

ECONOMIC COMMISSION FOR AFRICA

**Digital libraries development: imperatives and best practices:
The Need for Capacity Development in the Use of Online Resources,
The Case of Funded Online Resources for Africa**

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Abbreviations and Acronyms

AGORA	Access to Global Online Research in Agriculture
AVLIN	African Virtual Library and Information Network
CD	Capacity Development
CODI	Committee On Development Information
CSO	Civil Society Organizations
DOAJ	Directory of Open Access Journals
DSF	Digital Solidarity Fund
eIFL	Electronic Information For Libraries
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
HDI	Human Development Index
HINARI	Health InterNetwork Access to Research Initiative
ICSU	International Council of Science
ICT	Information and Communication Technologies
IL	Information Literacy
INASP	International Network for the Availability of Scientific Publications
NGOs	Non-Governmental Organizations
OARE	Online Access to research in the environment
PERI	Programme for the Enhancement of Research Information
TEEAL	The Essential Electronic Agricultural Library
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
WSIS	World Summit on Information Society

Introduction

1. Today we live in a competitive world, which is rapidly evolving, where everyday life is dependent on information and knowledge. Knowledge is vital for economic, political and social development of a country, it is used in policy making, in conflict and security management, in health management, in bank transaction, in businesses, in education, in offices, in environmental issues, in early warning systems, in productivity and competitiveness, in every field of life. People acquire, create, disseminate, and use knowledge more effectively for greater economic and social development. Thus making the application of knowledge being recognized to be one of the key sources of growth in the global economy (knowledge economy). (*Worldbank- K4D*).

2. The birth and explosion of ICTs that bring worldwide interdependency and connectivity has a greater contribution in this knowledge economy. It revolutionizes the magnitude, scale and way information is acquired, produced and distributed worldwide. The production and availability of electronic information provides the potential for countries in strengthening their economic, political and social development by providing more efficient ways of production, distribution, decision-making, etc. Like any living organism which has to grow to survive, a state has to interact with its surrounding environment in order to survive, develop and prosper (Theunissen, 1999). No state can isolate itself from the age of knowledge if he desires economic development. Interacting with others, learning from them and sharing experiences, are key to one's sustainable development in this global village.

3. However, in a divided world of rich and poor, developing and emerging countries lag behind. They fail to tap the vast and ever growing stock of knowledge because of their limited awareness, poor economic incentive regimes and weak institutional capacity. The bulk of available information might be worthless unless it has a utility value and is effectively used by information recipients, effectively becoming knowledge and being used efficiently. Unfortunately, the gap created a new challenge- the digital divide, a danger zone that might lead to social exclusion, economic stagnation and technological isolation of a country. The digital divide concerns governments, the private sector, multilateral organizations, financial institutions, non-governmental organizations and every individual.

4. The crucial issues of the digital divide are not only technological they are social, economic, cultural and political touching all spheres of our lives. Even the plan to achieve the 8 Millennium Development Goals (MDGs) in 2015, will be affected. These goals were adopted by all the world's countries to respond to the world's main development challenges which range from halving extreme poverty to halting the spread of HIV/AIDS and providing universal primary education as a blueprint for building a better world. But with the disparities in technology usage, resulting from a lack of access, skills or interest in use, Africa is far from reaching its MDGs.

5. There are several reasons for the digital divide, to list a few:

- Economic status (lack of financial resources to be allocated towards availing ICT based knowledge content);
- Lack of appropriate ICT infrastructure and internet connectivity; absence of adequate legal and regulatory frameworks surrounding ICTs and their content; lack of political will

in governments to do what is needed to enable the integration of technology throughout society;

- Lack of awareness of technology and what they can offer;
- Poor computer and general literacy (no sufficient literacy levels to use ICTs effectively (*like the barrier of language*), lack of computer literacy)
- Lack of relevance, interest and aspirations (thinking that it is not relevant to our life, no interest in using internet, number of available connected outlets is low)
- Lack of access and support (lack of access to suitable ICT equipment, lack of confidence and skills necessary to use the Internet, lack of people to help them learn about ICT, its contents and how to access them; lack of training and educational opportunities in the use and access of the online resources);
- Lack of intellectual capital --having appropriate skilled staff, be it in enterprise or educational environment; lack training and skills necessary in understanding how to use technology;
- Unsustainable, inconsistent, unsuitable and partial funding to community-based initiatives; ICT access points poorly promoted and marketed and their role and content lacking local focus;
- Little collaboration or communication between local projects or few mechanisms for sharing good practice. (Mwamadzingo, 2003)

6. African countries and communities face the threat of being left further behind if they do not address the growing digital divide. Working towards bridging the divide is a matter of urgency. Bridging the digital divide means in a short- overcoming the above listed problems. Few actions that could be taken are listed below.

