

## Access to the Electronic publishing in African Countries: Some Reflections

MARIA ALEXANDRA MIRANDA APARÍCIO

**Affiliation:** Student of P.H.D. of Information Science in Department of Information Science and Documentation of University of Brasilia;

Technician of the Ministry of Culture of Angola;  
Collaborator of National Historical Archives of Angola,  
and of Ministry of Science and Technology of Angola

**Address:** Colina, Bloco A, Apartamento 14, Universidade de Brasilia,  
CEP: 70910-900 BRASÍLIA DF BRASIL

Phones: residence: 005561-3071205

Celphone:005561-81187058

Fax: 005561-2738454 (at. Secretaria Pós-Graduação do CID)

**Email:** [ginger@unb.br](mailto:ginger@unb.br) [gingeraa@hotmail.com](mailto:gingeraa@hotmail.com)

### Abstract

This text presents a set of reflections about the use of electronic publishing in African countries, as a means of access to scientific information. It includes brief remarks about electronic publishing, their advantages and benefits. The text continues with a discussion about the need to find solutions to the problem of the different degrees of access to scientific and technological information between African and developed countries. This includes greater ease in obtaining online information that can aid in the diffusion of scientific data through electronic publishing, in order to support the development of communities, government and particularly the scientific and academic communities of African countries. Attention is given to the matter of the improved circulation of the results of research projects conducted in African countries. The text also focuses on the attitudes and initiatives related to the improvement of the current status of science and technology in African countries. It also examines existing African electronic publishing, which illustrate the degree of concern about this issue among African leaders and office holders. Finally, a brief discussion about the situation of Angola in the access to electronic information is presented.

**Keywords:** electronic publishing; access to electronic publishing; Africa; infoexclusion; scientific information; development;

### Introduction

Our purposes with this text is only to present a set of reflections and, once more, call the attention to the difficulties and deficiencies, suggesting actions that will help reduce the gap between developed and developing countries in terms of access to electronic information – in this case, the focus will be on African countries, one of which is represented here by me. We don't intend to discuss about electronic publishing, nor to formulate new theories about the subject, because there have been extensive discussions about these issues. Being African, I have experienced and continue to experience difficulty in having access to updated information. This barrier was in part, overcome, after I moved to Brazil in order to engage myself in postgraduate studies. The obstacles that affected me are quite common in Africa. However, we are optimistic and we believe that the differences between the North and the South may be considerably diminished by means of joint efforts and team work, going beyond political statements and formal resolutions and documents. We must all do our share.

Incurrent times, we are living the changes for a new society kind, called "Information Society, Knowledge Society, or Post-Industrial Era", information became the primary and most important consumer good. Nowadays, information is actually considered an economic asset, a crucial component in the development of economies and countries. It is concentrated in the so-called "knowledge-intensive industries", the ones that use technology and information with the highest degree of intensity. However, information should not be considered only as an economic asset. In its relation with social development, it should be considered also as a product of national welfare. Information is treated, preserved, accessed and retrieved by electronic and digital means. Those who do not have such means are and will faraway from knowledge. It is a real fact that humanity has entered in the age of information, but only a small part of the population has access to the high technologies that have already started to change social behavior. One of the aspects of this new information society is the possibility that information can and should be accessible to all, a status that will be attained only gradually.

Since the last decades of XX century, the world had watched to the arising of new technologies that can supply ways for expand the capacity of creation and communication of humanity. New technologies brought deep changes in diffusion and dissemination of scientific data and information, changing and transforming the way to obtain that knowledge. Storage, treatment, dissemination and publication of scientific information

became faster. In any place of the world, one can access such important information to the development of science, of technology and welfare of the citizen.

Divulgence of such information also changed the reading habits of scientific community, since it began to circulate and be transmitted not only on paper format, but also on online electronic format. Journals, scientific and specialized reviews, abstracts of congresses and conferences, beyond other scientific publications are distributed and read directly on computers, online, without being published or shared on paper format. Diffusion of those data in electronic publishing is already a current practice around the world, and there are reviews found only in electronic format. The development of communication and information technologies changed the forms of communication used by the scientific and academic community, allowing the exchange of updated and focused information, knowledge of research projects being conducted all over the world, and the acceleration of the exchange of messages between peers.

During the 1990s, the growth and spread of electronic publishing strongly impacted access to information. New forms of publishing and retrieval of information arose, creating issues that are still under discussion – such as the protection of copyrights and the privacy of information. The dissemination of these data in electronic forms became current practice in many countries, and some publications exist only in electronic format. Discussions about the several topics linked to electronic publishing have been going on for several years, and they are still going on, because no general consensus has been reached yet.

Electronic publishing should be understood as a new way of stimulating the production of knowledge and critical thought. The constant increase in the number of electronic publishing is explained by the strong benefits derived by their use. They have a few features that make them quite different from printed sources, such as easy editing, easy transmission, and connection with other documents and unlimited capacity of replication and copying. Scientific publications tend to assume a completely electronic format, given its versatility and the immediate possibility of updating and distribution. The notion of the disappearance of paper as a result of the advantages of electronic publishing continues to exist, but we think that paper will not be easily extinguished in its totality. There are still many researchers who have not adapted to reading electronic publishing on computer screens and thus prefer to print them.

