a global order. While evaluating the figures of growth in open access publishing during the last decade, on average the OA Journals have grown at the rate of over 155% per annum with US and Brazil the two largest OA publishing countries. According to the author the growing trend towards open access publishing is going to comprehend entire globe by next couple of years.

Sahu and Arya (2013) Researchers and scientists produce a lot of intellectual assets in the form of research papers which can be used for the improvement of society and for additional research. Therefore, it becomes essential to make scholarship accessible to others. In the world of the internet, access to information is very fast and free, but still a large amount of information is only available at high prices. Because of this reason, libraries are incapable of providing satisfactory access to the literature of their fields to scientists. For the free flow of information, it becomes necessary to remove this financial barrier. The open access publishing model overcomes this problem by making research works freely available to institutions and individuals. Open access, by providing free, quick and current research literature to others accelerates the growth of research in the world. In this model, interested users can access information free of cost from anywhere in the world through the internet. "Open access" is a term used to describe a new method of access to the literature, that is, any reader has access to literature on the internet at no cost.

Open access publishing is gaining prominence day by day in India. There are many projects in progress with the support of government as well as private agencies. Authors are now publishing their papers in open access journals, IRs and by self-

archiving. Due to increasing efforts of India, the country has reached the 4th rank in OA journals publishing in the world. The survey showed that the awareness level of open access literature and initiatives among the Indian research community and scientists is low but is gradually increasing. Researchers are taking an interest in open access publishing. The leading organizations and institutions of medical sciences, science and technology are creating repositories and providing open access content. As of today, India is ranked 7th in the world after Brazil terms of number of IRs. India is contributing to R&D and avoiding duplicate efforts in research by providing free access to a variety of content through IRs and open access journals.

Trencheva and Todorova (2013) in their paper provide a comparative retrospective analysis of Bulgarian, Turkish and Croatian Open Access (OA) journals added in Directory of Open Access journals (DOAJ) in the period 2002-2013.

The study is focused on a brief review of definitions and descriptions of the OA as a global movement. In the study were analyzed the three main OA initiatives and was shown the difference between Golden Road and Green Road. The authors used the comparative approach and made a comparative study of the OA journals in Bulgaria, Turkey and Croatia and present the evaluation results and findings.

Qualitative and quantitative data for the study are collected by the DOAJ. The data are analyzed in terms of quantity and period, and the results are presented graphically and tabular and finally there are made major specific conclusions and recommendations.

The paper shows that OA in the digital space has an important position in scientific research. There are many discussion issues related to the problems of OA, but

overall study of OA to scientific information, and in particular comparative study of Bulgarian, Turkish and Croatian journals in the DOAJ does not exist at the moment.

This paper helps to understand the difference between golden and green road of open access and presented the result by analyzing the OA journals in 3 countries.

Xia (2013) This paper is an attempt to review various aspects of the open access divide regarding the difference between those academics that support free sharing of data and scholarly output and those academics who do not. It provides a structured description by adopting the Ws doctrines emphasizing such questions as who, what, when, where and why for information-gathering. Using measurable variables to define a common expression of the open access divide, this study collects aggregated data from existing open access as well as non-open access publications including journal articles and extensive reports. The definition of the open access divide is integrated into the discussion of scholarship on a larger scale.

Joshi, Vatnal and Manjunath (2012) in their article give the meaning and definition of open access. It throws light on emergence and development of open access initiatives and various declarations in the world. The types of open access and their characters are given. The gradual increase of journals in DOAJ is shown. The impacts of OA are various facts of the academic community and the challenges for OA are dealt. The OA initiatives in India are listed.

This literature helps to understand the basic, emergence and development of open access initiatives. It also helps to know about the various OA declarations held in the world.

Singh and Chikate (2012) the purpose of this paper is to report results of a study which investigated the growth of open access (OA) journals across the world with reference to the Asian region. Details of 117 OA journals were collected from the Directory of Open Access Journals (DOAJ) to determine the geographic distribution, the language of publication and growth of periodical year-wise. The study makes detailed analysis of four OA periodical published from India, Iran, Pakistan and Taiwan. The pattern of authorship and contribution according to nature of professional work were analyzed. The study reveals that most contributions were made by teaching professionals in comparison to working library and information officers. Single-authored contributions dominated (44 per cent) in all periodicals of the Asian region, indicating low amount of teamwork/collaborative contributions to library and information science (LIS) research by the authors of this region. To know the subject distribution of articles, the study was limited to 27 subfields within the broad spectrum of LIS. The findings of the study also indicate that there is varied distribution of topics within the Asian LIS literature published in OA journals. Most popular areas of writing among authors in OA journals have been found to be bibliometrics, webometrics, research productivity or research methods besides information seeking pattern, information need of users and digital libraries.

OA removes restrictions that exist on access to scholarly information and knowledge, it empowers the readers to read, download, distribute and make use of relevant literature, besides giving authors and their work fairly good visibility, readership and impact. The OA movement is gaining importance and the scholarly community is now realizing that tolled or subscribed access is creating a barrier and preventing their

work from wider accessibility and readership. A number of journals across the world are now being published in OA mode. The present study attempts to map the growth of LIS literature in OA journals with special reference to periodicals published from Asian countries. The finding of this sample study suggests that many countries are promoting OA journals. While USA ranks first in publication of OA journals in the world. Taiwan publishes the highest number of articles in Asia. Majority of OA journals are published in English, and English appears to be most popular language for communicating research information. Of the four OA LIS journals analyzed in detail, it is observed that single-authored contributions are most popular. Collaborative contributions to LIS research were not so evident among authors of the Asian community. The teaching professionals or LIS teachers contributed the greatest number of articles, except for the Indian journal ALIS, demonstrating that working professional are more actively involved in writing and they outnumber the teaching community. Contributions from research students in all OA journals have been fairly significant. The study further reveals that ALIS from India and JLIS from Taiwan carried the highest number of articles. Universities and LIS need to come forward to take a need-based approach to LIS research, suggesting ways for improving existing LIS services in their respective countries. Researchers interested to carry further investigation will have to adopt appropriate measures to overcome the limitations mentioned in the study. It is likely that some journals may not have been included in this directory. Researchers interested to carry further investigations will have to adopt appropriate measures to overcome these constraints.

Scope and limitation access to data and timely completion are the two vital factors for the success and accomplishment of the objectives of any investigation. Hence,

considering the vast range of literature from every geographical region and limited time to complete research, the present study adhered to the following limitations. The study covers in its scope literature published in the period of five years (accessed from March 28 to May 25, 2011, only). The study includes only those publications/journals contributed by authors in English. The study includes four OA journals having full-text articles in English, abstracts not included. It considers those publications primarily inclined and relevant to library and information services. The study includes only those O LIS journals listed or included in DOAJ.

The present study has been taken with view to analyze the growth of OA journals in LIS with special reference to Asian countries. While several studies have been conducted on growth and publishing of traditional LIS journals, the present study is perhaps an interesting attempt to make a comprehensive review of the phenomena. The finding of the recent study will be of interest to many LIS professionals, researchers and academicians as it demonstrates the growth of OA journals.

Spezi, et al. (2012) in their paper aims to report on the findings of the second phase of the behavioral strand of the EC-funded PEER project (http://www.peerproject.eu/). The paper seeks to explore authors' and readers' behaviours in relation to authors' peer-reviewed accepted manuscripts in open access repositories.

The research was undertaken using a mixed-method approach, involving the distribution of a survey by the 12 participating publishers to their authors in selected journal titles and a participatory workshop with European researchers from selected disciplinary areas.

Researchers' attitudes towards versions of published journal articles made open access via open access repositories may vary depending on whether researchers report behaviours from the perspective of an author or a reader. The research found that disciplinary cultures, norms and traditions shape authors' self-archiving behaviour and readers' use of those versions of journal articles held in repositories.

The paper provides a disciplinary reading of the findings and augments the understanding of how disciplinary culture and norms shape authors' and readers' behaviours in relation to self-archiving.

COAR (2011) emphasized that the interoperability of open access repositories is a dynamic piece of the e-research infrastructure being developed throughout the world. The real value of repositories lies in the potential to interconnect them to create a network of repositories. So that it can be reused by researchers. Interoperability is the technical bond that helps to achieve the goals of open access on the global level.

The paper identified major issues and challenges such as new content types, software and systems, consistent identification and terminology, language challenges and long-term sustainability of guidelines and standards that need to be addressed in order to encourage the assignation of the repository community and promotion a process that will lead to the establishment of a COAR roadmap for repository interoperability. The need for interoperability will continue to grow as we move into the future.

This paper helps to make repositories interconnected and create a network of repositories to make potential use of all the repositories.

Kennan (2011) in this paper Mary Anne Kennan examines why open access is not practiced by all researchers all the time and not encouraged by library managers. The

findings in the paper are built upon analyses of the literature and upon qualitative research using observation, document analysis, interview techniques and thematic analysis conducted as part of a Ph.D. study in two Australian universities. One of the universities had a long-standing institutional mandate to encourage OA and the other did not. In terms of findings, of the universities studied, the institution with the mandate not only had a far greater proportion of its research output in its OA institutional repository but also the researchers and authors interviewed there had a deep understanding of, and engagement with, issues surrounding not just scholarly publishing but also OA and other publishing options. Further, OA and the mandate policy were reported by university executives as providing benefits both to individual researchers and to the institution as a whole.

In analyzing the relationships and entanglements that exist between authors, universities, publishers and other actors we see how these reinforce the current publishing paradigm. While proposals for mandates are not new, this paper illustrates how one is acting in practice. It proposes that despite reservations among academic library managers a mandate can work in practice. Sometimes, a new actor, such as a mandate or deposit policy is required, to assist library and repository managers, to encourage authors to look beyond their existing frames and embrace OA.

Maio (2011) in his paper entitle "Towards a Reference Model for Open Access and Knowledge Sharing, Lessons from Systems Research" suggests that in the systems engineering domain open access policies are not widely adopted. This paper presents the rationale, methodology and results of an evidence-based inquiry that investigates the dichotomy between policy and practice in Open Access (OA) of systems engineering

research in the UK, explores entangled dimensions of the problem space from a socio-technical perspective, and issues a set of recommendations, including a reference model outline for knowledge sharing in systems research.

This paper presents some of the findings and recommendations of a study aimed at filling the gap between Open Access theory and practice. It introduces OAM, a near zero cost public environment to support the monitoring of open access policies and presents an example of 'reference model' for knowledge sharing in systems engineering.

Bernius (2010) in this paper aims at analysing the impact of open access (OA) on the creation, retrieval and transfer of scientific knowledge. In doing so, the focus is set on scientific research as one core function of higher education institutions. It also aims to identify potential advantages of OA over traditional subscription-based publishing models from the viewpoint of academic scientists.

The approach of this study can be classified as analytical conceptual research. First the SECI model of organisational knowledge creation is applied to knowledge management in science (with the university as an organisation). In a second step, the resulting framework is used to describe influences of OA on the management of scientific knowledge.

OA accelerates the creation and widens the dissemination of scientific knowledge. Subject-based repositories are suggested to provide the best conditions for retrieval of scientific knowledge. Furthermore, in terms of economic efficiency, OA has the potential to significantly decrease the costs of scholarly communication.

In this paper, the focus of the investigation is academic research. Thus in order to get the “big picture” the influence of openly accessible information on knowledge

management processes in teaching and administration should also be evaluated. The approach used in this paper seems to be suitable for such an analysis.

The paper adds a theoretically sound approach of analysing OA impacts to the existing literature in this field.

Shin (2010) in the paper explained that Korea has been at the forefront of the open access movement since 2003, with four nation-wide repositories built to date. This study seeks to review their current status and to make proposals for further progress.

The study reviews the current status of the four nationwide repositories in Korea and identifies their drawbacks and solutions.

Korea's repositories were all built and are operated by government agencies. Their software is superb in contrast with the small volume of contents accumulated. If those repositories are to be invigorated, coordinated efforts are required to publicise the objectives of the repositories, and to try to have all research outputs contributed to the repositories with the cooperation of the operating agencies and researchers.

The study suggests several strategies for invigorating Korea's nationwide repositories. If the strategies are implemented in a calm and orderly way, Korea's nationwide repositories are expected to be more successful.

Avemaria and Bolarinwa (2009) the purpose of this paper is to examine Nigerian academics' adoption of open access initiatives as authors and readers of scholarly resources. The study was necessitated by the growing need to have the number of Nigerian scholarly publications increased on the internet and accessible to scholars around the world through the use of open access initiatives.

This study is conducted to find out the extent of awareness and use of open access initiatives as authors and readers of scholarly works. It was revealed that the respondents were aware of the pre-print and open access journal initiatives than the post-print initiative. In terms of the use of open access initiatives, although the study revealed insignificant use among the academics, academics in sciences showed more promise of adopting open access initiative as authors and readers of scholarly resources than their counterparts in the humanities.

Unlike studies that assessed specific subject-based and institutional repositories that allowed for the search and extraction of depositors' names and characteristics, this particular study relied on respondents' responses as a source of their actual use of open access repositories.

This paper reveals those academics' perception and publishing culture, and not awareness, determines the extent of their use of open access initiatives in Nigeria.

Chantavaridou (2009) The purpose of this paper is to present the current situation regarding open access and institutional repositories (IRs) in Greece.

This paper reports on the development of IRs in Greece and discusses their content and the various access restrictions that apply to content. A questionnaire survey was used to identify current and future steps regarding open access from the IR managers' and library directors' perspective.

The paper finds that Greek IRs using DSpace and CDS Invenio software have been developed by libraries of academic institutions. The Berlin Declaration on open access has been signed by two academic institutions and one research institution, while another university will bring the matter to the Senate. Metadata harvesting is one point

that all respondents agreed on, although it seems that a national harvesting service will not be established in the near future. Furthermore, content availability at the moment seems to be hindered by fear of copyright infringement rather than financial charges, at least for ETDs.

Further research should be conducted in order to identify the rate of deposited published peer-reviewed research in IRs. Furthermore, a broader survey could show the thoughts and future plans of the total of Greek IRs, not just those using OAI-PMH or those with mixed content (gray literature and published research). Possible research topics could be the interoperability of IRs in order to build a national harvesting service and the access restrictions that are available for authors in each IR.

Chauhan and Kaur (2009) propound a national model for open access to scholarly literature. In their paper "A national model for open access to scholarly literature in networked environment" discusses various open access initiatives in India and abroad. They find out that various institutes through digital libraries and institutional repositories are providing free access to their literature over the Internet but that is not sufficient Government has to take influential steps to enhance the free flow of information in the country.

They discussed that since most of the research work are being carried out in the universities and research institutes, it enforced a need to share their research output within or outside the campuses. Therefore, all institutions have to embark upon self-archiving their research output for public use for this submission of electronic versions of all reports, theses, dissertations, project reports, learning objects, courseware, and proceedings,etc. should be made compulsory by Government statute. They also demand a

law by which self-archiving should be made mandatory, and Government should direct all academic and research institutions to submit their output in an identified National Repository. Finally, they concluded that Open Access bridges the gap of access to scholarly literature to the deprived learner living in remote areas.

Meera and Ummer (2009) in their paper comprehend the different concepts that are closely associated in understanding the open access journal movement. The study aims to demonstrate the methodology of compiling lists of open access journals in an academic library environment. A web-based service of this kind in select subjects of study (knowledge domains) ensures visibility for open access literature in the scientific community.

The study generates comprehensive lists of open access journals in mathematics and statistics, library and information science and economics. Popular search engines such as Google and Yahoo! are employed to identify open access journals that are available in the above-mentioned areas. Some open access platforms such as DOAJ, Open J-gate and EMIS are also identified as the popular source for open access journals.

Research findings indicate that there are quite a number of sources that provide access to open access journals, and they are scattered across the internet. The journal home page is the most authentic source for accessing the full-text articles at any given time. DOAJ and Open J-gate have been identified as the next two popular platforms from where open access journals can be accessed.

The study signifies the usefulness of a one-stop platform for accessing open access journals in a specific subject. Since they are free by virtue of being open source,

they can be accessed by anyone from any part of the world, irrespective of geographical barriers.

This study acts as a guide for librarians to initiate an easy-to-provide web-based service to users. It helps to understand the methodology of compiling lists of open access journals in an academic library environment

Sawant (2009) focused on the current scenario of open access journal initiatives in India. The main aim of her research was to gather the data related to open access journal initiatives in India with respect to its type, funding agency/host organization, full-text availability, article charges, etc. In her findings results shows that all 178 open access journals were peer-reviewed, indexed and abstracted in various indexing and abstracting services, listed with DOAR and O-Jgate.

Finally, in concluding this topic she finds that in India, there are more than 300 universities and institutions of higher learning and hundreds of research laboratories, both in the government sector and in the private sector, but there are only 178 open access journals and 33registered archives. The situation can turn dramatically if national donor agencies such as the Department of Science and Technology and the Department of Biotechnology, and heads of major research councils such as the CSIR, UGC decide that the results of all publicly funded research should be made available through self-archiving and encourage open access journal publishing initiatives.

Schopfel and Prost (2009) in their paper *"Document supply of grey literature and open access: an update"* examine the impact of open archive initiative on the document supply of grey literature.

The article is based on a comparative survey of five major scientific and technical information centres: The British Library (UK), CISTI (Canada), INIST-CNRS (France), KISTI (South Korea), and TIB Hannover (Germany).

All major document suppliers are quite deeply involved in the open archive movement, and this involvement has an obvious impact on the policy of acquisition, archiving and supply of grey literature (dissertations, reports, conferences etc.).

Shukla and Singh (2009) in there paper "Open access initiatives for agricultural information transfer systems in India" they present various facets of rich agricultural heritage while noting the challenges and their mitigation through access to information. The study attempts to review the need and current status of Open Access and its evolving equation with respect to Agricultural Information Transfer Systems in India. It also presents the facts collected through an Internet-based study of various organizations involved in the process of amelioration of agricultural information transfer system. The article explores the problems and strategies for 'Open Access' implementation with suggestions.

In final conclusion they find that the major problems affecting impact, quantum and quality of Indian agricultural research could be limitedaccess to information and insufficient visibility due to use of 'tolled access' information dissemination modes. Authors' understand that research should be disseminated, as widely as possible, to realize its impact.

The whole public-funded agricultural research establishment (scholarly publishing chain) not only in India but across the world would like to effectively deliver the knowledge generated within their systems to the intended users — stakeholders

within and outside agricultural research, education and extension systems which mainly include researchers, development specialists, extension workers, food processors, policy-makers, educators, students and farmers. The authors conclude with a firm conviction that formulation and implementation of 'Open Access' mandate within Indian NARS is not a distant dream.

Bjork et al. (2008) found that a number of scientific articles published in 2006 were 1,346,000, out of which 4.6 percent are from the yearly article output appearing in gold OA journals and 11.3 percent of articles are openly available in repositories (green OA), i.e. on personal web pages. However, awareness of open access publishing among authors and readers remains very low. They also observed that medical institutes are contributing more of their publications to open access journals in comparison to other institutions.

Sreekumar (2008) in his study finds that advances in science comprising the pure, applied, humanities and the social sciences historically vouch for the collaborative and the communicative processes involved in the scholarly world. This has been the practice the world over for centuries and this (has to) will continue to be so in future too. Scholarly communication by means of scientific journals, research reports, short communications (letters), conference/symposia proceedings, monographs etc. have gone so deep into the world of scientific communication since long and it has grown into an institution by itself.

The scholarly communication system has been, for the past several hundred years, largely monopolised by the publishers. An exemption here would be the learned society publishers, who mostly do not handle scholarly literature with a profit motive. Publishers

also take away the copyright of the author while accepting their manuscripts for publication, freely, and the paradox is that the author or his university/institute will not have access to the article unless they have a subscription to the journal. On the other side, the spiraling costs of scholarly journals and the shrinking library budgets are of grave concerns to the academic and research fraternity the world over. Open Access Initiatives are indeed poised to revolutionise the scholarly communication process where the copyright of the article will rest with the author himself, which is a large departure from the conventional publication process.

This paper attempts to highlight the importance of Open Access movement and gives an overview of the numerous OA initiatives and exemplary efforts that have taken place worldwide and those in India.

Turk (2008) in his study aims to provide a synthesis of available key information about the citation impact of Open Access journals in LIS and science in general. Citation impact is defined as a surrogate measure of citation counts.

Design/methodology/approach – Based on a literature review, this paper discusses the methodology of the data collections for citation counts. The literature review is structured to address the literature about citation impact of Open Access journals.

The literature review indicates that there is quite a uniform way about the methodology of citation counts and substantial research about the motivation for URL citations to LIS articles.

Nicholas, Huntington and Jamali (2007) in their research, examine the impact on usage of the journal Nucleic Acids Research (NAR) moving to an open access model. A major objective was to examine the impact of open access in the context of other

initiatives that have improved accessibility to scholarly journals. The study also aims to demonstrate the potential of deep log analysis for monitoring change in usage over time.

Data were gathered from the logs for the period 2003-June 2005 and analysed using deep log methods. The data were analysed to provide the following information on use: type of item viewed; usage over time; usage for individual journal issues; usage per type of article; age of article. Usage analyses were further examined with regard to the following user characteristics: subscriber/non-subscriber; referrer link employed, organisational affiliation; geographical location.

The analysis showed that the rise in use of NAR over the survey period (140 per cent) could largely be attributed to the opening up of the site to search engines and that the move to OA had a relatively small influence on driving usage up further (less than 10 per cent).

The study thoroughly analyses the usage data of a significant experimental open access journal and reveals the huge impact of search engines on driving up usage.

Boukacem and Scho¨pfel (2006) in their article seeks to investigate the impact of the open archive initiative on the document supply of grey literature.

The article is based on a comparative survey of five major institutions: The British Library (UK), CISTI (Canada), INIST-CNRS (France), KISTI (South Korea) and TIB Hannover (Germany).

All major document suppliers are deeply involved in the open archive movement, and this involvement has an obvious impact on the policy of acquisition, archiving and supply of grey literature (dissertations, reports, conferences, etc.).

This paper helps to understand the impact of open archive initiatives on the policy of acquisition, archiving and document supply of grey literature.

Klump, et. al. (2006) discussed the application of Berlin declaration of open access in data publication in their paper "Data Publication in the Open Access Initiative." The 'Berlin Declaration' was published in 2003 as a guideline to policy makers to promote the Internet as a functional instrument for a global scientific knowledge base. According to them, Data publication needs to offer authors an incentive to publish data through long-term repositories. Data publication also requires an adequate license model that protects the intellectual property rights of the author while allowing further use of the data by the scientific community. Scientific knowledge is ultimately derived from data; they examined more closely the beginning of this process, the issues of data sharing and data publication.

Data publications should be treated in analogy to 'traditional' publications. They may be downloaded and shared freely, as long as they are properly attributed, and they may not be used commercially. In concluding their paper, they give an idea of a publication system for scientific data needs to be supplemented by an adequate license model. That allows scientists to use the published data, create new works derived from the original data, and in turn publish their new works based on these data, always respecting the intellectual property rights of the original author and the principles of 'fair use.' The options available in the Creative Commons License System suit many fields of scientific research.

Berlin declaration is a major milestone in the field of open access. In this paper the author discussed the application of Berlin declaration of open access in data

publication. The paper helps to understand the various decisions taken regarding open access.

Davis, et al. (2008) discussed in their paper that to measure the effect of free access to the scientific literature on article downloads and citations. Design Randomized controlled trial. Setting 11 journals published by the American Physiological Society. Participants 1619 research articles and reviews. Main outcome measures Article readership (measured as downloads of fulltext, PDFs, and abstracts) and a number of unique visitors (internet protocol addresses). Citations to articles were gathered from the Institute for Scientific Information after one year. Interventions Random assignment on online publication of articles published in 11 scientific journals to open access (treatment) or subscription access (control). Results Articles assigned to open access were associated with 89% more full-text downloads (95% confidence interval 76%to 103%), 42% more PDF downloads (32%to 522%),and 23% more unique visitors (16% to 30%/6), but 24% fewer abstract downloads (-29% to -19%) than subscription access articles in the first six months after publication.

Open access articles were no more likely to be cited than subscription access articles in the first year after publication. Fifty nine percent of open access articles (146 of 247) were cited nine to 12 months after publication compared with 63% (859 of 1372) of subscription access articles. Logistic and negative binomial regression analysis of article citation counts confirmed no citation advantage for open access articles.

Open access publishing may reach more readers than subscription access publishing. No evidence was found of a citation advantage for open access articles in the

first year after publication. The citation advantage from open access reported widely in the literature may be an artifact of other causes.

Xia (2008) endeavored to evaluate the influence of the disciplinary culture of depositing scholarly works in subject-based repositories and the eventual deposition in an institutional repository. It is find in this study that there is no correlation between the disciplinary culture of past use of subject-based repository and the present practice of self-archiving in an institutional repository. In other words, academics that have used subject-based repositories did not resort to using institutional repositories when they were introduced in their universities.

This study reflects the correlation between the deposition of scholarly works through subject based and of self archiving. Universities were preferred subject based deposition of scholarly works instead of self archiving in an institutional repository.

Ghosh and Das (2007) in their case study, "open access and institutional repositories in developing countries in the special context of India" they discussed the usefulness of open access among various institutions in India. They find that various open access initiatives have been undertaken and are operational, many are in the developmental stage, and some initiatives have also been taken in the area of metadata harvesting services. They concluded that future of open access in India was dependent upon a proper policy and developing a proper framework. In their suggestion implementation of open access, LIS professionals should play a proactive role in the growth of collections in institutional repositories.

The paper provides an overview of the present status of open access and institutional repositories in developing countries.

Haider(2007) The paper seeks to reconsider open access and its relation to issues of "development" by highlighting the ties the open access movement has with the hegemonic discourse of development and to question some of the assumptions about science and scientific communication upon which the open access debates are based. The paper also aims to bring out the conflict arising from the convergence of the hegemonic discourses of science and development with the contemporary discourse of openness.

The paper takes the form of a critical reading of a range of published work on open access and the so-called "developing world" as well as of various open access declarations. The argument is supported by insights from post-development studies.

Open access is presented as an issue of moral concern beyond the narrow scope of scholarly communication. Claims are made based on hegemonic discourses that are positioned as a priori and universal. The construction of open access as an issue of unquestionable moral necessity also impedes the problematisation of its own heritage.

This paper is intended to open up the view for open access's less obvious alliances and conflicting discursive ties and thus to initiate a politisation, which is necessary in order to further the debate in a more fruitful way.

Krishnamurthy (2007) The purpose of this paper is to describe the open access and open source movement in the digital library world.

A review of key developments in the open access and open source movement is provided. Open source software and open access to research findings are of great use to scholars in developing nations. This paper provides useful information about software for institutions introducing digital library concepts.

Bist and Mohanty (2006) finds in their study that Open access is a new trend in scholarly communication which aims at providing free access to scholarly literature over the internet and has gained enormous momentum in the recent years. Although OA started and has grown from the pockets of regional initiatives in the developing countries, it is appealing to developing countries and is spreading throughout the world quickly facilitated by common technical standards and open source software. OA endeavors to reduce the price and permission barriers to scholarly communication and the scholarly literature are freely accessible now without any hindrance.

This paper outlines the OA concept and specific Indian initiatives are mentioned and described. In addition, this paper also evaluates the OA movement in India and concludes with suggestions and recommendations for improving the OA scenario in India.

Fernandez (2006) Open access initiatives defined in this paper are based on interviews with information professionals responsible for creation and maintenance of online research repositories in India. Barriers to setting up institutional repositories are identified in this paper. Special features are described. Based on participant feedback a list of best practices is presented. The study has definite implications for the role of Canadian librarians in the promotion of Canadian research.

Hirwade and Rajyalakshmi (2006) highlighted the features of open access (free of charge, compatible with copyright, peer review, etc.) and the two vehicles, namely, open access journals and open access archives. She analyzed the open access initiatives in India and found a large opportunity for open access publishing in India but still the number of registered archives is very low. However, Indian scientific communities and

organizations like the Indian Academy of Sciences, Indian Institute of Science, Indian National Science Academy, NISCAIR, INFLIBNET, etc. are now actively taking the initiative towards the creation of IRs and providing open access to their publications.

McCulloch (2006) Aims at providing a broad overview of some of the issues emerging from the growth in open access publishing, with specific reference to the use of repositories and open access journals.

A paper largely based on specific experience with institutional repositories and the internationally run E-library and information science (LIS) archive.

The open access initiative is dramatically transforming the process of scholarly communication bringing great benefits to the academic world with an, as yet, the uncertain outcome for commercial publishers.

Outlines the benefits of the open access movement with reference to repositories and open access journals to authors and readers alike and gives some food for thought on potential barriers to the complete permeation of the open access model, such as copyright restrictions and version control issues. Some illustrative examples of country-specific initiatives and the international E-LIS venture are given.

Birdie (2005) in his paper reveals that Library Consortia evolved as a group activity over the years to empower the collective bargaining with publishers. The libraries felt the urge to collaborate not only for viable economics but also for enhanced information access and also to utilize the technology for resource sharing. Consortia and bargaining are considered to be complimentary to each other and this has necessitated the librarians and publishers to strike a relationship for a better understanding of budget distribution.

The author revealed that in a developing country like India, it is absolutely necessary to keep a check on the optimum utilization of allocated budget in any library. How far the collaborative gesture will help the libraries to achieve their target of accessing unlimited information in limited budget? The concept of Consortia practice has been discussed in only a small percentage of libraries in India, and can this be a yardstick to conclude whether the Consortia culture has really caught up aggressively or should we admit that we have a long way to go? Consortia that work together faces an array of challenges yet may also reap significant rewards. In this paper, the author attempted to highlight the pros and cons, advantages and pitfalls, when consortia collaborate.

E-publishing has taken the lead and while the consortia has been in support of e-access to information; it has also created a situation to initiate a more meaningful access to information by way of promoting, Open Access‟ . An easy transition for libraries, which are yet to join a consortium. An active consortium has a team of librarians who collaborate professionally to make the consortium succeed. The same level of collaboration is shifted to include the scholars and researchers along with publishers in initiating the "Open Access" mechanism.

The author also discussed the role of librarians in this transition of collaboration, to enumerate the expectations and responsibilities envisaged in support of the changed scholarly communication.

Schroter, Tite and Smith (2005) To explore authors' attitudes towards open access publishing and author charges, their perceptions of journals that charge authors, and whether they would be willing to submit to these journals. Design Semistructured telephone interviews. Participants 28 randomly selected international authors who

submitted to the BMJ in 2003. Results Authors were more aware of the concepts of open access publishing and author pays models than previously reported. Almost all authors supported the concept of open access, but few had submitted to an open access journal, other than BMJ. Reasons for not submitting included lack of awareness of which journals publish with open access, and journal quality taking a higher priority in decision making than the availability of open access. Authors disliked the idea of author charges without institutional support and were concerned about implications for authors from developing countries and those without research funding. However, many said they would probably continue to submit to journals they perceived as being of high quality even if they charged authors. Conclusions Authors consider perceived journal quality as more important than open access when deciding where to submit papers. New journals with open access may need to do more to reassure authors of the quality of their journals.

Antleman (2004) in his earlier research discovered factors that determine the adoption of open access initiatives as existing scholarly publication culture, scholars' perception of electronic publishing and availability of an influence mechanism to take up new electronic publishing models. Considering Antleman's revelation, it becomes necessary to assess factors that determine the extent to which Nigerian academics are adopting open access initiatives and since the need to have access to research emanating from Nigeria on the internet through the open access initiatives cannot be over emphasized. This is due to the unprecedented ways these initiatives have opened up the documentation and dissemination of scholarly publications.

In this paper Antleman (2004) has proved how articles published in open access journals have more academic impact than those published in paper journals.

