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Agricultural Information Networks

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Now it is imperative to have a look into the Agricultural Information Networks (AIS). A number of virtual information networks with the objective of linking agricultural institutions for facilitating better access to information resources have been initiated successfully. While some of these network agricultural institutions within a country, link to agricultural institutions around the globe. The conspicuous ones are profiled here.

Agriculture Network Information Center (AgNIC) www.agnic.org

The very important component requiring considerable attention is AgNIC. It is an Internet based network of public and private agricultural libraries and information centers, coordinated by the National Agriculture Library (NAL), USA The network aims to provide global access to agricultural Information. AgNIC Members represent 40 land-grant universities and other national and international partners including universities and research institutions, government agencies, and a non-profit organization. Through its website, the network provides access to a network of electronic sources on research and teaching in agriculture, food, renewable natural resources, forestry, and physical and social sciences. AgNIC is a distributed discipline-oriented source of agricultural information in electronic form on the Internet. The goals are to: identify major collections of agriculture-related information; provide mechanisms to facilitate access/ retrieval from these information resources; create mechanisms to encourage organizations to collaborate in creating/ using AgNIC. AgNIC partners select important information sources for inclusion in the system. Services include: Resource database with web sites, image collections, lists of publications, documents, databases, and other resources; Calendar of events which includes meetings, seminars, national and international symposia and conferences, conventions, and workshops in agricultural and related sciences; news items; specialized services-such as Plant Disease Announcements; discussions on emerging plant diseases

around the world; Expertise where specialists respond to individual questions (NAL, 2006). There are partnerships between libraries and United States Department of Agriculture (USDA) Cooperative Extension programs; between libraries and academic departments within colleges; between states and between technologists and librarians. Member participants take responsibility for small segments of agricultural information and develop Web sites and reference services in their specific subject areas. Nearly all participating AgNIC institutions have developed partnering relationships with a variety of internal and external institutions, groups, and agencies to develop content and tools for their respective web sites.

It can be observed that the Agriculture Network Information Center (AgNIC) alliance was formed in 1995 by a group of four land grant institutions - Cornell University, Iowa State University, University of Arizona, and University of Nebraska, Lincoln, and the U.S. Department of Agriculture's National Agricultural Library (NAL). In 1998, NAL assumed the role as "secretariat" to move the partnership forward. Members were committed to creating a voluntary "alliance" dedicated to providing Internet access to quality, authoritative agricultural information, and specialized reference services. In 2007, with 60 voluntary partners, this vision continues to sustain the Alliance, largely due to its collaborative nature. University libraries affiliated with land-grant colleges as well as other interested institutions, such as the International Rice Research Institute, the American Farmland Trust, the Agricultural Information and Documentation Service for America (SIDALC) and the University of Buenos Aires, School of Agriculture, Central Library, are working together with NAL to develop the AgNIC Alliance, its collections and services, and the technologies upon which it relies. Unlike most science and technology disciplines, agriculture has a mechanism for distilling and distributing research to those who need it. Historically, state and local extension staff research topics, synthesize, and prepare information for easy consumption, often on an "as needed" basis. Forming partnerships between libraries and subject specialists has been the cornerstone of AgNIC.

AgNIC is a distributed network, which provides access to agriculture-related information, subject area experts, and other resources. It was established due to joint effort of the National Agricultural Library, land-grant universities and other organizations committed to facilitating public access to agricultural and related information and went on public in Oct.1995.

Objectives

Looking into the true perspective, AgNIC focuses on providing access to quality agricultural information in electronic format available over the World Wide Web (WWW) via the Internet. One of the objectives of AgNIC is that member participants take responsibility for small vertical segments of agricultural information (including basic, applied, and developmental research, extension, and teaching activities in the food, agricultural, renewable natural resources, forestry, and physical and social sciences) and develop WWW home pages in that specific area of responsibility. The collective AgNIC WWW resource will benefit all members in ways that they cannot achieve

on their own, thus justifying the local costs of participation (Source: AgNIC Home page "agnic.org". http://www.agnic.org /)