When we refer the new technologies such as the increase of electronic publishing, we deal with a topic that is alien to a large percentage of the world population, the numerous individuals who do not know the reality and richness of telematics and information technologies, and who ignore the use of electronic instruments such as computers, the Internet, the www, providers, servers etc. – this is what happens in Africa.

How can African countries use new technologies developed especially in last decades of XX century, to overcome the poverty and suffering and in the improvement of health, education, citizenship – in short, in the construction of new countries with citizens who are confident and assertive about their rights and duties? How can the scientific and academic communities of these countries have access to electronic publishing that circulate all over the world, containing the information required to achieve the social development of these countries? To transplant solutions from developed countries does not provide answers and results. On the contrary, it has created other kind of problems related to the specific contexts of those African countries. Some of the applied solutions did not have the expected results.

How can one speak of technologies, development, Internet communication, fiber optic connections, libraries permanently connected to the Internet, if in most African countries electric energy supply is interrupted by rains or system failures, telephone lines cover limited portions of national territories, and the population dies for lack of sanitation, food and medical care? As professionals of information, we have the duty and need to call attention to this issue, to make African politicians and office holders understand the real meaning of the “Internet revolution”, the uses of new information and communication technologies applied to the everyday life of a country.

## **SOME THOUGHTS ABOUT ELECTRONIC PUBLISHING**

Information and communication technologies are changing the ways through which people can access information. The use of sites, the Internet, the web and electronic publishing have created new ways of accessing information, no matter where it is stored. But the costs of these operations must be considered in order to determine what should be used and which formats should be adopted. The swift expansion of electronic publishing over the recent years shows how these technologies were and continue to be widely accepted.

The topic of electronic publishing is not new and has been discussed widely over the last few years. However, since the late 1990s, due to rapid technological improvement, the discussions about the topic have multiplied. Several meetings, conferences and debates have occurred under the sponsorship of international organizations and institutions connected to these new information and communication technologies. They dealt with issues such as electronic publishing, copyrights, author/user relationships, access, costs, fixed fees, equipment, modernized infrastructure, interfaces between sites, evaluation and reliability of services. The relations between publishers and authors, the roles of publishers, graphic designers, information technicians and

web specialists, the training of users etc. are other topics under discussion. Another important subject is the opinion of users about electronic publishing. Their needs, what they wish to find in these publications, how they access them, if they are willing or not to pay for such access, how much they are willing to pay, the matter of subscriptions – these are some of the topics to be considered by anyone interested in adequately discussing electronic publishing. Scientific and academic publications, either in paper or in electronic format, are not the same across countries. Their level of development varies from country to country and from continent to continent. However, there is a general agreement about the existence of a pronounced distinction among developed and developing countries in the matter of the policies and economics of producing and disseminating information

Le Coadic<sup>[1]</sup> considers that electronic publishing have a promising future on account of the swift and continuous diffusion of articles, permanent access from any location, and expanded possibilities of research (Le Coadic, 1995, apud Menezes & Couzinet, 1999).

Targino<sup>[1]</sup> emphasizes the lack of concern with the reliability and consistence of data, linked to the almost instantaneous nature of the information and to its ephemeral existence on the Web. However, she considers publications on the Internet as a means of real-time access available to researchers from developing countries to the information generated in countries with a more developed scientific community. (Targino, 1995, apud Menezes & Couzinet, 1999).

For Gomes<sup>[2]</sup>(2000), electronic periodicals, despite claims about the advantages over printed ones, have still not become a prime means of scientific communication, as was expected just a few years ago. As products of human action, they are also subject to the influence of such action – technology is not enough to make them excellent or totally functional. They become useless and lose all purpose and functionality if their potential users do not incorporate them into their daily routines. In other words, there is little meaning in having access to electronic publishing if they are not used to obtain information and knowledge. Gomes recognizes that electronic publishing provide many practical advantages, but she also calls attention to shortcomings such as the lack of quality control, a factor that fails to endow this type of information with the reliability demanded by the scientific community in terms of the quality of production required to ensure prestige and visibility to the researcher.

Several other authors approached the matter of electronic publishing and reached different conclusions. But there is a consensus that such publications have come to stay, even if only as a complement to the printed media, as suggested by Costa<sup>[3]</sup> (2000, p. 98).

There are different definitions for the term “electronic publishing”. Let us examine some of them:

For Bloor<sup>[4]</sup> (2000, p. 277), electronic publishing is a term used to cover a variety of different technologies and types of information. Many of them are inter-related and allow the use of several methods to produce and disseminate information. He thinks that is necessary to understand that technological changes are universal, they are not confined to one type of publication, and that requires one to understand the general context.