Roy, Biswas and Mukhopadhyay (2003) studies and highlights the current state of open access institutional digital repositories (IDRs) of India. It describes and compares characteristics of all institutional digital repositories regarding content types, repository type, the number of records, software used; disciplines covered, languages, technical and operational issues, and policy matter. Lastly, key findings have been highlighted along with suggestions for further development of IDRs in the Indian context.

The study suggests several strategies for improving nationwide growth of repositories incompatible with the global standard. As almost all the Indian IDRs are based on open standards and open source software so surely there is scope for developing a 'Best Practice Guidelines' for designing institute-oriented IDR.

The study helps to identify several key issues such as contents quality, metadata standards, preservation technique, workflow pattern, customization and technical specifications of software, copyrights policy, OAI-PMH compatibility, etc. This study finds that if strategies are implemented and policies are formulated in a calm and orderly way, Indian's repositories are expected to be more successful.

2.2 Conclusion

After going through these 58 literatures, it has been found that open access to scholarly literature was first originated in 2001 in first conference related to the concept which one is held at Budapest (Budapest Open Access Initiative). There are lots of studies done concerning open access in different countries, trends in open access initiatives and also on some issues and challenges related to open access movement.

Many studies reveal the various models of open access initiatives and problems in populating and maintaining the repositories.

Some emphasis on the copyright issues, author's awareness to open access, author's concern to self-archive, and a few of them describe various platforms on which open access repositories are based.

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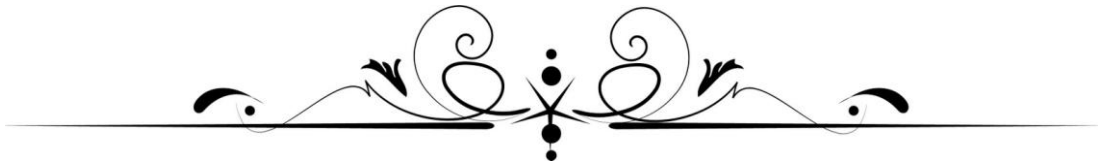
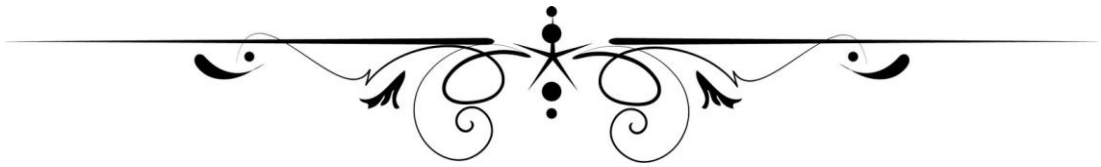


Chapter 3

Methodology



Chapter-3

Methodology

3.1 Introduction

The process of solving a research problem systematically is known as Research Methodology which incorporates the various steps that are adopted by researchers to solve their research problems. Researchers need to know how to measure central tendency or the standard deviation, how to develop certain tests and also need to know most relevant methods and technique for their study. They also need to aware of the assumptions which are based on various techniques as well as they need to know the criteria which help them to decide that specific procedure and techniques will use in their study. Before implementation a researcher has to expose the research decision to evaluation and he has to clearly specify about his decisions and reason behind selecting them.

The present study is focused on to identify the steps to be taken and planning of open access initiatives in the libraries of National Research Centre of ICAR. The study is focused on evaluation and assessing the status and policies of open access initiatives, to find out the main purpose of open access and to identify the documents and services that are open accessd in the libraries of National Research Centre of ICAR.

This chapter deals with objectives, hypothesis, scope and limitations of the study, sample used for the study, data collection method and data collection procedure and statistical methods used.

3.2 Objectives of the Study

The aim of the study is to assess the status of open access initiatives and what steps should be taken to implement it completely. The following specific objectives are identified to achieve the above aim.

1. To evaluate and assess the status and policies of open access initiatives in all research centre libraries of ICAR.
2. To find out the main purpose of open access.
3. To identify the type of documents and services those are open accessed.
4. To ascertain the availability of infrastructure and budget for open access.
5. To find out the various challenges and hurdles in open access.

3.3 Hypotheses of the Study

The following hypotheses are formulated based on aforesaid objectives of the study.

H_1: Open access services are provided in most of the National Research Centre libraries of ICAR.

H_2: All libraries of National Research Centre have a policy for open access.

H_3: Most of the National research centre libraries are providing open access services for exchange of information.

H_4: There is sufficient availability of budget and infrastructure for open access services in most of the National Research Centre Libraries.

H_5: Lack of technical manpower is the main hurdle in providing open access services in the libraries selected for the study.

3.4 Scope and Limitations of the study

Indian Council of Agricultural Research has 15 National Research Centers in all over the country. The scope of the study covers 11 national research centre libraries of ICAR all over the India. As the title suggests, "*OPEN ACCESS INITIATIVES: A STUDY OF NATIONAL RESEARCH CENTRE LIBRARIES OF ICAR",* the study is confined to National Research Centre libraries of ICAR. The total population of survey comprises librarians of selected National Research Centre libraries of ICAR.

Table 3.1: List of National Research Centers of ICAR

Srl. No.	RESEARCH CENTERS	PLACE	STATE
1.	National Centre for Integrated Pest Management	NEW DELHI	NEW DELHI
2.	National Research Centre for Banana	TRICHI	TAMIL NADU
3.	National Research Centre for Citrus	NAGPUR	MAHARASHTRA
4.	National Research Centre for Grapes	PUNE	MAHARASHTRA
5.	National Research Centre for Litchi	MUZAFFARPUR	BIHAR
6.	National Research Centre for Pomegranate	SOLAPUR	MAHARASHTRA
7.	National Research Centre on Camel	BIKANER	RAJASTHAN
8.	National Research Centre on Equines	HISAR	HARYANA
9.	National Research Centre on Meat	HYDERABAD	TELANGANA
10.	National Research Centre on Mithun	MEDZIPHEMA	NAGALAND
11.	National Research Centre on Orchids	PAKYONG	SIKKIM
12.	National Research Centre on Pig	GUWAHATI	ASSAM
13.	National Research Centre on Plant Biotechnology	NEW DELHI	NEW DELHI
14.	National Research Centre on Seed Spices	AJMER	RAJASTHAN
15.	National Research Centre on Yak	WEST KEMANG	ARUNACHAL PRADESH

Table 3.2: List of National Research Centers of ICAR Selected for Study

Srl. No.	RESEARCH CENTRES	PLACE	STATE
1.	National Centre for Integrated Pest Management	NEW DELHI	NEW DELHI
2.	National Research Centre for Banana	TRICHI	TAMIL NADU
3.	National Research Centre for Citrus	NAGPUR	MAHARASHTRA
4.	National Research Centre for Grapes	PUNE	MAHARASHTRA
5.	National Research Centre for Litchi	MUZAFFARPUR	BIHAR
6.	National Research Centre for Pomegranate	SOLAPUR	MAHARASHTRA
7.	National Research Centre on Camel	BIKANER	RAJASTHAN
8.	National Research Centre on Equines	HISAR	HARYANA
9.	National Research Centre on Meat	HYDERABAD	TELANGANA
10.	National Research Centre on Plant Biotechnology	NEW DELHI	NEW DELHI
11.	National Research Centre on Mithun	MEDZIPHEMA	NAGALAND

3.5 Sample selection and data collection

3.5.1 Sample Used for the Study

There are 15 National Research Centers of ICAR in all over the India. Out of the 15National Research Centers, 11 research centres has been selected for study. Therefore this study was based on the data collected from these 11 National Research Centre libraries:

1. National Centre for Integrated Pest Management, New Delhi (NRCPM)
2. National Research Centre for Banana, Trichy (NRCB)
3. National Research Centre for Citrus, Nagpur (NRCCt)
4. National Research Centre for Grapes, Pune (NRCG)
5. National Research Centre for Litchi, Muzaffarpur (NRCL)
6. National Research Centre for Pomegranate, Solapur (NRCP)
7. National Research Centre on Camel, Bikaner (NRCC)
8. National Research Centre on Equines, Hisar (NRCE)
9. National Research Centre on Meat, Hyderabad (NRCMt)
10. National Research Centre on Plant Biotechnology, New Delhi (NRCPB)
11. National Research Centre on Mithun, Medziphema (NRCM)

Questionnaire has been distributed to all these research centre libraries. But out of these 11 National Research Centers 1 National Research Centre that is National Research Centre for Meat, Hyderabad was not responded. So this study is limited to 10national research centre libraries of ICAR.

The data was collected during the period of 2015-2016. For this librarian of selected National Research Centre Libraries were selected.

3.5.2 Sample Population

Table 3.3: Sample Population

Category	Questionnaire Distributed	Questionnaire Returned	Response rate
Librarian	11	10	90%

Above table shows that out of 11questionnaires distributed 10 filled questionnaire were returned. So a completely filled 10 questionnaires were formed the sample for the study.

3.5.3 Sources of Data

Both primary and secondary data were collected for the present study. Primary data were collected through questionnaire administered to librarians and library incharge of National Research Centre Libraries of ICAR. Besides this, for personal observation, the investigator visited libraries and discussion were made with the librarians of National Research Centre Libraries of ICAR. The Secondary data were collected from the National Research Centre brochures, websites, and periodicals, published and unpublished research reports.

3.5.4 Research Tools

Questionnaire has been used as research Tool for the collection of data.

A questionnaire is a written list of questions, the answers to which are recorded by respondents, Questionnaire are extremely flexible and can be used to gather

information on almost any topic from a large or small number of people. The questionnaire used in this study can be found in Appendix 'A'.

3.5.5 Data Collection Procedure and Statistical Methods Used

For data collection, the structured questionnaires were sent to concerned directors of NRC's by post and also visited some NRC's personally. During these visits close observation of libraries has been done. Some of the data will also collected by means of surveying various institutional documents (including annuals reports, procedure guidelines, and brochures, Websites and etc.). Necessary discussions were also made with the librarians and library incharge of concerned libraries. Some of them asked more time to fill the questionnaires and self-addressed stamped envelopes were given to them. Some respondents sent back the questionnaires through e-mail.

3.5.6 Statistical Methods used for the Study

After collecting data, the next step of every type of research is to analyze and presentation of data in tabular and another suitable form. To find suitable techniques and tools is of a vital importance for successful research. For the present study, the researcher with the help of various literatures developed the questionnaire on the "Open Access Initiatives: A Study of National Research Centre Libraries of ICAR". The data collected using the tools selected for the study was analyzed using Microsoft Excel. Tables and graphs were employed as and when required for analysis and interpretations of data.

3.5.7 Microsoft Excel

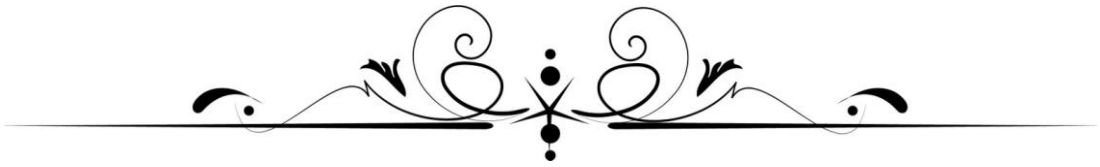
Excel is an Electronic Spreadsheet Program. An electronic spreadsheet is a computer software program that is used for storing, organizing and manipulating data. Electronic spreadsheet programs were originally based on paper spreadsheets used for accounting. As such, the basic layout of computerized spreadsheets is the same as the paper ones. Related data is stored in tables - which are a collection of small rectangular boxes or cells organized into rows and columns. Current versions of Excel and other spreadsheet programs can store multiple spreadsheet pages in a single computer file. The saved computer file is often referred to as a workbook and each page in the workbook is a separate worksheet.

3.5.8 Reference Style

American Psychological Association (APA) style is used for citation to cite the sources in the study at the end of each chapter and also in bibliography mentioned at the end of the thesis. The study followed APA Format 6th Edition (2006) of citation to cite the sources.

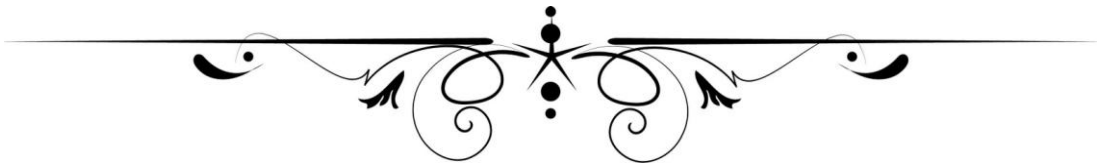
3.6 Conclusion

In this chapter discussed about objectives, hypotheses, scope and limitations of the study, sample selection and data collection. The next chapter contains open access practices, open access history and various landmarks in open access initiatives.



Chapter 4

Open Access Initiatives



Chapter 4

Open Access Initiatives

4.1 Introduction

The academic and the scientific fraternity in India, since the beginning of Open Access movement worldwide, have been striving its best in promoting and scouting for the cause of open access and unrestricted access to scholarly literature. India also has been able to convince the international community, with an array of local, national, regional as well as international initiatives, taken up in different parts of the country. These include publishing of open access journals, setting up of open access archives (institutional repositories), configuring and commissioning of open access archive harvester service, providing open coursewares to the academic world, imparting of training programs on E-publishing of journals as well as on institutional repositories etc. Some of the commendable activities such as the OA journals of the India Academy of Sciences (IAS), e-prints@iisc, ldl@drtc, open MED and the indMed services of NIC New Delhi, efforts of Med Know publications, the e-journal initiatives and archives at INS A, IIT Delhi, Raman Research Institute, NIT Rourkela, Vidyanidhi etc. deserve special mention [Open Med]. From the corporate world, the OPEN J- Gate open access journals portal service is a laudable service accessible worldwide [OPEN J-Gate].

Open access to information and knowledge is an innovative mode of scholarly communication aimed at the achievement of universal access to information and knowledge. While open access helps digital inclusion of citizens in developing countries

by bringing within easy reach full-text contents and development related literature, the Digital Library remains a knowledge repository of such citizens, indigenous people, communities and institutions. Open access to knowledge is a model adopted by many international and intergovernmental forums, such as the World Summit on the Information Society (WSIS), for disseminating full-text contents to online communities.

Connecting users with the information they need is an essential function of a good scholarly information system, and free access to information is central to its effective functioning. Therefore supporting policies/procedures that promote unrestricted access to information should be high on the agenda of leading institutions that are concerned with intellectual pursuits, particularly in developing countries like India. In this context, Open Access. Free and Open Source Software (FOSS) and Copyright and topics of considerable importance.

A first approximate definition of the term 'Open Access' is free access to knowledge at no charge to the user. Open Access on the part of the three main groups of actors, namely authors, publishers and libraries, and this understanding, in turn, is influenced by their specific experiences, expectations and fears with respect to knowledge dissemination.

An open access publication is one that meets the following two conditions:

1.The author(s) and copyright holder(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, perform and display the work publicly and to make and distribute derivative works in any digital medium for any reasonable purpose, subject to proper

attribution of authorship, as well as the right to make small numbers of printed copies for their personal use.

2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving

Open access means online access to scholarly publications on the internet, particularly peer-reviewed journal articles, without access charges to individual researchers or libraries. This excerpt from the write-up "open access: Restoring scientific communication to its rightful owners" in the European Science Foundation Policy Briefing. No. 21, April 2003, provides a representative view of open access: "open access to scientific articles means online access without access-charge to readers or libraries. The second key property of open access is that the researcher retains the copyright to his/her research article, but consents in advance to its unrestricted reading, downloading, copying and sharing by any other user.

The attitudes of academic authors are characterized by the different cultures of their disciplines and offer a heterogeneous picture, as the following examples will show.

- **Natural and Life Sciences** In the natural and life sciences, the academic journal is the relevant medium. As users, however, natural and life scientists increasingly come up

against its limitations. Free access for the individual researcher via library subscriptions is no longer guaranteed as subscriptions are being cut back severely due to cost increases on the one hand and reduced library budgets on the other. As subscriptions decline, so does the number of readers and thus the visibility of research results within the scientific community. A novel area addressed by the Berlin Declaration is that of access to raw and primary data, which to date scientists have generally closely guarded and kept under lock and key. Advocates argue that Open Access could contribute to good scientific practice through the dissemination of these data, which could be of increasing relevance in the natural and life sciences in view of a number of spectacular cases of scientific fraud in recent years.

- **Humanities and Social Sciences** For historians, philosophers, philologians and linguists, archaeologists, musicologists, as well as jurists and economists, the printed book continues to be the primary medium for disseminating research results. In these disciplines, online media are used primarily as research instruments. Access is in principle guaranteed, if not in the local library, then with some delay via inter-library-lending schemes or document delivery from other libraries. Instead of concrete access, the emphasis in the humanities and social sciences is on the potential of electronic publishing, for example, greater publication speeds, the uniting of different media (text, pictures, speech, film etc.) and the development of new 'types of text' (hypertext). Academics in these disciplines are thinking not so much of replacing the print medium as of usefully supplementing it. While Open Access is welcomed as a basic principle of academic information infrastructure, it is not a primary goal in itself.

- **Publishers,** At first sight, the publishers' understanding of Open Access seems unambiguous: commercially damaging and, at worst, life-threatening since income is traditionally generated precisely via access. In particular, it is alleged that Open Access means lack of quality assurance. Publishers' actual practice vis-à-vis Open Access, however, is far more differentiated.

In the natural and life sciences, numerous publishers already allow parallel storage of the author's final corrected version. Alongside declared Open Access publishers such as BioMed Central, other publishers offer authors an Open Access option for accepted articles. The starting point for the implementation of Open Access varies widely. While large STM publishers already offer their journals online, considerations of cost have so far stopped many publishers in the humanities and social sciences from going down this road. Readiness to cooperate with partners from the business world and in particular, the public sector (especially academic libraries) is growing in an effort to take the plunge into Internet publishing.

- **Libraries**

Securing comprehensive access to knowledge is one of the specific tasks of libraries, both in the public and the academic sphere. The German Library Association was among the first signatories to the Berlin Declaration. The appearance of Open Access has taught libraries a great deal about the working methods of scientists and scholars and has at times put them on a collision course with publishers, who traditionally have been their good partners. Today, public institutions are the ones primarily building up an infrastructure in the spirit of the Berlin Declaration to secure reliable and sustainable access to knowledge in the sciences and humanities. They are doing so as operators of

institutional repositories and their national and international networks, as sponsors of university presses, or as partners of scientists and scholars in the organization and operation of Open Access journals. However, libraries are also increasingly approaching publishers with a view to trying out alternative business and payment models, or else are proposing their partnership and support in 'going online', in particular to small and medium-sized publishing houses. Libraries deal with one aspect in the context of Open Access only marginally: access to the cultural heritage, which is also created by libraries alongside museums and archives. Libraries notice that they themselves still have major deficits in the networking of their services: while in principle scientists and scholars have Open Access, this access can in practice be laborious in view of the numerous isolated digitalized collections. Libraries share with publishers the insight that digitalisation and permanent online provision will require a major financial contribution, which could certainly come from the public purse, but could also be recouped via 'customers'.

4.1.1 Open Access Practice

In the wake of the Berlin Declaration, two basic forms of implementation have established themselves, with a focus on academic journals:

i. the 'green road': deposit of copies of already published, peer-reviewed research articles in university or research institute repositories;

ii. the 'golden road':

   a. publication by Open Access publishers or in Open Access journals, financed either upfront through publishing fees (e.g.BioMed Central) or through public funds (e.g. Digital Peer Publishing Initiative DPPI);

b. the parallel publication of books in printed form (for a fee) and in an electronic version (free access) in Open Access publishing houses, in particular, university presses.

4.2 Open Access History

Our mission of disseminating knowledge is only half complete if the information is not made widely and readily available to society. New possibilities of knowledge dissemination not only through the classical form but also an increasingly through the Open Access paradigm via the Internet has to be supported.' This is a statement in the 'Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities' of October 2003, signed by all the leading German academic organizations and funding bodies, and in the meantime also by 227 academic institutions worldwide. This declaration is well-known to many people because it launched the notion of Open Access not only in Germany but worldwide. More than three years have elapsed since this conference in Berlin, and these years have made it clear that the path from public perception to constructive implementation can be a long one. On the other hand, three years is a relatively short time in light of the fact that unhindered access to the results of academic research has always occupied mankind. For a long time, the question was one of the technical barriers to duplication. These were to some extent broken down only in 1452 by Gutenberg's invention of 'movable types'. Of no small importance was the quality of local libraries, which was decisive in determining whether one had a chance of getting hold of the latest insights of the academic community or not. Of course it has always been and still is a question of publishing economics, which even in the academic world was and is determined by supply and demand. These aspects make it clear that, in

the past, preconditions and chances of realization precluded raising the question of free access to academic information. The decisive difference today lies in the possibility to digitize research results and thus the real option of placing them at users' disposal worldwide via the Internet. Thus the technical barriers to free access have come down. The greatest upheaval in the history of academic communication is currently under way, and it has forced a debate about a new culture of academic publishing. One component of the discussion is the confrontation with the question of whether and how we organize access to information. Technically, digitization and the Internet create the preconditions to allow free worldwide and unrestricted access to knowledge as it appears. However, this presupposes that we can answer the question of who will bear the costs involved, as in any other form of publishing.

The development of the Open Access initiative makes clear the stages in the upheaval of the academic communication system. Peter Suber, one of the main voices of the Open Access initiative, has worked out a 'Timeline of the Open Access Movement', in which many details and basic data of the evolution to date are listed. The conference mentioned at the beginning of this section culminating in the Berlin Declaration was the third to be held on this subject. The first conference to deal with the matter was organized by the OSI (Open Society Institute) in Budapest in December 2001. The scientists and scholars who took part in it had set themselves the goal of finding a way to bring together existing Open Access activities and, as a first step, to determine the kinds of academic literature for which free access should be made possible. On 14 February 2002 a corresponding call to an initiative appeared, which in the meantime (as of March 2007) has been signed by 4 391 individuals and 391 academic organizations: 'An old tradition

and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the Internet. The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds.

4.3 Landmarks in Open Access Initiatives

4.3.1 First open access journal

First open access journal was 'New Horizons in Adult Education', published in 1987. It was Syracuse University Kellogg Project managed and edited by graduate students.

OA was defined in three influential public statements: the Budapest Open Access Initiative (February 2002), the Bethesda Statement on Open Access Publishing (June 2003), and the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (October 2003).

4.3.2 Budapest Open Access Initiatives

One of the most important events in OA development is the Budapest Open Access Initiative (BOAI), which arises at a meeting held in Budapest, organized by Open Society Institute on December 1-2, 2001. The primary intention of this meeting was to bring together the international effort in order, research articles in all scientific fields to become available onlinefree. The initiative was signed by participants in the forum in

Budapest and increasing the number of people and organizations around the world that represent researchers, universities, laboratories, libraries, foundations, journals, publishers, learned societies, which joined to the initiative.

The initiative begins with one sentence, which covers the main OA sense in itself: "An old tradition and a new technology were brought together to make possible an unprecedented public good." The old tradition is the willingness of scientists to publish their research results in free scientific journals, in the name of knowledge. The new technology is the internet. Public good that is created through tradition and modernity removes barriers to access to scientific literature and thus accelerate research, enrich education, share knowledge, thereby unites humanity in a common intellectual conversation, looking forward to the new knowledge.

In Budapest Open Access Initiatives the basic definition of OA is: OA is the free availability on the public internet.Permitting any users to read, download, copy, distribute, print, search or link to the full texts of these articles. Crawl them for indexing, pass them as data to software or use them for any other lawful purpose, without financial, legal or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution and the only role for copyright in this domain should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited (Budapest Open Access Initiative, 2002).

Initiative for OA from Budapest recommends two complementary ways of OA to scientific literature. The first way is self-archiving, i.e. the author deposits his reviewed journal article in OA repositories by himself. If these repositories meet the standards established by the initiative of OA repositories, all search engines may operate searching

across all repositories as a single entity. The second way is the publication of the article in a journal of a new generation of OA. These journals of the new generation should not have a publication fee and a fee for the use of already published articles. The purpose is one – to achieve OA to scientific literature. The self-archiving and publication in journals of the new generation are ways to achieve this goal.

4.3.3 Bethesda Open Access Initiatives

Another important initiative is the Bethesda Statement on OA Publishing, which was established on April 11, 2003, in Howard Hughes Medical Institute in Chevy Chase, Maryland. The purpose of this statement is to stimulate discussion in the biomedical research community on how to proceed as quickly as possible to provide free access to the primary scientific literature in the field (Bethesda Statement on Open Access Publishing, 2003).

The original text of the statement consists of four main parts. The first part contains a definition of OA according to which OA has to meet two conditions. According to the first, the author should provide access to his publication free for all users as they are entitled to use, copy and distribute the work, to recognize his authorship and the second one is the full text of his scientific publications, as well as any supporting materials, including a copy of the review, to be deposited with the initial publication in at least one online repository which is supported by an academic institution, scientific society government agency, or other well-established organization that seeks to enable OA, unrestricted distribution, interoperability and long-term archiving (for the biomedical sciences such repository is PubMed Central).

The second part of the statement is a declaration of the institutions and agencies working group that declares their commitment to sponsor and foster research to encourage the creation and dissemination of new ideas and knowledge for the benefit of society. They emphasize their willingness to finance the publication in OA peer-reviewed journals.

The third part of the statement includes a report of the libraries and publishers working group which says that they believe in free access as an essential component of scientific publications in the future and that the reporting of the results of the current researchers should be open, accessible and freely usable. According to the statement, libraries and publishers should make every effort to accelerate this transition in a way that doesn`t disturb the dissemination of scientific information. Libraries offer to create and support mechanisms for the development of OA and promote among its members the benefits of OA publishing and provide access to OA journals in their catalogs. Publishers, on the other hand, are committed to providing an option to publish in OA for each study or article in one of the journals that they issue.

The fourth part of the statement expresses the opinion of the scientists and scientific Societies working group which fully support the principles of OA. Scientists and scientific societies declare their readiness to promote the benefits of OA among their colleagues. Scientists will show their support for OA in practice – publishing, review and editing of OA journals.

4.3.4 Berlin Declaration on Open Access

The third important initiative that deals with OA is the Berlin Declaration on OA to Knowledge in the Sciences and Humanities from 2003. The statement is a result of a Conference on OA to Knowledge in the Sciences and Humanities, held in Berlin in October 2003, organized by Max Planck Society and Project ECHO (European Cultural Heritage Online). Berlin Declaration overlaps as the definition of OA to the previous two initiatives so far, i.e. August 2013, is supported by 444 organizations.

We call on the signatories of the Berlin Declaration and on all other organizations that perform or support scholarly research to:

1. Increase the support for and interoperability of OA repositories for scholarly materials, while reducing and where possible eliminating embargoes, and improving the ability to re-use works;

2. Support new and innovative OA publishing models that meet the highest possible scholarly standards, and invest in a publication infrastructure optimised for the needs of research and scholarship; and

3. cooperate with one another to ensure a smooth transition to a stable and functioning, truly open scholarly publishing system, including access to scholarly source and cultural heritage data, where the full text of every research work is open immediately upon publication. We, therefore, urge research organizations to work together internationally and intensively to formulate a viable, coordinated and transparent strategy to enable a transition to a system where OA publishing is the norm. This strategy should address the following key issues:

(a) Standards: Establish a shared definition of OA, based on that in the Berlin Declaration, which includes an appropriate license enabling maximum re-use of published material, with full attribution. The definition of OA should set standards to allow the widest sharing, re-use, and computational analysis of the scholarly literature, and insist that data supporting the research results should also be openly accessible.

(b) Quality: Ensure the quality of the published literature by expecting appropriate selectivity and high standards of scholarship in OA publications. No research work by any scholar should be prevented from being published in such an OA journal by the lack of funding for OA publishing fees. Organizations should encourage new and more effective OA-based methods for peer review and for the assessment of the impact and quality of published works.

(c) Stability: Adopt mutually compatible policies that will allow scholars access to funding for OA publishing fees, and find comparable ways to support or subsidize no-fee OA journals. These policies should permit the greatest possible re-purposing of money currently used for subscriptions into funding for such fees and subsidies, and they should create a truly competitive, efficient, and scalable market where publishers compete with one another for the best scholarly publications. They must also ensure permanent open access to complete archives of the published literature. Stability and effectiveness must be monitored.

(d) Transition: Cooperate to create coordinated and transparent policies and reward systems that enable a smooth transitiontothe scholarly research literature according to an agreed roadmap, from its present domination by subscription-based

journals to the OA model outlined above. Such policies should include, for example, progressive conversion of subscription funds into OA publishing funds and enhanced recognition for OA publications. We believe that a stable, competitive, and quality-assured OA research publishing system offers immense benefits not only to scholarship but also to society as a whole. Scholarly publishing is a global activity, and organizations that perform and support research, particularly those using public money, have a responsibility to work together globally to realize these benefits. It is time to return control of scholarly publishing to the scholars.

4.3.5 IFLA Statement on Open Access

IFLA (the International Federation of Library Associations and Institutions) is committed to ensuring the widest possible access to information for all peoplesbythe principles expressed in the Glasgow Declaration on Libraries, Information Services and Intellectual Freedom.

IFLA acknowledges that the discovery, contention, elaboration and application of research in all fields will enhance progress, sustainability and human well-being. Peer-reviewed scholarly literature is a vital element in the processes of research and scholarship. It is supported by a range of research documentation, which includes preprints, technical reports and records of research data.

IFLA declares that the worldwide network of library and information services provides access to the past, present and future scholarly literature and research documentation; ensures its preservation; assists users in discovery and use; and offers educational programs to enable users to develop lifelong literacies.

IFLA affirms that comprehensive open access to scholarly literature and research documentation is vital to the understanding of our world and the identification of solutions to global challenges and particularly the reduction of information inequality. Open access guarantees the integrity of the system of scholarly communication by ensuring that all research and scholarship will be available in perpetuity for unrestricted examination and, where relevant, elaboration or refutation.

IFLA recognizes the important roles played by all involved in the recording and dissemination of research, including authors, editors, publishers, libraries and institutions, and advocates the adoption of the following open access principlesto ensure the widest possible availability of scholarly literature and research documentation:

1. Acknowledgmentand defense of the moral rights of authors, especially the rights of attribution and integrity.

2. Adoption of effective peer review processes to assure the quality of scholarly literature irrespective of mode of publication.

3. Resolute opposition to governmental, commercial or institutional censorship of the publications deriving from research and scholarship.

4. Succession to the public domain of all scholarly literature and research documentation at the expiration of the limited period of copyright protection provided by law, which period should be limited to a reasonable time, and the exercise of fair use provisions, unhindered by technological or other constraints, to ensure ready access by researchers and the general public during the period of protection.

5. Implementation of measures to overcome information inequality by enabling bothpublicationsof quality assured scholarly literature and research documentation by

researchers and scholars who may be disadvantaged, and also ensuring effective and affordable access for the peoples of developing nations and all who experience disadvantage including the disabled.

6. Support for collaborative initiatives to develop sustainable open access* publishing models and facilities including encouragement, such as the removal of contractual obstacles, for authors to make scholarly literature and research documentation available without charge.

Implementation of legal, contractual and technical mechanisms to ensure the preservation and perpetual availability, usability and authenticity of all scholarly literature and research documentation.

4.4 Ways of delivering Open Access

There are many ways to deliver OA: personal websites, blogs, wikis, databases, e-books, videos, audios, webcasts, discussion forums, RSS feeds, and P2P networks. Unless creative thinking stops now, there will be much more to come. However, two delivery vehicles are the main journals and repositories.

OA repositories are online collections or databases of articles. Unlike OA journals, OA repositories have no counterpart in the traditional landscape of scholarly communication. That makes them woefully easy to overlook or misunderstand.