International Information System for Agricultural Sciences and Technology (AGRIS) http://www.fao.org/agris

The Food and Agriculture Organization (FAO) of the United Nations initiated Agricultural information networking through AGRIS. Established in 1974 AGRIS facilitates information exchange and bring together world literature dealing with all aspects of agriculture and related subjects. AGRIS is a co operative system in which 240 national, international and intergovernmental centers in participating countries input references to the literature produced within their countries draw on the information provided by the other participants. The new vision of AGRIS in response to the needs include; decentralized approach with greater emphasis on national partnerships, improved linkages between the AGRIS network and other FAO initiatives; focus on management of documents in agricultural science and technology in full text; information about activities, organizations, and people in agricultural science and technology; etc

AGRIS (International System for Agricultural Science and Technology) is a global public domain database with more than 4 million structured bibliographical records on agricultural science and technology. The database is maintained by FAO, and its content is provided by more than 150 participating institutions from 65 countries. The AGRIS Search system, allows scientists, researchers and students to perform sophisticated searches using keywords from the AGROVOC thesaurus, specific journal titles or names of countries, institutions, and authors. (http://en.wikipedia.org)

AGRIS covers the wide range of subjects related to agriculture, including forestry, animal husbandry, aquatic sciences and fisheries, human nutrition, and extension. Its content includes unique grey literature such as unpublished scientific and technical reports, theses, conference papers, government publications, and more. A growing number (around 20%) of bibliographical records have a corresponding full text document on the web which can easily be retrieved by Google. Access to the AGRIS Repository is provided through the AGRIS Search Engine. As such, it:

- enables retrieval of bibliographic records contained in the AGRIS Repository,
- allows users to perform either full-text or fielded, parametric and assisted queries.

(Source: "agris.fao.org". agris.fao.org.)

Agrigate (www.agrigate.edu.au)

Coordinated by the national level libraries of Australia is a project of the Universities of Melbourn, Adelaid and Queeensland and the Commonwealth Scientific and Industrial Research Organization (CSIRO) in Australia. This is subject information gateway for resources, both online and offline, in agricultural research. The purpose is to support the identification and dissemination of quality research materials selected by an editorial review process consisting of members of the agricultural research community. The resources selected have been reviewed by subject specialist librarians. The majority of resources identified in the data base are available online.

Consultative Group on International Agricultural Research (CGIAR)

CGIAR is a research network of fifteen international agricultural research centers. The 15 centers supported by the CGIAR are independent institutions, each with its own charter, international board of trustees, Director General and staff. The institutions are Africa Rice Center(WARDA), Biodiversity international, Centro International de Agricultural Tropical(CIAT), Center for International Forestry Research(CIFOR), International Maize and Wheat improvement Centre(CIMMYT), International Potato Centre(CIP), International Center for Agricultural Research in the Dry Areas (ICARDA), International Crop Research Institute for Semi Arid Tropics(ICRISAT), International Food Policy Research Institute (IFPRI), International Institute of Tropical Agriculture (IITA),International Livestock Research Institute(IRRI), International Water Management Institute(IWMI), World Agro-Forestry Centre(ICRAF) and World Fish Center(WFC). Thirteen of the 15 CGIAR centre are located in developing countries and the knowledge gathered is shared and disseminated across the world. The CGIAR website gives access to a Virtual Information Centre and Library. One can tap into agricultural information database, including online libraries of the CGIAR Centre and the core collection Database. The CG Library gives access to database and e-journals and facility to go directly to the full text of publications. One can search CGIAR libraries/other agricultural libraries/by specific topics. The Virtual Information Center provides information on various topics mentioning the source against each topic. Each institutional library is the source for/and responsible for providing information on specific subject areas viz: Agriculture in the Dry Areas- ICARDA library; Agriculture in Semi Arid Tropics: ICRISAT library; Agro-forestry: ICRAF library; Aquaculture and Fisheries: WFC library; Food Policy: IFPRI library, Agricultural Biodiversity: IPGRI library; Water Management-IWMI library; Wheat: CIMMYT library, etc.

