FIFTH SESSION OF THE COMMITTEE ON DEVELOPMENT INFORMATION (CODI-V)

OF THE UNITED NATIONS ECONOMIC COMMISSION FOR AFRICA

Subcommittee: Knowledge, Libraries and Information Services in Development

DATE 30 :APRIL 4 - MAY 2007

# The way to Knowledge Economy: a review of Sudan Knowledge Services

Rafaa Ashamallah GHOBRIAL[1] ; Prof . Hamad Abdel Gadir [2]

[1]*Assistant Research Professor, Head of Information Services and Systems, Documentation and Information Centre, National Centre for Research, Ministry of Science and Technology, P.O. Box 2404, Khartoum, Sudan. Fax 249-183-770701, Mobile phone: 24915504104, E-mail: rafaasham@yahoo.com*

[2] *Dean of Educational Media Production, Open University of Sudan, Obeid khatim St, Khartoum, Sudan. Fax 249-183-242776, Mobile phone249912144897 E-mail: elib@ous.edu.sd*

## 1.0. Background

Sudan is a vast agricultural, pastoral and multicultural country. Its population is about 40 million out of which 75% live in rural areas. Agriculture is the dominant sector in the Sudanese economy. It contributes about 35% to the Gross Domestic Product (GDP), generates over 80% of the foreign exchange earnings, and provides the raw materials for agro-industries and employment for over 80% of the labour force. About 87% of economically active people are depended on agricultural or pastoral activities and related enterprises for their livelihoods. Forest resources contribute about 10 % to the GDP, while livestock, which is predominantly kept by the traditional nomadic people, contributes about 8 % of GDP [9]. It abounds with potential mineral wealth, of which petroleum is the most important with 900 million barrels of proven reserves. Most of the population of the affected States (by natural disasters / civil wars) who is poor and relies heavily on the natural resources for subsistence (cultivation of marginal lands, tree cutting for fuel and construction of huts, overgrazing etc.). Poverty leads to subsistence livelihood, which enhances land degradation, and hence desertification, which aggravates poverty. This vicious circle may only be broken if programs are integrated with strategies for poverty alleviation. Sudan has implemented a number of development projects within regional and international interventions [6].

Sudan carries its own unique resources and problems such as the limited infrastructure and the low level of economic activity, all these individually or in combination have a great influence on knowledge needs of people involved in diverse ways of development activities. There is dire need to invest a significant proportion of our national wealth to the generation, management and utilization of quality knowledge for development which is recognized by National Information Centre (NIC) [1]. NIC has the authorities to coordinate the activities of information sector. Since the past centuries we perceive information as mankind's accumulated knowledge, derived from all subjects that could help its users to reduce their levels of uncertainty. Sudan has a catalogue of long and short-term development plans, the failure of which is largely attributable to lack of proper information management and utilization.

## 2.0. Knowledge Infrastructure

The interest in the management of knowledge is considered an essential milestone in post-industrial era. In order to guarantee the success of organizations in various fields, steps have been

taken to improve their productivity in the midst current competitive environment. These organizations are relaying on their intellectual strength and efficiency of their knowledge systems. The transformation of knowledge into products and services has become essential factor in the management of organizations. Sudan has set up a policy which promotes research and development in basic and applied sciences. It has also developed long-, medium- and short- term national strategies in science and technology that are aimed at achieving sustainable socio-economic development in the country. Scientific research and development are conducted by multidisciplinary teams composed of scientists with different specializations, working in multiple locations at different parts of the country. These research communities have generated massive information that needs to be properly managed and made available to all the stakeholders [7].

Within this framework, there is a growing interest in creativity process, innovation and knowledge production within organizations. Information and communication technologies have facilitated the process of gathering information, its selection, processing and transfer. Knowledge systems have been integrated in the strategies of organizations in order to enhance their capabilities and performance. These transitions and challenges as faced with Sudanese knowledge institutions will be focused upon. Consequently new job opportunities have been developed.

Our Minister of Science and Technology as representative of the President of Sudan in WSIS Geneva Summit 2003[10] said that the Summit aimed to reach consensus on a declaration of principles to uphold and organize the distribution of information. The *Sudan supported this objective, as well as its target to ensure that information was protected from all forms of discrimination and corrupting influences. In this context, it would be important to eliminate monopolies in software and hardware and to respect cultural and linguistic diversity. The monopoly currently at play made the flow of information one way and unbalanced.*

## 3.0 Sudan Knowledge Agencies (SKA) [4].

SKA provide a measure of the relative numbers, size and capacity of the information infrastructures in the country and indicate the intensity of the economic activities devoted to information. The ongoing survey, which is currently carried out by Sudanese Association for Library and Information collected data from 235 libraries in Khartoum State [8].