Vickers e Martyn define electronic publishing as “*any publication which requires the user to use an electronic device, at some stage for its reception and/or its reading.*” (Vickers and Martyn, apud Bloor, 2000, p. 279)<sup>[4]</sup>

Deschamps<sup>[5]</sup> (1994, p. 308) classifies electronic publishing in several categories - electronic periodicals, electronic conferences, discussion lists and information bulletins.

Electronic publishing may be accessed by Internet and may not be similar to their versions printed in paper. They offer the same services as the ones provided by paper versions, with a few additional possibilities.

## **ADVANTAGES AND DISADVANTAGES OF ELECTRONIC PUBLISHING**

One of the biggest advantages is the diminution of postage and cost of the printing publishing, as well the elimination of delays in dissemination and divulgation of scientific data. They also eliminate delays in announcements, distribution and delivery. Distances and borders between different domains are erased, improving access and learning. International coverage is achieved. Swiftness of publication entails immediate access to highly important information that allows the scientific community to gain knowledge about the research projects of their colleagues in many distant parts of the world.

Other advantages are: the addition of other texts, enhance the answer power of users, easy connections with other publications, efficiency of data transmission and specialization, low production costs, lack of physical size limits (such as happens with printed materials in libraries); the practically unlimited capacity of production; diversity; transmission and reception of information in all places, without mailing costs; online access to full texts; instant reception of information; availability of multiple access points, which does not happen in the case of materials printed in paper; ability to transfer personal data; greater storage capacity than paper publishing; lower retrieval costs.

Electronic publishing have also disadvantages. One of the biggest disadvantages is the need of a networking system and the connection to the Internet. There exist large sectors of the potential readership that are unable to take advantage of networking services. This happens because of the lack of adequate equipment, support, and infrastructure, lack of good telecommunication services, inability to connect to the appropriate networks. The consequence of this is that a large number of citizens around the world, and especially in Africa remain out of the system.

Other difficulties are the additional costs of technology, the costs related to equipment maintenance and operation, the legitimacy of electronically publishing texts, the vulnerability to plagiarism, alterations and reproduction; the difficulty of determining the authenticity of texts and authors of publishing texts; the short life span of online texts, as well the issue of controlling the versions of publishing texts, because they can be easily changed and updated without knowledge of reference sources, citations and identity of the author or authors, are also disadvantages.

The archiving and conservation of electronic publishing are still a challenge for information professionals, because nobody knows how to save texts for the future, as is commonly done with printed materials. Lack of credibility and access are also disadvantages of electronic publishing that must change to a better situation.

## **ELECTRONIC PUBLISHING IN AFRICA AND THE INFO EXCLUSION**

The digital revolution that has affected the entire world has influenced Africa and caused Africans to think extensively about it. Africans were faced with the unlimited possibilities of the new technologies and with the problems that they entail, dividing themselves between those who are in favor of the adoption of these technologies and those who do not trust them. These reactions are natural and inherent to human beings. Others receive everything that causes change in life with enthusiasm by some and with skepticism – or mistrust –.

The role of these publications in developing countries may be different from their role in developed ones. Acceptance, involvement or rejection of electronic publishing in African countries may be influenced by the way the entire process is treated and by the context. This new industry will cause the emergence of new forms of work, with new actors, new forms of commerce and new structures.

African countries face many obstacles and difficulties in the matter access to electronic services – lack of adequate supply of electricity; lack of proper equipment (easily damaged on account of adverse conditions such as humidity and dust); deficient telecommunication infrastructure; scarce and ill-qualified human resources; large numbers of poorly schooled and even illiterate people; language barriers; absence of national information policies; lack of possibility of updating obsolete equipment.

African rural areas are in worse shape than urban areas in terms of access to information necessary for survival and to everyday life, due to difficulties of long distances, lack of energy, roads and infrastructure that may provide access to the new technologies and updated information which can improve the living conditions of rural populations.

A distinct aspect that we consider relevant is that African countries, if they wish to obtain financial and technical support from the World Bank, must follow its orders, instructions and programmes in terms of expenditures, budget restrictions, subsidy cuts (the first areas to be affected are health and education). These programmes almost always do not have a euro centric view of African problems, which do not fit properly into the contexts of the different countries, nor do they consider the real needs of the African peoples.

African countries need do adjust as far as possible to the new technologies, in order to reduce the gap between the developed and the underdeveloped countries that keep enlarging day by day, because of the technological differences. Despite we speak today in information society, in knowledge society, and the fact that information became the most precious issue, in most African countries there still is not links between science, technology, productive systems, government and society. This is caused by the weak and inconsistent relationship among science, technology and society, a fact that perpetuates the status of underdevelopment and dependence of these countries inherited from colonial times.

African countries must not fall behind. They must join the waves of change and the new currents of science and technology that affect the world, make their voices heard in the context of global information, and make their publications known and respected. In order for them to have access to information, they must have a minimal infrastructure, such as communication technologies, equipment, and computers, fax machines, printers and other equipment. Technology transfers must be tied in with knowledge, training and equipment maintenance.