- Taking rigorous actions to implement proper policies and deploying proper technologies in the right context at the right place
- Raising awareness about the extent and dimensions of the divide to industry/commerce which would help identify specific areas of product development and marketing level.
- Internet service and content providers should develop alternative perspectives to attract non-users and give clearer messages about how they can benefit from online resources (availing online resources that are tailored to their needs.)
- Availing opportunities to acquire skills and proper education on the access and use of online resources (BECTA, 2001)

7. In efforts to bridging the digital divide, African-led initiatives were introduced like the case of using the internet to treat patients. This type of initiative offered inspiration for those working to bridge the digital divide. Yet because of funding and other structural, organizational issues, such projects are few in number and coverage despite the great need for it.

8. In looking for ways to overcome this funding problem, African leaders saw the World Summit on Information Society (WSIS) as an opportunity to obtain international commitments to extend ICTs and their use to the majority of their people. At a round table conducted on creating digital opportunities for developing countries, President Abdoulaye Wade of Senegal, who was chairing the session, appealed for the introduction of the 'Digital Solidarity Fund (DSF)'. It was an initiative that was approved and setup later on.

‘We welcome the Digital Solidarity Fund (DSF) established in Geneva as an innovative financial mechanism of a voluntary nature open to interested stakeholders with the objective of transforming the digital divide into digital opportunities for the developing world by focusing mainly on specific and urgent needs at the local level and seeking new voluntary sources of “solidarity” finance. The DSF will complement existing mechanisms for funding the Information Society, which should continue to be fully utilized to fund the growth of new ICT infrastructure and services.’ (WSIS, 2005)

9. The initiative of bridging the digital divide was further reaffirmed in the Tunis Agenda for the Information Society

“We reaffirm the commitments made in Geneva and build on them in Tunis by focusing on financial mechanisms for bridging the digital divide, on Internet governance and related issues, as well as on implementation and follow-up of the Geneva and Tunis decisions.”

We call upon the international community to promote the transfer of technology on mutually agreed terms, including ICTs, to adopt policies and programmes with a view to assisting developing countries to take advantage of technology in their pursuit of development through, *inter alia*, technical cooperation and the building of scientific and technological capacity in our efforts to bridge the digital and development divides. We recognize and acknowledge the special and specific funding needs of the developing world, as referred to in paragraph 16 of the Geneva Declaration of Principles, which faces numerous challenges in the ICT sector, and that there is strong need to focus on their special financing needs to achieve the internationally agreed development goals and objectives, including the Millennium Development Goals.” (WSIS, 2005)

10. Indeed, aiding the initiatives of the African countries is not new thing. The international community has already started supporting these efforts of bridging the digital divide by introducing new services like the case of the INASP (International Network of the availability of Scientific Publications.). INASP was established in 1992 by the International Council for Science (ICSU) to improve access to information and knowledge through a commitment to capacity building in emerging and developing countries. Its mission is to ‘enable worldwide access to information and knowledge with particular emphasis on the needs of developing and transitional countries. INASP works with partners and networks around the world to encourage the creation and production of information, to promote sustainable and equitable access to information, to foster collaboration and networking.’ (INASP1)

11. One of the initiatives of the international community towards the road of bridging the divide was to avail donor-funded online resources to developing and emerging countries. The following section gives a description of some of them.