### 1. Academic libraries

- University libraries are mainly located in governmental universities (university library /Faculty) and private universities and colleges, i.e. single library per university/college where most of them have started to acquire electronic resources
- School Libraries are mainly located in private schools, while in public schools are neglected but recently are supported by mobile libraries on a limited scale in collaboration with private sector.

### 2. Public libraries & Cultural Centres

These facilities are very few and belong to private or charity organizations in most cases. They are scattered and poor infra-structured libraries in the country. Some cultural centres which are established with diplomatic missions in Sudan as part of culture exchange programs; specifically the British Council Library has played great role in development of Knowledge resources in Sudan.

### 3. Documentation and Information Centres

These centres are embodied mainly in governmental bodies, non-governmental ,international agencies working in Sudan and private institutions. The Research Information Centres are the forefront regarding the use of ICT for knowledge management.

### 4. National Records Office (NRO)

NRO has the authority to dispose of the records belonging to the different governmental departments. Recently it has received a great appreciation of government, restarts its restructuring based on international standards and norms, and collaborates with local government offices in Sudan States.

### 5. Sudan National Library (SNL)

SNL is still under construction under the umbrella of Ministry of Culture and its plans are supervised by a board of trustees. However, it has already started to develop its collections and structure its organizational plans including staff and work plans.

## 4.0 Status of Knowledge

SKA has been created to ensure the long-term accessibility of recorded information. That is what they do now, and that is what they will be doing in the future. This means they acquire, catalog or process, organize, offer for use and preserve publicly available material irrespective of the form in which it is packaged in such a way that, when it is needed, it can be located and used. This is the unique function of the knowledge agency, and no other institution carries out this long-term, systematic work. [4]

SKA play a very important role, one that will far surpass the simple conservation of a patrimony and become mediators in the Sudanese knowledge society i.e. WSIS has defined as *Heart of Information Society*. They contain variety of information, which covers different sectors of national resources such as: agriculture, education, economy, industry, finance, natural resources, social welfare and research and development depending on mission of the parent institution of the knowledge unit. Their collections are well organized traditionally following mostly Dewy or UDC classification schemes and the Anglo American Cataloguing Rules (AACR2). These collections are acquired mostly by donation and quietly by exchange / purchase depending on the allocated budgets. In the last two decades, most of institutions have introduced information technologies specifically computers and Internet connectivity into their institutions but not used mainly or properly for knowledge activities, services and dissemination.

Most of the institutions involved in knowledge management have developed electronic bibliographic databases and catalogues using UNESCO's Micro CDS/ISIS (English and Arabic versions), while a few have adopted WEBISIS " WEBAGRIS" and OPEN Access to develop online full text databases, Only one institution has implemented an integrated library software system, Horizon software. [6]. SKA delivers a number of services and products, some of them are mentioned below:

The National Centre for Research - Documentation and Information Centre (NCR-DIC) and the Central Library of Agricultural Research Corporation (CL-ARC), are in the forefront regarding the use of ICT for knowledge management among research-based libraries. Electronic (online) catalogues based on the standard Common Communication Format (CCF) using the Micro CDS/ISIS. The electronic catalogue at NCR-DIC is used to teach and give hands-on experience on online information retrieval for the clients. It has also been used to produce several information products including:

- **Accession Bulletin of New Publications**
  It is a quarterly bulletin, aims to keep the awareness with the recent acquired publications, and is circulated to researchers and other libraries since 1974.
- **Sudan Science Abstracts (32 volumes)**
  This biannual abstracting journal is produced from the national bibliographic database. It abstracts and indexes reports, theses, dissertations, conference papers, published research findings and journal articles relating to Sudan whether generated in or outside Sudan since 1979. It is circulated in/outside Sudan.
- **National Register for Current Researches in Sudan** (4 volumes)
  This inventory is produced from database contain ongoing researches (in broad sense including surveys) and master/doctoral dissertations in Sudan. It gives information on executive/collaborating research and funding bodies, researchers, and budgets. It categories research activities according into the fields of the knowledge using UDC scheme and type of research (fundamental or experimental or applied). It gives statistical analysis of distribution of research a projects by fields of science, state, and duration. It comes out every two years. It provides a more comprehensive and effective services to planners, research managers, as well as funding organizations.
- **Records of National Centre for Research(NCR) Researchers**
  This record is produced from the databases of the outputs of NCR-Researchers who participate actively in research programmes of the NCR. It is issued every two years.
- **Union Catalogue of Periodicals in Sudanese Libraries (UCP)**
  This inventory attempts to bridge the gap and meet bibliographical needs of scientists in the country, avoid duplication, save foreign currency through sharing of the periodicals and add to national economy. UCP elaborates, gives details about the volumes actually available in SKA and reports the missing or incomplete ones from the set. UCP is helpful for users, especially those of CD-ROM and Internet to identify the location of periodicals internally.
- **Specialized bibliographies** such as Bibliography of Sudanese Medicinal Plants.