Technological evolution also changed the world of telecommunications, making them more efficient and quicker. In African countries, however, telecommunications continue to be a problem for accessing information. In many countries telecommunications are state monopolies that charge high rates, have high costs that vary from country to country and do not allow easy access to and use of electronic information.

Several authors have discussed the issue of electronic publishing in developing countries, focusing on advantages, disadvantages, benefits, certainties, uncertainties and mistakes about the creation of electronic

publishing. Adebowale,<sup>[6]</sup> Chisenga<sup>[7]</sup> (2002) Daly,<sup>[8]</sup> (1999) Hahn & Schoch<sup>[9]</sup> (1997), Hussein,<sup>[10]</sup> Kirsop,<sup>[11]</sup> Letshle & Lor<sup>[12]</sup> (2002), Lynden<sup>[13]</sup> (1996), Morris,<sup>[14]</sup> Nwankwo,<sup>[15]</sup> Rosenberg<sup>[16]</sup> and Smart<sup>[17]</sup> are authors who examined several aspects and matters related to electronic publishing in developing countries, with a special focus on African countries.

The authors mentioned above recognize the need to improve access of researchers based in developing countries to scientific information and databases. This does not mean totally free access, due to the costs involved in such operations. Electronic publishing are a valuable opportunity for developing countries to promote the advancement of their scientific communities. They allow access to information and help to reduce the technological gap between North and South. They can be a viable option for African researchers to publish the results of their research projects, the quality of which can thus be internationally recognized. This can also help the search for international donors and partners in order to obtain funding to improve on-going projects and to create new ones. The need to improve infrastructure and telecommunications in these countries has also been recognized.

Communication and information technologies already exist and are in operation, even if in precarious manners. Electronic mail systems exist in some cities, but their operation is far from perfect, because of obsolete technologies, defective equipment and failures in energy supply. Neighboring countries have conducted experiences in the creation of service networks and common databases, connecting universities and other research institutions in different countries, proving that the situation can change for the better. Electronic publishing exist in many African countries, some of them operating better than others, on account of developmental differences among the several countries. According to Zell “*reliable statistical information about Africa's book publishing output is difficult to obtain. The situation is even more difficult to determine with regard to electronic publishing*”. He maintained that with the possible exception of South Africa, the volume of electronic publishing in Africa was not significant and was difficult to monitor. Part of the problem concerning statistics for electronic publishing was the fact that what is understood to constitute electronic publishing varies considerably. (Zell, 2002, p.141, apud Letshele & Lor 2002) <sup>[12]</sup>

The number of African web sites has been growing recently and almost all countries have local or internationally hosted web servers and providers. Despite this, a report by the United Nations Economic Commission for Africa (UNECA) have shown that Africa generate only 0,4% of the global content in Internet. If South Africa's contribution is excluded, the figure falls to 0.02% (UNECA, 1999, apud Chisenga, 2002, p. 57).<sup>[7]</sup>

According to Chishenga,<sup>[7]</sup> the Internet access in Africa started to move very fast since 1995. The author refers to a 1998 study written by Mike Jensen about the Internet development in Africa, in which he noted at that time, that French-speaking countries were more developed in the issues of connection and access to the Internet, on account of the support provided by Canada and France. English-speaking countries were lagging behind. (Chisenga, 2002, p. 57). I can assure you that Portuguese-speaking countries were even further behind.

Use of the Internet and online services in some African countries started with teaching and research institutions. In others, the pioneers were NGOs (many of them not African), starting with electronic mail services, and later including the Internet, using electronic publishing as a means to obtain information required for their operation. Online and Internet services are almost always located in larger cities, while they hardly exist in rural areas, with very few exceptions. Sometimes happens that research institutions and public agencies install online servers to be used only by the chiefs and the staff members are not allowed to use equipment and services. This type of connection without use amounts to the same as the non-existence of the connection.

Showing that they pay due attention to international developments, African governments considerate now as main priority to avoid and reduce the info exclusion that jeopardize all African continent, and will jeopardize more and more if the right attitudes and measures are not taken in the right time. The creation of NEPAD (New Partnership for Africa's Development) formally adopted as the strategic framework programme, which includes information and communication technology actions derived from the last Summit of the Organization of African Unity (AU), realized in July of 2001 shows these intentions.

African cultural richness and diversity should be expressed in local sites, in the Internet and in electronic publishing. Africans should not become mere consumers of information. They should also produce information about their own countries and place it on the Internet. African publishing companies can devise partnerships with phone and telecommunication companies, arrangements that can be mutually useful to each other, increasing their chances of survival in the digital era.

## **ONGOIN PROJECTS TO PROVIDE ACCESS TO ONLINE INFORMATION AND ELECTRONIC PUBLISHING IN AFRICAN COUNTRIES**

International institutions and organizations have supported conferences, meetings, discussions and workshops about the creation, access and use of electronic publishing in developing countries, with special emphasis on African countries.