In brief, the CGIAR (formerly the Consultative Group on International Agricultural Research) is an international organisation which funds and co-ordinates research into agricultural crop breeding with the goal of "reducing rural poverty, increasing food security, improving human health and nutrition, and ensuring more sustainable management of natural resources". It does this through a network of 15 research centers known as the CGIAR Consortium of International Agricultural Research Centers. These research centers are spread around the globe, with most centers located in the Global South, at Vavilov Centers of agricultural crop genetic diversity. CGIAR research centers are

generally run in partnership with other organizations, including national and regional agricultural research institutes, civil society organizations, academia, and the private sector. (Source:cgiar.org, http://www.cgiar.org/who-we-are/, Rice, Africa. "CGIAR". Consortium.cgiar.org. Kloppenburg, Jr., Jack Ralph (2004) First the Seed: The Political Economy of Plant Biotechnology, 1492-2000, Second Edition, Madison: University of Wisconsin Pres)

Achievements

Over a period of 40 years, the CGIAR system, with the support of Canada and other donors, has:

- Improved wheat, maize and rice crops in developing countries, resulting in benefits of more than US$10 billion annually
- Triggered the production of additional food in developing countries—$9 worth of additional food for every $1 invested in CGIAR research
- Increased average per capita food consumption
- Prevented malnutrition in at least 13 million children, predominantly in South Asia
- Increased food production in developing countries
- Lowered world grain prices
- Supported crop genetic improvement
- Produced average yield gains of 20 percent in drought-tolerant maize grown on 1 million hectare of land in Africa

Information Network on Post-harvest Operations (INPhO) www.fao.org/inpho/

INPhO is an FAO databank project of the Post-harvest management Group. It is an international collaborative effort by the FAO, GTZ and, CIRAD which aims to support the collection and dissemination of information on proven technologies and products in post harvest systems. Components of the network include a comprehensive collection of information on post harvest issues, communication/interactive services; links with other databases. The website includes full text documents of training and technical publications, country profiles, crop profiles (main focus is on cereals and grains, fruits and vegetables, oil seeds, roots and tubers). Recipients of this information include people working in the agricultural production and marketing sector viz., producers, researchers, policy makers, private investors and donors (FAO, 2006). The Information Network on Post-Harvest Operations (INPhO) was designed by FAO with the support and collaboration of GTZ and CIRAD. The main objective is to increase the development of activities of the global post-harvest sector for tropical agricultural products for a better access to technical data and an exchange of information among the different post harvest actors. Food security has two legs: production and post-production, and only a well managed post-production system allows the consumer to have access to the food produced. In this context and to assist in preventing the loss of millions of tons of cereals, roots, tubers, fruits and vegetables in developing countries, caused by inadequate handling and storage, pest damage, transport and marketing problems, INPhO started to operate. In the site you can find fact sheets on products, equipment, traditional storage, a photo gallery, and a document and video library.

Electronic Publishing in Agriculture

Electronic Publishing (e-Publishing) is quickly becoming an important part of publishing mainstream. Recent innovations in this area have made it possible to publish on the information super highway. E-document can be accessed at the computer. It makes much easier for readers to search the information. It is very quick and easy for a reader to browse the table of the contents of previous issues, to jump directly to a particular section of a document or even particular section of an article.

Advantages of e-Publishing

E-Publishing (EP) difference lies in the new levels of value it provides through features not possible in traditional media. EP products may differ to an even greater degree than print products. Nevertheless, there are some common features, to distinguish EP from print publishing in terms of value to end users. EP products create additional value for the user with regard to following three dimensions: content availability, content transparency and interactivity and content format. Content availability means that EP products can be delivered and accessed with more independence of time and place than can be traditional print products and that their delivery is less limited with regard to quantity. Content availability includes: time of delivery available any time; location of delivery- consumption anywhere; amount of information- end of traditional boundaries imposed by paper volume and price. Content transparency and interactivity refers to new tools and opportunities concerning information navigation. The main features are Interactivity- contextual hyperlinks open new dimensions of information retrieval and lead to new types of information behavior: browsing, etc. the possibility to integrate content and services; and search tools across one or thousands of documents- interactive information processing.