Description of Donor-Funded Online Resources for Africa

PERI (Programme for the Enhancement of Research Information) <http://www.inasp.info/peri/index.shtml>

12. PERI was born through initiatives made by researchers and librarians in Africa, Asia, Latin America and the Newly Independent States who seek assistance in the design and implementation of a programme of complementary activities to support information production, access and dissemination utilizing ICTs. It is:

‘A programme to support capacity building in the research sector in developing and transitional countries by strengthening the production, access and dissemination of information & knowledge.’ (INASP2)

13. The immediate objectives of the programme are to: facilitate the acquisition of international and local information and knowledge; improve access to local research through the improved preparation, production and management of local journals; provide awareness or training in the use, evaluation and management of electronic information and communication technologies (ICTs); support problem-solving of regional and local information access and dissemination challenges.

14. Complementary components used to met the above –mentioned objectives are: Delivering information to have ICT-enabled national access to international research findings; Strengthening national research publications for Improved local publication quality, visibility and sustainability; Enhancing ICT skills for Enhanced capacity in using and managing electronic resources and tools; Supporting country collaboration and networking for stronger local mechanisms for information resource sharing; and Initiating research and development for Providing answers to regional and local information access and dissemination challenges.

15. Focusing on the Information Delivery aspect of PERI, the main objectives of the programme is to provide researchers with access to international scholarly literature based on electronic delivery - unlimited access to journals, databases and articles across the widest range of disciplines, and to develop a network of libraries, national and international, to interface with researchers in developing and transitional countries to maximize access to and use of international scholarly literature.

16. PERI supports access to information resources for the following not-for-profit institutes: university departments, university libraries, not-for-profit research institutes and centres, higher education institutes, colleges, polytechnics, teaching hospitals, indigenous non-government organizations (NGO's) and indigenous Civil Society Organisations (CSOs). Access is also available to health professionals and agricultural extension workers and other professionals with a not-for-profit remit, working within remote areas.

17. Participating countries are selected for eligibility in the programme using Gross Domestic Product (GDP) and the Human Development Index (HDI) – (see annex for the list of eligible countries). For the selection, country coordinators work closely with INASP in reviewing the current situation in their country with respect to the supply and availability of scholarly literature. In collaboration with the research community, the resource requirements for each country are identified. INASP then negotiates access to as many required resources as possible with content owners and publishers. Since availing these resources is not without cost, access is funded by international organizations/ institutions and partners.

18. PERI is global in its coverage, contents include subjects in all disciplines of life: Economics, History, Political Science, Agriculture, Archaeology, Music, Art & Art History, Business, Ecology & Botany, Language & Literature, Mathematics & Statistics, etc.

19. PERI's main resources and services include access to bibliographic databases (CD-ROM (or DVD format of journals and databases provided where they are available), access to over 14,500 full text online journals, document delivery from over 20,000 research journals, capacity building and promotion of network. The following are examples of some online scientific full-text journals and database that PERI avails for emerging and developing countries.

[African Journals OnLine \(AJOL\)](#): Tables of Contents and abstracts of over 200 African journals with document delivery.

[Annual Reviews](#): Analytic reviews in 32 focused disciplines within the Biomedical, Physical and Social Sciences

[Beech Tree Publications](#): Three international, peer-reviewed academic journals

[Bentham Science Publishing](#): Over 75 leading peer-reviewed biomedical and pharmaceutical journals

[Blackwell Publishing](#): Over 840 peer-reviewed journals in a wide range of academic disciplines.

[British Library Direct](#): Provides free table of contents searching from 5 years of data for over 20 000 journals.

[CAB Abstracts](#): Agriculture and Life Sciences, current awareness database containing over 4.3 million records.

[Global Health](#): Public Health and Human Medicine, current awareness database containing over 900,000 records.

[Cambridge University Press](#): Over 180 leading titles in Linguistics, Politics, Medicine, Science, Technology, Social Science and Humanities.

[DATAD: Database of African Theses and Dissertations](#) The regional database of theses and dissertations currently draws from eleven founding institutions.

[EBSCO](#): Over 10,000 full text, peer-reviewed journals and over 17,000 abstracted and indexed titles.

Access to 8 major databases: Academic Search Premier; Business Source Premier; ERIC; Masterfile Premier; Newspaper Source; Health Source Nursing Academic; Health Source Consumer Edition; Medline.

[Emerald Group Publishing Limited](#): Access to the world's widest range of management, and library and information science journals.

[Gale \(Thomson Learning\)](#): General research database that covers subject areas from art and literature to economics and the sciences.