In 1994, during the African Conference on Telecommunications, held in Cairo (Egypt), there was a proposal for the creation of an African information network, so that nations of the continent could be connected to each other by means of fiber optics cables. The required actions for such a project were sketched.<sup>[18]</sup>

In October of 1998, a workshop was held in Paris, sponsored by the ICSU (International Council for Science) and UNESCO, under the auspices of AAAS (American Association for the Advancement of Science). The goal was to examine the application of electronic methods for publishing scientific journals, in order to stimulate the development and the international recognition of African research projects.

Another experience occurred at the University of Ibadan (Nigeria). This was a training course, conducted in October of 2002, supported by INASP (International Network for the Availability of Scientific Publications), through the PERI (Programme for the Enhancement of Research Information) programme, and by the AJLAIS (African Journal of Library, Archives and Information Science). The goal was to help and encourage researchers in the preparation of texts to be published in electronic formats.

A project was created linking the Eduardo Mondlane University, in Mozambique, the University of Zimbabwe, in Harare, and the University of Zambia, in Lusaka, for the change information and knowledge among these universities. This project is still working. Some countries already have Internet providers and servers that create networks between their institutions and those of neighboring countries, a proof that such experiences may be attempted in other countries. South Africa is perhaps; the only African country endowed with developed infrastructure for telecommunications, communication and information and can help other African countries to reach this stage.

Several projects were launched, tested and evaluated in Africa during the 1990s, with the support of these international organizations and NGOs. African electronic publishing already circulate at the international level and their value and scientific quality are recognized. In Zimbabwe some of these publications are inserted in databases such as MEDLINE, TROPAG and RURAL. Other examples are Bioline Publications, ExtraMED, ExtraSCI-UNESCO, AgROM Extra – FAO, INASP, Liblicense and ALPS.<sup>[18]</sup>

Other experiences with positive results were that of the EJP (Electronic Journal Publishing), supported by the EPT (Electronic Publishing Trust for Development). The EPT emerged in 1997, in the United Kingdom, as a result of the experience of Bioline Publications, with the purpose of supporting electronic publishing in African countries, given their poor viability in the context of the international scientific community and the difficulties experienced by African researchers to publish in the more prestigious scientific reviews from the North. The EPT allowed the electronic publishing of full texts about bioscience and medicine in several African and Latin American countries. One of EPT's goals is to stimulate African publishers to acquire the abilities needed to start up electronic publishing, together with providing them with access to international support, by means of partnerships with other publishers or with international organizations and institutions.

The AJOL (African Journals OnLine) project was launched in May of 1988 by INASP. Its major goals were to provide access to scientific information – both published and ongoing – in Africa; expand the knowledge held by the African scientific community; and support the publication of African scientific journals. It offers free access to the contents of African academic publications. In its early years it offered access only to English-language electronic publishing, excluding those from South Africa.

This project had pilot status from 1998 to 2000, receiving evaluations for its extension. Evaluations recommended its expansion and the inclusion of more journal titles and article abstracts. After that, more titles of electronic publishing in English were added, including South Africa, together with titles in French. More disciplines were also covered, such as agricultural sciences, arts, culture, language and literature, health, social sciences, science and technology; as well as abstracts, links to full texts and tables of contents. Articles could be sent to users by fax or mail. The large numbers of people who access AJOL is the proof of its success, and INASP is interested in the continuation of this project.

Other ongoing initiatives and projects in which African electronic publishing may be found are AJOPP (African Journals OnLine Publishing Project). The publications that this project has placed online were selected on the basis of the quality of their contents, dependable and regular production, and their subject matters (agriculture, health, science and technology and social sciences). BellaNet, P Free Online Resources, EJDS, are other electronic services that allow online access to African publications.

African publishers should be more active, though, and make more efforts to disseminate their publications by electronic means, assuring them visibility. These initiatives are easier to describe than to put into practice, on account of several obstacles. Hussein<sup>[10]</sup> states that African editors should be more aggressive, using tools in the fields of marketing and publicity and seeking support, because “*the road is not easy but it can be traveled with some help*”

## THE SITUATION IN ANGOLA

Angola is a country located on the West coast of Africa, to the South of the Equator. Its area is 1,246,700 km<sup>2</sup>. It has 18 provinces and borders with the Popular Republic of Congo (to the North), the

Democratic Republic of Congo (ex-Zaire) and the Republic of Zambia (to the East), the Republic of Namibia (to the South), and the Atlantic Ocean (to the West). Portuguese is the official language, despite the fact that different socio-cultural groups speak several other national languages. Most inhabitants of Angola are of Bantu ascent, and the oldest ones having Khoisan origins. Since colonial times, there have been also numerous descendents of Europeans, many of them already born in Angola.