Electronic Publishing in Agriculture in India

The Directorate of Information and Publications of Agriculture, (DIPA), New Delhi, is the official publication wing of the ICAR through which the research and other activities are revealed to the world. DIPA brings out a variety of Publications in English and Hindi languages for the use of scientists, Researchers, students, policy planners, extension personnel, farmers and the General public. The e-publications of DIPA include- "Handbook of Horticulture", ICAR Research Projects Information- Research Project Files (RPF) Database, ICAR Vision 2020 Document etc. Some other important Institutions bringing out e-publications' in Agriculture in India include, National Institute of Agricultural Extension Management, MANAGE, Hyderabad (www.manage.gov.in), Indian Agricultural Research Institute, New Delhi (www.iaripusa.org), Indian Farmers Fertilizer Cooperative Limited(IFFCO), (www.iffco.nic.in), Krishak Bharati Co-operative Limited (KRIBHCO), (www.kribhco.net), National Bank for Agricultural and Rural Development (NABARD) (www.nabard.org), National Agricultural Co-operative Marketing Federation of India Ltd.

(NAFED) (www.nafed-india.com), Indian Agricultural Statistics Research Institute (IASRI), New Delhi (www.iasri.res.in) and State Agriculture Universities of Tamilnadu, Uttarakhand, Punjab, Haryana and Andhra Pradesh. Two major open universities namely Indira Gandhi National Open University (IGNOU), Delhi and Yeshwantrao Chavan Maharashtra Open University (YCMOU), Nashik and National Institute of Agricultural Extension Management (MANAGE), Hyderabad have taken open and distance learning in Agriculture on a national scale, and all these institutions are in the process of bringing out a number of e-publications in Agriculture.

Electronic publishing (also referred to as ePublishing or digital publishing) includes the digital publication of e-books, EPUBs, Digital Magazines (also sometimes known as electronic articles), and the development of digital libraries and catalogues. Electronic publishing has become common in scientific publishing where it has been argued that peer-reviewed scientific journals are in the process of being replaced by electronic publishing. It is also becoming common to distribute books, magazines, and newspapers to consumers through tablet reading devices, a market that is growing by millions each year, generated by online vendors such as Apple's iTunes bookstore, Amazon's bookstore for Kindle, and books in the Google Play Bookstore. Market research suggests that half of all magazine and newspaper circulation will be via digital delivery by the end of 2015 and that half of all reading in the United States will be done without paper by 2015. Although distribution via the Internet (also known as online publishing or web publishing when in the form of a website) is nowadays strongly associated with electronic publishing, there are many non network electronic publications such as Encyclopedias on CD and DVD, as well as technical and reference publications relied on by mobile users and others without reliable and high speed access to a network. Electronic publishing is also being used in the field of test-preparation in developed as well as in developing economies for student education (thus partly replacing conventional books) - for it enables content and analytics combined- for the benefit of students. The use of electronic publishing for textbooks may become more prevalent with eBooks from Apple Inc. and Apple's negotiation with the three largest textbook suppliers in the U.S.

Electronic publishing is increasingly popular in works of fiction as well as with scientific articles. Electronic publishers are able to provide quick gratification for late-night readers, books that customers might not be able to find in standard book retailers (erotica is especially popular in eBook format and books by new authors that would be unlikely to be profitable for traditional publishers. While the term "electronic publishing" is primarily used today to refer to the current offerings of online and web-based publishers, the term has a history of being used to describe the development of new forms of production, distribution, and user interaction in regard to computer-based production of text and other interactive media.