4.5 Salient features of Open Access Literature

1. Open Access literature is freely available.
2. Open Access literature is online and it is available on the Internet.
3. Open Access literature includes scholarly works.
4. The authors of these works are not paid for their efforts.

5. Most of the peer-reviewed journal's articles are not paid, but not all. Such works are scholarly; these articles are identified as a primary type of open access literature.
6. Users can copy and distribute open access works without any constraints. The segmentation of permission barriers is different from the different works.
7. There are two open access strategies self-archiving and open access journals.

Besides these features, Peter Suber characteristics the core concept of open access this way "open access removes" price barriers" (e.g. subscription fee) and permission barriers" (e.g. copyright and licensing restrictions) to "royalty-free literature" (i.e. scholarly works created for free by authors), making them available with "minimal use restrictions" (e.g. author attribution)

4.6 Open Access, Internet and Digital Libraries

Several approaches are being pursued today for achieving open access. These include open access journals, discipline-basedarchives, and institutional repositories. Open access journals provide completely free online access and use non-subscription based economic models for sustaining publishing and online delivery. Some of the economic models being explored include author charges, advertising, institutional support from universities and grant making bodies. RePEc (Research Papers in Economics) is another good example of a discipline-based open archive, in addition to Arxiv. Institutional repositories are institutional based and aim to capture, organize,

preserve and disseminate research output of the institution with nil or very low access barriers.

In addition to the Internet and the web, several open digital library technologies have strengthened open access publishing. These include the availability of open source software for e-journal publishing (e.g. the open journal system of the public knowledge project) and institutional repositories (e.g. E.Prints and DSpace), metadata standards like Dublin Core and the Open Archives Initiative protocol for exchange and aggregation of metadata. These developments augur particularly well for researchers in developing countries. It is now relatively easy and inexpensive to establish new online-only journals and institutional repositories so that more research from these countries can be disseminated online.

One also needs to mention here other types of online scholarly contents that are available within the domain of open access. Prime examples include electronic theses and dissertations and open courseware. Libraries have a key role to play in promoting open access. These include: integrating access to quality open access resources along with other online library services, improving awareness of open access, and establishment and maintenance of institutional repository for their institution.

4.7 Important Impacts of Open Access Environment in Libraries

Peter Suber has identified the very important impact is that open access removes price and permission barriers in the library considerably.

1. Open access literature as the libraries own copies.
2. Open access literature has the rights to archive them forever.

3. Open access literature can be migrated to the new format synchronously with IT development, i.e. there is no permission or extra payment for this format migration.
4. Global access and availability through Net.
5. Researchers and other could donate their literature, data sets and software without violating their license.
6. There is no hurdle of accounting and auditing of the consortium price and physical availability location.
7. No discontinuation in the process of acquiring open access literature due to cost or publication delay users can access immediately nascent information. And there is no information gap.
8. The importance of using Open Source Software at libraries were
   - Zero cost acquisition
   - Ability to use software for whatever purpose
   - Ability to adapt the software to meet local requirements
   - Ability to distribute changes to the software.

4.8 OA Application tools

4.8.1 Open Journal System (OJS): The Public Knowledge Project developed the open source publishing software Open Journal System (OJS), which is the most used open source application for developing and launching open access journals around the world.

4.8.2 Institutional Repository (IR) Software: There are many world renowned free open source Institutional Repository (IR) software's available such as EPrints, DSpace, FEDORA, ARNO, i-TOR, CDSware etc. They are issued either under GNU public license or the BSD license and can be downloaded from their own sites or open source software directories such as Source Forge. Each of the software has a host of features, unique facilities and excellent capabilities, which the users could explore and experiment.

4.8.3 Open Archives Harvester: The OA harvester service PKP harvester software developed by the Public Knowledge Project is excellent application software which can be easily downloaded, configured and customized.

4.8.4 Project Gutenberg: Project Gutenberg began in 1971 when Michael Hart decided that it would be a good idea to make many classic and important texts freely available worldwide. The project operates on a system of volunteers selecting a text that is no longer in copyright, turning the text into e-text, and adding it to the archive.

4.8.5 Open Access Journals: Open access journalsarepeer-reviewed journals whose articles may be accessed online by anyone without charge. They are scholarlyjournals published with the quality control mechanism like those of conventional journals. The author may allow retaining their copyrights and these journals may mostly use Creative Commons or similar licenses. There are three types of open access journal publishers:

1. Non-traditional publisher/professional publisher
2. Born-open access publisher
3. Conventional publisher

There are many challenges Indian journals face, such as quality of articles, stringency in the peer-review process, timeliness of production, infrastructure and funding, subscription and readership, distribution channels and market demand etc. In spite of all these, many organizations and scientific bodies are striving their best to make our journals open access. Some of the laudable efforts include:

1. The Indian Medlars Centre of NIC provides free full-text access to 38 Biomedical Journals.
2. The Indian Academy of Sciences has put all its 11 journals in the public domain.
3. The Indian National Science Academy's all 4 journals are available in the public domain.
4. MedKnow publication has, within the past three years, brought 28 Indian Biomedical Journals into the Open Access domain.
5. Kamala-Raj Enterprises has brought 5 social sciences and humanities journals to open access.
6. Indian Journals.com provides open access to 7 scholarly journals.

Added to these several other single title open access efforts are also progressing in the country, such as 'Sankhya'of the Indian Statistical Institute Calcutta, the Economic and Political Weekly.

List of Library & Information Science Open Access Journals

- Annals of Library & Information Studies
- Bulletin of the American Society for Information Science and Technology
- Chinese Librarianship: an International Electronic Journal
- Collaborative Librarianship
- Communications in Information Literacy
- Cybermetrics : International Journal of Scientometrics, Informetrics and Bibliometrics
- DESIDOC Journal of Library & Information Technology
- D-Lib Magazine

- Electronic Journal of Knowledge Management
- Evidence Based Library and Information Practice
- Information Research: an international electronic journal
- Information Technology and Disabilities
- Information Technology and Libraries
- International Journal of Digital Curation
- International Journal of Digital Library Services
- International Journal of Doctoral Studies
- International Journal of Information Dissemination and Technology
- International Research: Journal of Library and Information Science
- Issues in Science and Technology Librarianship
- Journal of Digital Information
- Journal of Electronic Publishing
- Journal of eScience Librarianship
- Journal of Health Informatics in Developing Countries
- Journal of Information and Organizational Sciences
- Journal of Information Literacy
- Journal of Information, Information Technology, and Organizations
- Journal of Librarianship and Scholarly Communication
- Journal of Library Innovation
- Journal of Medical Internet Research
- Journal of southern academic and special librarianship
- Journal of the Association for History and Computing
- Journal of the European Association for Health Information and Libraries
- Journal of the Medical Library Association
- Kansas Library Association College and University Libraries Section Proceedings
- Liber Quarterly : The Journal of European Research Libraries
- Library and Information Research : Research into Practice for Information & Library Services
- Library Philosophy and Practice
- Library Student Journal
- Libres: Library and Information Science Research Electronic Journal
- Pakistan Journal of Library and Information Science
- Practical Academic Librarianship
- School Library Media Research
- Singapore Journal of Library & Information Management
- South African Journal of Information Management
- The journal of the Rutgers University Library.
- Trends in Information Management
- Urban Library Journal
- Virginia Libraries
- Webology

4.9 Copyright Law

The copyright period in most countries is 40 to 60 years either from the date of the creation or from the death of the author. In India, it is 60 years from the death of the author. However in reality, it becomes very difficult to establish the date of the death of the author. There are many works which do not have the copyright disclosures printed in them. With the advances in digital scanning and web-based dissemination, it is necessary to ensure that the documents that are out of copyright in the country of origin should automatically come into public domain throughout the world. Nearly 75% to 90% of the books that are in copyright are also out of print, making no economic sense to anyone. Often the proprietor or the publisher does not pay royalty to the creator.

4.10 Open Source Software

A key definition for Open Source Software is access to the actual source code, often available under GNU public license, which allows programmes to alter the software and redistribute it with the requirement that they make these changes available to other developers. The GNU website offers the following definition of open source software:

- The freedom to run the program, for any purpose.
- The freedom to study how the program works, and adapt it to your needs. Access to the source code is a precondition for this.
- The freedom to redistribute copies.
- The freedom to improve the program, and release your improvement to the public, so that the whole community benefits.

4.10.1 Some important Open Source Software used in the libraries

4.10.1.1 Greenstone digital library software (GSDL): Greenstone is a suite of software which has the ability to serve digital library collections and build new collection. It provides a new way of organizing information and publishing it on the Internet or on CD-ROM. Greenstone is produced by the New Zealand Digital Library Project at the University of Waikato and distributed in cooperation with UNESCO and the human Info NGO. It is open-source software, available fromhttp://greenstone.org under the terms of the GNU General Public License.

4.10.1.2 Digital Software-DSpace: A number of free software is available for developing digital libraries. DSpace (http://www.dspace.org) is one of the most popular software available. It has been developed jointly by MIT library and HP labs. DSpace incorporates digital asset management system and helps to create, index and retrieve various forms of digital content. Dspace is adaptable to various needs of libraries and information centers and maintains inbuilt interoperability programs for application between various systems. It adheres to international standards for metadata.

4.10.1.3 Fedora: www.fedora.info sponsored by the University of Virginia Library and Cornell University with support from the Andrew W. Mellon Foundation, the Fedora project is "devoted to the goal of providing open-source repository software that can serve as the foundation for many types of information management system".

4.10.1.4 Eprints2: http://software.eprints.org/ developed by the Christopher Gutteridgeet. al. of thecOpCit project. E-print software provides a Web-based institutional repository and has large and growing installations based around the world.

Gutteridge has received "UK Unix and Open System User Groups 2005 Award" for the development of Eprints.

4.10.1.5 Open Journal System: www.pkp.ubc.ca/ojs/this software is "for the purpose of making open access publishing a viable option for more journals". This free, open source, OAI-PMH compliant software is used to manage peer-review and other editorial functions and to publish and index E-journals. It also has an e-mail notification function that sends anew table of contents to readers, and additional capabilities that allow users "to post comments to articles, join in the discussion or establish a personal portfolio of selected works" developed by John Willinsky, University of British Columbia's Public Knowledge Project.

4.10.1.6 Mylibrary: http://www.deway.library.nd.edu/mylibrary/My library is developed by Erics Lease Morgan. It is a portal for library written in pert language with the foundation of a relational database application using MySQL and postgres SQL. It has the trigonal relationship between resources, patrons and librarians to assign the controlled vocabulary for the electronic documents.

4.10.1.7 Koha: http://www.koha.org is full featured first Integrated Library System (ILS) open source software. Initially developed by Katipo Communications Ltd. in New Zealand. It includes circulation, cataloguing, acquisitions, serials, reserves and user management, etc. modules. It has a Web-based interface with relational database management system. It is under General Public License (GPL) open source software.

4.11 Conclusion

Open access movement in worldwide have been motivated by promoting and scouting to scholarly literatures. This study reveals the various steps taken for open access initiatives and availability of infrastructure for providing smooth open access service to the library users. In this chapter we saw the various forms of open access publishing and also many definitions of open access given by time to time. The researcher also discussed history of open access and various landmarks in open access initiatives. Many open access declarations like Budapest declaration, Bethesda Declaration, Berlin Declaration any many more were provides a strong support to open access movement in the worldwide.

The next chapter is data analysis and interpretation in which collected data is analyzed through tables and graphs after that the result has been interpreted.

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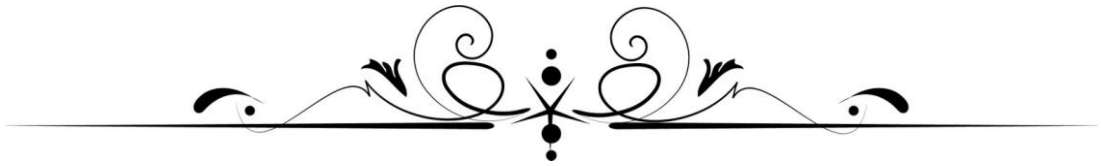
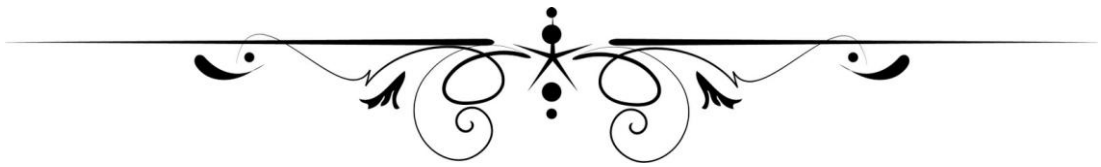


Chapter 5

Analysis of Data and Interpretation



Chapter-5

Analysis of Data and Interpretation

5.1 Introduction

This chapter deals with the details of the statistical analysis and interpretations of the data collected from the librarians/library in-charge of the National Research Centre Libraries of ICAR through the structured questionnaires and observation of the libraries. The analysis of the consolidated data has been done based on the objectives set for the study using tables and graphs. The data for analysis were collected and analyzed as per the procedure described in chapter 1.

This chapter deals in 7 sections:

1. General information about the organization
2. General information about the library
3. Infrastructure and Resources
4. Open Access Policy
5. Attitude towards Open Access Initiatives
6. System followed
7. Access to Information

5.2 General information about the organization

This section gives information about name of institutions selected for study their URL and year in which they established.

Table-5.1: General information about the organization

Srl. No.	Institution Name	URL	Year of Establishment
1.	NCIPM, New Delhi	www.ncipm.org.in	1988
2.	NRCB, Trichy	www.nrcb.res.in	1993
3.	NRCC, Bikaner	www.nrccamel.res.in	1984
4.	NRCC, Nagpur	http://nrccitrus.nic.in	1985
5.	NRCE, Hisar	www.nrce.nic.in	1986
6.	NRCG, Pune	http://nrcgrapes.nic.in	1997
7.	NRCL, Mzp	www.nrclitchi.org	2001
8.	NRCM, Mdz	http://www.nrcmithun.res.in/	1988
9.	NRCP, Solapur	www.nrcpomegranate.org	2005
10.	NRCPB, New Delhi	http://www.nrcpb.res.in/	1985

There are 11 National Research Canters were selected for study out of which 10 research centers had returned filled questionnaire. In Table 5.1we can see that National Research Centre for Camel (NRCC) which is established in 1984 is the oldest and National Research Centre for Pomegranate (NRCP) which is established in 2005 is newest among all research centers. All research centers have their own dedicated websites.

5.3 General information about the library

This section deals with general information about the libraries of selected National Research Centers. Like name of the libraries of concerned National Research Centers

selected for study. This section also deals with strength of library users in different National Research Centres libraries.

Table 5.2 General information about the library

Srl. No.	Institution Name	Name of Library
1.	NRCB, Trichy	ICAR-NRCB, Library
2.	NRCC, Bikaner	NRCC, Library
3.	NRCCt, Nagpur	CCRI, Library
4.	NRCE, Hisar	NRCE, Library
5.	NRCG, Pune	ICAR NRCG, Library
6.	NRCL, Mzp	Central Library, NRCL
7.	NRCM, Mdz	NRCM Library
8.	NRCPM, New Delhi	NCIPM, Library
9.	NRCPB, New Delhi	NRCPB, Library
10.	NRCP, Solapur	NRCP, Library

Table no. 5.2 shows that all research centers libraries are known by their institutions name, except library of National Research Centre for Litchi, which is known as central library.

Table-5.3: Strength of Users

Srl. No.	Research Centers	Scientists	Faculty member	Staff	Total
1.	NRCB	17	3	30	50
2.	NRCC	13	-	15	28
3.	NRCCt	16	16	23	55
4.	NRCE	20	79	-	99
5.	NRCG	15	-	24	39
6.	NRCL	15	-	15	30

Srl. No.	Research Centers	Scientists	Faculty member	Staff	Total
7.	NRCPM	22	3	53	78
8.	NRCPB	20	10	50	80
9.	NRCP	20	-	25	45
10	NRCM	15	9	32	56
	Total	**173**	**120**	**267**	**560**

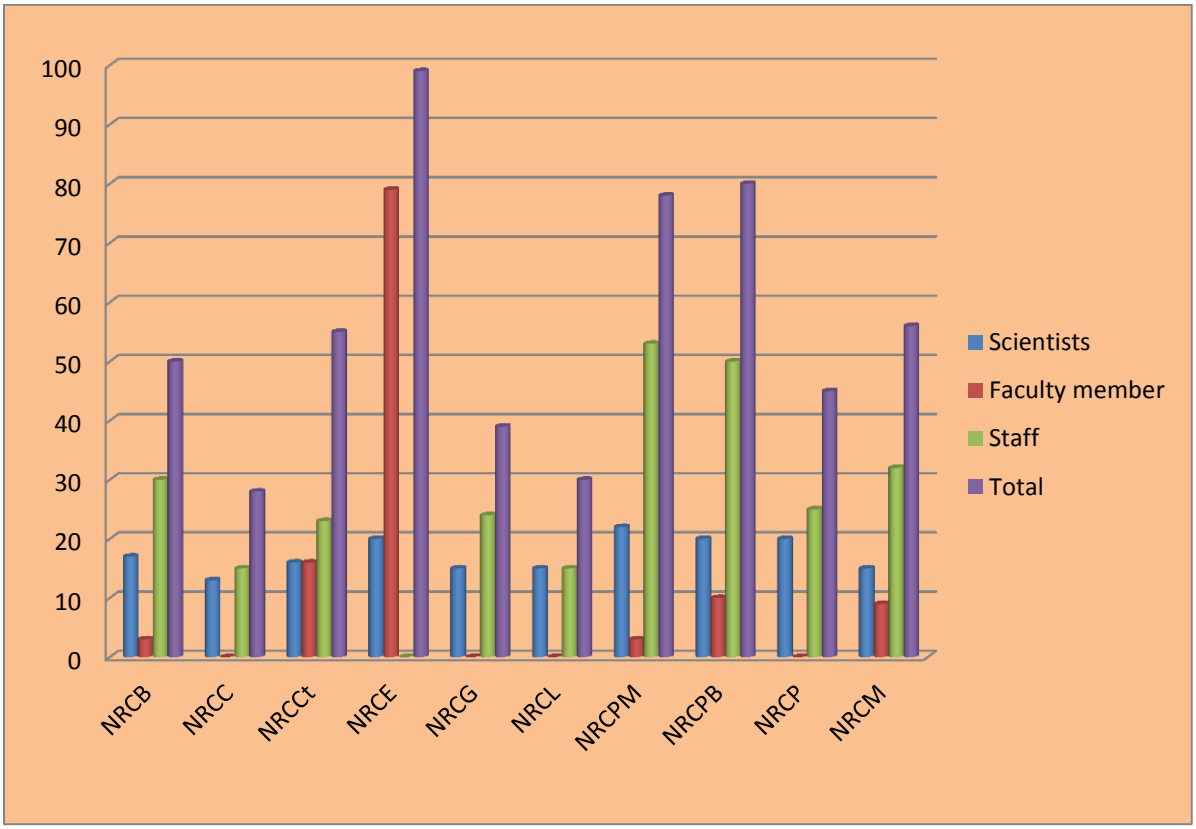


Fig. 5.1: Strength of Users

Table 5.3and fig. 5.1 represents clear picture of number of users enrolled in all libraries of National Research Centres selected for study. NRCE has the maximum number of users 99out of which 20 are scientists and 79 are faculty members followed by NRCPB with 80 users enrolled. NRCPB has 20 scientists, 10 faculty members and 50

staff members were enrolled NRCPM has 78 users out of which 22 scientists, 3 faculty members and 53 staff are enrolled. NRCM library has 56 users enrolled and NRCCt has little less user's comparison with NRCM. In NRCCt there are total 55 users out of which 16 scientists, 16 faculty members and 23 staffs. NRCB has 50 numbers of users out of which 17 scientist, 03 Faculty members and rest 30 are staffs. National Research Centre for Pomegranate (NRCP) has 45 numbers of users in total. Out of which 20 are scientists and 25 are staff. National Research Centre for Graphs has 39 users out of which 15 are Scientists and 24 are Staff followed by National Research Centre for Litchi (NRCL). NRCL have 30 users out of which 15 are Scientists and 15 are staff. National Research Centre for Camel has least number of users in their library. NRCC have only 28 users, out of which 13 are scientists and 15 are staff.

5.4 Infrastructure and Resources

This section 5.3 deal with available infrastructure and resources in all National Research Centers libraries selected for study. This section further divided in four headings Learning Resources, Human Resources, Technical Resources and Financial Resources.

Learning Resources

This section deals with all learning resources (print and non-print) available in the libraries of selected National Research Centres of ICAR.

Table-5.4 Learning Resources Available in Library (Print Material)

Srl. No.	Research Centres	Books	Journals (Current Volume)	Journal (Back Volume)	Reports	Patents	Total
1.	NRCB	1164	18	500	100	00	1782
2.	NRCC	7000	-	1000	50	-	8050
3.	NRCCt	1880	8	715	1200	-	3803
4.	NRCE	2000	14	100	6	-	2120
5.	NRCG	807	8	1728	2930	-	5473
6.	NRCL	1785	4	18	50	-	1857
7.	NRCPM	2505	10	100	10	1	2626
8.	NRCPB	2500	26	250	52	-	2828
9.	NRCP	1765	14	-	-	-	1779
10.	NRCM	1254	14	-	722	-	1990
	Total	22660	116	4411	5120	1	32308

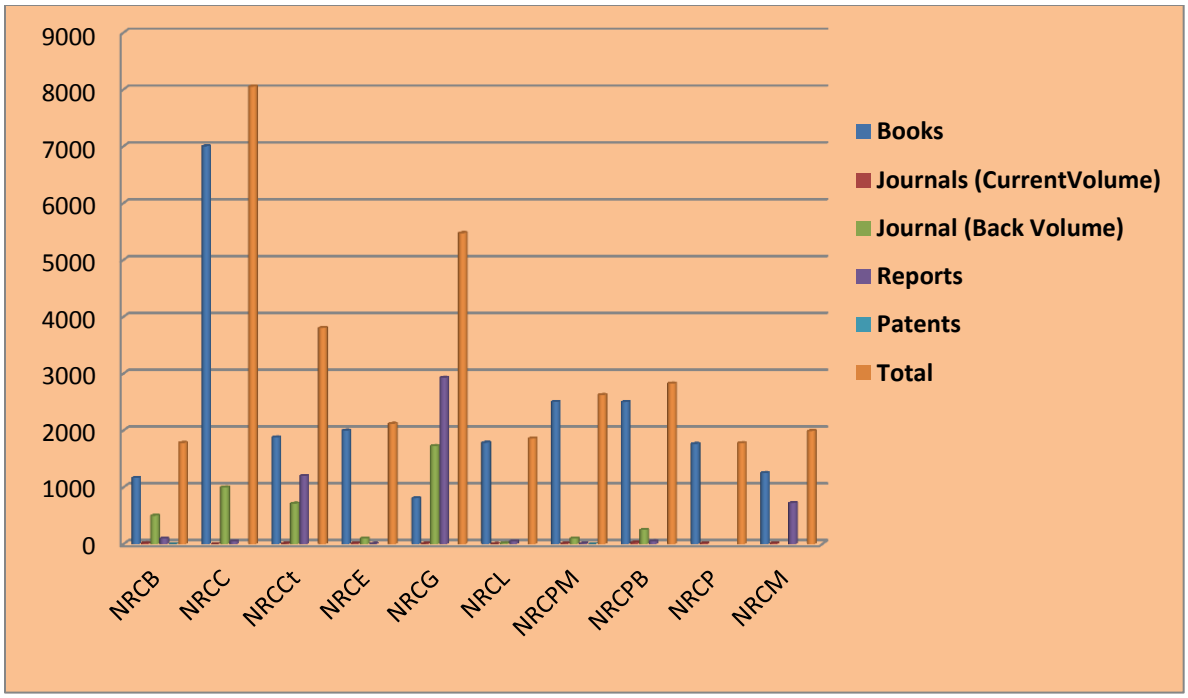


Fig. 5.2: Print Resources

Above table 5.4 and fig. 5.2 gives description of available print resources in selected libraries of National Research Centre. This table shows number of books, journals (current volumes), journals (back volumes), reports and patents. National research centre for camel have the largest collection of print learning material among all libraries of NRC. National Research Centre for Camel (NRCC) has 7000 books followed by 1000 back volume journals and successively followed by reports (50). In total NRCC has 8050 print materials. National Research Centre for Grapes has 5473 total number of print collection. Out of which 2930 are reports followed by 1728 back volume journals and 807 books. NRCG has only 8 current volume journals. National Research Centre for citrus has 1880 books followed by 1200 reports and 715 back volume journals. They have also 8 current volume journals. NRCCt has total 3803 print material in their library. National research centre for plant biotechnology (NRCPB) has total 2828 numbers of learning

print materials in their library. They have 2500 books, 250 back volume journals followed by 52 reports and 26 current volume journals. National research centre for pest management has 2505 books and 100 back volume journals followed by 10 current volume journals and 10 reports. NRCPM has total 2626 learning materials in print form. NRCE has 2120 numbers of total print materials in their library. Out of which books are 2000 and 100 back volume journals followed by 14 current volume journals and 6 reports. NRCM library has collection of 1990 print resources, NRCL has 1785 books and 50 reports followed by 18 back volume journals and 4 current volume journals. NRCL has total 1857 print materials. NRCB has total 1782 print learning materials. Out of which books are 1164 back volume journals are 500 followed by 100 back volume journals and 18 current volume journals. NRCP has total 1779 print learning materials out of which books are 1765 followed by 14 current volume journals.

Table- 5.5: Learning Resources Available in Library (Non-Print Material)

Srl. No.	Research Center's	Audio Visual Materials	CD ROM Databases	On Line Databases	Electronic Journals	Micro-film/Micro fiche	Total
1.	NRCB	25	12	-	-	-	37
2.	NRCC	-	50	-	-	-	50
3.	NRCCt	-	10	-	2	-	12
4.	NRCE	2	10	-	1(CeRA)	1	14
5.	NRCG	1	12	-	3	-	16
6.	NRCL	5	-	-	-	-	5
7.	NRCPM	-	5	6	-	-	11
8.	NRCPB	2	15	5	-	-	22
9.	NRCP	-	-	-	-	-	-
10.	NRCM	-	82	-	-	-	82

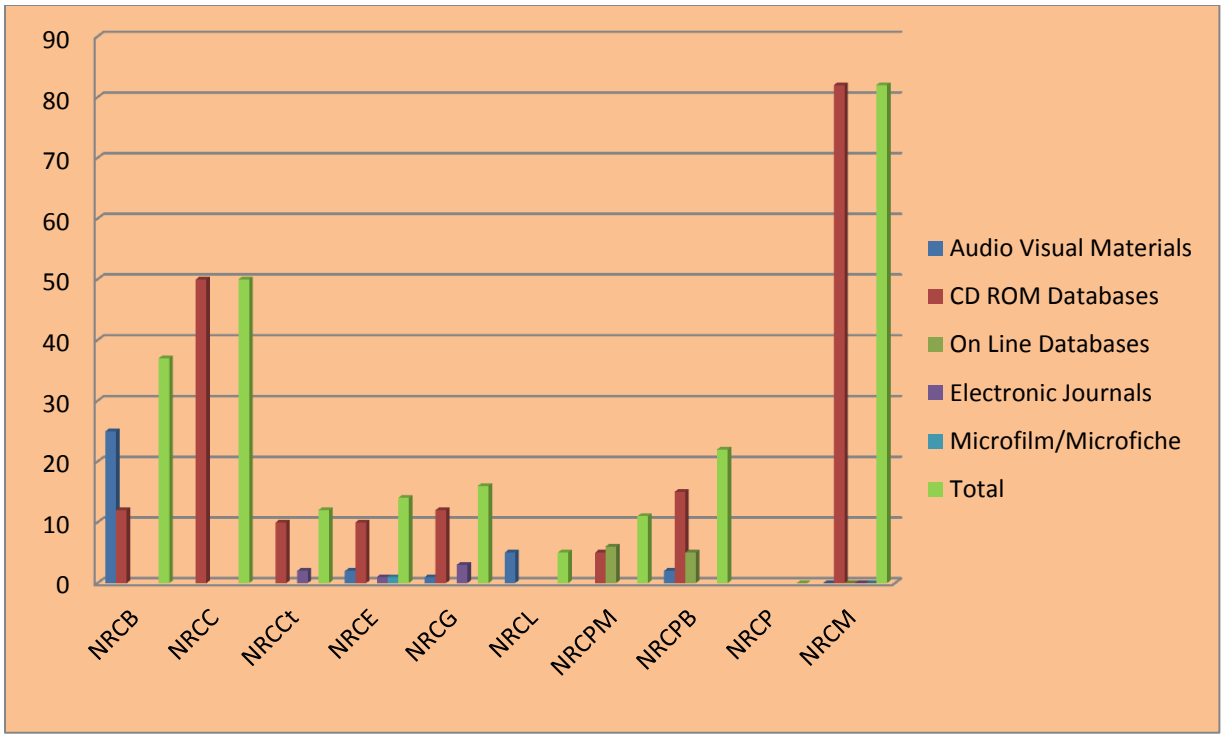


Fig. 5.3: Non-Print Resources

Table 5.5 and Fig 5.3 explained availability of non-print learning materials in all NRC libraries. In this table we find various non-print materials like audio visual materials, CD- ROM databases, Online Databases, electronic journals and micro-films/microfiche. National research centre on Mithun has the largest collection of non-print materials among all NRC's. There are82CD ROM databases in total. Secondly NRCC has 50 CD-ROM databases, NRCB has total 37 non-print learning materials. Similarly, NRCPB has total 22 non-print materials out of which 2 audio visual, 15 CD-ROM databases and 5 online databases. NRCG has 16 non-print materials in total out of which 12 CD-ROM databases, 3 electronic journals. NRCE has total 14 non-print materials out of which 10 are CD-ROM databases, 2 audio visual materials and 1 electronic journal. NRCCt has total 12 numbers of non-print materials out of which 10 CD-ROM databases and 2 electronic Journals. NRCPM has 11 non-print materials out of which 6 online data-

bases followed by 5 CD-ROM databases. Lastly NRCL has 5 non-print materials in total as audio-visual materials.

Human Resources

This section deals with human resources available in selected libraries of National Research Centres. This is further divided into Semi-professionals, Non-professionals, Professionals and others.