[IEEE/IET Electronic Library \(IEL\)](#) provides access to more than 1.2 million full-text documents in electrical engineering and computer science

[Sage Publications](#): Over 200 titles in the humanities

[Taylor & Francis E-Journals](#): Over 1200 titles in a full range of disciplines

[Wiley InterScience](#): Access to the full text of over 500 leading scientific, technical, medical, and professional journals.

AGORA (Access to Global Online Research in Agriculture) <http://www.aginternetwork.org/en/>

20. AGORA is an initiative to provide free or low-cost access to major scientific journals in agriculture and related biological, environmental and social sciences to the students and researchers of qualifying not-for-profit public institutions in developing countries. Led by the Food and Agriculture Organization (FAO), the goal of AGORA is to increase the quality and effectiveness of agricultural research, education and training in low-income countries, and in turn, to improve food security.

21. Currently AGORA provides access to over 948 journals from the world's leading academic publishers. Blackwell Publishing, CABI Publishing, Elsevier, Kluwer Academic Publishers, Lippincott, Williams & Wilkins, Nature Publishing Group, Oxford University Press, Springer-Verlag, and John Wiley & Sons are the founding publishers of AGORA, providing access to over 400 of their journals. Currently 39 publishers contribute journal content to AGORA. Through AGORA, researchers, policy-makers, educators, students, technical workers and extension specialists have access to high-quality, relevant and timely agricultural information via the Internet.

22. The subject areas AGORA covers are: Agriculture, Animal Science, Biology, Biotechnology/Applied Microbiology, Chemistry/Biochemistry/Biophysics, Economics/Social Science, Entomology/Pest Control, Environment/Ecology/Natural Resources, Fisheries/Aquatic Science, Food Science/Nutrition, Forestry, Plant Science/Soil Science.

23. The AGORA Publisher Partners offer free access of online resources to relevant institutions in developing countries, where the country is selected based on GNP per capita. The eligible African countries are: Angola, Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, Sudan, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe. Within these countries, AGORA will benefit not-for-profit national academic, research or government institutions in agriculture and related biological, environmental and social sciences. Institutions wishing to use AGORA must register with FAO. Access is password controlled, and upon successful completion of the registration process, the institution will receive a password that can be used by all students, faculty and/or staff at the institution.

EIFL (Electronic Information For Libraries) <http://www.eifl.net>

24. eIFL is an independent foundation that strives to lead, negotiate, support and advocate for the wide availability of electronic resources by library users in transition and developing countries. Its main focus is on negotiating affordable subscriptions on a multi-country consortia basis, while supporting national library consortia and maintaining a global knowledge sharing and capacity building network in related areas, such as open access publishing, intellectual

property rights, open source software for libraries and the creation of institutional repositories of local content. Its' vision is to provide leadership and be a strong international advocate for expanded availability of electronic resources and to enhance the skills base of eIFL.net library consortia, so that they are at the leading edge of developments.

25. eIFL is based on the principle that one library consortium per country can participate. In large countries with several consortia, eIFL participation is typically through an umbrella organization or a coalition. The structure, membership and funding of the consortia varies from country to country, according to circumstances. The country consortium designates an eIFL country coordinator who is the link between the consortium and the eIFL program team. The country coordinator is responsible for the dissemination to the consortium libraries of information coming through eIFL channels and for keeping eIFL informed about in-country developments. A participation fee, according to the country's ability to pay, is levied to cover some of the eIFL costs.

26. Currently eIFL includes 50 library consortia in developing and transition countries in central, eastern and south-east Europe, the former Soviet Union, Africa, the Middle-East and south-east Asia. African member countries are Botswana, Cameroon, Egypt, Ghana, Lesotho, Malawi, Mali, Mozambique, Nigeria, Senegal, South Africa, Sudan, Swaziland, Uganda, Zambia, Zimbabwe.

27. Access to the products of the following publishers and aggregators is available to libraries that are part of eIFL.net consortium: American Chemical Society , American Physical Society , Anthropological Index Online , Bentham Science Publishers Ltd. , BioOne , Cambridge University Press , EBRARY , EBSCO Publishing , Emerald Group Publishing Limited , Humana Press , Institute of Physics Publishing , Integrum Techno , Journal of Chemical Education , Morgan & Claypool Publishers , New England Journal of Medicine , Oxford English Dictionary , Oxford Reference Online , Oxford University Press , Royal Society , SAGE , Thomson Gale , Wiley InterScience Journals.