Electronic versions of traditional media:

- CD-ROM
- E-book

- Electronic journal
- Online magazine
- Online newspaper
- PDF

New media:
- Blog
- Collaborative software
- Digital publication app
- File sharing
- Mobile apps
- Podcast (http://en.wikipedia.org/)

Electronic mail (E-mail), compact disc read only memory (CD-ROM), and electronic journals (E-journals; online journals) are common everyday terms that only originated in the 1980s (WWWebster Dictionary, 2000; www.m-w.com/dictionary.htm). Yet, these words are increasingly found in everyday conversations of people of all ages, professions, countries, and businesses. Electronic publishing has revolutionized the way we think, talk and act. In less than 20 years, changes in communication and information management (the essence of electronic publishing) have become so profound that the era we now live in is called Information Age. An Age that is not completely understood by many of us living in it, but will be scrutinized by historians and studied by school children as the Industrial Revolution and Space Age have been examined by current generations. Of importance to nursing, other healthcare providers and consumers experiencing this latest era of change is how electronic publishing is altering and reforming how we communicate and control information in our lives.

The purposes of this article are to provide an overview of electronic publishing, to describe how information increasingly is being exchanged within the scientific community, and to discuss the scholarly qualifications of electronic venues. First, we will discuss what is meant by electronic publishing and second, give examples of usage and types of electronic publishing. Third we will examine how electronic publishing, particularly e-journals are used in nursing and health care. Fourth, we will discuss the advantages and disadvantages of electronic journals and fifth, discuss the advantages and disadvantages of print journals. We will end with a look into the 21st century and project how electronic journals maybe used by nurses in the future.

Use of and Types of Electronic Publishing

The use of computers has exploded. Currently there are 43 million connected computers across the world (Matrix Information and Directory Services, Inc, 1999www.ngi.org/trends/TrendsPR9902.txt, www.ngi.org/trends/trendsregional.html).W orldwide there are projected to be over 200 million users online over the age of 16 (NUA survey, 1999, (www.nua.net/surveys/how_many_online/world.html). The use of electronic

medium enables a large segment of the peoples of the world to seek out information and exchange ideas for personal, business, and/or educational use. In the United States, for example, fifty percent of all students had access to the use of computers for studying math (ETS's Policy Information Center, 1999.www.ets.org/research/pic/ccsum.html). Using the framework of communication and managing information this section will provide an overview of the ways computers are used a) to send messages and network and b) provide for information management.

Messaging and networking

Messaging and networking are two means of using electronic publication for communication. Messaging through e-mail is one of the most widely established ways to communicate and allows one or more persons to correspond in writing. Networking allows messages to be sent and discussions to occur among a few people or in some cases among thousands of people. As both messaging and networking use an e-mail type application, e-mail will be briefly reviewed first. For the novice user seeking more "how-to" information on e-mail. (Source: www.nursingworld.org/ www.webfoot.com/ advice/ email.context.html, www.pbs.org/uti/guide/email.html,www.pb.org/emoticon.html.)

E-mail can be likened to letter or note writing. However, instead of mailing a written copy through a carrier such as a postal service or leaving a message on someone's desk, a note/letter is electronically published through computers. While most e-mail is simply a written message, a file or files can be sent along with the e-mail. These attachments can contain pictures, video, audio, or long text or database files like protocols, articles or research data. (Electronic Publishing: The Movement From Print To Digital Publication)

Open Access to Information Retrieval

Open Access (OA) is free, immediate, permanent online access to the full text of research articles any. There are two roads to open Access:
(1) the "golden road" of OA journal-publishing , where journals provide OA to their articles (either by charging the author-institution for Refereeing/publishing outgoing articles instead of charging the user-institution for accessing incoming articles, or by simply making their online edition free for all);
(2) The "green road" of OA self-archiving, where authors provide OA to their own published articles, by making their own e-prints free for all.
The two roads to OA should not be confused or conflated; they are Complementary: An Open Access Publication is one that meets the following two conditions:
1. The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible 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 (for the biomedical sciences, PubMed Central is such a repository).