Table-5.6 Strength of Library Staff

Srl. No.	Research Centres	Semi- Profes-sional	Non-Professionals	Profession-als	Oth-ers	Total
1.	**NRCB**	**-**	**1**	**-**	**-**	**1**
2.	**NRCC**	**-**	**1**	**1**	**-**	**2**
3.	**NRCCt**	**1**	**1**	**-**	**-**	**2**
4.	**NRCE**	**-**	**-**	**2**	**-**	**2**
5.	**NRCG**	**1**	**-**	**-**	**-**	**1**
6.	**NRCL**	**-**	**4**	**-**	**-**	**4**
7.	**NRCPM**	**1**	**1**	**-**	**1**	**3**
8.	**NRCPB**	**1**	**1**	**-**	**-**	**2**
9.	**NRCP**	**1**	**2**	**-**	**-**	**3**
10.	**NRCM**	**1**	**1**	**-**	**-**	**2**

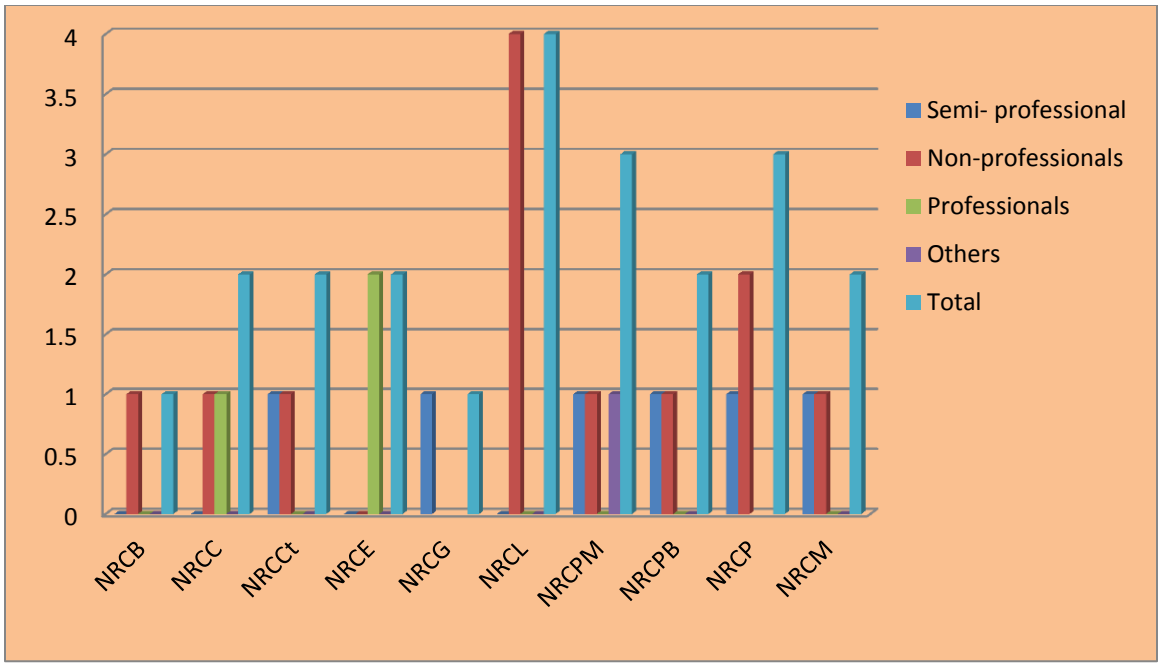


Fig. 5.4: Strength of Library Staff

Table 5.6 and Fig 5.4 shows strength of library staff in selected libraries of National Research Centres. National research centre for Litchi has maximum numbers of staffs in their library. There were 4 non-professionals staffs in National Research Centre for Litchi. National Research Centre for Pest Management and National Research Centre for Pomegranate both have3 library staffs. In NRCPM 1 semi-professional, 1 non-professional and 1 other staff is there. NRCP has 1 semi-professional and 2 non-professional staff. NRCCt, NRCM, NRCE and NRCC has 2 library staff. NRCC has 1 professional and 1 non-professional staff. NRCCt has 1 semi-professional and 1 non-professional staff. NRCE has 2 Professional staff.

Technical Infrastructure

This section deals with available technical infrastructure in all selected libraries of National Research Centres of ICAR. This section deals in availability of Computers, Servers, Scanners printers, CD/DVD, security and software.

Table-5.7 Available IT infrastructure for performing open access initiatives

Srl. No.	Research Centers	Computers	Servers	Scanners	Printers	CD/DVD	Security System	Software/s	Total
1.	NRCB	1	-	1	1	37	-	1	41
2.	NRCC	2	1	-	1	-	-	1	5
3.	NRCCt	3	-	1	1	-	-	-	5
4.	NRCE	1	-	1	1	1	1	-	5
5.	NRCG	9	-	1	1	-	-	-	11
6.	NRCL	3	-	1	1	-	-	1	6
7.	NRCPM	3	1	2	2	-	-	1	9
8.	NRCPB	3	1	1	1	-	-	1	7
9.	NRCP	1	-	-	1	1	-	-	3
10.	NRCM	1	1	1	1	82	-	1	87

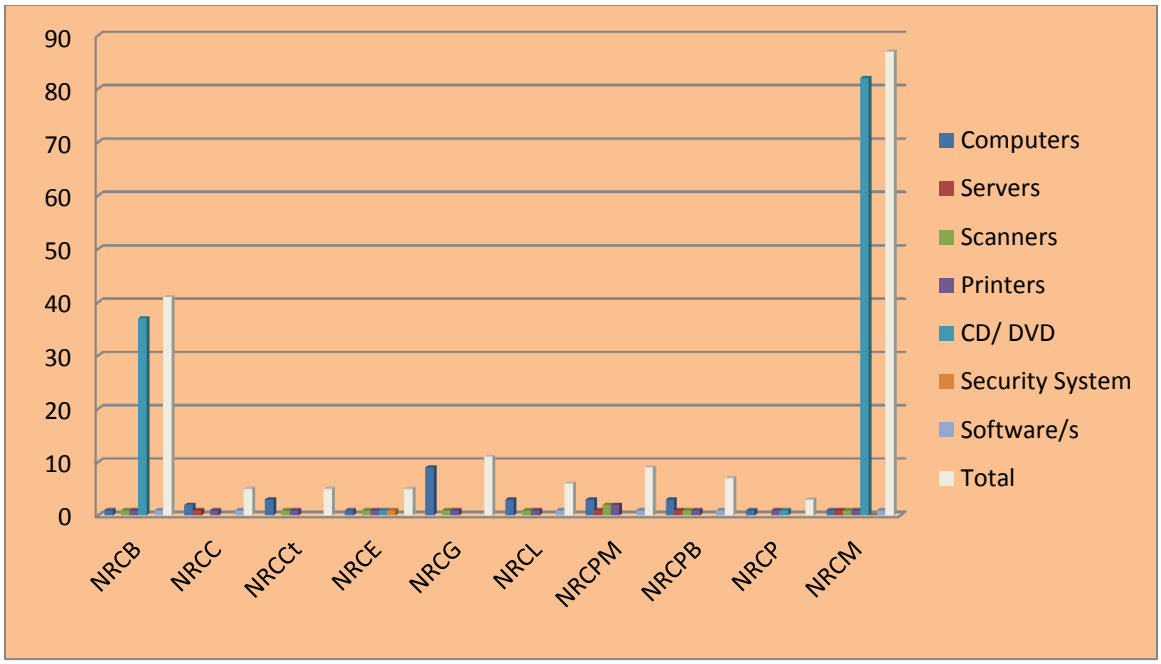


Fig. 5.5: IT infrastructure

Table 5.7 and Fig 5.5 present the current picture of infrastructure availability in libraries of National Research Centres selected for study. National research centre on Mithun has the largest collection of technical infrastructure available in the library. National research centre for Banana has 41 numbers of technical infrastructures available in their library. They have 37 CD/DVD and 1 computer, scanner, printer and software each. National Research Centre for Grapes has 11 numbers of total technical infrastructures. Out of which 9 computers, 1 Scanner and 1 Printer. NRCPM has total 9 technical equipment's in their library. Out of which there are 3 computers, 1 server, 1 software, 2 scanner and 2 printers. NRCPB has total 7 numbers of technical equipment's available in library. Out of which 3 computers and 1 scanner, printer and server each. NRCCt, NRCC and NRCE has equal numbers of technical equipment's. Each NRC libraries has 5 technical equipments out of which NRCC has 2 computers 1 server 1 printer and 1 software. NRCCt has 3 computers 1 scanner and 1 printer. NRCE has 1 computer, 1 scanner, 1

printer, and 1 CD ROM and security system. National Research Centre for Pomegranate has least numbers of technical equipment's among all research centre libraries.

Financial Resources

This section shows status and sources of financial resources available. This section deals in many sub divisions like funding agency, financial resources of library, allocation of library budget on different heads like e-journals, e-books, repositories, databases on CD ROM's, Audio/Video Cassettes, VCD'S DVD'S and miscellaneous.

Table-5.8: Funding Agency

Srl. No.	Agencies	Research Centres
1.	Central Govt.	3 (30%)
2.	ICAR	7 (70%)

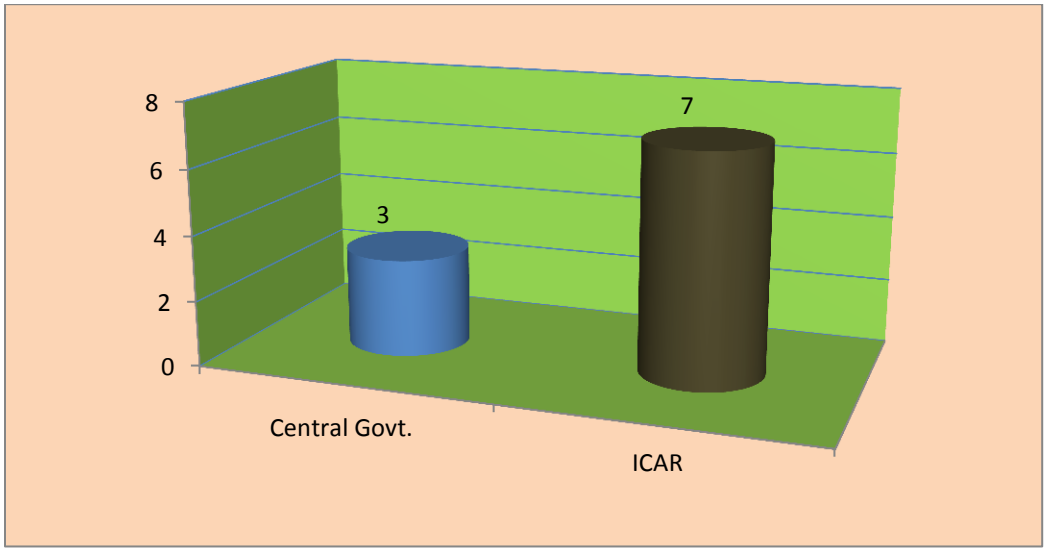


Fig. 5.6: Funding Agency

Table 5.8 and Fig. 5.6 provide the clear picture of agencies that provide funds to the libraries of National Research Centre. Out of 10 research centers libraries 7 (70%) are getting funds from Indian Council of Agricultural Research and 3(30%) were getting from central government.

Table-5.9: Financial Resources of library

Srl. No.	Research Centres	NRCB	NRCC	NRCCt	NRCE	NRCG	NRCL	NRCPM	NRCPB	NRCP	NRCM
1.	UGC	-	-	-	-	-	-	-	-	-	-
2.	State Gov-ernment	-	-	-	-	-	-	-	-	-	-
3.	Trust/Manag ement Grants	-	-	-	-	-	-	-	-	-	-
4.	Donations/ Endowments	-	-	-	-	-	-	-	-	-	-
5.	Over Charg-es, Sale of Old Newspa-pers, Xerox charges Membership Charges, Etc.	-	-	-	-	-	✓	-	-	-	-
6.	Any Other (Please speci-fy)	ICAR	ICAR	ICAR	ICAR	-	-	ICAR	ICAR	ICAR	ICAR

Above table 5.9 shows availability of financial resources other than regular funds these institutes receiving from their parent body. National Research Centre for Litchi has Over Charges, Sale of Old Newspapers, Xerox charges Membership Charges, are the other financial resources. Other Research centres have respond to ICAR as their financial resources. National Research Centre for Grapes has no other financial resources other than their regular fund received from their parent body.

5.4.1 Allocation of Library Budget.

This section deals with allocation of library budget on different heads like E-Journals, E-books, repositories, databases: CD-ROM Online, Audio/Video Cassettes, VCD'S DVD'S and Miscellaneous. All the heads were shown separately through table.

Library budget is divided in 7 sections. Below 50000, 50000 to 100000, 100000 to 500000, 500000 to 1000000, 1000000 to 1500000, above 1500000 and No budget.

Table-5.10: E-Journals

S. No	Research Centers	Library Budget (Approximate) in Rs.						
		Below 50,000	50,000-1,00,000	1,00,000 - 5,00,000	5,00,000 - 10,00000	10,00,000-15,00,000	Above 15,00000	No Budget
1.	NRCB	✓	-	-	-	-	-	-
2.	NRCC	-	-	-	-	-	-	✓
3.	NRCCt	-	-	-	-	-	-	✓
4.	NRCE	-	-	-	✓	-	-	-
5.	NRCG	-	-	✓	-	-	-	-
S. No	Research Centers	Library Budget (Approximate) in Rs.						

		Below 50,000	50,000-1,00,000	1,00,000 - 5,00,000	5,00,000 - 10,00000	10,00,000-15,00,000	Above 15,00000	No Budget
6.	NRCL	-	-	-	-	-	-	✓
7.	NRCPM	-	-	-	-	-	-	✓
8.	NRCPB	-	-	-	✓	-	-	-
9.	NRCP	-	-	-	✓	-	-	-
10.	NRCM	✓	-	-	-	-	-	-

Table 5.10 shows library budget allotted for subscription of E-Journals. National Research Centre for Banana and National Research Centre on Mithun are getting less than Rs. 50,000 budget for e-journals. NRCG was getting budget between 1 lakh to 5 lakhs. NRCE, NRCPB and NRCP was getting budget between 5 lakhs to 10 lakhs for e-journals. Rest of the National Research Centre libraries were getting zero budget for subscribing e-journals.

Table-5.11: E-Books

S. No	Research Centers	Library Budget (Approximate) Rs						
		Below 50,000	50,000-,1,00,000	1,00,000 - 5,00,000	5,00,000 - 10,00000	10,00,000- 15,00,000	Above 15,00000	No Budget
1.	NRCB	-	-	-	-	-	-	✓
2.	NRCC	-	-	-	-	-	-	✓
3.	NRCCt	-	-	-	-	-	-	✓
4.	NRCE	-	-	-	-	-	-	✓
5.	NRCG	-	-	✓	-	-	-	-
6.	NRCL	-	-	-	-	-	-	✓
7.	NRCPM	-	-	-	-	-	-	✓
8.	NRCPB	✓	-	-	-	-	-	-
9.	NRCP	✓	-	-	-	-	-	-
10.	NRCM	-	-	-	-	-	-	-

Table 5.11 shows the budget allocation on E-books by selected National Research Centre libraries. NRCP and NRCPB both are getting below Rs 50,000 as budget for e-book. NRCG was getting budget between 1 Lakh to 5 Lakhs and rest of the NRC's library is not getting any budget for e-book subscription.

Table-5.12: Repositories

S. No	Research Centers	Library Budget (Approximate) Rs						
		Below 50,000	50,000-,1,00,000	1,00,000 - 5,00,000	5,00,000 - 10,00000	10,00,000- 15,00,000	Above 15,00000	No Budget
1.	NRCB	-	-	-	-	-	-	✓
2.	NRCC	-	-	-	-	-	-	✓
3.	NRCCt	-	-	-	-	-	-	✓
4.	NRCE	-	-	-	-	-	-	✓
5.	NRCG	-	-	✓	-	-	-	-
6.	NRCL	-	-	-	-	-	-	✓
7.	NRCPM	-	-	-	-	-	-	✓
8.	NRCPB	-	-	-	-	-	-	✓
9.	NRCP	-	-	-	-	-	-	✓
10.	NRCM	-	-	-	-	-	-	-

Above table 5.12 provide the clear picture of budget spend on institutional repositories. Only National Research Centre for Grapes was getting budget for repository. NRCG was getting budget between Rs 1 lakh to 5 lakhs. But rest of NRC's is not getting any budget for repository.

Table-5.13: Databases: CD-ROM ONLINE

S. No	Research Centers	Library Budget (Approximate) Rs						
		Below 50,000	50,000-,1,00,000	1,00,000 - 5,00,000	5,00,000 - 10,00000	10,00,000- 15,00,000	Above 15,00000	No Budget
1.	NRCB	-	-	-	-	-	-	✓
2.	NRCC	-	-	-	-	-	-	✓
3.	NRCCt	-	-	-	-	-	-	✓
4.	NRCE	-	-	-	-	-	-	✓
5.	NRCG	-	-	✓	-	-	-	-
6.	NRCL	-	-	-	-	-	-	✓
7.	NRCPM	-	-	-	-	-	-	✓
8.	NRCPB	✓	-	-	-	-	-	-
9.	NRCP	-	-	-	-	-	-	✓
10.	NRCM	✓	-	-	-	-	-	-

This table deals with budget allotted for database of online CD ROM. Only 3 NRC's were getting budget for online database of CD ROM. NRCPB and NRCM were getting budget bellow Rs. 50,000. NRCG was getting budget for database of online CD ROM between 1 lakh to 5 lakhs. Rest of NRC's libraries were not getting any budget for database of online CD ROM.

Table-5.14: Audio/Video Cassettes, VCD'S DVD'S

S. No	Research Centers	Library Budget (Approximate) Rs						
		Below 50,000	50,000-,1,00,000	1,00,000 - 5,00,000	5,00,000 - 10,00000	10,00,000- 15,00,000	Above 15,00000	No Budget
1.	NRCB	-	-	-	-	-	-	✓
2.	NRCC	-	-	-	-	-	-	✓
3.	NRCCt	-	-	-	-	-	-	✓
4.	NRCE	-	-	-	✓	-	-	-
5.	NRCG	-	-	-	-	-	-	✓
6.	NRCL	-	-	-	-	-	-	✓
7.	NRCPM	-	-	-	-	-	-	✓
8.	NRCPB	-	-	-	-	-	-	✓
9.	NRCP	-	-	-	-	-	-	✓
10.	NRCM	-	-	-	-	-	-	-

This table 5.14 shows the budget allocation for Audio/Video Cassettes, VCD'S DVD'S. Only National Research Centre for Equines was getting budget between 5 lakhs to 10 lakhs for Audio/Video Cassettes, VCD'S DVD'S. Rest of NRC's libraries were not getting any budget for Audio/Video Cassettes, VCD'S DVD'S.

Table-5.15: Miscellaneous

S. No	Research Centers	Library Budget (Approximate) Rs.						
		Below 50,000	50,000-,1,00,000	1,00,000 - 5,00,000	5,00,000 - 10,00000	10,00,000- 15,00,000	Above 15,00000	No Budget
1.	NRCB	-	-	-	✓	-	-	-
2.	NRCC	-	-	✓		-	-	-
3.	NRCCt	-	-	-		-	-	✓
4.	NRCE	-	-	-		-	-	✓
5.	NRCG	-	-	-		-	-	✓
6.	NRCL	-	-	-		-	-	✓
7.	NRCPM	-	-	-		-	-	✓
8.	NRCPB	-	-	-		-	-	✓
9.	NRCP	-	-	-		-	-	✓
10.	NRCM	-	-	-	-	-	-	-

Table no. 5.15 shows the budget allocation on miscellaneous heads. National Research Centre for Citrus was getting budget between Rs.1 lakh to 5 lakhs for miscellaneous heads. National Research Centre for Banana was getting budget between Rs.5 lakhs to 10 lakhs. Rest of the Research Centre Libraries were getting no budget for miscellaneous heads.

Table-5.16: Adequacy of library budget for providing open access services

Srl. No.	Research Centres	Sufficient	Not sufficient	Can't say
1.	NRCB	-	-	✓
2.	NRCC	✓	-	-
3.	NRCCt	✓	-	-
4.	NRCE	-	-	✓
5.	NRCG	-	-	✓
6.	NRCL	✓	-	-
7.	NRCPM	-	✓	-
8.	NRCPB	-	-	✓
9.	NRCP	-	-	✓
10	NRCM	-	-	✓
	Total	**3** (30%)	**1** (10%)	**6** (60%)

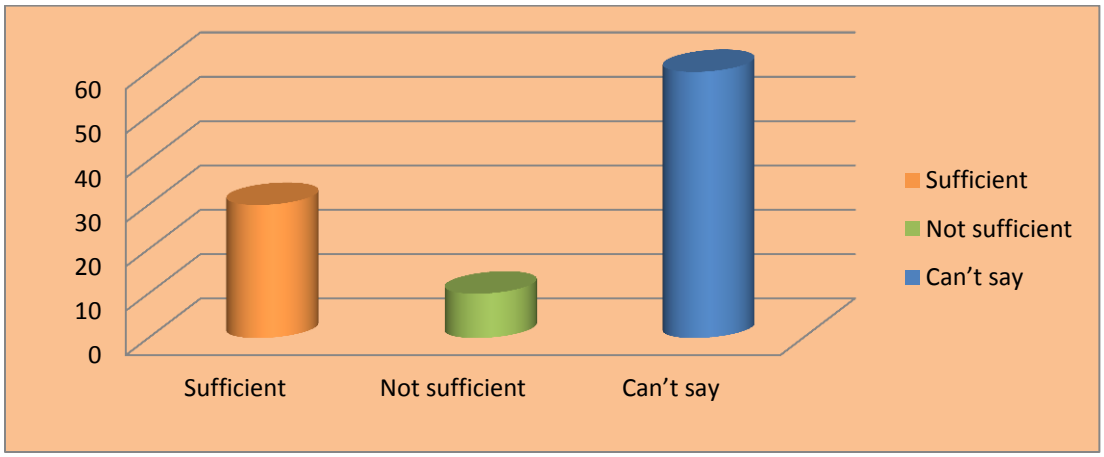


Fig. 5.7: Adequacy of library budget

Table no. 5.16 and Fig. 5.7 shows adequacy of library budget for providing open access services in NRC Libraries. Only 3 (30%) NRC's (NRCC, NRCCt and NRCL) were getting sufficient budget for open access services. Maximum no. of NRC's that is 6 (60%) responds that they can't say on this topic. Rest of the respondent that is National

Research Centre for Pest Management is not getting sufficient budget for open access services.

Digitization Status

This section deals with digitization status in selected National Research Centre libraries. This section is further divided into sub sections like digitization status, numbers of digitized materials, reason of not digitized, mission and purpose of open access and key open access initiatives/Services of the Library.

Table-5.17: Digitization Status of library collections.

Srl. No.	Research Centres	Yes	No	No but plan for digitization
1.	**NRCB**			✓
2.	**NRCC**	✓		
3.	**NRCCt**		✓	
4.	**NRCE**	✓		
5.	**NRCG**		✓	
6.	**NRCL**		✓	
7.	**NRCPM**	✓		
8.	**NRCPB**		✓	
9.	**NRCP**			✓
10.	**NRCM**			✓
	Total	**3** (30%)	**4** (40%)	**3** (30%)

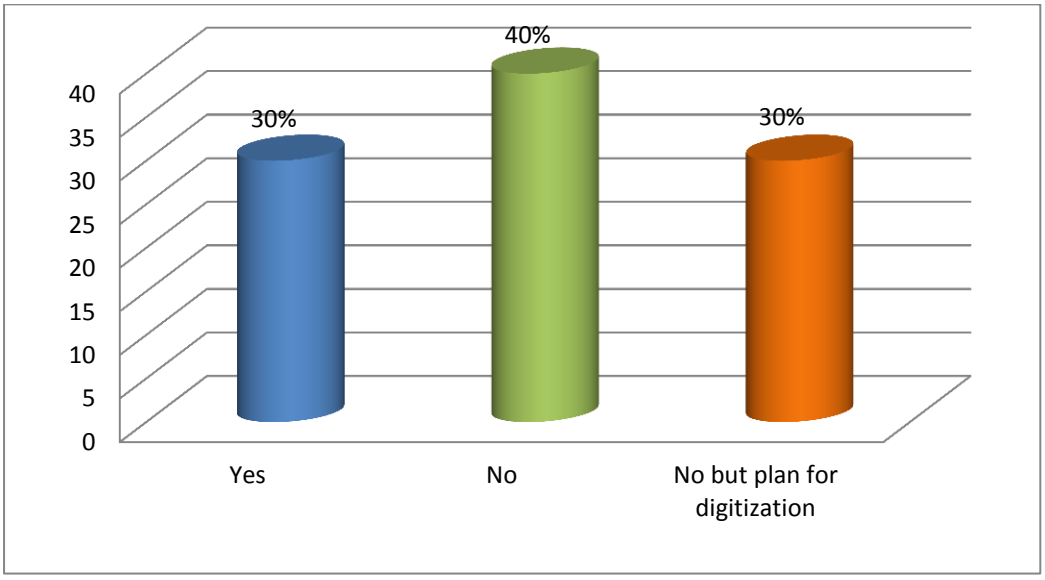


Fig. 5.8: Digitization Status

Table no. 5.17 and fig. 5.8 shows digitization status of library collection. Out of total number of NRC's selected for study only 30% (NRCC, NRCE and NRCPM) were digitized. There are 4 NRC's (NRCCt, NRCG, NRCL and NRCPB) which were not digitized their library collection. And 3 National Research Centres (NRCB, NRCM and NRCP) were planning for digitization of their library collection.

Total number of digitized materials.

Only 2 NRC's were given data of digitized materials out of 4 NRC's. National Research Centre for Pest Management has 2000 digitized books and National Research Centre for Citrus has 20 digitized reports.

If answer is "No" to Table no. 5.4.9 reasons for not digitized.

As above we can see that 4 NRC's were not digitized their library collection but only one NRC that is National Research Centre for Litchi was given reason for not digitization of library collection. According to NRCL lack of skills and expertise is the main reason behind not digitization of library collection.

Table-5.18: Mission and Purpose of Open Access

Srl. No.	Research Centers	NRCB	NRCC	NRCCt	NRCE	NRCG	NRCL	NRCPM	NRCPB	NRCP	NRCM	Total
1.	Exchange Information	✓	✓	✓	-	✓	✓	-	-	-	✓	6
2.	Set Standards	-	✓	-	-	-	-	-	-	-	-	1
3.	Educate	-	✓	-	-	✓	✓	-	-	-	-	3
4.	Promote Innovation	-	✓	-	-	✓	✓	-	✓	-	-	4
5.	Other	-	-	-	No	-	-	No	-	No	-	3

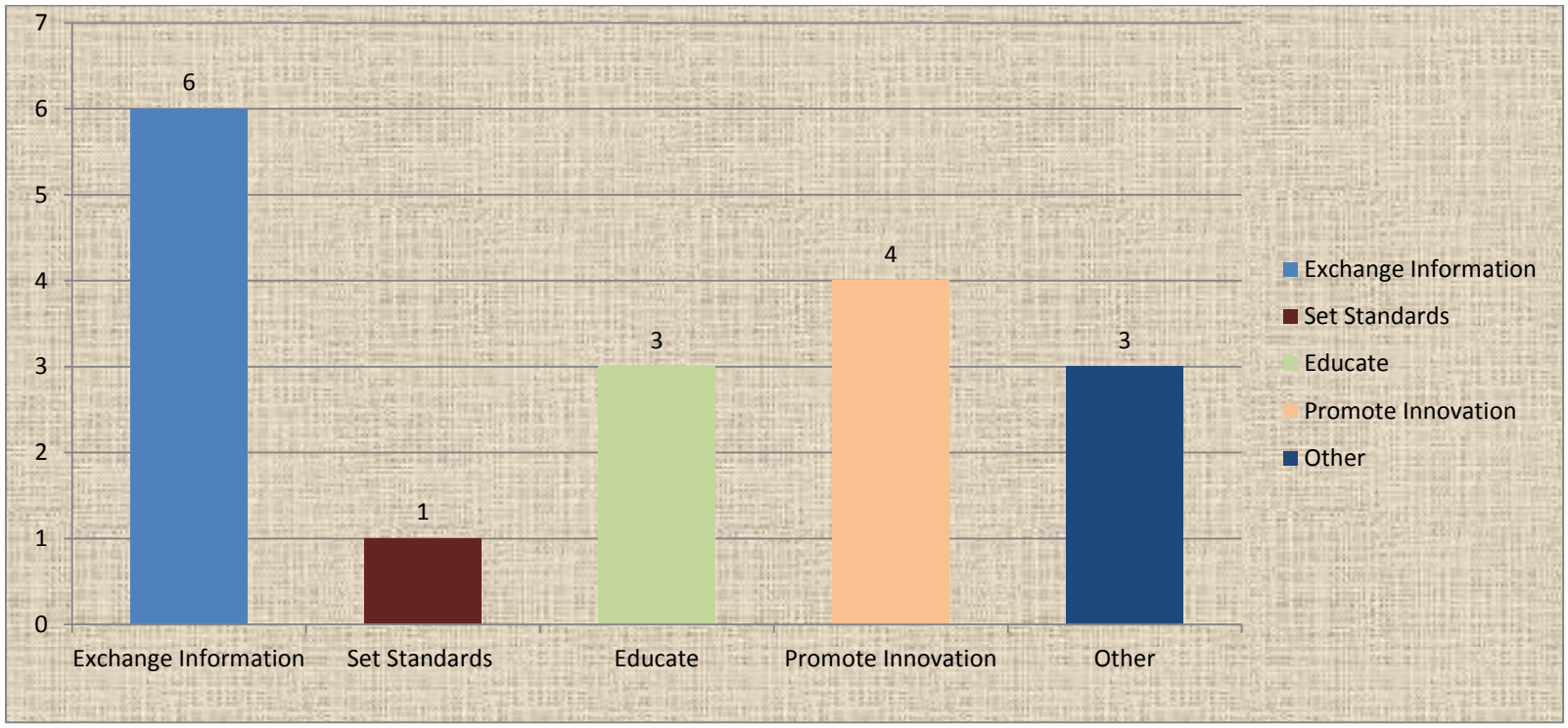


Fig. 5.9: Mission and Purpose of Open Access

Table 5.18 and fig 5.9 shows the mission and purpose of open access in all selected National Research Centre libraries. Maximum numbers of NRC's were providing or will provide open access for exchange of information. NRCB, NRCC, NRCCt, NRCL, NRCM and NRCG libraries are using open access for exchange of information. NRCC, NRCG, NRCL and NRCPB are using open access for promoting innovation. NRCC, NRCG and NRCL are using open access to educate. NRCE, NRCPM and NRCP are not using open access mission and purpose. National Research Centre for Citrus is using open access for Set and Standard.

Table-5.19: Key Open Access Initiatives/Services of the Library

Srl. No.	Research Centres	Institutional Repository	Other
1.	NRCB	✓	-
2.	NRCC	✓	-
3.	NRCCt	-	-
4.	NRCE	-	CeRA
5.	NRCG	✓	-
6.	NRCL	✓	-
7.	NRCPM	-	KOHA
8.	NRCPB	✓	-
9.	NRCP	-	-
10.	NRCM	✓	-

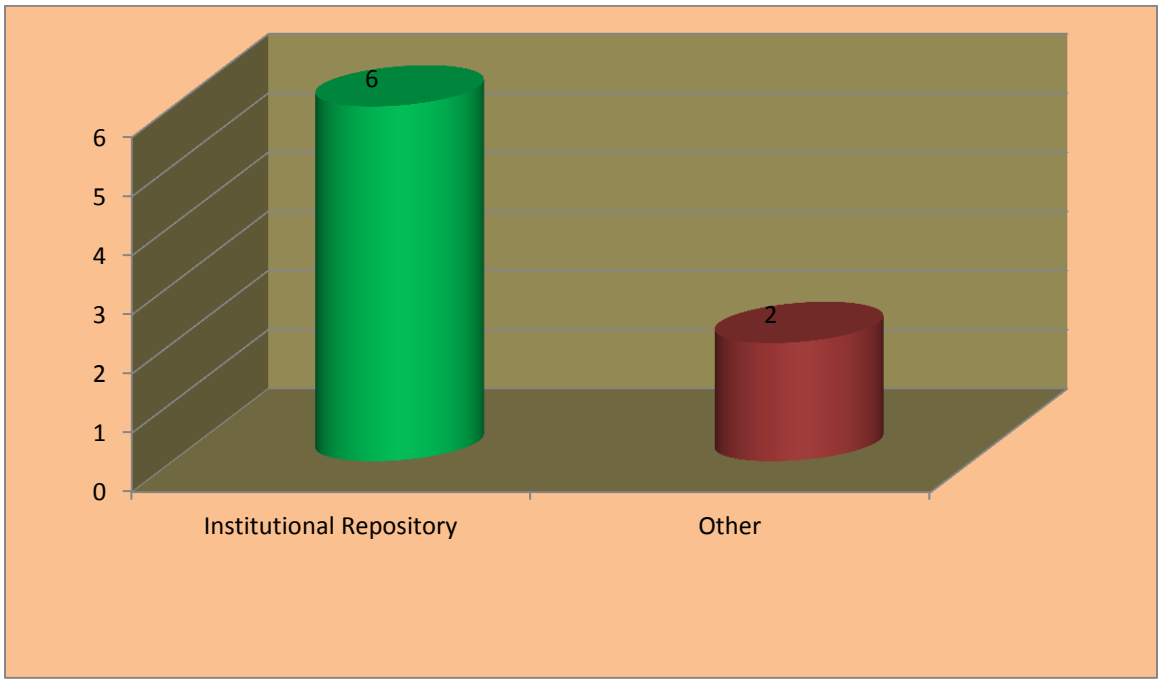


Fig. 5.10: Open Access Services of the Library

Table 5.19 and fig. 5.10 shows key open access initiatives and services of the library. NRCB, NRCC, NRCG, NRCL, NRCM and NRCPB have their institutional repositories. National Research Centre for Equines library is using Consortium for e-resources in Agriculture (CeRA).