Angola was a Portuguese colony all the way up to November 11, 1975. Since its independence, the country was constantly besieged by armed conflicts; it was invaded from the south by South African armies, and went through civil war. Permanent peace was achieved only on February 22, 2001, after the death of the leader of UNITA (National Union for the Independence of Angolan Peoples) – opposed to the government in power since 1975 – resulting in cease-fire treaties signed on April 4, 2001. This put an end to military hostilities and guerrilla warfare that destroyed the country during the last decades. After approximately 41 years of war, initiated in the 1960s against colonial occupation, Angola has finally achieved a perspective of lasting peace. We can now think about the future, in the reconstruction of everything that was destroyed, in preparing its population for a normal and peaceful life, without turmoil and moving away from living one day at a time.

The country is extremely rich in all sorts of mineral resources, particularly oil and diamonds, responsible for supporting the national economy since the first years of independence. Powerful rivers cross the territory, a valuable source of richness in the form of sources of energy and food. There are vast and rich soils for agriculture and animal husbandry. Since independence, the national government has drafted several economic, social and cultural plans and projects with the goal of developing the country, but none of them reached significant results, due to the state of warfare and of mistakes. International organizations rank Angola as one of the least developed countries of the world, mainly on account of the destruction caused by protracted warfare.

The Angolan population of approximately 12 million people is predominantly young. Most Angolans live in the national capital and in urban zones, educational levels are low, and illiteracy is high (even among the young). These are negative factors for national development and for the transition to an information-based society, in which new information and communication technologies are crucial. In urban zones there already exist groups with professional, technical and university training, and these groups know and use the new technologies.

In the national capital, Luanda, there are several information technology companies, endowed with advanced technology, connected to the rest of the world through the Web, with their own providers. Commercial companies use the e-mail and Internet regularly, both for business transactions and for keeping up with what happens around the world. Electronic-mail use is also common in public institutions. There are Web sites created by private businesses, NGOs, communication companies (newspapers and radio stations). Because of decades of war, it is still premature and difficult to speak about electronic publishing, about statistical data on the use of information and communications technologies, about the numbers of companies that use online information services, about e-mail and so on. However, it is not totally impossible to care about these issues, even though the current priority is the physical reconstruction of the country.

The Angolan government, recognizing the paradigm changes and global reality, created a programme called “Government Strategies for the Development of Information Technologies in Angola - 2000-2010” and instituted a “National Commission for Information Technologies”, charged with the mission of leading Angola in the direction of becoming an Information Society. Both the programme and the commission started to operate officially only in early 2003. Among the several projects to be developed inside this programme, there are the creation and mutual integration of national networks, connecting governmental agencies, existing universities and research institutes to be created; the creation of infrastructure for computer networks; improvement of telecommunication services; training courses for information users, among others actions.

Government goals to achieve a country capable of participating in a globalise and Information Society include the creation of a national information policy, the development of new information and communication technologies, and the creation of information units in schools, neighborhoods and rural communities, in order to familiarize local populations with the use of information.

## **WHAT CAN BE DONE TO CHANGE THE SITUATION?**

Since the 1990s there have been many courses, workshops and meetings in several African countries and in other parts of the world focused on the subject of inserting Africa in the new globalise world, with a special emphasis on the possibilities and the required joint actions of African countries and international organizations,<sup>[19]</sup> in order to improve access, use, training, creation and maintenance of electronic publishing.

As stated by Van Brakel, cited by Rossouw<sup>[20]</sup>: “*The African continent can undoubtedly benefit by utilizing electronic communication technology to exchange scientific information. Although a number of infrastructure problems still exist, current Africa networking activities indicate that the advantages of electronic interaction across borders and continents are being realized*” (Van Brakel, apud Rossouw, 1996, p. 168).

African governments should stimulate the private sector to provide more training course for accessing the Internet, besides the edition and use of electronic publishing. Local initiatives should be supported in these countries, in order to improve infrastructure, access and creation of electronic publishing. International donors can encourage the competition among online service providers, so that these services, while competing among themselves, will decrease their prices to levels affordable to the majority of the population.

Collaboration between libraries and research institutes, such as efforts in the development of joint collections, will make easier to place them and other materials online. There have been some successful experiences on putting libraries collections on electronic format that illustrate the potential of this pathway.

Several seminars, held in African countries, focused on training and preparing current technicians and new generations of technicians in the operation of information and communication technologies, which goal is to improve access to electronic publishing. Training structures and teaching methods may vary from country to country, on account of different contexts and of their specific cultures.

Some actions have been take place together with African organizations such as the SADC (Southern African Development Community), discussing the possibilities of creating databases and CD-ROMs that can be used in the region, with the required quality and access from any part of the world. This is a potentially viable solution that requires urgent implementation. English-speaking countries belonging to the SADC are implementing projects that pull together universities and research institutions, and positive results may come out of them. Portuguese-speaking countries including them in these projects, allowing the translation of information into Portuguese so that these countries can use them, can adopt the same solutions.

Sometimes it happens that African universities and/or research institutes make temporary subscriptions to certain publications in order to provide support for current research projects. The renewal of such subscriptions is not a rule, resulting in loss of access to both electronic and printed publications. Subscription prices are sometimes high and institutions cannot afford them. One solution for this could be the support from other institutions based in developed countries, in order to help pay for these costs, allowing African researchers to have continuous access to updated information and to engage themselves in research that is relevant to the welfare of their countries.