According to Directory of open Access Journals (DOAJ, 2008), open access journals are defined as journals that use a funding model that does not charge readers or their institutions for access. Acceptance of OA archiving does not mean abandoning peer review or ceasing to publish journals. It merely means the parallel archiving of all research papers in interoperable institutional archives searchable by all on the Internet, a process increasingly accepted by major journals. This process is almost cost-free since it can be carried out by individual researchers themselves, or by their institutions, paper by paper. Software for establishing e-print archives is available free to all. Alternatively, OA can be achieved by publication in the increasing number of OA journals. In these, the cost of document management is met by the contributors or their organizations, rather than the readers, so that accessing the content remains free to all. A number of journals published in developing countries are converting to OA, since the value to their countries of international visibility is recognized as being of far greater importance than the small amount of income the journals generate. For example, the Indian Institute of Science has established an "eprints" archive and there: is now significant OA activity in the sub-continent (New institutional archives being established, workshops. on OA being organized). Similarly the Central Marine Fisheries Research Institute (CMFRI) of ICAR also established eprints of entire publications as institutional repository consisting of more than 10000 research papers uploaded along with other publications like journal and periodicals of the institute.

The recent agreement to provide free or low cost journals to the poorest countries by publishers that make few sales in these areas is a welcome development (eg WHO HINARI and INASP PERI projects), and can alleviate information poverty for some countries in the immediate term. However, these efforts are unlikely to be sustainable and exclude many poor countries where collaborating publishers may lose sales, such as India. In the longer term the worldwide acceptance of OA is the only mechanism, immediately available and at almost no cost, that can provide equality of access as well as professional inclusion for developing country. Scientific information is both a researcher's greatest output and technological innovation's most important resource. The rising cost of journal subscription is a major force behind the emergence of the open access (OA) movement. The emergence of digitization and Internet has increased the possibility of making information available to anyone, anywhere, anytime, and in any format. The major benefits of OA include: Researchers and students gain increased access to knowledge, publications receive greater visibility and readership, the potential impact of research is heightened, increased access to and sharing of knowledge leads to opportunities for equitable economic and social development, intercultural dialogue, and has the potential to spark innovation. OA improves the speed, efficiency, and efficacy of research as also OA enables computation upon the research literature.

With this backdrop, it is heartening to note that biomedical scientists are increasingly gaining access to medical literature for a variety of assignments like writing a research paper or a research proposal or even staying current with advances in biomedical field.

Thanks to OA, a number of sources are now available in the biomedical field apart from PubMed (http://www.ncbi.nlm.nih.gov/pubmed), which provides free access to the largest biomedical resource available and is updated daily. Specifically, PubMed listed 5,645 journals (as on January 1, 2013) indexed from various countries.(2) A total of 42 (0.74 %) journals are included from India (also as on January 1, 2013).(3) Encouragingly, the national initiative by the Indian Council of Medical Research (ICMR) funded project, 'National database of Indian medical journals' by the National Informatics Centre Services Inc. (NICSI), New Delhi, provides among others, a bibliographic database of about 100 prominent peer – reviewed Indian biomedical journals indexed from 1985 onwards through indMED (http://indmed.nic.in/,accessed on January1, 2013) as also full text of 63 Indian biomedical journals (medIND).(4) It supplements international indexing services like PubMed. It simply means one gets 45,928 records using 'contraception' as the key word in PubMed, while another exclusive 170 Indian records using 'contraception' as the key word in indMED.

1. Swan A. Policy guidelines for the development and promotion of open access. Paris: United Nations Educational, Scientific and Cultural Organization; 2012.)

2. Currently Indexed Journals in PubMed. [Last accessed on 2013 Jan1]. Available from: http://www.ncbi.nlm.nih.gov/nlmcatalog?term=currentlyindexed%5Ball%5D .

3. Currently indexed journals in PubMed from India. [Last accessed on 2013 Jan 1]. (Source: http://www.ncbi.nlm.nih.gov/nlmcatalog?term=currentlyindexed%5Ball%5D%2B %20Indi)

Open Access in India

Open Access is gaining momentum in India, Some' major Indian institutions, which have joined the Open Access movement include:
1. Indian Institute of Science, Bangalore
2. Indian Academy of Sciences, Bangalore
3. Indian Institute of Astrophysics, Bangalore
4. Raman Research Institute, Bangalore
5. Indian Statistical Institute, Bangalore
6. National Chemical Laboratory, Pune
7. University of Hyderabad, Hyderabad
8. Indian Institute of Technology, New Delhi
9, Indian Institute of Technology, Kharagpur
10. Indian Institute of Management, Kozhikode
11. Indian Statistical Institute, Kolkata
12. Indira Gandhi Institute for Development Research, Mumbai
13. G.B. Pant University of Agriculture and Technology, Pantnagar, Uttaranchal
14. National Institute of Oceanography, Goa
15. National Institute of Technology, Rourkela
16. Sri Venkateswara University, Tirupati