5.5 Open Access Policy

This section deals with availability of open access policies in selected National Research Centre Libraries. This section is further divided into 22 sub sections mainly about written open access policies, measures to control copyright and digital rights of e-resources, organization of archives, member of Indian Consortia Initiatives and maintaining institutional repository.

Table-5.20: Written Open Access Policy.

Srl. No.	Research Centers	Yes	No
1.	NRCB	-	✓
2.	NRCC	-	✓
3.	NRCCt	-	✓
4.	NRCE	-	✓
5.	NRCG	✓	-
6.	NRCL	-	✓
7.	NRCPM	-	✓
8.	NRCPB	-	✓
9.	NRCP	-	✓
10.	NRCM		✓
	Total	**1** (10%)	**9** (90%)

Table 5.20 shows the availability of written open access policy in National Research Centre Libraries of ICAR. Out of 10 research centre libraries only 1(10%) have written open access policy. National Research Centre for Grapes have written open access policy.

Table-5.21: Regularly Implemented by NRC Library authorities.

Srl. No.	Research Centres	No
1.	NRCB	✓
2.	NRCC	✓
3.	NRCCt	✓
4.	NRCE	✓
5.	NRCG	✓
6.	NRCL	✓
7.	NRCPM	✓
8.	NRCPB	✓
9.	NRCP	✓
10.	NRCM	✓

Table 5.21 shows list of National Research Centre's who implemented their open access policy. No NRC's were implemented open access policy although NRCG has written open access policy.

Table-5.22: Revised and Updated

Srl. No.	Research Centres	Yes	No
1.	**NRCB**	-	✓
2.	**NRCC**	-	✓
3.	**NRCCt**	-	✓
4.	**NRCE**	-	✓
5.	**NRCG**	✓	-
6.	**NRCL**	-	✓
7.	**NRCPM**	-	✓
8.	**NRCPB**	-	✓
9.	**NRCP**	-	✓
10.	**NRCM**		✓
	Total	**1** (10%)	**9** (90%)

Table 5.22 shows NRC's who regularly revised and updated their open access policies. As we find in table 5.24 that only NRCG has written open access policy and they have regularly revised and updated it and there is no question of revised and updated open access policies by other NRC's. So only 1 (10%) NRC was revised and updates their open access policy and rest of 9 (90%) NRC's have no written access policy.

Table-5.23: Measures to control copyright/digital rights of E-Resources

Srl. No.	Research Centres	Special security measures	Anti-plagiarism software	Any oth-er
1.	NRCB	✓	-	-
2.	NRCC	-	-	Open
3.	NRCCt	✓	-	-
4.	NRCE	✓	-	-
5.	NRCG	-	-	IP Based login
6.	NRCL	-	-	-
7.	NRCPM	-	-	No open Access
8.	NRCPB	-	✓	-
9.	NRCP	-	-	-
10.	NRCM	-	✓	-

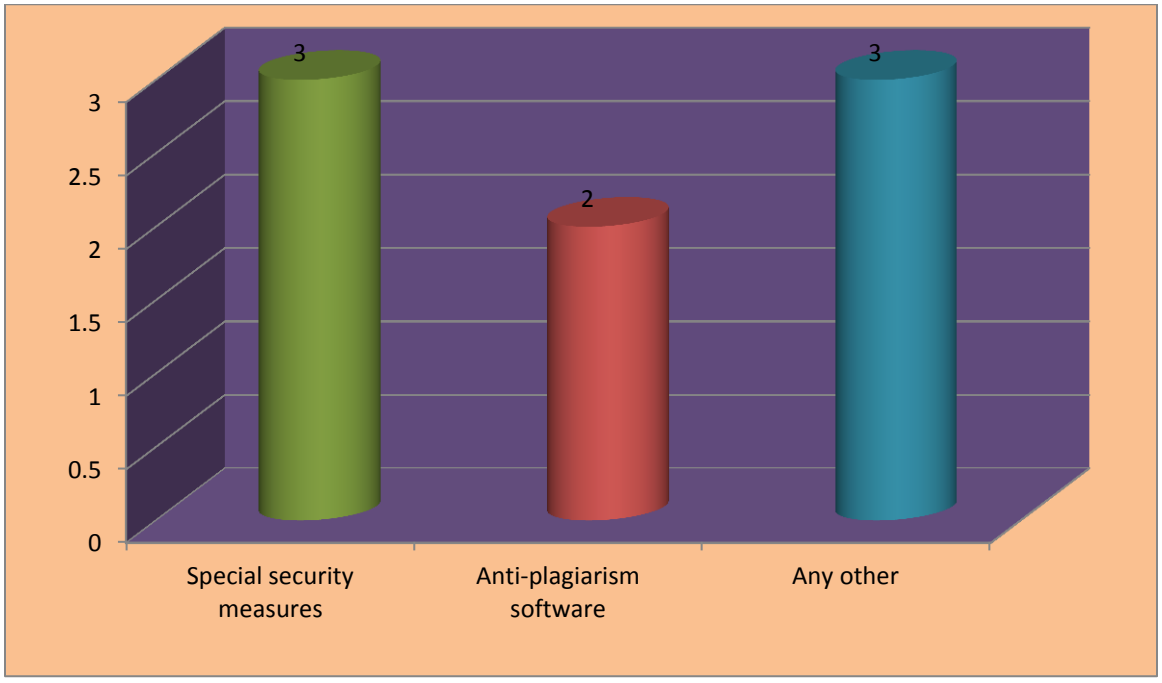


Fig. 5.11: Measures to control copyright/digital rights

Above table 5.23 and fig. 5.11 shows measures taken to control copyright and digital rights by NRC's libraries. NRCB, NRCCt and NRCE has special security measures to control copyright and digital rights. National Research Centre for Plant Biotechnology and National Research Centre on Mithun has Anti-plagiarism software for controlling copyright and digital rights. National Research Centre for Citrus has open for all users and there is no copy right and digital rights. National Research Centre for Grapes has IP based login process where as National Research Centre for Pest Management has no open access.

Table-5.24: Organization of Archives

Srl. No.	Research Centres	Selected articles	Organize by category	As issued originally
1.	**NRCB**	✓	-	-
2.	**NRCC**	-	✓	-
3.	**NRCCt**	✓	-	-
4.	**NRCE**	-	-	✓
5.	**NRCG**	-	✓	-
6.	**NRCL**	-	✓	✓
7.	**NRCPM**	-	✓	-
8.	**NRCPB**	-	-	✓
9.	**NRCP**	-	✓	-
10.	**NRCM**		✓	
	Total	**2** (20%)	**6** (60%)	**3** (30%)

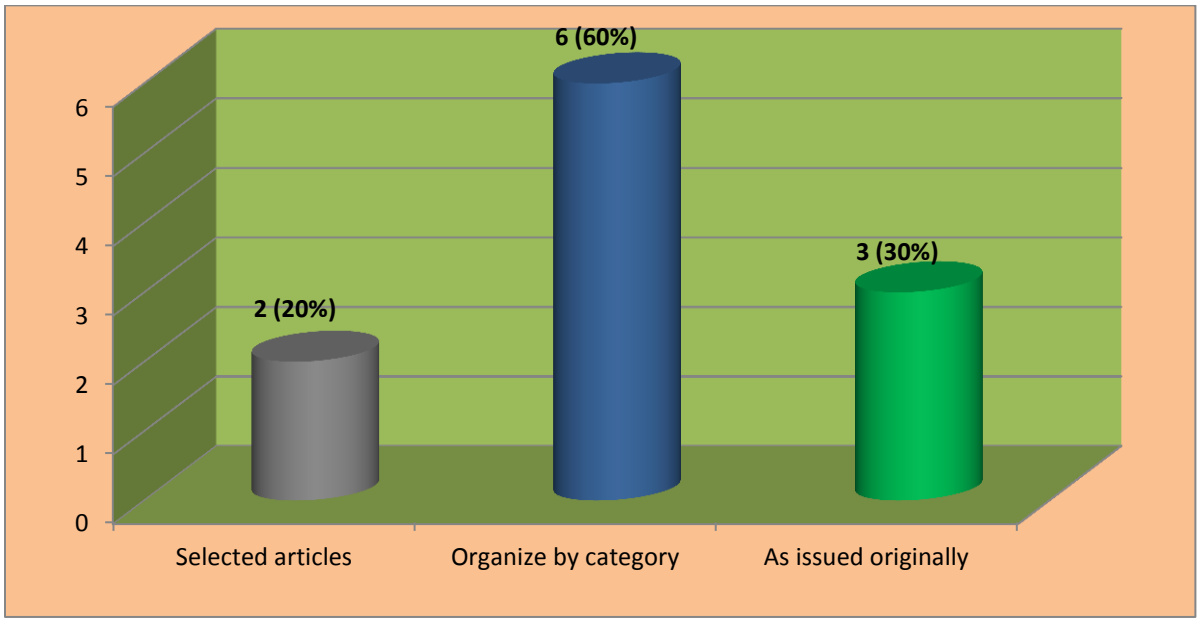


Fig. 5.12: Organization of Archives

Table 5.24 and fig 5.12 shows organization of archives in all National Research Centre libraries selected for study. 20% of total research centre libraries were organizing archives by selected articles. 60% of total research centre libraries are organising archives by category and 30% of libraries were organising archives as they were issued originally.

Table-5.25: Member of Indian Consortia Initiatives

Srl. No.	Research Centres	CeRA (Consortium of Electronic Resources in Agriculture)	ICAR e-consortia	HELNET Consortium
1.	NRCB	-	-	✓
2.	NRCC	✓	-	-
3.	NRCCt	✓	-	-
4.	NRCE	✓	-	-
5.	NRCG	✓	✓	-
6.	NRCL	✓	-	KOHA e-

				granth
Srl. No.	**Research Centres**	**CeRA (Consortium of Electronic Resources in Agriculture)**	**ICAR e-consortia**	**HELNET Consortium**
7.	**NRCPM**	✓	-	-
8.	**NRCPB**	✓	✓	-
9.	**NRCP**	-	✓	-
10.	**NRCM**	✓	✓	
	Total	**8 (80%)**	**4 (40%)**	**1 (10%)**

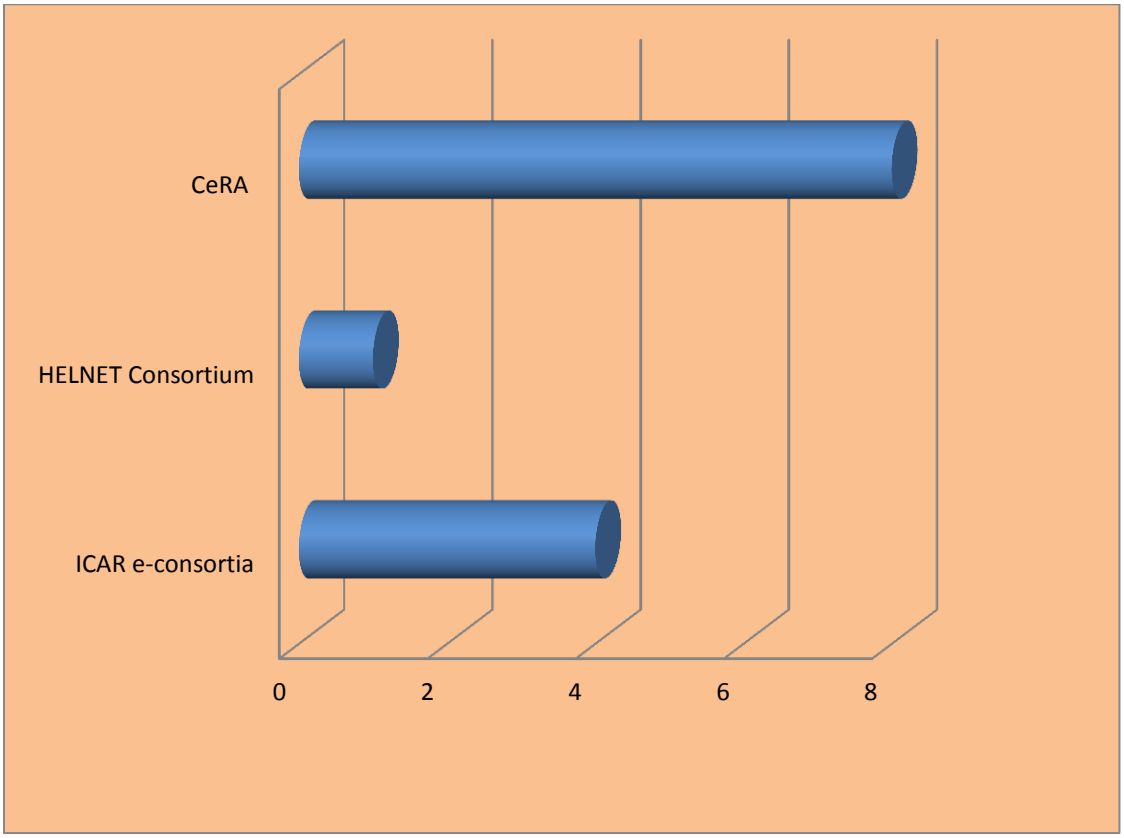


Fig. 5.13: Member of Indian Consortia Initiatives

Table 5.25 and fig 5.13 shows the status of NRC's libraries as the member of various Indian Consortia Initiatives. Maximum numbers 8 (80%) of NRC libraries were

members of Consortium of electronic resources in agriculture (CeRA). 4 (40%) National Research Centre libraries are members of ICAR e-consortia. Whereas only one NRC library (NRCL) is member of HELNET Consortium.

Table-5.26: Maintaining Institutional Repository

Srl. No.	Research Centres	Yes	No
1.	NRCB	-	✓
2.	NRCC	✓	-
3.	NRCCt	✓	-
4.	NRCE	✓	-
5.	NRCG	✓	-
6.	NRCL	-	✓
7.	NRCPM	✓	-
8.	NRCPB	-	✓
9.	NRCP	-	✓
10.	NRCM	✓	-
	Total	6 (60%)	5 (50%)

Table 5.26 shows availability of Institutional Repository in libraries of selected National Research Centres. Out of 10 research centre libraries 6 (60%) were maintaining institutional repositories. These are NRCC, NRCCt, NRCE, NRCG, NRCM and NRCPM and 4 (40%) NRC libraries are not maintaining their institutional repository. These are NRCB, NRCL, NRCPB and NRCP.

Table-5.27: Maintaining Statistics of the Consortium/ Consortia in Use

Srl. No.	Research Centres	Yes	No
1.	**NRCB**	-	✓
2.	**NRCC**	-	✓
3.	**NRCCt**	-	✓
4.	**NRCE**	-	✓
5.	**NRCG**	✓	-
6.	**NRCL**	-	✓
7.	**NRCPM**	-	✓
8.	**NRCPB**	-	✓
9.	**NRCP**	-	✓
10.	**NRCM**	-	✓
	Total	**1**(10%)	**9**(90%)

Table 5.27 shows the status of maintaining statistics of their consortium. Only National Research Centre for Grapes has maintaining statistics of their consortium. Rest of 9 (90%) NRC's were not maintaining any record or statistics of their consortium.

Table-5.28: If Yes Give Details for Past One Year.

	NRC →	NRCG
Srl. No.	**Month ↓**	
1.	Jan	**--**
2.	Feb	**186**
3.	Mar	**141**
4.	Apr	**220**
5.	May	**398**
6.	June	**302**
7.	July	**156**
8.	Aug	**36**
9.	Sep	**12**
10.	Oct	**255**
11.	Nov	**259**
12.	Dec	**103**

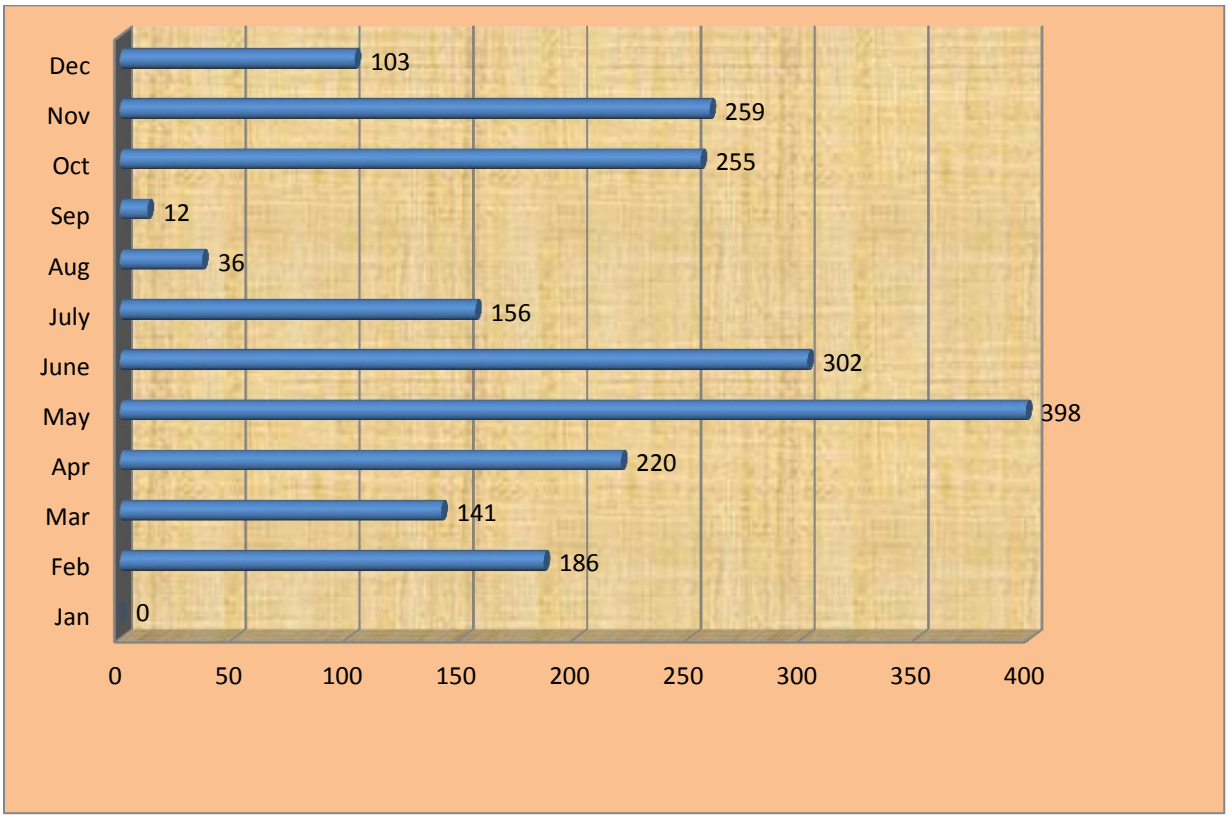


Fig. 5.14: Consortia Use in NRCG

Table 5.28 and fig 5.14 shows past one year statistics of using consortia of National Research Centre for Grapes library. We can see that in the month of May maximum number (398) of users were use the consortium. In the month of January, no user access consortium. There are 302 users followed by 259 users used consortia in the month of June and November. In the month of October and April,255 and 220 users uses consortia. In the month of Feb and July 186 and 156 users respectively used NRCG library consortia. In the month of Dec, Aug and Sep total 103, 36 and 12 users respectively used consortia.

5.6 Attitude towards Open Access Initiative

Table-5.29: Awareness of Open Access Publishing.

Srl. No.	Research Centres	I'm not aware of OA publishing	Less than one year	Three years	More than three years
1.	NRCB	✓	-	-	-
2.	NRCC	-	-	-	✓
3.	NRCCt	-	-	-	✓
4.	NRCE	-	-	✓	-
5.	NRCG	-	-	-	✓
6.	NRCL	-	-	-	✓
7.	NRCPM	-	-	-	✓
8.	NRCPB	-	-	-	✓
9.	NRCP	-	-	✓	-
10.	NRCM		✓		
	Total	**1** (10%)	**1** (10%)	**2** (20%)	**6** (60%)

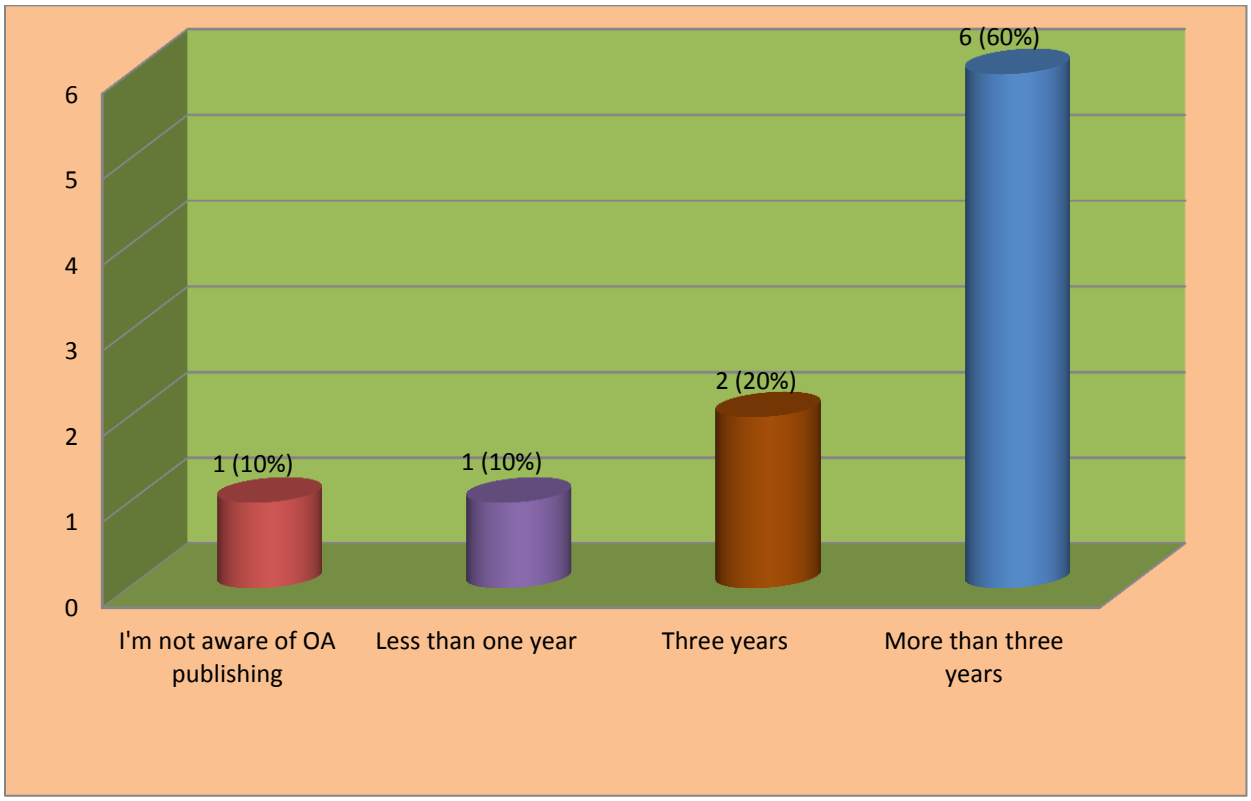


Fig. 5.15: Awareness of Open Access Publishing

Table 5.29 and fig. 5.15 shows awareness of open access publishing by the librarians/library in-charge of selected NRC's library. 60% of NRC librarians are aware of open access publishing from more than 3 years. 20% of NRC's librarians are aware of open access publishing from past 3 years and only 10% of NRC's librarians are not aware of open access publishing.

Table-5.30: Awareness to promote Open Access publishing.

Srl. No.	Research Centres	Yes
1.	**NRCB**	✓
2.	**NRCC**	✓
3.	**NRCCt**	✓
4.	**NRCE**	✓
5.	**NRCG**	✓
6.	**NRCL**	✓
7.	**NRCPM**	✓
8.	**NRCPB**	✓
9.	**NRCP**	✓
10.	**NRCM**	✓
	Total	**10**(100%)

This table 5.30 shows the awareness about various initiatives in country to promote open access publishing. All National Research Centre Libraries librarians are aware about various initiatives in country to promote open access publishing.

Table-5.31: Opinion on cost effectiveness of Open Access publishing model over current subscription-based model

Srl. No.	Research Centres	Strongly agree	Agree	Disagree	Don't know
1.	NRCB	-	-	✓	-
2.	NRCC	✓	-	-	
3.	NRCCt	✓	-	-	-
4.	NRCE	-	-	-	✓
5.	NRCG	-	✓	-	-
6.	NRCL	-	✓	-	-
7.	NRCPM	✓	-	-	-
8.	NRCPB	-	✓	-	-
9.	NRCP	-	✓	-	-
10.	NRCM		✓		
	Total	**3** (30%)	**5**(50%)	**1** (10%)	**1** (10%)

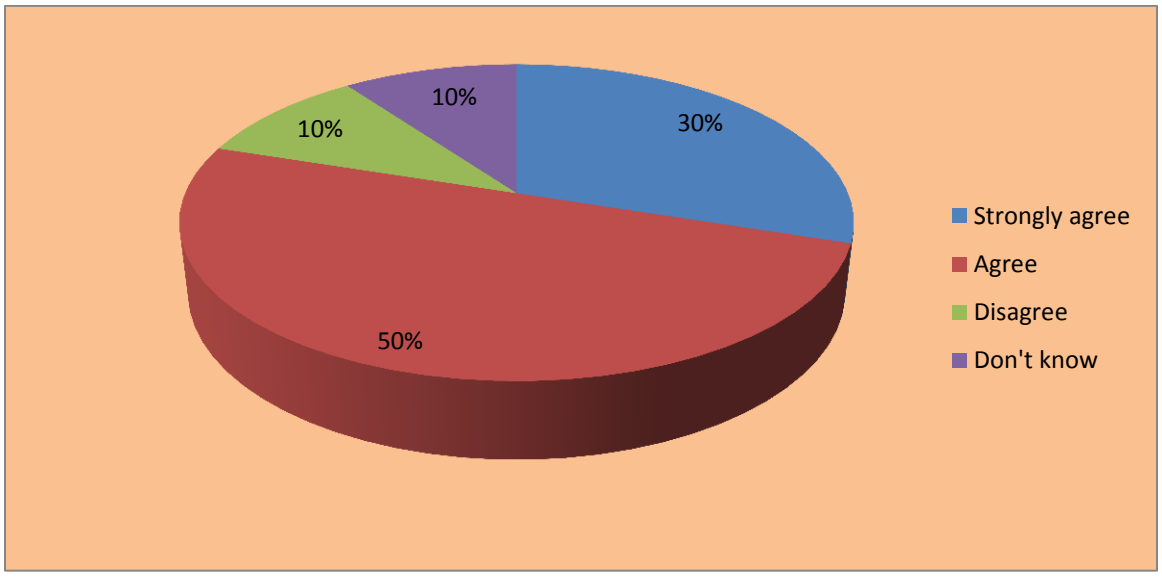


Fig. 5.16: Cost Effectiveness of Open Access Publishing

Above table 5.31 and fig. 5.16 shows opinion on "Open Access publishing model will be more cost-effective to the academic research community in the long run than the current subscription-based model". 50% (5) NRC's are agree with this statement followed by 30% (3) NRC's who were strongly agree with above statement on open access publishing. National Research Centre for Banana is disagreeing with the above statement and National Research Centre for Equines have no opinion on this statement.

Table-5.32: Opinion on cost effectiveness of Open Access Publishing Model.

Srl. No.	Research Centres	Publishing costs will reduce	Publishers' profits will reduce	Didn't Know
1.	**NRCB**	✓	-	-
2.	**NRCC**	-	✓	-
3.	**NRCCt**	✓	-	-
4.	**NRCE**	-	-	✓
5.	**NRCG**	-	-	✓
6.	**NRCL**	✓	-	-
7.	**NRCPM**	✓	-	-
8.	**NRCPB**	✓	-	-
9.	**NRCP**	-	✓	-
10.	**NRCM**	✓	-	-
	Total	**6** (60%)	**2** (20%)	**2** (20%)

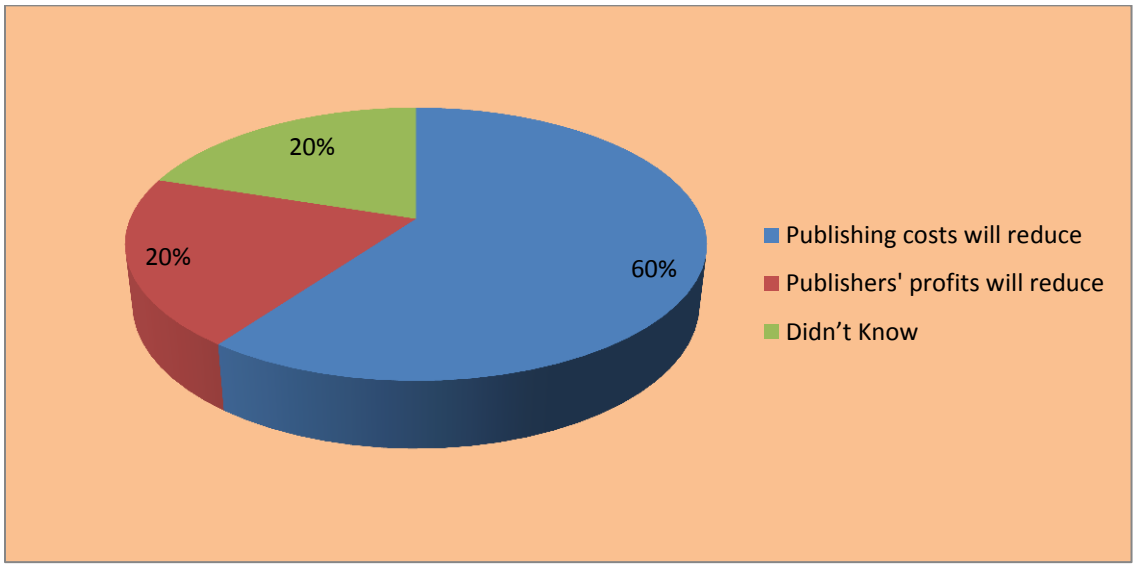


Fig. 5.17: Cost Effectiveness of Open Access Publishing model

Table 5.32 and fig. 5.17 shows opinion on cost effectiveness of open access publishing model. Maximum number of NRC's (6) has opinion that due to open access publishing model, publishing costs will reduce. Followed by 20 % of NRC's has opinion that publishers profit will reduce due to open publishing model. Rest of 2 NRC's have no opinion on this regard.

Table-5.33: Opinion on the effect of the quality of the scholarly publishing process by price-based competition.