HINARI (Health InterNetwork Access to Research Initiative) <http://www.who.int/hinari/en/>

28. The Health InterNetwork Access to Research Initiative (HINARI) was launched in January 2002, with some 1500 journals from 6 major publishers: Blackwell, Elsevier Science, the Harcourt Worldwide STM Group, Wolters Kluwer International Health & Science, Springer Verlag and John Wiley, following the principles in a Statement of Intent signed in July 2001. Twenty-two additional publishers joined in May 2002, bringing the total number of journals to over 2000. Since that time, the number of participating publishers and of journals and other full-text resources has grown continuously. Today more than 70 publishers are offering their content in HINARI and others will soon be joining the programme.

29. HINARI provides free or very low cost online access to 2300 major journals in biomedical and related social sciences to local, non-profit and academic institutions in the health sector in 113 developing countries. Selection of participating country is based on GNP per capita, where

institutions in countries with GNP per capita below \$1000 are eligible for free access. Eligible categories of institutions are: national universities, research institutes, professional schools (medicine, nursing, pharmacy, public health, dentistry), teaching hospitals, government offices and national medical libraries, all staff members and students.

30. Currently HINARI offers free access to the following African countries: Angola, Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of Congo, Djibouti, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, Sudan, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe.

31. To register an institution, one is required to complete an online HINARI registration form after which necessary instructions are sent by e-mail on how to get started. Only one registration is required per institution. Participating institutions need computers connected to the Internet with a high-speed link.

OARE (Online Access to Research in the Environment) <http://www.oaresciences.org/about/en/>

32. OARE an international public-private consortium coordinated by the United Nations Environment Programme (UNEP), Yale University, and leading science and technology publishers, enables developing countries to gain free or low cost access to one of the world's largest collections of proprietary environmental science literature. Research is provided in a wide range of disciplines, including biotechnology, botany, climate change, ecology, energy, environmental chemistry, environmental economics, environmental engineering and planning, environmental law and policy, environmental toxicology and pollution, geography, geology, hydrology, etc. Over a thousand scientific journal titles owned and published by OARE partners are now available to environment institutions in 70 eligible low-income countries. OARE also provides access to important Abstract and Index Research Databases (A&I Databases), intellectual tools the scientific and professional community uses to search for specific information within thousands of scholarly publications.

33. OARE Publisher Partners offer free access to eligible institutions located in 70 low-income countries. Individual publishers reserve the right to add or delete from country eligibility lists. Within the eligible countries, OARE benefits non-profit public and indigenous non-governmental organizations performing environment-related work, broadly defined. Eligible institutions whose staff and students may have access to OARE content are: universities and colleges, research institutes, Ministries of Environment and other government offices, libraries and indigenous non-governmental organizations (NGOs).

34. So far, the eligible African countries under the OARE program are: Angola , Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of Congo, Djibouti, Equatorial Guinea , Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali , Mauritania,

Mozambique, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, Sudan, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe

35. Institutions that would like to access full-text articles and use the A&I database search tools must register with OARE and receive an institutional password. Upon successful completion of the registration process, all employees, staff, faculty, administrators and students of that institution may use the password to access OARE resources. Users can find basic guidance on how to access and use scholarly resources available through OARE in the Using OARE section of the website.

TEEAL (The Essential Electronic Agricultural Library) <http://teeal.cornell.edu>

36. TEEAL is a project of Cornell University's Albert R. Mann Library in cooperation with over 60 major scientific publishers, societies and index providers, and with the ongoing support of the Rockefeller Foundation. TEEAL is a comprehensive full-text collection of core journals in the field of over 140 agricultural and related sciences. This collection is available to over 100 eligible developing countries, and is a powerful tool for building capacity in agriculture by helping researchers, faculty, students and extension workers quickly retrieve relevant and current scientific information. The journal collection starts with 1993 and is updated annually. It includes over two million pages of articles, generously provided by 60 participating publishers and index providers. TEEAL is available on compact disc or local area network.