Academic online networks could bring together universities and research institutes from different countries – as is already happening – improving the situation of those who do not have access to updated information.

Governments will have to pay closer attention to the area of science and technology and to the issue of access to scientific knowledge, and less attention to the sectors of industry, commerce, business and agriculture, because these sectors will not be adequately developed in the absence of updated information and knowledge.

Africans should invest and believe more in us, in our capabilities, and governments should take the lead in this effort. Instead of waiting for international institutions, NGOs and organizations to finance development projects, we should place pressure on our own governments, so that they will subsidize research projects in the fields of information, technology and communication. This can be done by the creation of pressure groups, and by actions by civil society organizations, parliaments and politicians. This is required to change our situation, so that we can move beyond the status of being “on the road to development”, lacking of preparation for the new era of knowledge. It cannot and should not be enough to count on the support of international institutions committed to aiding African development.

## CONCLUSIONS AND SUGGESTIONS

Statistical studies conducted by the institutions that support African electronic publishing have shown that the interest in them has been growing steadily, a fact that indicates that their major goals are within reach. As these publications become better known, African researchers are encouraged to publish their texts in them. Use and expansion of electronic publishing may stimulate other types of technological innovation that can broaden access to information generated in any corner of the world. Electronic publishing have entailed innovations that can be adopted. The enlargement of networks and the broader use of electronic information will allow Africans to have access to information and knowledge that will help solve current problems like hunger, suffering and underdevelopment.

We agree with Letshela & Lorwhen they state that electronic “*publishing in Africa is still in its infancy, the need for African countries to have laws that cover this medium is without question.*”<sup>[12]</sup>

We can conclude by stating that electronic publishing entail huge advantages for the developing world – they can open new pathways, transform and reconstruct realities and social environments. The extension of these changes will cause impacts on social relations and spheres, and these impacts may lead to contradictions and tension. It is true that the majority of the African population does not or cannot have connection, cannot use these technologies, due to the lack of infrastructure, but it is still valid to state that the current era offers a space for the participation of individuals and groups engaged in the globalize culture, as participants and not merely as “marginalized observers”.



Michel Menou <sup>[21]</sup> (1999) suggested some initiatives in order to study the impact of the Internet. Considering how close this issue is to our concern, some of these initiatives could become part of a more comprehensive effort to conduct more detailed examinations about access and use of electronic publishing in African countries.

On the basis of these initiatives, we suggest the following:

- The creation of an inventory or catalogue of different African research groups, so that they can interact among themselves and connect by means of networks;
- Construct and maintain a portal or a bridge to enhance access to electronic publishing, the results of several research projects and to digital libraries;
- Stimulate the interaction among research groups, users, and Internet servers and providers, given the increase of the number of electronic publishing available on the Web;
- Create a network that connects African universities, allowing access to research projects, scientific and technological information, exchanges, all this with translations provided for the major languages spoken in African countries;
- Support to courses to train users on access to electronic resources.

Despite their growing acceptance, we are still far away from being able to say that everything has been done in order to stimulate electronic publishing. On the contrary, we think that there are many surveys to be made about this issue in order to know the real range of electronic publishing in African countries.

The benefits of including African publications in electronic format on the Web are exactly those that are most needed by the African academic and scientific community – quality and international recognition, which will help create more projects and generate development in Africa.

## NOTES AND REFERENCES

[1] MENEZES, Estera Muszkat e COUZINET, Viviane. O interesse das revistas brasileiras e francesas de biblioteconomia e ciências da informação pela revista eletrônica no período de 1990-1999 vol.28 n.3 Brasília set./dez. 1999.

[.www.ibict.br/cionline](http://www.ibict.br/cionline)

[2] GOMES, Suely. A apropriação dos periódicos eletrônicos: repensando as abordagens teóricas. In: MUELLER, Suzana Pinheiro Machado e PASSOS, Edilenice J. L. (orgs.) Comunicação Científica. Estudos Avançados em Ciência da Informação. vol.1. Brasília: Departamento de Ciência da Informação e Documentação (CID), 2000, p.73-84.

[3] COSTA, Sely M. S. Mudanças no processo de comunicação científica: o impacto do uso de novas tecnologias. In: MUELLER, Suzana Pinheiro Machado e PASSOS, Edilenice J. L. (orgs.) Comunicação Científica. Estudos Avançados em Ciência da Informação. vol.1. Brasília: Departamento de Ciência da Informação e Documentação (CID), 2000, p.85-105.

[4] BLOOR, Kate. Scientific electronic publishing: European policy strategies. Library Review, vol. 49, n° 6, 2000, p.277-285.

[5] DESCHAMPS, Christine. The Electronic Library, Bielefeld Conference, 1994. In: Libri, vol. 44, n° 4, 1994, p.304-310.