Srl. No.	Research Centres	In a positive way	In a negative way	Don't know
1.	NRCB	-	✓	-
2.	NRCC	✓	-	-
3.	NRCCt	✓	-	-
4.	NRCE	-	✓	-
5.	NRCG	-	-	✓
6.	NRCL	✓	-	-

Srl. No.	Research Centres	In a positive way	In a negative way	Don't know
7.	NRCPM	-	✓	-
8.	NRCPB	-	-	✓
9.	NRCP	✓	-	-
10.	NRCM	✓	-	-
	Total	5(50%)	3 (30%)	2(20%)

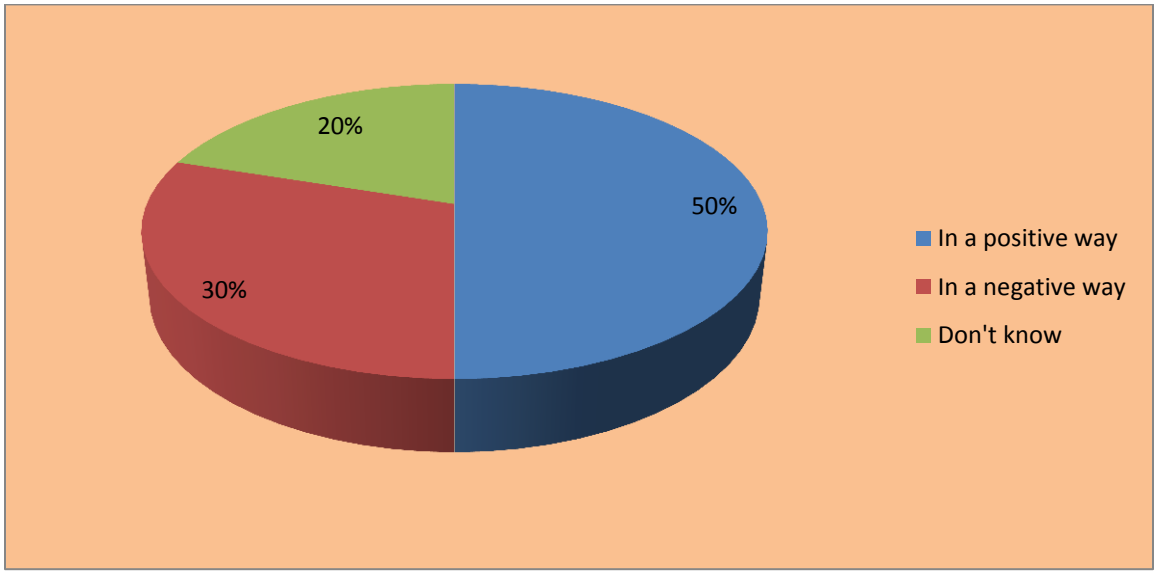


Fig. 5.18: Effect on quality of the scholarly publishing process

Above table 5.33 and fig. 5.18 shows opinion on "price based competition will affect the quality of scholarly publishing process". Out of 10 research centres5 (50%) has opinion that it affects in a positive way. 3 (30%) research centres has opinion that it affects in a negative way and rest of 2 (20%) research centres has no opinion on this statement.

5.7 Impact of Open Access Initiatives

This section deals with impact of open access initiatives on library and their services.

Table-5.34: Impact on library image after introduction of open access services.

Srl. No.	Research Centres	Improved	Decreased	No. Change
1.	NRCB	✓	-	-
2.	NRCC	✓	-	-
3.	NRCCt	✓	-	-
4.	NRCE	-	✓	-
5.	NRCG	✓	-	-
6.	NRCL	-	-	-
7.	NRCPM	✓	-	-
8.	NRCPB	-	-	✓
9.	NRCP	✓	-	-
10.	NRCM	✓		
	Total	7(70%)	1 (10%)	1 (10%)

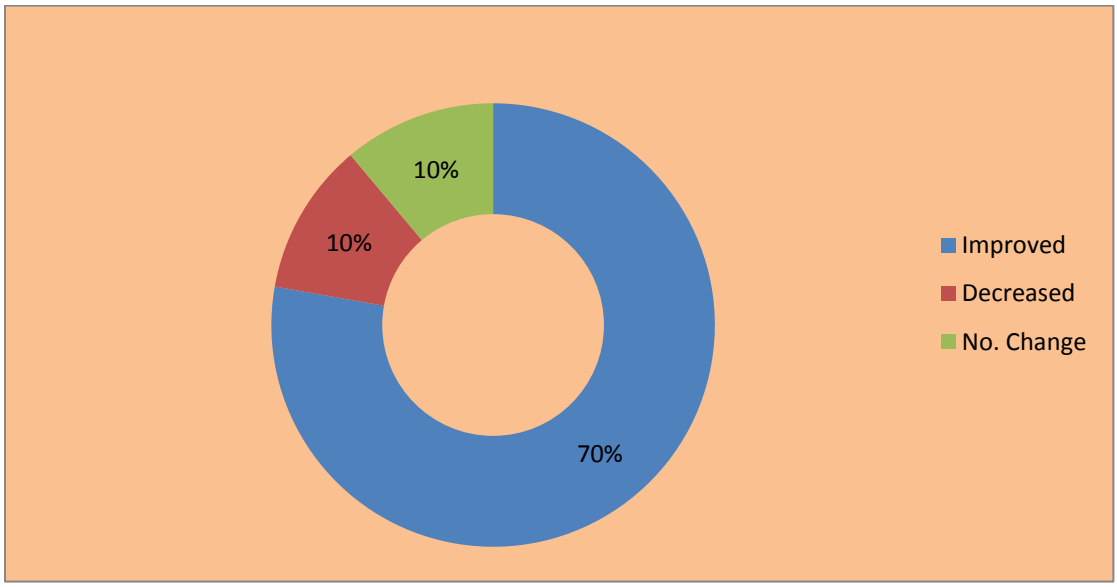


Fig. 5.19: Impact of Open Access Services on Libraries

Above table 5.34 and fig. 5.19 shows impact of open access services on library image. 70% of NRC's have said that after introduction of open access services in the library, library image is improved. 10% of NRC's have said that there is no change in the image of the library and 10% of NRC's have said that the image is decreased due to open access services. National Research Centre has given no response on this statement.

Table-5.35: Impact on number of users after introducing open access Services.

Srl. No.	Research Centres	Increased	Decreased
1.	**NRCB**	-	✓
2.	**NRCC**	✓	-
3.	**NRCCt**	✓	-
4.	**NRCE**	-	✓
5.	**NRCG**	✓	-
6.	**NRCL**	-	-
7.	**NRCPM**	✓	-
8.	**NRCPB**	✓	-
9.	**NRCP**	✓	-
10.	**NRCM**	✓	-
	Total	**7**(70%)	**2** (20%)

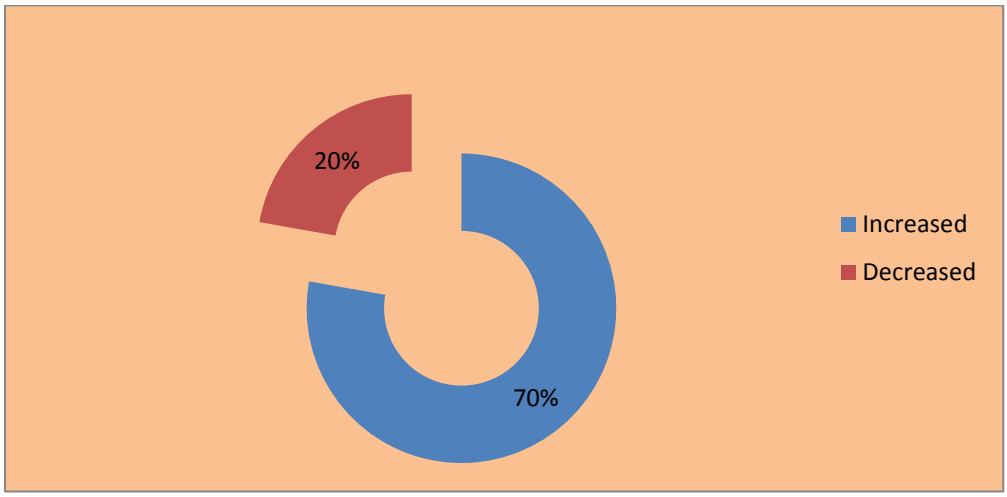


Fig. 5.20: Impact on users

Table 5.35 and fig. 5.20 shows the impact of open access services on number of users using library. Out of 10 Research Centre libraries 7 (70%) were said that the number of user was increased after introducing open access services. And 2 (20%) NRC's said that users become less in numbers after introducing open access services in the library. National Research Centre for Litchi has given no response on this statement.

Table- 5.36: Impact of open access initiative on annual budget of selected libraries.

Srl. No.	Research Centres	Yes	No
1.	NRCB	-	✓
2.	NRCC	✓	-
3.	NRCCt	-	✓
4.	NRCE	-	✓
5.	NRCG	-	-
6.	NRCL	-	-
7.	NRCPM	✓	-
8.	NRCPB	-	✓
9.	NRCP	-	✓
10.	NRCM		✓
	Total	2 (20%)	6(60%)

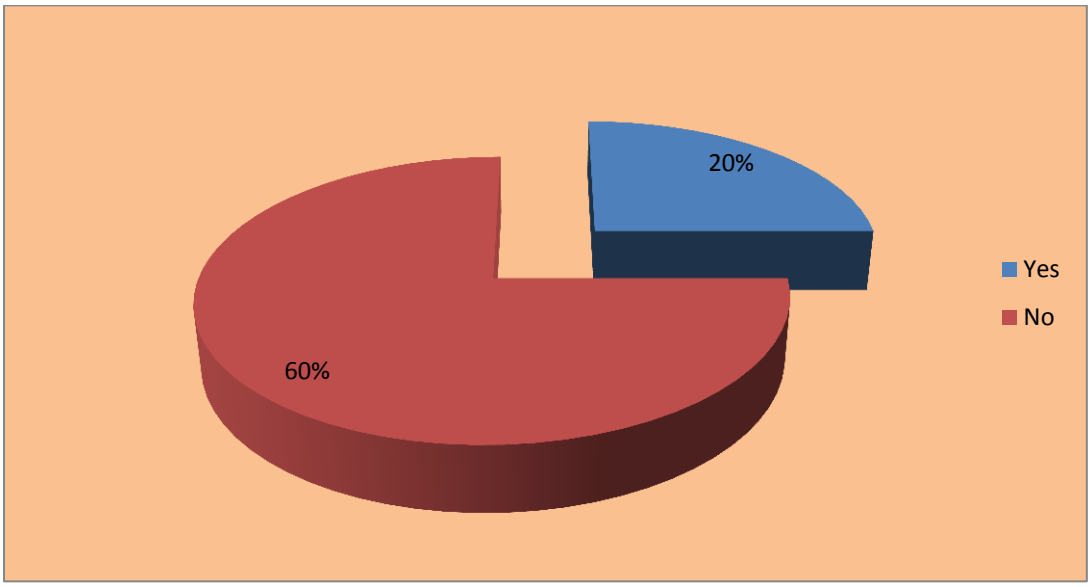


Fig. 5.21: Impact on annual budget

Table 5.36 and fig.5.21 shows impact of open access initiatives on annual budget of concerned library. Maximum number of NRC's (6) were said that there is no impact on their annual budget after introducing open access initiatives and 2 NRC's has replied that there is a impact on their annual budget after introducing open access initiatives. National Research Centre for Grapes and National Research Centre for Litchi has no response on this statement.

Table-5.37: Significant changes in the scientific output after introducing open access services.

Srl. No.	Research Centres	Yes	No
1.	NRCB	-	✓
2.	NRCC	✓	-
3.	NRCCt	-	-
4.	NRCE	✓	-
5.	NRCG	-	-

Srl. No.	Research Centres	Yes	No
6.	NRCL	-	-
7.	NRCPM	-	✓
8.	NRCPB	-	✓
9.	NRCP	-	-
10.	NRCM	-	✓
	Total	**2** (20%)	**4**(40%)

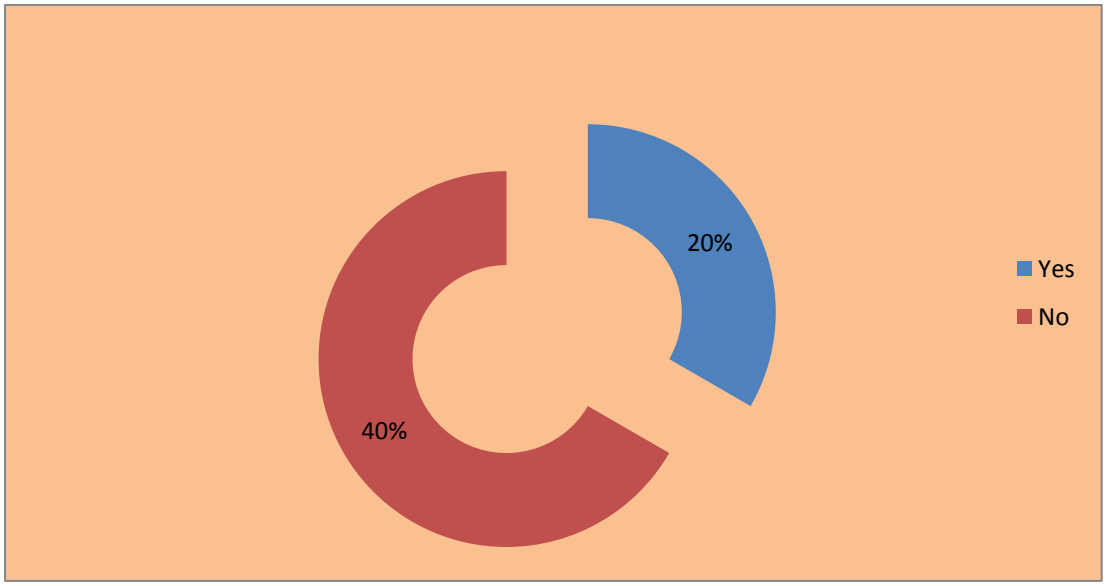


Fig. 5.22: Significant changes in scientific output

Above table 5.37 and fig. 5.22 shows significant changes in scientific output after introducing open access services. Out of 10 research centres 4 (40%) respond that there is no any significant change in scientific output. 2 (20%) research centres have significant changes in scientific output after introduction of open access services and rest of 4 (40%) research centre libraries have no response on this statement.

Table-5.38: Opinion on significant move to Open Access publishing may disrupt the established system of scholarly publishing.

Srl. No.	Research Centres	Very con-cerned	Concerned	Not very concerned	Not at all concerned	Don't know
1.	**NRCB**	-	✓	-	-	-
2.	**NRCC**		✓	-	-	-
3.	**NRCCt**	✓	-	-	-	-
4.	**NRCE**	-	✓	-	-	-
5.	**NRCG**	-	-	-	-	-
6.	**NRCL**	-	-	-	✓	-
7.	**NRCPM**	-	-	-	✓	-
8.	**NRCPB**	-	-	-	-	✓
9.	**NRCP**	-	-	✓	-	-
10.	**NRCM**	✓	-	-	-	-
11.	**Total**	**2** (20%)	**3**(30%)	**1**(10%)	**2**(20%)	**1**(10%)

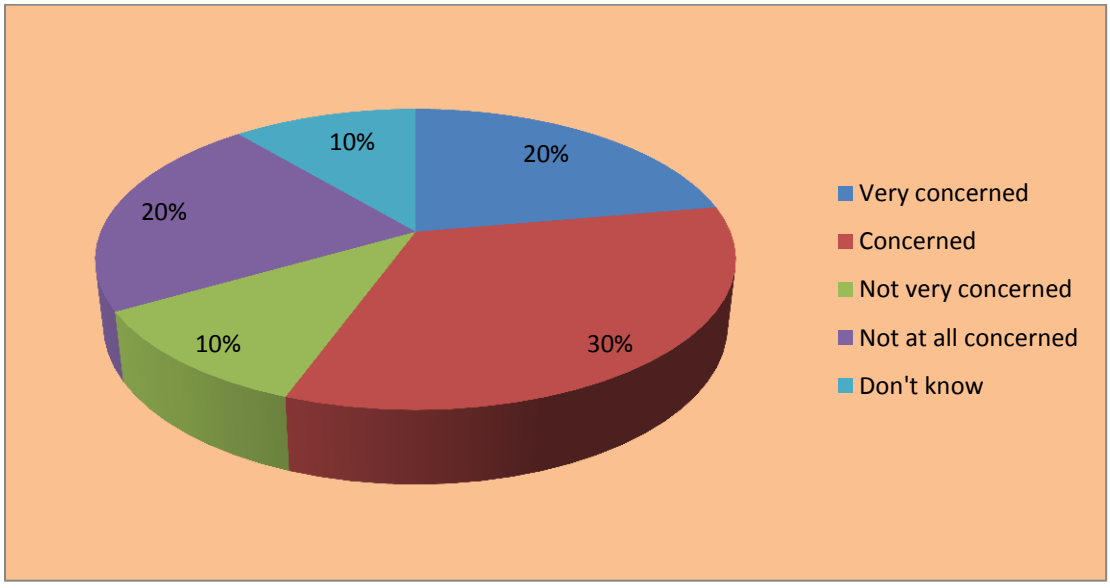


Fig. 5.23: Opinion on significant move to Open Access publishing

Table 5.38 and fig. 5.23 shows opinion of librarians and library in-charge on significant move to Open Access publishing may disrupt the established system of scholarly publishing. 3 (30%) research centre libraries are concerned on the above statement followed by 2 (20%) NRC's who not at all concerned with this statement. National research centre for Citrus library is very concerned on this statement and National Research Centre for Pomegranate is not very concerned. National Research Centre for Plant Biotechnology didn't know about this and National Research Centre for Grapes didn't respond on this question.

Table-5.39: Opinion about the efficiency of library staff regarding handling Electronic Information Sources and Services.

Srl. No.	Research Centres	All are efficient	Majority are efficient	Majority are not efficient	Can't say
1.	NRCB	-	-	-	✓
2.	NRCC	-	✓	-	-
3.	NRCCt	✓	-	-	-
4.	NRCE	-	-	-	✓
5.	NRCG	✓	-	-	-
6.	NRCL	-	-	✓	-
7.	NRCPM	-	✓	-	-
8.	NRCPB	-	-	-	✓
9.	NRCP	-	-	-	✓
10.	NRCM	-	-	✓	-
	Total	**2** (20%)	**2** (20%)	**2**(20%)	**4** (40%)

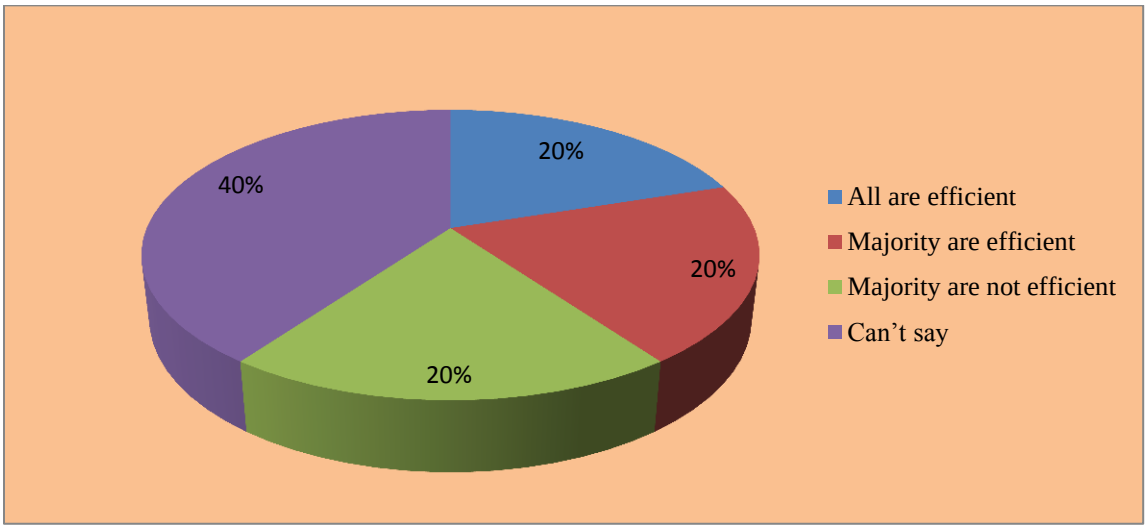


Fig. 5.24: Efficiency of library staff

Table 5.39 and fig. 5.24 shows opinion on efficiency of library staff regarding handling of electronic information sources and services. NRC Citrus and NRC Grapes libraries have efficient library staff regarding handling of electronic information sources. Out of 10 research centres 4 (40%) research centres respond that they can't say on this statement. NRC for Camel and NRC for Pest Management responded that majority of library staff are efficient in handling of electronic information sources and services. NRC for Litchi have responded that majority of library staff are not efficient in handling of electronic information sources and services.

Table-5.40: Awareness of open access initiatives.

Pre-Prints			
Srl. No.	**Research Centres**	**Aware**	**Not Aware**
1.	**NRCB**	✓	-
2.	**NRCC**	-	✓
3.	**NRCCt**	-	✓
4.	**NRCE**	-	✓

Pre-Prints			
Srl. No.	**Research Centres**	**Aware**	**Not Aware**
5.	**NRCG**	✓	-
6.	**NRCL**	-	✓
7.	**NRCPM**	✓	-
8.	**NRCPB**	-	✓
9.	**NRCP**	✓	-
10.	**NRCM**	✓	-
	Total	**5** (50%)	**5** (50%)

Table 5.40 shows awareness of open access initiatives of Pre-Prints in the libraries of selected NRC's. 50% of libraries were aware of Pre-Print open access initiatives of NRC's libraries. 50% of librarians are not aware of Pre-Prints open access initiatives.

Table-5.41: Post-Prints

Post-Prints			
Srl. No.	**Research Centres**	**Aware**	**Not Aware**
1.	**NRCB**	-	✓
2.	**NRCC**	✓	-
3.	**NRCCt**	-	✓
4.	**NRCE**	-	✓
5.	**NRCG**	✓	-
6.	**NRCL**	-	✓
7.	**NRCPM**	-	✓
8.	**NRCPB**	-	✓
9.	**NRCP**	-	✓
10.	**NRCM**	✓	-
	Total	**3** (30%)	**7** (70%)

Table 5.40 shows awareness of open access initiatives in terms of post print. Only 30% NRC's (National research centre for citrus and National Research Centre Grapes) are aware of open access in post prints but rest 70% NRC's library are not aware of post print open access initiatives.

Table-5.42: Open access journals

Open access journals			
Srl. No.	**Research Centres**	**Aware**	**Not Aware**
1.	**NRCB**	**-**	✓
2.	**NRCC**	**-**	✓
3.	**NRCCt**	✓	**-**
4.	**NRCE**	✓	**-**
5.	**NRCG**	✓	**-**
6.	**NRCL**		✓
7.	**NRCPM**	**-**	✓
8.	**NRCPB**	✓	**-**
9.	**NRCP**	**-**	✓
10.	**NRCM**	✓	**-**
	Total	**5**(50%)	**5** (50%)

This table 5.42 shows the awareness of open access journals. 5 (50%) NRC libraries (NRCPB, NRCG, NRCE, NRCCt) are aware of open access journals. Out of 10 NRC libraries 5 (50%) were not aware of open access journals.

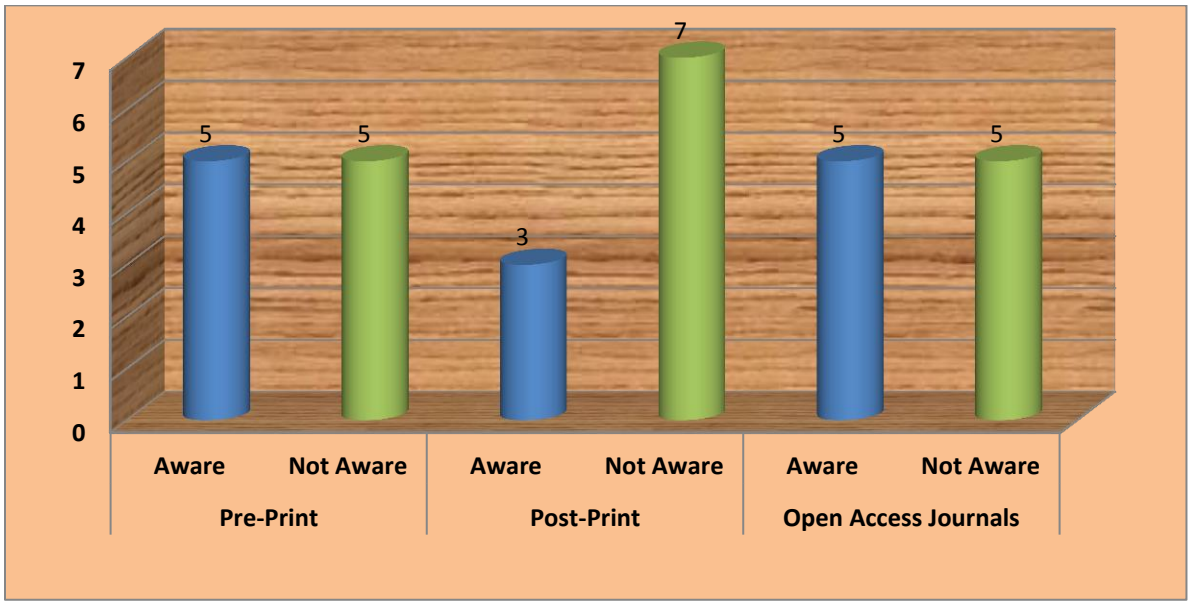


Fig. 5.25: Awareness of open access initiatives

Above fig 5.25 shows awareness of pre-print, post-print and open access journal in single graph. We can see that maximum numbers of NRC's librarians are not aware of open access initiatives in pre-print, post-print and open access journals.

5.8 Librarian's Opinion regarding Open Access Initiatives

This section deals with opinion of librarians/library in-charge over open access initiatives. This section further divided into 2 subsections, "factors that influenced open access and challenges and barriers in open access initiatives."

Table-5.43: Factors that influenced the Open Access Initiatives Services in library. (Rating scale: 1= strongly agree; 2= Agree; 3= Undecided; 4= Disagree; 5= strongly disagree).

Srl. No.		NRCB	NRCC	NRCCt	NRCE	NRCG	NRCL	NRCPM	NRCPB	NRCP	NRCM
1.	Allocation of funds	1	1	1	-	-	2	-	1	5	1
2.	Developments in the field ICT	2	1	1	-	2	1	1	2	4	4
3.	Demand from the users	2	1	1	-	2	2	-	3	1	-
4.	Other institutions repositories and consortiums	3	1	1	-	2	1	-	2	-	1
5.	Research centre administration interest	-	1	1	-	-	3	-	5	3	-
6.	To provide advanced services to users	1	1	1	-	2	2	-	1	2	-
7.	To attract the attention of higher authority	3	1	1	-	-	1	-	4	-	2

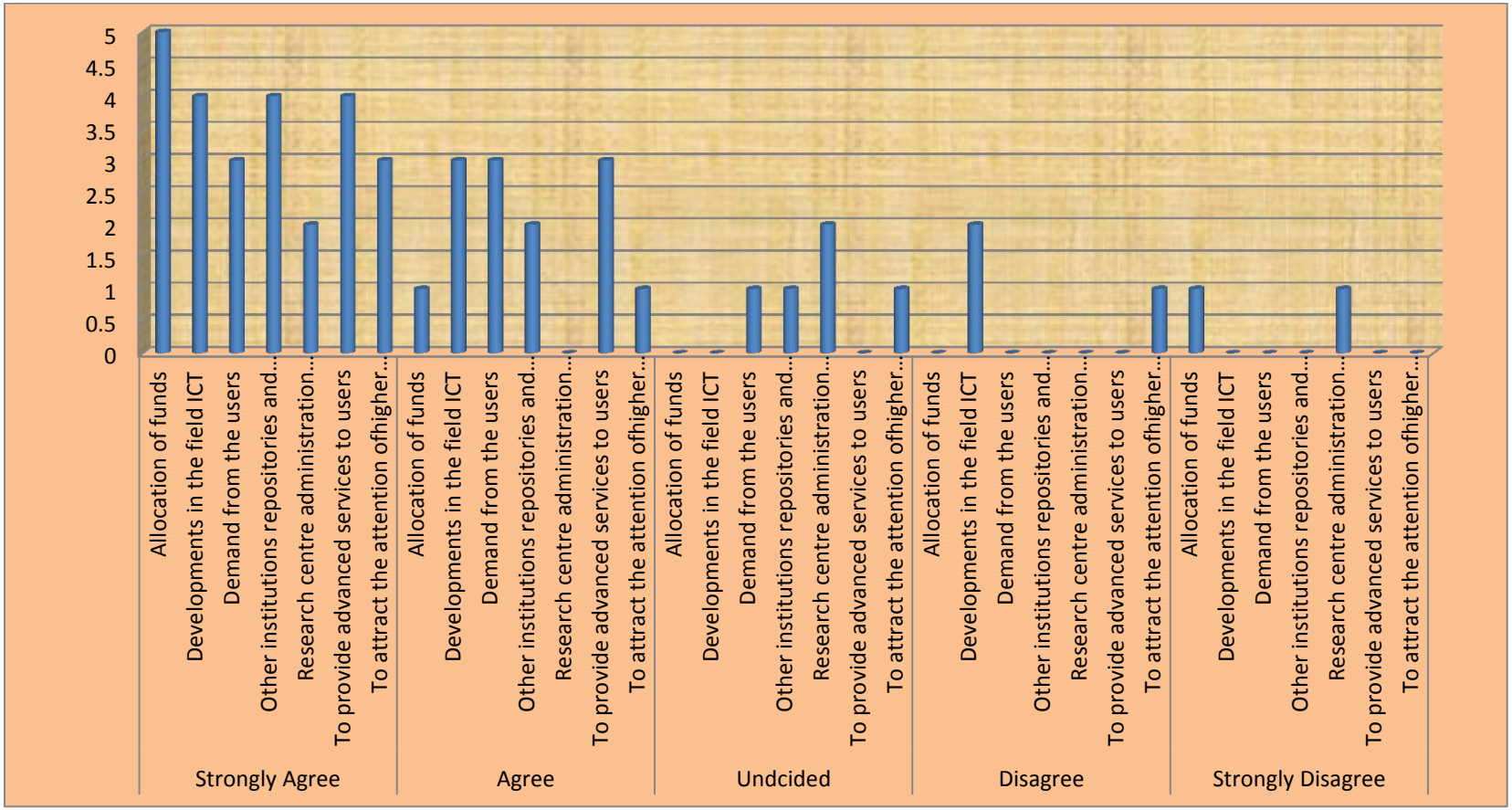


Fig. 5.26: Factors that influenced Open Access Initiative Services

Table 5.43 and fig 5.26 shows opinion of librarians/library in-charge on factors that influenced open access initiatives. Different numbers shows different rating scale. 5(50%) NRC's are strongly agreed that allocation of fund, developments in the

field of ICT and to provide advanced services to users are influenced open access initiatives. 3 (30%) NRC's are agreeing that developments in the field of ICT, demand from the users and to provide advanced services to users are influenced open access initiatives. 1(10%) NRC is undecided on demand from the users, other institutions repositories and consortiums and to attract the attention of higher authority are influenced open access initiatives. 2(20%) NRC is disagreeing that developments in the field of ICT and to attract the attention of higher authority is influencing open access initiatives. 1 (10%) NRC is strongly disagreeing that allocation of fund is influence open access initiatives.