NCR-DIC [4] and CL-ARC also benefit of CD-ROM technology brought great hopes for narrowing the digital divide as they have facilitated access to a wider range of literature resources. This technology was soon replaced with newer technology such as the Internet, which has facilitated greater access to more information resources than CD-ROM. It provides real support to scientific research community which has trusted and appreciated these resources such as CAB Abstracts, AGRIS, AGRICOLA, MEDLINE, POPLINE, INIS etc.... Our clients can access online e-resources such as The Essential Electronic Agricultural Library (TEEAL), Access to Global Online Research in Agriculture (AGORA) and Health InterNetwork Access to Research Initiative (HINARI).

University of Khartoum has used Open Access (OA) and Open-Source (OS) technology to improve collaboration and knowledge sharing among academics, researchers and other stakeholders since 2003. OA has been used effectively and efficiently within the University Network benefited from value-added services, which include search engines that provide citation and indexing services such as Google. This technology provides a number of tools that can be used by Sudanese libraries to improve knowledge sharing among their users. Such tools contribute in content management systems and journal publishing software. This experiment of technology has been appreciated by Ministry of Higher education and Scientific Research which plans to implement this technology within academic and research libraries as part of the Electronic connectivity of Sudanese Universities Network Project. [Source: Deputy Dean of University of Khartoum Library, 12/03/2007] .

## 5. SKA Challenges [2, 4, 6]

SKA are accommodated in very small areas or rooms which are not based on library building standards, even they can not accommodate reasonable number of users at same time. They are poorly furniture and equipped. Furthermore, the expansion in books, and resources, collections of paper material become bulky and create storage problem.

Patrons, who are customers of SKA, are more and more demanding. They expect SKA to have long opening hours so that they can consume their information services whenever realistically open eighteen hours a day and six days a week. Beside a single paper document only one person can use especially Sudanese documents at a time. Each extra copy of the same paper document requires the double space for storage.

Traditionally, SKA have adopted continuous improvement in initiatives to deal with some of these challenges. However even these initiatives had been successful in the past, the internet operating environments of many research and academic are showing signs of organizational stress that requires more radical solution. The major symptoms of the organizational stress in information Institutions:

- Decline in resources
- Tendency to shift the blame to others
- Chronic under-investment in new technologies due to low appreciation of decision makers
- Inability to re-examine the need for existing practices and /or need to change
- Organizational structures and cultures are resistance to change
- Inadequate salaries and difficult working conditions for those who are working in public sector
- Lack of standardization, norms, cooperation in their systems increase maintenance cost
- Absence of institutional information management strategies and policies
- Ineffective capacity building programs and inadequate training on knowledge management based on commercial not on competence purposes which affect labour market
- Little fund allocated for managing and developing knowledge i.e. SKA budget is not separated of that of the parent organization

## 6. SKA Professionals

This professional cadre is essential in creating and sustaining a knowledge culture SKA that have training and know-how to organize knowledge into systems and structures that facilitate the productive use of knowledge resources. They include librarians, records managers, archivists, and other information specialists. Their tasks include the representation of the various kinds of organizational knowledge; developing methods and systems of structuring and accessing knowledge; knowledge distribution and delivery; amplifying the usefulness and value of knowledge; knowledge storage and retrieval; and so on. Their general focus is to enhance the accessibility and quality of knowledge so that the organization will have an enlightened view of itself and its environment. The knowledge professionals design and develop knowledge products and services that promote learning and awareness; they preserve the organization's memory to provide the continuity and context for action and interpretation [5].

## 7. SKA Users

The individuals in SKA parent organization act as producers and users of knowledge. Users, including the professionals, technologists, managers, and many others possess and apply the tacit knowledge and explicit knowledge. The knowledge and expertise they have is specialized and focused on the organization's domain of activity. Through their coordinated effort the organization

as a whole performs its role and attains its goals. Through their knowledge creation and use, the organization learns, makes discoveries, creates innovations, and undergoes adaptation [5].