37. The journals in TEEAL were selected by 600 international scientists as the most essential to research and education conducted in the developing world. Some of the subject areas covered in the TEEAL journal collection include: Agricultural Economics, Agricultural Engineering, Crop Improvement, Environment and Natural Resources, Food Processing and Nutrition, Forestry, Livestock Production, Plant Protection, Range Management, Rural Development, Soil and Water Management, Sustainable Agriculture, Veterinary Medicine.

38. TEEAL is available at well below cost to over 100 developing countries, as listed in the World Bank's 1998-99 World Development Report. Some of the countries are Algeria, Angola, Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Rep., Chad, Comoros, Congo (DR), Congo (Rep), Cote d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome e Principe, Senegal, Sierra Leone, Somalia, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

DOAJ (Directory of Open Access Journals) <http://www.doaj.org>

39. DOAJ tries to cover free, full text, quality controlled scientific and scholarly journals, covering all subjects and languages. The aim of the DOAJ is to increase the visibility and ease of use of open access scientific and scholarly journals thereby promoting their increased usage and

impact. It aims to be comprehensive and covers all open access scientific and scholarly journals that use a quality control system to guarantee the content. There are now 2644 journals in the directory of which 795 are searchable at article level.

40. Subject covered include: Agriculture and Food Sciences, Arts and Architecture, Biology and Life Sciences, Business and Economics, Chemistry, Earth and Environmental Sciences, General Works, Health Sciences, History and Archaeology, Languages and Literatures, Law and Political Science, Mathematics and Statistics, Philosophy and Religion, Physics and Astronomy, Science General, Social Sciences, Technology and Engineering.

African Journals OnLine (AJOL) <http://www.ajol.info>

41. AJOL was introduced in 1998 as a pilot project managed by INASP, to support the wider dissemination and visibility of research results published through African journals in the sciences, medicine, agriculture, humanities and social sciences. The objective of AJOL is to give greater visibility to the participating journals, and to the research they convey. The service is now managed within the African continent and changes have been made to enhance what it offers both journals and researchers. Journals are accepted on the basis of their quality of content and proven record of regular publication. Currently, it contains tables of contents and abstracts, links to full text (if available) of over 200 African journals with document delivery of paper articles, subsidized to less developed countries.

42. AJOL offers the tables of contents and abstracts from journals published in Africa in the following subjects: agricultural sciences; arts, culture and literature; health; science and technology and social sciences. To gain access users need to register briefly if they are using the service for the first time. After this they will be able to access the bibliographic resources and order documents as they require them.

JSTOR (Journal Storage) <http://www.jstor.org/>

43. Originally conceived as a project at the Andrew W. Mellon Foundation, JSTOR began as an effort to ease the increasing problems faced by libraries seeking to provide adequate shelf space for the long runs of backfiles of scholarly journals. It is an online archive of some of the most important scholarly journals published in the humanities and social sciences. JSTOR offers both multidisciplinary and discipline-specific collections where each journal in the archive is digitized from Volume 1, Issue 1, and contains full-text journal articles available as searchable, scanned page images in order to capture the "look and feel" of the original print journal.

44. Open Africa Initiative JSTOR has adopted a plan to waive participation fees for any academic or not-for-profit institution on the continent of Africa. Access to JSTOR is provided via the Internet, using IP addresses that are authorized at the institution to have that access. An institution must have stable IP addresses in order to participate in this program. Participation fees will be waived for a minimum of three years, and will remain waived for as long as economic conditions in the institutions and within the country dictate, at which point JSTOR will evaluate

whether conditions or circumstances have changed significantly enough to warrant a change in policy.

45. Subject coverage include: Economics, History, Political Science, Archaeology, African Studies, Music, Art & Art History, Business, Ecology & Botany, Language & Literature, and Mathematics & Statistics. The archive currently includes over 600 important scholarly journals in 42 disciplines, and over 20 million pages of content.