Table-5.44: Challenges and Barriers in Open Access Initiatives. (Please use this rating scale: 1=Strongly agree; 2= Agree; 3= Undecided; 4= Disagree; 5= Strongly disagree)

Srl. No.	Challenges and Barriers	NRCB	NRCC	NRCCt	NRCE	NRCG	NRCL	NRCPM	NRCPB	NRCP	NRCM
1.	Lack of funds	**1**	**1**	**1**	**2**	**3**	**1**	**1**	**1**	**-**	**1**
2.	IPR issues in performing open access	**2**	**1**	**4**	**2**	**3**	**1**	**-**	**2**	**-**	**1**
3.	Organizations open access policy	**-**	**1**	**1**	**2**	**3**	**2**	**-**	**3**	**-**	**3**
4.	Technical hurdles to accessing data	**2**	**1**	**3**	**3**	**3**	**3**	**-**	**4**	**-**	**2**

Srl. No.	Challenges and Barriers	NRCB	NRCC	NRCCt	NRCE	NRCG	NRCL	NRCPM	NRCPB	NRCP	NRCM
5.	Lack of knowledge to use open access resources among library users	**1**	**1**	**4**	**4**	**4**	**1**	**-**	**5**	**-**	**3**
6.	Lack of support from the Ad-ministration	**1**	**2**	**1**	**3**	**3**	**2**	**-**	**5**	**-**	**-**
7.	Lack of infra-structure facili-ties	**1**	**2**	**1**	**4**	**3**	**1**	**-**	**4**	**-**	**4**
8.	Lack of trained staff	**1**	**2**	**1**	**2**	**3**	**1**	**-**	**3**	**-**	**1**
9.	Cost of provid-ing open access services is high, and users make less use of them	**-**	**1**	**2**	**5**	**4**	**3**	**-**	**2**	**-**	**3**

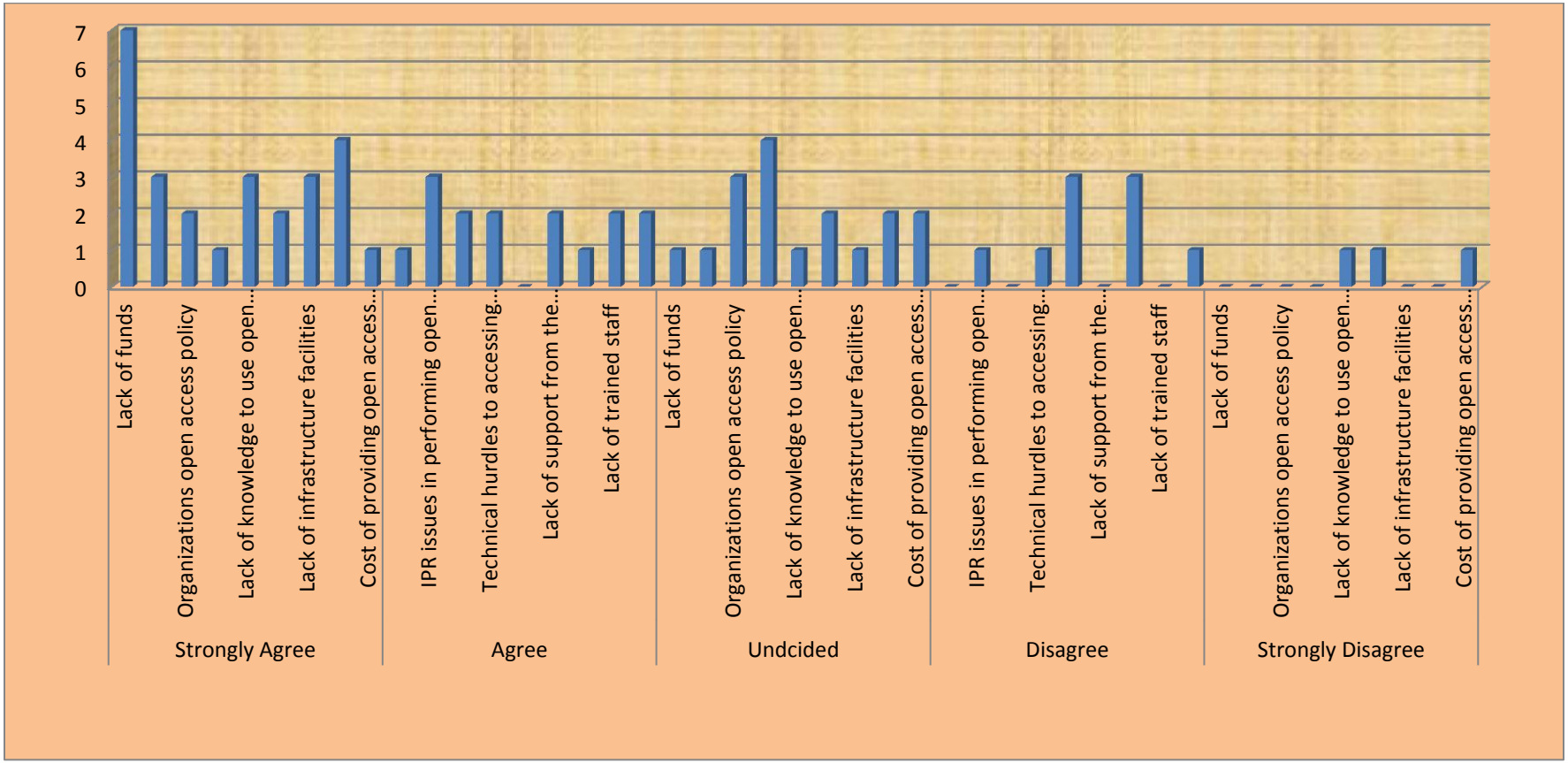


Fig. 5.27: Challenges and Barriers in Open Access Initiatives

Table 5.44 and fig 5.27 shows challenges and barriers in open access initiatives. Total 7(70%) NRC's are strongly agreed that lack of fund is a big barrier in the way of open access initiatives. 3(30%) NRC's are strongly agreed that IPR issues in performing open access, organizations open access policy and lack of support from the administration are the main challenges in the way of open access initiatives. 3(30%) NRC's are strongly agreed that lack of infrastructure facilities, lack of knowledge to use open access resources among library users and lack of trained staff are challenges in the way of open access initiatives. 1 (10%) NRC is strongly agreed that technical hurdles to accessing data and cost of providing open access services is high and users make less use of them are a big challenge in front of open access initiatives.

3 (30%) NRC's are agreed that an IPR issue in performing open access is a big barrier in the way of open access initiatives. 2 (20%) NRC's agreed that Organizations open access policy, lack of support from the administration, lack of trained staff and cost of providing open access services is high and users make less use of them are major barriers in providing open access initiatives. 1 (10%) NRC is agreed that lack of fund and lack of infrastructure facilities are challenges for providing open access initiatives.

4(40%) NRC's are undecided that a technical hurdle to accessing data is a major challenge in the way of open access initiatives. 3 (30%) NRC's are undecided that organizations open access policy, lack of support from the administration and lack of trained staff are the major barriers in the way of open access initiatives. 1 (10%) NRC's are undecided that lack of fund, IPR issues in performing open access and lack of infrastructure facilities. 3 NRC's are disagreeing on lack of knowledge to use open access resources among library users is a challenge for open access initiatives. 3(30%) NRC's are disa-

greeing that lack of infrastructure facilities is a major challenge in the way of open access initiatives. 1 (10%) NRC is disagreeing that IPR issues in performing open access, technical hurdles to accessing data and cost of providing open access services is high and users make less use of them are a big challenge in front of open access initiatives.

1 (10%) NRC is strongly disagreeing that lack of knowledge to use open access resources among library users, lack of support from the administration and cost of providing open access services is high and users make less use of them are major barriers in providing open access initiative.

5.9 System Followed

This section presents status of systems followed by the libraries of National Research Centre's of ICAR.

Table-5.45: Software used in the library

Srl. No.	Research Centres	Libsys	SOUL	CDS/ISIS	Alice for Windows	Granthalaya	e-Granthalaya	Other
1.	**NRCB**	-	-	-	-	-	-	Nirmal Lib. S/W
2.	**NRCC**	-	✓	-	-	-	-	-
3.	**NRCCt**	-	-	-	-	-	-	KOHA
4.	**NRCE**	-	-	-	-	-	-	BEAST, Vet CD
5.	**NRCG**	-	-	-	-	-	-	-
6.	**NRCL**	-	-	-	-	-	-	KOHA
7.	**NRCPM**	-	-	-	-	-	-	KOHA
8.	**NRCPB**	-	-	-	-	-	-	KOHA
9.	**NRCP**	-	-	-	-	-	-	-
10.	**NRCM**	-	✓	-	-	-	-	-

Above table 5.45 shows various software used by the respective National Research Centres library. National Research Centre for Banana is using Nirmal library software whereas National Research centre for camel and National Research centre on Mithun is using much known, SOUL software. National Research Centre for Citrus, National Research centre for Litchi, National Research centre for Pest Management and National Research centre for Plant Biotechnology they all are using KOHA in their library.

5.10 Access to Information

This section deals with various means of accessing and disseminating information in libraries of National Research Centre of ICAR. In this section we also see the status of retrospective conversion.

Table-5.46: Various means used to disseminate information among users in library

Srl. No.	Research Centres	OPAC	Library website	Digital library	E- Newsletters	E- News clippings	Current Awareness Service
1.	**NRCB**	-	-	-	-	✓	
2.	**NRCC**	✓	-	-	-	✓	✓
3.	**NRCCt**	-	-	-	-	-	✓
4.	**NRCE**	-	-	-	-	-	-
5.	**NRCG**	-	✓	-	-	-	-
6.	**NRCL**	-	-	-	-	-	-
7.	**NRCPM**	-	✓	✓	-	-	-
8.	**NRCPB**	-	-	-	✓	-	✓
9.	**NRCP**	-	-	-	-	-	-
10	**NRCM**	-	-	-	-	-	✓

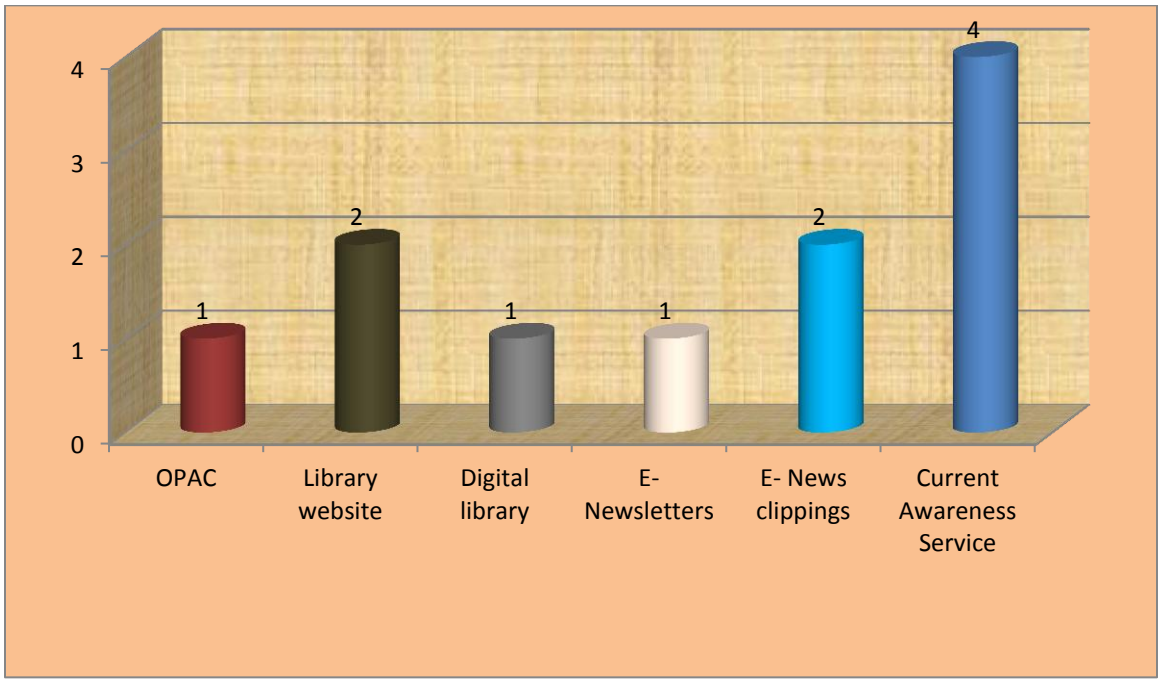


Fig. 5.28: Means Used to Disseminate Information

Above table 5.46 shows various means of dissemination of information by the libraries of National Research Centres of ICAR. The first row shows the various ways of disseminating information like OPAC, library website, digital library, e-newsletter, e-news clipping and current awareness services. National Research Centre for Banana is providing information through E- news clipping. National Research Centre for Camel is disseminating information through OPAC, e-news clipping and current awareness services. National Research Centre for Citrus is using current awareness services for disseminating information. National Research Centre for Grapes is providing information through library website. National Research Centre for Pest Management is disseminating information through library website and digital library. National Research Centre for Plant Biotechnology is disseminating information through E-newsletter and current awareness service.

Table-5.47: Retrospective Conversion

Srl. No.	Research Centres	Not started	50-60%	60-70%	70-80%	80-90%	completed
1.	NRCB	✓	-	-	-	-	-
2.	NRCC	✓	-	-	-	-	-
3.	NRCCt	✓	-	-	-	-	-
4.	NRCE	✓	-	-	-	-	-
5.	NRCG	-	-	-	-	-	-
6.	NRCL	-	-	-	-	-	-
7.	NRCPM	-	-	-	-	✓	-
8.	NRCPB	✓	-	-	-	-	-
9.	NRCP	-	-	-	-	-	-
10.	NRCM	✓	-	-	-	-	-
	Total	6 (60%)	-	-	-	1 (10%)	-

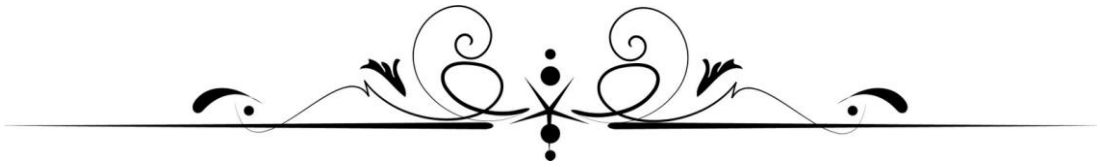
Table 5.47 shows the status of retrospective conversion in selected libraries of National Research Centre of NRCB, NRCC, NRCCt, NRCM, NRCE and NRCPB is not started yet. National Research Centre for Pest Management has completed 80-90% retrospective conversion.

5.11 Conclusion

This chapter is based on the analysis of collected data through structured questionnaires administered to librarian of National Research Centres. After analysing of col-

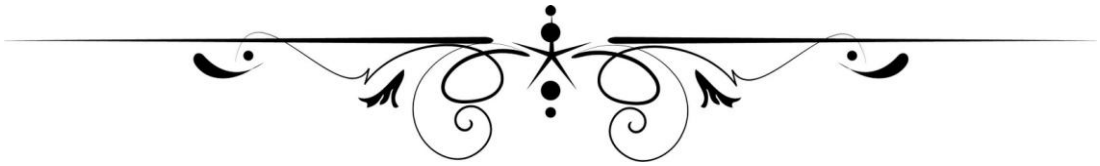
lected data a clear picture regarding open access initiatives and steps taken for providing free access of scholarly publication can be seen. The study has provided detailed information of status of NRC libraries in terms of providing open access services.

Having discussed the availability of infrastructure, finance, manpower and knowledge about open access in this chapter, major findings, conclusion and suggestions were presented in next chapter of this thesis.



Chapter 6

Discussion of Results



Chapter-6

Discussion of Results

In this study, there was an effort to learn about the open access initiative of ICAR's National Research Center libraries. The result derived in the previous chapter "analysis of data and interpretation" is being discussed in this chapter in the light of analysis and observations made by the researcher. This chapter contains the discussion of the results. Based on the analysis, it has been discussed in detail. It also presents the real picture of the initiative of open access to ICAR's National Research Center libraries. The various key findings of the study have been discussed and highlighted, as mentioned below.

6.1 Strength of Users

In this part, the number of users enrolled in selected libraries of National Research Centres is discussed. The outcome indicates that total 560 users are enrolled in 10 selected research centres. According to **Table 5.3**, the maximum number of users in NRCE is 99, out of which 20 are scientist and 79 are faculty members, followed by NRCPB having 80 enrolled users including 20 scientists, 10 faculty members and 50 staff members. NRCPM has shown that 78 users are enrolled including 22 scientists, 3 faculty members and 53 staff members. Total 56 users enrolled in the NRCM Library and NRCC has very few users compared to NRCM. NRCCt has total 55 enrolled users having16 are scientists, 16 faculty members and 23 staff members. NRCB has total 50 users with 17 scientists, 03 faculty members and rest 30 are staffs. National Research Centre for

Pomegranate (NRCP) has total 45 users including 20 scientists and 25 are staff. National Research Centre for Graphs shown total 39 users out of which 15 are Scientists and 24 are Staff followed by National Research Centre for Litchi (NRCL). NRCL has total 30 users including 15 are Scientists and 15 are staff. National Research Centre for Camel has least number of users in their library. NRCC has lowest number of enrolled users, total 28 out of which 13 are scientists and 15 are staff.

6.2 Infrastructure and Resources

In this study, availability of infrastructure and resources in selected libraries of National Research Centres is discussed including Learning Resources, Human Resources, Technical Resources and Financial Resources.

Learning Resources Available in Library (Print Material)

The results highlighted the availability of print resources in selected libraries of National Research Centre. According **Table 5.4**, total 32308 print material including books, journals (current volumes), journals (back volumes), reports and patents are available in selected libraries of National Research Centres. National research centre for camel have the largest collection of print learning material among all libraries of NRC. National Research Centre for Camel (NRCC) has total 8050 print materials covering with 7000 books followed by 1000 back volume journals and successively followed by reports (50). National Research Centre for Grapes has 5473 total number of print collection out of which 2930 are reports followed by 1728 back volume journals and 807 books and 8 current volume journals. National Research Centre for citrus has 1880 books followed by 1200 reports, 715 back volume journals and 8 current volume journals. NRCCt library

has total 3803 print material. National research centre for plant biotechnology (NRCPB) has total 2828 numbers of learning print materials in their library having 2500 books, 250 back volume journals, 52 reports and 26 current volume journals. National research centre for pest management(NRCPM) has total 2626 learning print materials with 2505 books and 100 back volume journals, 10 current volume journals and 10 reports. NRCE has 2120 numbers of total print materials in their library including 2000 books, 100 back volume journals, 14 current volume journals and 6 reports. NRCM library has total 1990 print resources with 1254 books, 14 current volume journals and 722 reports. NRCL has total 1857 print materials covering with 1785 books, 50 reports, 18 back volume journals and 4 current volume journals. NRCB has total 1782 print learning materials having 1164 books, 500 back volume journals, 100 back reports and 18 current volume journals. NRCP has total 1779 print learning materials out of which 1765 books and 14 current volume journals.

Learning Resources Available in Library (Non-Print Material)

The result has explored the availability of non-print learning materials in selected libraries of National Research Centre. According to **table no. 5.5**, researcher find various non-print materials in form of audio visual materials, CD- ROM databases, Online Databases, electronic journals and microfilms/microfiche. NRCM has the largest collection of non-print materials including 82 CD ROM databases which is highest in all selected libraries of NRCs. Secondly NRCC has 50 CD-ROM databases, NRCB has total 37 non-print learning materials. Similarly, NRCPB has total 22 non-print materials out of which 2 audio visual, 15 CD-ROM databases and 5 online databases. NRCG has 16 non-print materials including 12 CD-ROM databases and 3 electronic journals. NRCE has

total 14 non-print materials having 10 CD-ROM databases, 2 audio visual materials, 1 electronic journal and 1 microfilm. NRCCt has total 12 non-print materials covering with 10 CD-ROM databases and 2 electronic Journals. NRCPM has 11 non-print materials out of which 6 online databases and 5 CD-ROM databases. Lastly NRCL has 5 non-print materials, all are audio-visual materials.

Human Resources

The outcomes also have shown the human resources availability in selected libraries of National Research Centres including semi-professionals, Non-professionals, Professionals and others.

Strength of Library Staff

The outcome (**Table no.5.6**) has illustrated the strength of library staff in selected libraries of National Research Centres. NRCL library has maximum numbers of staffs including 4 non-professionals staffs. NRCPM and NRCP both have 3 library staffs. NRCP has 1 semi-professional and 2 non-professional staff and NRCPM having 1semi-professional, 1 non-professional and 1 other staff. NRCCt, NRCM, NRCE and NRCC have 2 library staff. NRCC has 1 professional and 1 non-professional staff, NRCCt has 1 semi-professional and 1 non-professional staff and NRCE have 2 Professional staff.

Technical Infrastructure

The study also revealed the availability of technical infrastructure in all selected libraries of National Research Centres. This section deals in availability of computers, servers, scanners printers, CD/DVD, security and software.

Availability of IT infrastructure for performing open access initiatives

The outcome (**Table 5.7**) has explored that NRCM library has the largest collection of technical infrastructure and resources. In NRCB library, has total 41 technical infrastructure and resources are available with 37 CD/DVD, 1 computer, scanner, printer and software each. NRCG library has total 11 technical infrastructures and resources including 9 computers, 1 Scanner and 1 Printer. NRCPM library has total 9 technical assets covering with 3 computers, 1 server, 1software, 2 scanner and 2 printers. NRCPB library has total 7 technical equipment's out of which 3 computers and 1 scanner, printer and server each. NRCCt, NRCC and NRCE have equal numbers of technical equipment's. Each NRC libraries has 5 technical assets out of which NRCC has 2 computers 1 server 1 printer and 1 software. NRCCt has 3 computers, 1 scanner and 1 printer. NRCE has 1 computer, 1 scanner, 1 printer, 1 CD ROM and security system. NRCP have minimum technical resources among all research centre libraries including 3 technical resources out of which 1 computer, 1 printer and 1 CD-ROM is available.

Financial Resources

The findings of the study have also discussed available Financial Resources such as funding agency, financial resources of library, allocation of library budget on different heads like e-journals, e-books, repositories, databases on CD ROM's, Audio/Video Cassettes, VCD'S DVD'S and miscellaneous.

Funding Agency

Table 5.8 has delineated the agencies that provide funds to the libraries of National Research Centre. Out of 10 research centers libraries 7 (70%) are receiving funds from ICAR and rest of 3(30%) were receiving from central government.

Financial Resources of library

The result **(Table 5.9)** has shown the availability of financial resources other than regular funds, these institutes receiving funds from their parent body. NRCL has over charges, sale of old newspapers, photocopy charges, membership charges, are the other financial resources. Other research centres have respond to ICAR as their financial resources. NRCG has no extra financial resources other than their regular fund received from their parent body.

Allocation of Library Budget

The findings have shown the allocation of library budget on different heads like E-Journals, E-books, repositories, databases: CD-ROM Online, Audio/Video Cassettes, VCD'S DVD'S and Miscellaneous. All the heads were shown separately through table.

Table 5.10 has demonstrated the library budget allotted for subscription of E-Journals. NRCB and NRCM are receiving less than Rs. 50,000 budget for e-journals. NRCG was receiving budget between 1 lakhs to 5 lakhs. NRCE, NRCPB and NRCP was receiving budget between 5 lakhs to 10 lakhs for e-journals. Rest of the National Research Centre libraries were not receiving budget for subscription of e-journals.

Table 5.11 has highlighted the budget allocation on E-books by selected National Research Centre libraries. NRCP and NRCPB both are receiving below Rs 50,000 as budget for e-book. NRCG was receiving budget between 1 Lakh to 5 Lakhs and rest of the NRC's libraries were not receiving budget for e-book subscription.

Table 5.12 has observed the budget that is spend on institutional repositories. Only NRCG was receiving budget for repository. NRCG was receiving budget between Rs. 1 lakh to 5 lakhs and other NRC's libraries were not receiving any budget for repository.

Table 5.13 has depicted the budget which is allotted for database of online CD ROM. Only 3 NRC's were receiving budget for online database of CD ROM. NRCPB and NRCM were receiving budget below Rs. 50,000. NRCG was receiving budget for database of online CD ROM between 1 lakh to 5 lakhs and rest of other NRC's libraries were not receiving budget for database of online CD ROM.

Table 5.14 has found the budget allocation for Audio/Video Cassettes, VCD'S/ DVD'S. Only NRCE was receiving budget between 5 lakhs to 10 lakhs for Audio/Video Cassettes, VCD'S DVD'S and rest of other NRC's libraries were not receiving any budget for Audio/Video Cassettes, VCD'S DVD'S.

Table no. 5.15 has revealed the budget allocation on miscellaneous heads. NRCC was receiving budget between Rs.1 lakh to 5 lakhs for miscellaneous heads. NRCB was receiving budget between Rs.5 lakhs to 10 lakhs and rest of other NRC's libraries were not receiving budget for miscellaneous heads.

Adequacy of library budget for providing open access services

The results **(Table no. 5.16)** have carried out that Only 3 (30%) NRC's were receiving sufficient budget for open access services these are NRCC, NRCCt and NRCL. 6 (60%) NRC's were not reacting on this subject. NRCPM is not receiving sufficient budget for open access services.

Digitization Status

The findings of the results also highlighted the digitization status in selected libraries of NRC's including numbers of digitized materials, reason of not digitized, mission and purpose of open access and key open access initiatives/Services of the Library.

Digitization Status of library collections

The result **(Table no. 5.17)** has described the digitization status of library collection. only 30% NRC's were digitized these are NRCC, NRCE and NRCPM. There are 40% NRC's (NRCCt, NRCG, NRCL and NRCPB) were not digitized their library collection. Some other 30% NRC's libraries (NRCB, NRCM and NRCP) were planning for digitization of their library collection.

Total number of digitized materials

The consequence has delivered information that only 2 NRC's were given data of digitized materials out of 10 selected NRC's. NRCPM has 2000 digitized books and NRCC has 20 digitized reports.

The result of **(Table no. 5.18)** has depicted the reason behind not digitization of library collection. Only NRCL was given reason for not digitization of library collection. According to NRCL lack of skills and expertise is the main reason behind not complete the digitization of library collection.

Mission and Purpose of Open Access

The outcomes of the study have explored the mission and purpose of open access in selected National Research Centre libraries. Maximum numbers of NRC's were providing open access services for exchange of information. NRCB, NRCC, NRCCt, NRCL, NRCM and NRCG libraries are using open access services for exchange of information. NRCC, NRCG, NRCL and NRCPB are using open access services for promoting innovation. NRCC, NRCG and NRCL are using open access services to educate.

The conclusion of **Table 5.19** has shown the key open access initiatives and services of the library. NRCB, NRCC, NRCG, NRCL, NRCM and NRCPB have their institutional repositories. National Research Centre for Equines library is using Consortium for e-resources in Agriculture (CeRA).

6.3 Open Access Policy

The outcomes of the study have illuminated the availability of open access policies in selected libraries of NRC's including written open access policies, measures to control copyright and digital rights of e-resources, organization of archives, member of Indian Consortia Initiatives and maintaining institutional repository.

Written Open Access Policy.

Table 5.20 has delineated the information about availability of written open access policy in NRC's libraries of ICAR. Out of 10 research centre libraries only 1(10%) have written open access policy that is NRCG.

Implementation of Open Access Policy

Table 5.21 has shown the list of NRC's who implemented their open access policy. Selected libraries of NRC's were not implemented open access policy although NRCG has written open access policy.

Revised and Updated

According to **Table 5.22,** only NRCG has written open access policy and they have regularly revised and updated it and there is no question of revised and updated open access policies by other NRC's. Only 1 (10%) NRC was revised and updates their open access policy and rest of 9 (90%) NRC's have no written access policy.

Measures to control copyright/digital rights of E-Resources

Table 5.23 has depicted the measures to control copyright and digital rights by NRC's libraries. NRCB, NRCCt and NRCE have special security measures to control copyright and digital rights. NRCPB and NRCM have anti-plagiarism software for controlling copyright and digital rights. NRCC has opened for all users and there are no copyright and digital rights. NRCG has IP based login process where as NRCPM has no open access.

Organization of Archives

Table 5.24 has shown organization of archives in all NRCs libraries selected for study. The results shows that 20% of total research centre libraries were organizing archives by selected articles. 60% of total research centre libraries are organising archives by category and 30% of libraries were organising archives as they were issued originally.

Member of Indian Consortia Initiatives

Table 5.25 has analysed the status of NRC's libraries as the member of various Indian Consortia Initiatives. The outcomes shows that the maximum 8 (80%) of NRC libraries were members of Consortium of electronic resources in agriculture (CeRA). 4 (40%) National Research Centre libraries are members of ICAR e-consortia. Only one NRC library (NRCL) is a member of HELNET Consortium.

Maintaining Institutional Repository

The outcome **(Table 5.26)** has demonstrated the availability of institutional repository in libraries of selected NRC's. 6 (60%) were maintaining institutional repositories out of 10 NRC's, these are NRCC, NRCCt, NRCE, NRCG, NRCM and NRCPM. Only 4 (40%) NRC libraries were not maintaining their institutional repository, these are NRCB, NRCL, NRCPB and NRCP.

Maintaining Statistics of the Consortium/ Consortia in Use

Table 5.27 has shown the status of maintaining statistics of their consortium. Only NRCG has maintaining statistics of their consortium. Rest of 9 (90%) NRC's were not maintaining any record or statistics of their consortium.

Details of Consortia use for past one year

Table 5.28 has explored past one year statistics of using consortia of NRCG. We can see that in the month of May maximum number (398) of users were use the consortium. In the month of January no user access consortium. There are 302 users followed by 259 users used consortia in the month of June and November. In the month of October and April, 255 and 220 users uses consortia. In the month of Feb and July 186 and 156 users respectively used NRCG library consortia. In the month of Dec, Aug and Sep total 103, 36 and 12 users respectively used consortia.

6.4 Attitude towards Open Access Initiative

Awareness of Open Access Publishing

Table 5.29 has highlighted awareness of open access publishing by the librarians/library in-charge of selected NRC's library. 60% of NRC librarians are aware of open access publishing from more than 3 years. 20% of NRC's librarians are aware of open access publishing from past 3 years and only 10% of NRC's librarians are not aware of open access publishing.

Awareness to promote Open Access publishing

The results **(Table 5.30)** depicted the awareness about various initiatives in country to promote open access publishing. All National Research Centre Libraries librarians are aware about various initiatives in country to promote open access publishing.

Opinion on cost effectiveness of Open Access publishing model over current subscription-based model

The outcome **(Table 5.31)** has explored the opinion on "Open Access publishing model will be more cost-effective to the academic research community in the long run than the current subscription-based model". 50% (5) NRC's are agree with this statement followed by 30% (3) NRC's who were strongly agree with above statement on open access publishing. National Research Centre for Banana is disagreeing with the above statement and National Research Centre for Equines have no opinion on this statement.

Opinion on cost effectiveness of Open Access Publishing Model

The results **(Table 5.32)** illustrated opinion on cost effectiveness of open access publishing model. Maximum number of NRC's (6) has opinion that due to open access publishing model, publishing costs will reduce. Followed by 20 % of NRC's has opinion that publishers profit will reduce due to open publishing model. Rest of 2 NRC's have no opinion on this regard.

Opinion on the effect of the quality of the scholarly publishing process by price-based competition

The outcome (**Table 5.33)** has noticed the opinion on "price based competition will affect the quality of scholarly publishing process". Out of 10 research centres5 (50%) has opinion that it affects in a positive way. 3 (30%) research centres has opinion that it affects in a negative way and rest of 2 (20%) research centres has no opinion on this statement.

6.5 Impact of Open Access Initiatives

The findings of the study further noticed the impact of open access initiatives on library and their services.

The outcome (**Table 5.34)** has observed the impact of open access services on library image. 70% of NRC's have said that after introduction of open access services in the library, library image is improved. 10% of NRC's have said that there is no change in the image of the library and 10% of NRC's have said that the image is decreased due to open access services. National Research Centre has given no response on this statement.

Impact on number of users after introducing open access Services.