[6] ADEBOWALE, Sulaiman. Disseminating the Electronic Publishing Philosophy in Developing Countries.

[www.inasp/info/psi/ejp/adebwale.html](http://www.inasp/info/psi/ejp/adebwale.html)

[7] CHISENGA, Justin. Global Information Infrastructure and the question of African content. In: Libraries in the Information Society. Ed. by Tatiana V. Ershova and Yuri E. Hohlov. München: Saur, 2002, p. 56-66.

[8] DALY, John A. Measuring Impacts of the Internet in the Developing World. [http://www.cisp.org/imp/may\\_99/daly/05\\_99daly.htm](http://www.cisp.org/imp/may_99/daly/05_99daly.htm)

[9] HAHN, Karla; SCHOCH, Natalie A. Applying diffusion theory to electronic publishing: A conceptual framework for examining issues and outcomes. In: ASIS'97. Proceedings of the 60<sup>th</sup> ASIS Annual Meeting. Vol.34, 1997, p.5-13.

[10] HUSSEIN, Janet. The Importance of Electronic Journal Publishing for Developing Countries. [www.inasp/info/psi/ejp/index.html](http://www.inasp/info/psi/ejp/index.html)

[11] KIRSOP, Barbara. The Electronic Publishing Trust for Development: Putting developing country journals online. [www.inasp/info/psi/scpw/papers/kirsop.html](http://www.inasp/info/psi/scpw/papers/kirsop.html)

[12] LETSHELA P.Z. & LOR P.J. Implementing legal deposit of electronic publishing in Africa: progress report from South Africa and Namibia. [www.ifla.org/IV/ifla68/papers/072-124e.html](http://www.ifla.org/IV/ifla68/papers/072-124e.html)

[13] LYNDEN, Frederick C. Resource Sharing: Making Possible the Transition from Paper to Electronic Information. In: FID. 48<sup>th</sup> Conference and Congress. Globalization of Information. The Networking Information Society. Graz, Austria: FID/Ögdi/JOANNEUM Research, 1996. p. 580-586.

[14] MORRIS, Sally. Getting Started in Electronic Journal Publishing. [www.inasp/info/psi/ejp](http://www.inasp/info/psi/ejp)

- [15] NWANKWO, Victor. Print-on-Demand: An African Publisher's Experience. [www.inasp.info/psi/arusha/papers/nwankwo](http://www.inasp.info/psi/arusha/papers/nwankwo)
- [16] ROSENBERG, D. Making African journals more accessible AJOL 2000. INASP Newsletter, nº15, November 2000 <http://www.inasp.info/newslet/nov00.html#14>
- [17] SMART, Pipa. E-journals: Developing Country Access Survey. [www.inasp.info/pubs/survey.html](http://www.inasp.info/pubs/survey.html)
- [18] We didn't find more information about this proposal.
- [19] See notes on the article by Sally Morris. Getting Started in Electronic Journal Publishing. [www.inasp.info/psi/ejp](http://www.inasp.info/psi/ejp)
- [20] ROSSOUW, Steve F. Networking Africa's Scientific and Technical Information Resources. In: J. E Dubois; N. Gershon. (orgs) The Information Revolution: Impact on Science and Technology. Berlin: Springer, 1996, p.163-170.
- [21] MENO, Michel. Impacto da Internet: algumas questões conceituais e metodológicas, ou como acertar um alvo em movimento atrás da cortina de fumaça. [www.dgzero.org.br](http://www.dgzero.org.br) n.zero,dez/99, artigo 06.

## RECOMMENDED READING

- CUNHA, Leo. Publicações Científicas por meio eletrônico: critérios, cuidados, vantagens e desvantagens. Perspct. Ciênc. Inf., Belo Horizonte, vol.2, nº1, p.77-92, jan./jun. 1997.
- DUBOIS, J. E.; GERSHON, N. (orgs) The Information Revolution: Impact on Science and Technology. Berlin: Springer, 1996.
- RUSSELL, Jane M. Tecnologias eletrônicas de Comunicação: bonus ou onus para os cientistas dos países em desenvolvimento? In: MUELLER, Suzana Pinheiro Machado e PASSOS, Edilenice J. L. (orgs.) Comunicação Científica. Estudos Avançados em Ciência da Informação. vol.1. Brasília: Departamento de Ciência da Informação e Documentação (CID), 2000, p.35-49.
- SHAUDER, Don. Electronic Publishing of Professional Articles: Attitudes of Academics and Implications for the Scholarly Communication Industry. Journal of the American Society for the Information Science, vol.45, n.2, 1994, p.73-100.
- TARGINO, Maria das Graças. Novas Tecnologias e Produção Científica: uma relação de causa e efeito ou uma relação de muitos efeitos? (Palestra proferida no XII Seminário Nacional de Bibliotecas Universitárias 2002, como participante da mesa redonda *Contribuições da tecnologia para o desenvolvimento da produção científica e da publicação eletrônica*, Recife – PE, 24 outubro de 2002.)