Usage Gap

46. According to information collected from the different websites offering free online resources and services described above, out of all eligible African countries only a few countries have already registered for the services. But registration doesn't not mean usage, most of the registered potential users have only registered for the service and haven't gone further in usage. They haven't explored what the online services have to offer, or maybe are evaluating the different services in order to apply for each at their own pace. The collected information shows that only a few number of them have registered and are active users, these are mostly universities, libraries, documentation centers and some organizations and institutions. The INASP webpage provides a link to information about usage statistics from publishers' side, but only 25 publishers have answered so far to the query of INASP regarding information about usage statistics of their services. Therefore making it difficult to give exact percentage of usage. (INASP4)

47. The cause of little use and nonuse of the bulk of online information as indicated earlier are lack of awareness, lack of ICT appropriate infrastructure, means of acquiring knowledge, ability to adopt and adapt technologies, limitations on the use of codified knowledge even when access is granted; lack of skills and capabilities, proper organizational planning, ability to learn to apply these knowledge to the implementation of locally innovative economic activities (UNIDO, 2005). In order to alleviate these dimensions of problems, there is an urgent need in Africa in strengthening the capacity level of users, specially capacity building in the use of online resources and services.

Capacity Issues

48. Capacity is defined by UNDP as:

“..the ability of individuals, institutions and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner. Capacity Development (CD) is thereby the process through which the abilities to do so are obtained, strengthened, adapted and maintained over time (UNDP).

49. Specifically, capacity building involves human resources development/training which is the process of equipping individuals with the understanding, skill and access to information, knowledge and training that enables them to perform effectively. It is at the same time education/building awareness, strengthening institutions.

50. In addition to strengthening capacity building, African countries must also keep adjusting their aim to a moving target due the rapid growth of capabilities within developed countries. Catching-up to avoid falling further behind the introduction of information literacy and lifelong learning is a must.

51. Information literacy (IL) is:

“...knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner. (CILIP)’

52. Participants in the High-Level Colloquium on Information Literacy and Lifelong Learning held at the Bibliotheca Alexandrina on 6-9 November 2005 proclaim that:

‘Information Literacy and lifelong learning are the beacons of the Information Society, illuminating the courses to development, prosperity and freedom.’
(NFIL, 2006)’

53. Information Literacy indeed empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social and political inclusion of all nations. IL being crucial to the competitive advantage of individuals, institutions, nations, it comprises the competencies to recognize information needs and to locate, evaluate, apply and use information. It provides the key to effective access, use and creation of content to support economic development, education, health and human services, and all other aspects of contemporary societies, and thereby provides the vital foundation for fulfilling the goals of the Millennium Declaration and the WSIS. It also extends beyond current technologies to encompass learning, critical thinking and interpretative skills across professional boundaries and empowers individuals and communities. (NFIL, 2005)

54. In the current ever evolving knowledge economy, lifelong learning enables individuals, communities and nations to attain their goals and to take advantage of emerging opportunities. It assists them and their institutions to meet technological, economic goals by following up, catching-up fast.

Recommendations

55. Local governments should adjust their ICT policies to provide reliable, affordable and equitable telecommunication infrastructure, ICT hardware, software and networking facilities to all. They should work towards liberalizing telecommunication markets, creating a separate telecommunications regulator, opening spectrum for new wireless technologies and promoting the development of human ICT capacity. At the same time, governments should create legislation to provide funds to subsidize computer purchases and internet access for all.

56. African Nations should participate more in international negotiations on ICT issues to better serve their own needs. They should have their say and convince the international community in assisting them further and considering the pricing of online resources, making

digital content more available. The development and deployment of open, flexible and interoperable international standards for ICT networking, and the creation and dissemination of content and network services should be integrated in policies to ensure that all can utilise the technology and associated content and services to their maximum potential.

57. **UNECA** should promote awareness, and provide mechanisms for African countries (member states) to move forward in narrowing the digital divide. Through programs like the WSIS and CODI the UNECA should continue in availing the means and floor for capacity building, awareness raising both at individual and national level, etc. The introduction of the African Virtual Library and Information Network (AVLIN) - a network of Internet-based information and knowledge resources and services that form a web of virtual libraries and knowledge exchanges, and will link African libraries, information centres and specialized networks - will surely help Africa's plan to achieve the MDGs. It is an enhanced platform of knowledge and information among researchers and policy makers, which will be accessible to the people of the region and to others engaged in African development sectors.