The result **(Table 5.35)** has found that out of 10 Research Centre libraries 7 (70%) were said that the number of user was increased after introducing open access services. And 2 (20%) NRC's said that users become less in numbers after introducing open access services in the library. NRCP has not given any response on this statement.

Impact of open access initiative on annual budget of selected libraries

The outcomes **(Table 5.36)** indicated that maximum number of NRC's (6) were not find any impact on their annual budget after introducing open access initiatives and 2 NRC's were find the impact on their annual budget after introducing open access initiatives. NRCG and NRCL were not given any response on this statement.

Significant changes in the scientific output after introducing open access services.

The study **(Table 5.37)** has explained that out of 10 research centres, 4(40%) NRC's were not find significant change in scientific output and 2 (20%) research centres were find significant changes in scientific output after introduction of open access services and rest of 4 (40%) research center libraries were not given any response on this statement.

Opinion on "significant move to Open Access publishing may disrupt the established system of scholarly publishing".

The results (**Table 5.38**) highlighted that 3 (30%) research center libraries are concerned on the above statement followed by 2 (20%) NRC's who not at all concerned with this statement. NRCC library is very concerned on this statement and NRCP is not very concerned. NRCPB didn't know about this and NRCG didn't respond on this question.

Opinion about the efficiency of library staff regarding handling Electronic Information Sources and Services

The study **(Table 5.39)** has observed that out of 10 research centres, 4 (40%) research centres respond that they can't say on this statement. NRCC and NRCPM responded that majority of library staff are efficient in handling of electronic information sources and services. NRCL have responded that majority of library staff are not efficient in handling of electronic information sources and services.

Awareness of open access initiatives

The outcomes **(Table 5.40)** has analysed that 50% of libraries were aware about Pre-Print open access initiatives of NRC's libraries. 50% of librarians were not aware about Pre-Prints open access initiatives.

The finding **(Table 5.41)** has revealed that only 30% NRC's (NRCC and NRCG) were aware about open access in post prints but rest 70% NRC's library were not aware about post print open access initiatives.

The results **(Table 5.42)** has found that 5 (50%) NRC's libraries (NRCPB, NRCG, NRCE, and NRCCt) were aware about open access journals. Out of 10 NRC's libraries 5 (50%) were not aware about open access journals.

6.6 Librarian's Opinion regarding Open Access Initiatives

The outcome of the study has revealed the opinion of librarians/library in-charge over open access initiatives. This section further divided into 2 subsections, "factors that influenced open access and challenges and barriers in open access initiatives."

Factors that influenced the Open Access Initiative Services in library

The results **(Table 5.43)** has discovered that 5(50%) NRC's are strongly agreed that allocation of fund, developments in the field of ICT and to provide advanced services to users are influenced open access initiatives. 3 (30%) NRC's are agreeing that developments in the field of ICT demand from the users and to provide advanced services to users are influenced open access initiatives. 1(10%) NRC is undecided on demand from the users, other institutions repositories and consortiums and to attract the attention

of higher authority are influenced open access initiatives. 2(20%) NRC is disagree that developments in the field of ICT and to attract the attention of higher authority is influencing open access initiatives. Only 1(10%) NRC's is strongly disagree that allocation of fund is influence open access initiatives.

Challenges and Barriers in Open Access Initiatives

The study **(Table 5.44)** focuses that 7(70%) NRC's are strongly agreed that lack of fund is a big barrier in the way of open access initiatives. 3(30%) NRC's are strongly agreed that IPR issues in performing open access, organizations open access policy and lack of support from the administration are the main challenges in the way of open access initiatives. 3(30%) NRC's are strongly agreed that lack of infrastructure facilities, lack of knowledge to use open access resources among library users and lack of trained staff are challenges in the way of open access initiatives. 1 (10%) NRC is strongly agreed that technical hurdles to accessing data and cost of providing open access services is high and users make less use of them are a big challenge in front of open access initiatives.

3 (30%) NRC's are agreed that an IPR issue in performing open access is a big barrier in the way of open access initiatives. 2 (20%) NRC's agreed that Organizations open access policy, lack of support from the administration, lack of trained staff and cost of providing open access services is high and users make less use of them are major barriers in providing open access initiatives. 1 (10%) NRC is agreed that lack of fund and lack of infrastructure facilities are challenges for providing open access initiatives.

4(40%) NRC's are undecided that a technical hurdle to accessing data is a major challenge in the way of open access initiatives. 3 (30%) NRC's are undecided that

organizations open access policy, lack of support from the administration and lack of trained staff are the major barriers in the way of open access initiatives. 1 (10%) NRC's are undecided that lack of fund, IPR issues in performing open access and lack of infrastructure facilities. 3 NRC's are disagree on lack of knowledge to use open access resources among library users is a challenge for open access initiatives. 3(30%) NRC's are disagreeing that lack of infrastructure facilities is a major challenge in the way of open access initiatives. 1 (10%) NRC is disagree that IPR issues in performing open access, technical hurdles to accessing data and cost of providing open access services is high and users make less use of them are a big challenge in front of open access initiatives.

1 (10%) NRC is strongly disagree that lack of knowledge to use open access resources among library users, lack of support from the administration and cost of providing open access services is high and users make less use of them are major barriers in providing open access initiative.

6.7 System Followed

The findings emerged thepresents status of systems followed by the libraries of National Research Centre's of ICAR.

Software used in the library

The finding **(Table 5.45)** has illustrated various software used by the respective NRC's library. NRCB is using Nirmal library software whereas NRCC and NRCM are using much known, SOUL software. National Research Centre for Citrus, National

Research centre for Litchi, National Research centre for Pest Management and National Research centre for Plant Biotechnology they all are using KOHA in their library.

6.8 Access to Information

The results of the study highlighted the various means of accessing and disseminating information in libraries of National Research Centre of ICAR. In this section we also see the status of retrospective conversion.

Various means used to disseminate information among users in library

The consequence **(Table 5.46)** has found that various means of dissemination of information by the libraries of National Research Centres of ICAR. The first row shows the various ways of disseminating information like OPAC, library website, digital library, e-newsletter, e-news clipping and current awareness services. National Research Centre for Banana is providing information through E- news clipping. National Research Centre for Camel is disseminating information through OPAC, e-news clipping and current awareness services. National Research Centre for Citrus is using current awareness services for disseminating information. National Research Centre for Grapes is providing information through library website. National Research Centre for Pest Management is disseminating information through library website and digital library. National Research Centre for Plant Biotechnology is disseminating information through E-newsletter and current awareness service.

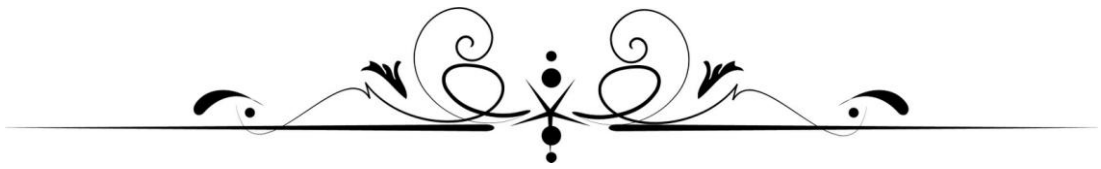
Retrospective Conversion

The results **(Table 5.47)** has explored the status of retrospective conversion in selected libraries of National Research Centre of NRCB, NRCC, NRCCt, NRCM, NRCE and NRCPB is not started yet. National Research Centre for Pest Management has completed 80-90% retrospective conversion.

6.9 Conclusion

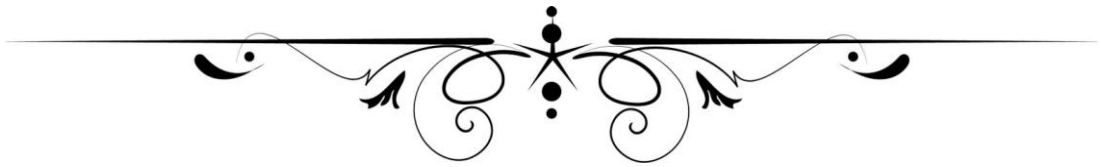
In this chapter, results of data analyzed in previous chapter were discussed in the light of analysis and observations made by the researcher. After the discussion, this study concluded that most of the selected national research libraries of ICAR faced problems associated to infrastructure and trained manpower. Discussion also concluded that most of libraries were facing lack of budget for providing open access services. They also have lack of trained staff and lack of expertise. Libraries should have more collection of non-print materials which can helps in providing open access services to the users. Study also shows that some 50% selected libraries were not aware about the open access initiatives. The discussion also provides information that most of the respondent want to develop open access services in libraries.

Findings and conclusions were explained in next chapter of this thesis with suggestion for providing better open access services. Suggestion for further future study were also provided with some interesting topics.



Chapter 7

Findings, Conclusion and Suggestions



Chapter 7

Findings, Conclusion and Suggestions

7.1 Introduction

This study shows the status of Open Access Initiatives in the libraries of selected National Research Centre's of Indian Council of Agricultural Research. This chapter emphasise the findings, suggestions and conclusions derived from data analysis and interpretation of data in previous chapter. This chapter also presents the suggestions, recommendations and further research topics.

Total 14 National Research Centres of ICAR were situated in India. Out of 11 were selected for study.

7.2 Major Findings of the Study

General information about the organization

- Out of 10 National Research Centres, National Research Centre for Camel is the oldest research centre established in 1984 and National Research Centre for Pomegranate is newest established in 2005.
- NRCE has the maximum number of users 99 out of which 20 are scientists and 79 are faculty members. NRCC has the least number of users 28 enrolled in their library. Out of 28 users 13 were scientists and 15 were staff.

Infrastructure and Resources

- In terms of print learning resources NRCC has the largest collection 8050 among all NRC libraries. NRCP libraries have 1779 numbers of print collections in their library which is least in all NRC libraries.
- NRCM library has the largest collection (80) of non-print materials and NRCL library has only 5 non-print materials in their library which is least among all NRC's.
- NRCL library has the largest number of staff (4) in their library. They have 4 non-professionals staff. NRCB and NRCG has least number of library staff in their library both has only 1 staff.
- In terms of availability of Information Technology infrastructure in concern libraries. NRCM library has the largest collection 41 of IT infrastructure in their libraries. In which NRCP has the least no of IT infrastructure that is 3.
- Out of 10 research centres 7 (70%) has getting fund from ICAR and 3 (30%) research centres been receiving fund from Central government.
- In the libraries of National Research Centres there are other financial resources were available other than fund receiving from their parent organisation. NRCL has other financial resources like over charges, sale of old newspaper, Xerox charges and membership charges.
- Budget is the main force behind providing smooth services in any library. 6(60%) NRC libraries were getting budget for e-journals, 3 (30%) NRC libraries were getting budget for e-books, 1 (10%) NRC libraries were getting budget for repositories, 3 (30%) NRC libraries were getting budget for databases CD ROM

online, 1 (10%) NRC libraries were getting budget for Audio/ Video cassettes, VCD'S DVD'S and 2(20%) NRC libraries were not getting budget for miscellaneous heads.

- Out of 10 NRC libraries NRCE, NRCPB and NRCP is getting maximum budget for E-journals. NRCB and NRCM are getting least budget among all NRC libraries. NRCG library is receiving maximum budget among all NRC libraries for E-books. NRCG library is the only library getting budget for repository of Rs 1 lakh to 5 lakhs. NRCG library is getting highest budget for CD-ROM online of Rs 1 lakh to 5 lakhs approximate. NRCE is getting Rs 5 lakhs to 10 lakhs for Audio/Video Cassettes, VCD's DVD's. In miscellaneous fund NRCB is getting maximum budget from other NRC libraries, received Rs 5 lakhs to 10 lakhs.
- It is found that 60% National Research Centres library were respond that they can't say library budget is adequate for providing open access services, 30% of National Research Centre libraries were said that library budget is sufficient for providing open access services.
- It is found that maximum numbers of NRC library (40%) were not digitized. Out of 10 NRC's 3 (30%) were planning for digitization. Only 3 (30%) NRC libraries were digitized.
- Most of the NRC libraries (60%) were exchanging information through open access. Only 1 (10%) NRC Library is using open access for setting standards.
- Most of NRC libraries (60%) have institutional repository through which they provide open access services.

Open Access Policy

- In most of the libraries (90%)there is no written open access policy. Only National research Centre for Grapes has written open access policy.
- Most of the libraries (30%) have followed special security measures to control copyright/digital rights of e-resources.
- Most of the libraries (60%) organised their archives category wise and very few libraries (20%) organise by selected articles.
- Most of the NRC libraries (80%) were member of Consortium of electronic resources in Agriculture (CeRA) and 40% of NRC libraries are member of ICAR e-consortia.
- Most of the NRC libraries (60%) were maintaining institutional repository.
- Most of the NRC libraries are not maintaining their statistics of the consortium which they are using.

Attitude towards of Open Access Initiatives

- Most of the librarians (60%) were aware of open access publishing concept from more than three years. Librarian of National Research Centre for Banana is not aware of open access publishing.
- All the librarians are aware of any initiatives in country to promote open access publishing.
- Most of the librarians (50%) were agree on the contention that open access publishing model will be more cost effective to the academic research community in the long run than the current subscription based model.

- Opinion of most of the NRC librarians (60%) they are agreeing that cost effectiveness of open access publishing model will be more cost-effective to the academic research community in the long run than the current subscription model.
- Most of the librarians (60%) have the opinion on cost effectiveness of open access publishing model is that publishing costs will reduce by implementing open access publishing model.
- Most of the librarians (50%) thought that price based competition in which open access model becomes more widely accepted, publishers may compete for work on the basis of price as well as the strength of their journal brand and quality of service affects the quality of scholarly publishing process in a positive way.

Impact of Open access initiatives

- Most of the librarians (70%) respond that after introducing open access services in the library the image of library improved.
- After introducing open access services in most of the libraries of National Research Centre (70%) the number of users increased.
- There is no impact on annual budget of most of the selected libraries (60%) after implementation of open access services.
- There is no any significant change in the scientific output after introducing open access services in most of the selected libraries (40%) of National Research Centre of ICAR.
- Most of the librarians (30%) were concerned about the significant move to open access publishing may disrupt the established system of scholarly publishing.

- In 20% libraries all staffs were efficient in handling of electronic information sources and services and in another 20% libraries majority of staff are efficient in handling electronic information sources and services.
- Most of the librarians (50%) were not aware of pre-print open access initiatives and most of the librarians (70%) were also not aware of post print open access initiatives. Most of the librarians (50%) were not aware of open access journals.

Librarian's opinion regarding open access initiatives

- Most of the librarians (50%) were strongly agreed that allocation of fund is influence the open access initiatives services in library. Majority of librarian (40%) were strongly agreed that developments in the field of ICT is influence the open access initiative services in library.
- Most of the librarians (40%) were strongly agree that other institutions repositories and consortium were also influence the open access initiatives services in library. Majority of librarians (40%) were strongly agree that to provide advanced services to users were influence the open access initiatives services in library.
- Majority of librarians (30%) were strongly agree that to attract the attention of higher authority were also influence the open access initiatives services in library.
- Most of the librarians (70%) were strongly agree that lack of fund is a challenge and barrier in open access initiatives. Majority of librarians (30%) were agree that IPR issues are big challenge and barrier in open access initiatives.
- Most of the librarians (40%) were undecided that technical hurdles to accessing data are challenges and barriers in open access initiatives. Majority of librarians

(30%) were strongly agree that lack of infrastructure facilities are big challenge and barrier in open access initiatives.

- Majority of librarians (40%) were strongly agreed that lack of trained staff is a challenge and barrier in open access initiatives. 20%of librarians were agree that cost of providing open access services is high and users make less use of them and this is a challenge and barrier in the way of open access initiatives.

System followed

- Majority of NRC libraries (40%) were using KOHA integrated library software in their libraries to perform various library tasks.
- In most of the NRC libraries (60%) retrospective conversion work is not started yet.

7.3 Testing of Hypotheses

H_1: Open access services are provided in most of the research centre libraries of ICAR.

It is observed in table no. 5.19 that most of the National Research Centre libraries providing open access services through institutional repository. Table no 5.25 shows majority of NRC libraries were member of other consortia initiatives like CeRA and HELNET. Table no. 5.26 shows majority of NRC libraries were maintaining institutional repository. Thus above formulated hypothesis is proved and accepted.

H_2: All libraries have a policy for open access.

It is observed that in majority of NRC libraries there is no written open access policy (Table no.5.20). Hence above hypothesis is proved and rejected.

H_3: Most of the National research centre libraries are providing open access services for exchange of information.

It is observed in table 5.18 that in majority of NRC libraries, exchange of information is the main purpose of open access services. Hence above hypothesis is proved and accepted.

H_4: As ICAR is a very prominent institution of thegovernment of India there is no lack of budget and infrastructure for open access services.

After analysis of table no. 5.43 it is found that majority of librarians were strongly agree that budget and infrastructure is not sufficient for providing open access services. Hence the hypothesis is proved and rejected.

H_5: These research centres have their repositories and archives.

Almost all the NRC libraries have their archives as shown in table no. 5.24 and majority of NRC libraries have institutional repositories as shown in table no. 5.26. Hence the above hypothesis is proved and accepted.

H_6: Lack of technical manpower is the hurdle in open access.

After analysis of table no. 5.43 it is found that majority of librarians were strongly agree that lack of technical manpower is a big hurdle in open access. Hence the above hypothesis is proved and accepted.

7.4 Conclusion

Research literature are accessible freely in the form of open access journals, institutional repositories (IRs) or open archives, open courseware,self-posting on author's homepages and so on. While open access helps digital inclusion of citizens in developing countries by bringing within easy reach full-text contents and development related literature, the Digital Library remains a knowledge repository of such citizens, indigenous people, communities and institutions. Open access to knowledge is a model adopted by many international and intergovernmental forums, such as the World Summit on the Information Society (WSIS), for disseminating full-text contents to online communities. Open access publishing is increasing across many fields as a means of facilitating timely and equitable access to knowledge. Open Access accelerates the creation and widens the dissemination of scientific knowledge. Subject-based repositories are suggested to provide the best conditions for retrieval of scientific knowledge. Furthermore, in terms of economic efficiency, Open Access has the potential to significantly decrease the costs of scholarly communication.

Establishment of National Research Centers of ICAR are signs of entrepreneurial activities of faculty and academic units. Majority of National Research Center libraries

are providing open access services to their users but still they have shortage of infrastructure and budget.

The objective of the study as prepared in the first chapter has been achieved. The policies and status of the selected NRC libraries were evaluated and find that most of the libraries have no written open access policy in their libraries. All the National Research Centre libraries are back bone of their parent organization and providing major services to achieve specific goals related to specific subjects. The libraries have collection of all print and non-print materials like books, journals, reports, patents, audio visual materials, CD ROM databases, online databases, e-journals and micro films.

Research findings indicate that most of the NRC libraries maintaining institutional repositories by which quite number of sources provide access to open access services, but they are not maintaining statistics of the consortium. Most of the librarians prefer open access publishing model over current subscription based model. This indicates a bright future of open access publishing model.

According to NRC librarians open access publishing model will be more cost effective and will reduce publishing cost by which we can use that money for other productive work. The finding also describe that NRC librarians thought that price based competition in which open access model become more widely accepted, publishers may compete for work on the basis of price as well as the strength of their journal brand and quality.

The steps taken for open access initiatives has been improved the image of the library the numbers of the users increased but there is no any significant change in the

scientific output. Lack of fund is a big challenge in the path of open access initiatives in concern libraries of NRC.

The present study is greatly substantiated by the findings of this study in which the status of open access initiatives in National Research Centre libraries were find out by various means. Open access to information and knowledge is an innovative mode of scholarly communication aimed at the achievement of universal access to information and knowledge. While open access helps digital inclusion of citizens in developing countries by bringing within easy reach full-text contents and development related literature, the Digital Library remains a knowledge repository of such citizens, indigenous people, communities and institutions.

7.5 Suggestions

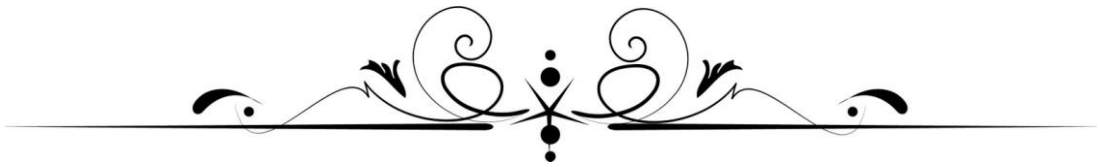
- There must be more technically trained library professional's appointment for smooth and effective working of the library.
- There should be written open access policy in all National Research Centre libraries.
- It should be make sure for providing better, depth and vast open access services their should be more electronic resources available in the libraries of National Research Centres.
- Library budget under different heads should be increased for providing uninterrupted open access services. Library budget for e-books, e-journals are very less.
- Digitization work should be speed up and all NRC library should be digitized for providing better service to the users.

- Their should be regular training and workshop programme related to open access services for library professionals. Librarian should know the importance of open access publishing and can explain to others.

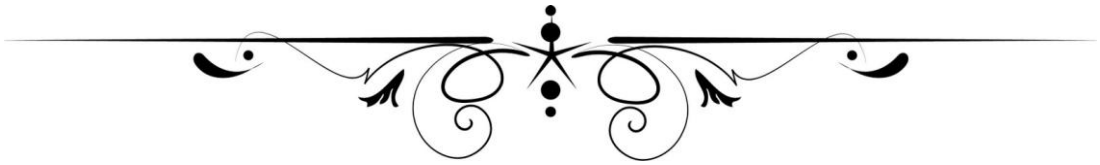
7.6 Suggestion for Further Future Study

This study is limited to 10 National Research centres libraries to find out the open access initiatives. There is a scope of other aspects to be studied. In future the following depth and other aspects study can be framed.

- Comparative study between any two National Research Centre libraries of ICAR.
- Users perspective can also be included by knowing the impact of open access services on users work.
- A study may be designed to investigate the quality and standard of institutional repositories of ICAR.
- Assessment of benefits of Institutional repositories to the users of National Research Centre libraries of ICAR.
- Digital literacy among the scientists of National Research Centres of ICAR.



Bibliography



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Appendix

APPENDIX

QUESTIONNAIRE ADMINISTERED TO LIBRARIAN/ LIBRARY INCHARGE

I. General information about the organization:

1. **Name of the Institution:**_____
2. **Name of Parent body/Trust:** _____
3. **URL of the institution:**_____
4. **Year of Establishment:** _____

II. General information about the library

5. **Name of the library:** _____
6. **Mention the URL of library, if any:**_____
7. **Mention the strength of present users in the library:**

(a) Scientists_____
(b) Faculty member _____
(c) Staff _____
(d) Visitors _____

8. **Working hours of the library:** _____
9. **How many days your library opens in a week:**_____

III. INFRASTRUCTURE AND RESOURCES

LEARNING RESOURCES

10. **Please provide details about learning resources available in your library.**

S.No	Learning Resources	Total Number
(a)	Books	
(b)	Journals (Current)	
(c)	Journal Back Volume	
(d)	Reports	
(e)	Patents	
Non Book Material		
(f)	Audio Visual Materials	
(g)	CD ROM Databases	
(h)	On Line Databases	
(i)	Electronic Journals	
(j)	Microfilm/Microfiche	
(k)	Others (Please Specify)	

HUMAN RESOURCES

11. What is the total strength of library staff

(a) Semi- professional: _____

(b) Non-professionals : _____

(c) Others (Pl. Specify): _____

(d) Total : _____

TECHNICAL INFRASTRUCTURE

12. Please specify the available IT infrastructure for performing open access initiatives through the library.

	Items	**Present Strength**
(a)	Computers	
(b)	Servers	
(c)	Scanners	
(d)	Printers	
(e)	CD/ DVD	
(f)	Security System	
(g)	Software/s	

FINANCIAL RESOURCES

13. Kindly mention the name of funding agency

(a) Central govt. ☐

(b) State govt. ☐

(c) MHRD/UGC ☐

(d) Self ☐

14. What are the Financial Resources of your library

S. No	Sources / Grants	Please (Tick)
(a)	UGC	
(b)	State Government	
(c)	Trust/Management Grants	
(d)	Donations/ Endowments	
(e)	Over Charges, Sale of Old Newspapers, Xerox charges, Membership Charges, Etc.	
(f)	Any Other (Please specify)	

15. Kindly provideallocation of library budget.

S. No	Budget Head	Library Budget (Approximate) Rs						
		Below 50,000	50,000-1,00,000	1,00,000 - 5,00,000	5,00,000 - 10,00000	10,00,000-15,00,000	Above 15,00000	No Budget
(a)	E-Journals							
(b)	E-Books							
(c)	Repositories							
(d)	Databases: CD ROM ONLINE							
(e)	Audio/Video Cassettes, VCD'S DVD'S							
(f)	Miscellaneous							

16. Is the allocation of budget sufficient for providing open access services in your library? Please indicate:

(a) Sufficient ☐ (b) Not sufficient ☐ (c) Can't say ☐

DIGITIZATION STATUS

17. Have you digitized any of the library collection?

(a) Yes ☐ (b) No ☐ (c) No but plan for digitization ☐

If ***Yes***, please name the materials digitized and specify the number of such materials

Documents	Total No.
Books	
Journals	
Reports	
Patents	
Standards	
Magazines	

Newspapers	
Others (please specify)	

If your answer is ***No*** to Q. No.17, give reasons for not digitized:

Lack of funds ☐ Lack of demand ☐

Lack of equipment's ☐ Lack of trained staff ☐

Lack of skills/expertise ☐ Others (please specify):

_____

18. Mission and Purpose of Open Access

(a) Exchange Information ☐

(b) Set Standards ☐

(c) Advance Models ☐

(d) Advocate for Gold[1] OA ☐

(e) Educate ☐

(f) Promote Innovation ☐

(g) Other (please specify)……

[1] Gold OA refers to implementing the free and open dissemination of original scholarship by publishers, as opposed to Green OA, in which free and open dissemination is achieved by archiving and making freely available copies of scholarly publications that may or may not have been previously published.

19. Mention the key open access initiatives/services of the library.

(a) Publishing Open Access Journals ☐

(b) Institutional Repository ☐

(c) Other (please specify) _____

IV. Open Access Policy

20. Does your library have a written Open Access policy? Yes [ ] No [ ]

(a) If yes, is it regularly implemented by the University Library authorities?Yes [ ] No [ ]

(b) Is it revised and updated? Yes [ ] No [ ]

21. What measures are applied to control the copyright/ digital rights of e-resources?

(a) Special security measures ☐

(b) Anti-plagiarism software ☐

(c) Any other (please specify) _____

22. How does your library organize archives? ☐

(a) Selected articles
(b) Organize by category ☐
(c) As issued originally ☐
(d) Any other (please specify) _____

23. Is the library a member of any of the following Indian consortia initiatives?

(a) UGC- INFONET ☐
(b) INDEST ☐
(c) CeRA (Consortium of Electronic Resources in Agriculture) ☐
(d) ICAR e-consortia ☐
(e) HELNET Consortium ☐
(f) Any other (please specify) _____

24. Does library/ institution maintaining any institutional repository?

Yes [ ] No [ ]

25. Do you have the statistics of the consortium/ consortia in use?

Yes [ ] No [ ]

If yes please give details of the use statistics for the past one year.

Category	Year											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Faculty												
Research Scholars												
Scientists												

V. Attitude towards Open Access Initiatives

26. For how many years have you been aware of Open Access publishing?

(a) I'm not aware of OA publishing ☐
(b) Less than one year ☐
(c) Two years ☐
(d) Three years ☐
(e) More than three years ☐

27. Are you aware of any initiatives in your country to promote Open Access publishing?

Yes [ ] No [ ]

28. To what extent do you agree or disagree with the contention that the Open Accesspublishing model will be more cost-effective to the academic research community in the longrun than the current subscription-based model?

(a) Strongly agree ☐
(b) Agree ☐
(c) Disagree ☐
(d) Strongly disagree ☐
(e) Don't know ☐
(f) Don't care ☐

29. Why do you think the Open Access publishing model will be more cost-effective?

(a) Publishing costs will reduce ☐
(b) Publishers' profits will reduce ☐
(c) Other (please specify) _____

30. The Open Access model becomes more widely accepted, publishers may compete for work on the basis of price as well as the strength of their journal brands and quality of service. Do you feel that this type of price-based competition will affect the quality of the scholarly publishing process:

(a) In a positive way ☐
(b) In a negative way ☐
(c) In neither a positive nor negative way ☐
(d) Don't know ☐
(e) If you have any _____

Impact of Open Access Initiatives

31. With the introduction of open access services Library image has:

(a) Improved ☐ (b) Decreased ☐ (c) No. Change ☐

32. No. of users are increased or decreased by introducing open access Services.

(a) Increased ☐ (b) Decreased ☐

33. Has open access initiative made any impact on your annual budget?

(a)Yes ☐ (b) No ☐

34. Have you observed any significant changes in the scientific output after introducing open access services?

(a) Yes ☐ (b) No ☐

35. To what extent are you concerned that a significant move to Open Access publishing may disrupt the established system of scholarly publishing?

(a) Very concerned ☐
(b) Concerned ☐
(c) Not very concerned ☐
(d) Not at all concerned ☐
(e) Don't know ☐

36. What is your opinion about the efficiency of your library staff regarding handling Electronic Information Sources and Services? Please indicate: ☐

(a) All are efficient •
(b) Majority are efficient • ☐
(c) Majority are not efficient • ☐
(d) Can't say ☐

37. Awareness of open access initiatives

Open Access Initiatives	**Pre-prints**	**Post-prints**	**Open access journals**
Aware			
Not Aware			
Against It			
No adequate knowledge about the initiative			
No response			

Librarian's Opinion regardingOpen Access Initiatives

38. In your opinion, which are the factors that influenced the Open Access Initiatives Services in your library? (Please use this rating scale: 1=Strongly agree; 2= Agree; 3= Undecided; 4= Disagree; 5= Strongly disagree).

Factors	**1**	**2**	**3**	**4**	**5**
Allocation of funds					
Developments in the field ICT					
Demand from the users					
Other institutions repositories and consortiums					
Research centre administration					

interest					
To provide advanced services to users					
To attract the attention ofhigher authority					
Others (please specify):					

39. What are the challenges and barriers in open access initiatives?(Please use this rating scale: 1=Strongly agree; 2= Agree; 3= Undecided; 4= Disagree; 5= Strongly disagree)

Barriers	**1**	**2**	**3**	**4**	**5**
Lack of funds					
IPR issues in performing open access					
Organizations open access policy					
Technical hurdles to accessing data					
Lack of knowledge to use open access resources among library users					
Lack of support from the Administration					
Lack of infrastructure facilities					
Lack of trained staff					
Cost of providing open access services is high, and users make less use of them					
Others (please specify):					

VI. System followed

40. Software used in the library?

(a) Libsys ☐
(b) Soul ☐
(c) CDS/ISIS ☐
(d) Alice for Windows ☐
(e) Granthalaya ☐
(f) e-Granthalaya ☐
(g) Others(please specify) _____

VII. Access to Information

41. Mention the various means used to disseminate information among users in your library? Please tick (√) mark which is applicable, multiple answers are permitted:

(a) OPAC ☐
(b) Library website ☐
(c) Digital library ☐
(d) E- Newsletters ☐

(e) E- News clippings ☐
(f) Current Awareness Service ☐

42. The retrospective conversion of your collection is done up to:

(a) Not started ☐
(b) 50-60% ☐
(c) 60-70% ☐
(d) 70-80% ☐
(e) 80-90% ☐
(f) completed ☐

43. Please give your suggestions, if any:

_____
_____
_____
_____
_____
_____
_____
_____

Thanks for your cooperation and time sparing.

Signature and stamp of Librarian/ Library In-charge