## 8. SKA and Employability

SKA strategize its future plans for the clients which includes learning opportunities for education and employability. The tendency of employability is measured in terms of whether the graduate obtains a job of a specific type within a given period after graduating. In Sudan employability is measured after one year of graduation after the graduate fulfills the obligations on National Service. Sudanese Association for Libraries and Information shows some progress in this issue. SKA also supports the broad educational and employment information needs of clients. The Job support is provided by a mixture of private, public and charitable agencies. They can produce appropriate information in forms of documents of employment and instructions required to get the job done. [4].

## 9. SKA Partnership

Partnership envisions a future which enlists the resources of other types of libraries, integrates the SKA's services within the existing information infrastructure used by the general population and applies technology to bridge these relationships. It is certain that no single institution acting on its own can provide all the information resources necessary to sustain education, employ ability and life long learning. Sudan's knowledge system is linked effectively to regional and international systems through various collaborative initiatives and activities [5, 6] such as ICARDA, UNESCO, FAO, UNEP, African Universities Union, ASERECA, IGAD and so. Technical and financial support is a part of the collaboration programmes of the parent bodies of SKA.

## 10. Conclusion and Recommendations

It is concluded that knowledge is operated by various organizations by various forms, no matter what they are, that is to reach out those who have less opportunity to access information through regular information services offered by SKA that it is time to take the advantages of the possibilities of knowledge management and develop closer relationships with relevant organizations and professionals. Sustainable development may not be achieved unless redirect of our efforts to develop the full potential of people through education and human resources development programs by applying and mastering modern technologies.

The services and products of SKA are foundation of knowledge economy. The internet becomes the heart of Knowledge community leading the way for human rights and sustainable development worldwide.

These recommendations are results of our daily work, observations, and recent training programs; furthermore there is need for SKA to work towards building a coordinated national knowledge system. They also need to adopt ICTs on a wider scale in order to facilitate networking and sharing of knowledge resources. However, for this to happen, a number of things need to be put in place, and it is recommended that information institutions in the country implement the following:

- Formalize the current efforts towards collaboration/cooperation by drafting and signing a Memorandum of Understanding (MoU) among the concerned institutions
- Develop appropriate knowledge management strategies and policies that support the proper investments
- Re-engineer their knowledge management infrastructure, procedures, and practices through the use of ICT tools
- Facilitate a change of mentality among library and Information managers so that they understand that they are partners in digital resources

- Set up a unified system for digitization of national knowledge sources, with specific emphasis on grey literature and periodical collections
- Promote the use of the Internet and Web tools for collaboration, knowledge exchange and dissemination
- Encourage the development of institutional repositories in knowledge generator such as research institutes and universities.
- Build essential ingredients of employment based on redesigned information
- Embed employability in LIS curriculum and research programmes

## 11 . References

[1] Council of Ministries. National Information Centre Constitution (in Arabic and Electronic form), [Unpublished], 1997

[2] Elkarim A K H A, Musa, A I, Osman E , Osman I E H, Ghobrial R A. 2004. Sudan agricultural information management: challenges and opportunities. Paper presented at the 1st Sudan Agricultural Information Network (SNAIN). Khartoum: Agricultural Research and Technologies Corporation

[3] Ghobrial, Rafaa Ashamallah (2002).. Role of Higher Education, Technology and Employee planning in Development of Libraries and Information Studies in Sudan. In: Workshop on Libraries and Information Studies curriculum in the Arab countries, IFLA/ALP/ Lebanese University, Beirut, Lebanon 4-6 June 2002

[4] Ghobrial, Rafaa Ashamallah (2003). Establishing Basic Levels of Technology Transfer in Libraries and Documentation in Sudan In: the 6th scientific conference on Technology Transfer in Sudan, by National Centre for Research, Khartoum 8th –11 Th December 2003

[5] Ghobrial, Rafaa Ashamallah (2006). Knowledge Management Partnership for Development in Developing countries: Case of Sudan In: 2nd IEEE International Conference on Information & Communication Technologies: from Theory to Applications (ICTTA06), Damascus (Syria), April 24 – 28.

[6] Ghobrial, Rafaa Ashamallah & Musa, Ahlam I (2006). Towards an Agricultural Information Network in Sudan.In: 1st IAALD Africa Chapter Conference, Nairobi, and May 21st – 25th Published in IAALD Quarterly Bulletin, v . LI, no. 2,4 , 2006.

[7] Ministry of Science and Technology. National Work-Plan on Science and Technology, 2003-2008, p. 155-65, 2002

[8] Sudanese Association for Library and Information has started to update The inventory of Sudanese Libraries on October 2006 mainly covered Khartoum State in this phase

[9] http://www. CIA-The World Fact book-- Sudan.htm

[10] http://www.itu.int/wsis/docs.html