17. Indian National Science Academy, New Delhi

Institutional Repositories

Institutional Repositories (IRs) are the digital information warehouses of modern academic institutions. According to Clifford Lynch (2003), the IRs are "a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members". The key features of a professionally managed IR are: Rich digital Content, up to date full-length Institutional Research papers, full participation of all Research Scientists of the organization, and fully supported by top administration. The benefits of Institutional Repositories include- higher visibility in academic circles, better reach through WWW, efficiency through Centralization of Digital content, wider access and visibility, improved impact. and citation of their work, Opportunity to share unpublished ideas and know-how, motivation for junior researchers through immediate presence on IR. The IRs also promotes information documentation habit in young researchers and development functionaries.

An institutional repository is an online locus for collecting, preserving, and disseminating in digital form, the intellectual output of an institution, particularly a research institution. For a university, this would include materials such as research journal articles, before (preprints) and after (post prints) undergoing peer review, and digital versions of theses and dissertations. It might also include other digital assets generated by academics, such as administrative documents, course notes, or learning objects.

The four main objectives for having an institutional repository are:

- to provide open access to institutional research output by self-archiving it;
- to create global visibility for an institution's scholarly research;
- to collect content in a single location;
- to store and preserve other institutional digital assets, including unpublished or otherwise easily lost ("grey") literature such as theses or technical reports.

Advantages:
- Opening up outputs of the institution to a worldwide audience;
- Maximizing the visibility and impact of these outputs as a result;
- Showcasing the institution to interested constituencies – prospective staff, prospective students and other stakeholders;
- Collecting and curating digital output;
- Managing and measuring research and teaching activities;
- Providing a workspace for work-in-progress, and for collaborative or large-scale projects;
- Enabling and encouraging interdisciplinary approaches to research;

- Facilitating the development and sharing of digital teaching materials and aids,
- Supporting student endeavours, providing access to theses and dissertations and a location for the development of e-portfolios.(en.wikipedia.org)

Institutional Repositories in India

In India, there are 16 functional institutional repositories, developed by research and academic institutions of national and international importance, such as Indian Institute of Science, Indian Institute of Management etc. Apart from institutional repositories, subject specific repositories also exist in India. These store and provide access to subject specific collections of documents. These repositories accept scholarly publications from any professional or researcher who belongs to the respective subject. *Librarian's Digital Library* (LDL) of the Documentation Research and Training Centre (DRTC), Bangalore is an example of a subject-specific repository for library and information professionals. Another subject-specific repository established in India is *OpenMed@NIC*, maintained by the National Informatics Centre, New Delhi. OpenMed@NIC stores and provides access to biomedical literature. Another kind of digital repository existing in India stores and provides access to document type specific collections. Vidyanidhi of the University of Mysore is an example of document type specific collection that stores and provides access to theses and dissertations (Cross institutional ETD repository). Vidyanidhi accepts any thesis or dissertation that has been accepted in any of the Indian universities or institutions (Fernandez, 2006).

It has found that all institutions had done planning and pilot testing before implementation of an IR. "Attending institutional repository software implementation training and workshops" and "Demonstrating an operational institutional repository to my institution's decision-makers" were the most exercised exploratory activities. All respondents agreed on the benefit that an IR provides "Better service to contributors and institution's learning community". "Contributor's lack of knowledge" was the most important inhibitor that impedes the web administrator's ability to set up a successful institutional repository. (Source: http://www.emeraldinsight.com)