58. Private sectors, civil societies should emphasize the place of **community access** to online resources to strengthen the learning and handling skills of digital tools. The spread and use of online resources should be encouraged to survival in the knowledge society. Educator preparation and continuing professional development are keys to improving learning outcomes through Information Literacy. Educational environments that nourish Information Literacy including appropriate infrastructure, knowledgeable leadership, supportive policies, productive partnerships and a learning culture should be availed. Therefore establishing sustainable multi-purpose community access points to ensure inclusive access to information and social services, particularly in rural areas should be given priority. The trainings to be provided must include basic computer literacy, web browsing skills, desktop publishing and email, networking, data selection and interpretation, information access and retrieval.

59. **Universities should introduce and strengthen their curriculum** to include introduction to and hands-on use of online resources and services in research. 'Research Methods' as a course should be part of every field of education (in the social science as well as natural science). And under the Research Methods course the availability and use of free and open access services should be a major part of the course outline. Students should be given hands-on training on using these services for their research paper, term paper and thesis.

60. In learning societies, which are based on lifelong learning, **libraries** must promote and facilitate learning at all levels by improving information and digital literacy skills, improving information use, building and linking local digital libraries, using freely available digital library software and support. Libraries are for everyone, educated and uneducated, rich and poor, they are a democratic force in availing access to computers, the internet, information, learning and training. In order to be able to make the best use of online resources, training is necessary and may be gained through frequent use and the gradual familiarization with technical know-how. Therefore, librarians need to train their patrons in modern information retrieval strategies, particularly in the use of the Internet, World Wide Web, electronic databases and many more. They need to equip themselves with good online information databases and other electronic

resources. They must also have reliable and fast internet connectivity, local and wide area networking.

61. **Funding Agencies and Publishers** should further widen the contents available for universal access. An assessment of developing countries needs' should be conducted in order to identify the information and resources that they really need. Then the number, type and range of online resources made available could be increased with close collaboration between publishers and funding agencies that could cover the cost of access for developing countries that cannot afford it.

62. This paper is only an overview on the need of capacity building in the use of online resources in Africa, it only highlights some main points. A detailed study on usage of online resources should be conducted at institutional and national level. This will give a good perspective on the status of usage, statistical figures will clearly show who is using it or not, what percentage of institutions are using it, are the resources appropriate to the users, is the user satisfied with content, etc.

Conclusions

63. The knowledge economy we live in is where individuals' economic and social well being increasingly depends on their ability to access, accumulate and assimilate information. With new ways of producing, presenting and distributing information using ICTs, African countries are faced with challenges of catching-up. A digital divide was created because they failed to tap the vast and ever growing stock of information. This gap was created because of lack of awareness, poor economic incentives, lack of appropriate ICT infrastructure, lack of appropriate literacy programs, lack of intellectual capital.

64. In order to bridge this digital divide, Africans as well as the international community are making several efforts. One of the initiatives of the international community is making online resources accessible to developing and emerging countries and at the same time support capacity building. This paper has highlighted some of the major resources and services that the international community has availed in different subject categories: health, agriculture, environment, etc.

65. But trends show that these resources and services are scarcely used. As indicated above lack of awareness is one reason, therefore promotion, and marketing of the available online resources and services is required. International organizations, libraries, universities, as well as civil society organization will have a major role in the promotion. Local governments should adjust their ICT policies to alleviate the lack of appropriate infrastructure, they should provide reliable, affordable and equitable telecommunication infrastructure, ICT hardware, software and networking facilities to all which in turn will help overcome the problem of access.

66. Means of acquiring knowledge, ability to adopt and adapt the technologies is one another reason that widened the gap in the knowledge era. For this, there is an urgent need of capacity building in Africa. Capacity development not as a one-time activity but on a continuing basis,

thus a lifelong learning. Lifelong learning will enable individuals, communities and nations to attain their goals and to take advantage of emerging opportunities. It will assist them to meet their economic goal by catching-up. Thus, African governments, institutions, private sector, civil societies, funding agencies, library and information centers should contribute to capacity building by working together. Governments should facilitate the accessibility of ICTs infrastructure and promote the use of online resources. Universities and learning agencies should strengthen their curricula by introducing courses on the use of online resources and services, and hands-on experience on how to use them in doing research. Libraries and information centers should avail these services and promote learning at all levels. These united efforts would enable Africa to make a big step in bridging the gap.

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