Importance of Institutional Repositories

IRs in universities generally include pre-prints of journal articles, seminar papers, technical reports, research data, theses, dissertations, work in progress, important print and image collections, teaching and learning materials, and other materials, documenting the history of the institution. For several years, universities and R&D institutions have been primarily responsible for creation of new knowledge by investigating activities. These are in the form of theses, dissertations, project reports, courseware, pre-prints, etc. These documents carries huge amount of valuable data and material which is probably not available in any published resource. Unfortunately these are inaccessible in the absence of appropriate mechanisms such as bibliographic control access. Even those resources that eventually appear in print and are published may still be in accessible to a vast majority of institutions due to the high cost of subscription to the source material in which they are

published. IRs are widely seen as one way of enhancing wider access to research carried out using public funds while at the same time improve visibility of research especially for developing countries. Thus, for universities/institutions, IRs are marketing tools, communicating available expertise and quality by showcasing output of faculty and research scholars, public service projects, and other activities and collection. IRs also complements existing metrics for gauging institutional productivity and prestige. While the increased visibility reflects a high quality of scholarship, this demonstration that value can also translate into tangible benefits, including attracting funding from public and private sources increasing the institution's status and reputation. With the availability of advanced information and communication technologies (ICTs) and by building up necessary infrastructure in India, particularly in academic institutes, this will become an active contributor to global open access literature. IRs in universities generally include pre-prints of journal articles, seminar papers, technical reports, research data, theses, dissertations, work in progress, important print and image collections, teaching and learning materials, and materials documenting the history of the institution. (Best practices in institutional repositories in Indian universities and research institute, Madaiah Krishnamurthy DRTC, Indian statistical institute, Bangalore560059,Talawar.V.G,University of Mysore, Jagirdar NAAC Bangalore)

Institutional Repositories in India are less than five years old; many are in the testing phase and none have more than a few thousand papers. The Indian Institute of Science was the first in the country to set up an interoperable institutional repository (ePrints@IISc) in 2002 (eprints.iisc.ernet.in). The archive now has more than 3,000 documents, with over 90% having full text. The Institute has a separate Archives Unit and well documented submission guidelines. Other Institutional repositories are new and not rich in content. Many are in the testing phase, and none have more than 500 papers. Eprints@CMFRI is the Open Access Institutional Repository of Central Marine Fisheries Research Institute. Research outputs of CMFRI - journal papers, conference papers, reports, theses, patents etc. - are uploaded/self-archived by CMFRI scientists who do research on fisheries and related areas. Interested users can freely download and use documents as most of them are directly accessible and full-text downloadable.

OA and IR movement has certainly helped the Indian journals to reach an international audience, as could be seen by the number and distribution of article downloads. The Journal of Postgraduate Medicine, a quarterly journal with a print circulation of less than 1,000 attracts close to 1,00,000 visitors with more than 110,000 article downloads per month. The increased accessibility and visibility has also increased the citations received by this journal (Sahu, Gogtay and Bavdekar, 2005). Professor Subbiah Arunachalam of the M, S. Swaminathan Research Foundation, Chennai, is the greatest OA advocate in the country. He organized a workshop on 'Open Access and Institutional Repositories under the aegis of the MSSRF, Chennai in May 2004. A special session on OA was held at the 93rd Indian Science Congress held at Hyderabad in January 2006, which came up with some far reaching recommendations for the 'Optimal National Open Access Policy'. According to their recommendations, "The Government of India expects authors of research papers resulting from publicly funded research to maximize the opportunities to make their results available for free. To this end, the Government requires electronic copies

of any research paper that has been accepted for publication in a peer-reviewed journal, and is supported in whole or in part by Government funding, to be deposited into an Institutional OA repository immediately on acceptance for publication."

CMFRI Open Access Institutional Digital Repository places CMFRI as the first ICAR institute to reach this stage and CMFRI also ranks first at national level and fifth at the global level among the open access repositories on marine sciences. Among all IR (including all disciplines), CMFRI ranks in 499th place in ranking the web of world repositories and 112th place in Google scholar. (Source: http:/repositories.webomerics.info/roprep.asp, MANAGE. 2012. Information and Communication Technologies in Agricultural Information Management and Networking, Training module.)

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