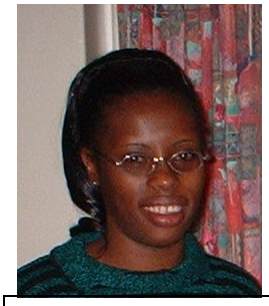

AFRICAN WEB-BASED ANIMAL HEALTH INFORMATION

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Abstract: *The quantity of research information being made available on the World Wide Web in various disciplines is increasing tremendously. This study examined the coverage of animal health information published on the web from Africa or about Africa. Challenges and opportunities of publishing and disseminating animal health information online in Africa were also examined.*
Websites and online databases which offer agricultural information were included in the analysis, but the main focus was on research, education and extension information in the core areas of animal health. Content analysis method was used to determine what agricultural academic indexing and abstracting databases have in terms of quality researched animal health information published from Africa or about Africa. Well-known databases, such as AGRICOLA, AGRIS, CAB Direct, PUBMED and Cochrane Library were investigated.
The criteria used to determine the African animal health information included the content of research animal health information available on the website, how easy it is to locate information once the site has been located, the usefulness of the information, and how current and up-to-date the information is.
It was found that the representation of African animal health information on the web is generally low. The poor coverage of animal health information on the web emanates from many factors: poor ICT (Information Communications Technology) infrastructure in many African countries, lack of ICT literacy, awareness and mindset, lack of recognition of all the values of information services, poor state of African indexing and abstracting services, inadequate funds, and perceived misconceptions of actual causes of the problem. Thus, this situation has led to the web being dominated by the animal health information from developed countries.
Despite the challenges faced by African researchers in publishing their research findings on the web, most animal health scholars collaborate well with some international organizations in disseminating animal health information on the web. It is recommended that the researchers in Africa should fully utilize Internet services to publish and disseminate the animal health information on the web.

Introduction

Since the 1990s, the quantity of research information being made available on the World Wide Web via the Internet has increased tremendously. Among others, online databases have largely been increasing the accessibility of research information in terms of books, research reports, theses, conference proceedings and scientific journals on the Internet. According to Bandyopadhyay (1999), online databases have facilitated the shift from “ownership” to “access” of scholarly information.

The extent of the African research information resource base is wide. However, most African information organizations like libraries can seldom afford to acquire such information (Katundu, 2000). Grey literature coming out of Africa which is relevant to researchers is abundant, but according to Raseroka (1993), it is either not collected by or not made available to African libraries. Online publishing might be a feasible solution to the problem of inadequate access to African research information. This would also solve the problems of increasing journal prices, reduced library budgets and increasing printing costs. E-journals, for example, just as other web information, are easily accessible, easy to publish, time saving, and low cost. Therefore, online publishing could benefit African countries to build their own online research communities.

Online databases can be multi-disciplinary or subject-specific in a full text or bibliographic format. Science Direct and EBSCO are examples of multi-disciplinary online databases while HINARI, CAB Direct and AGORA are a few examples of subject specific online databases. Subject-specific databases generally tend to include scholarly journals focusing on particular disciplines while multi-disciplinary include scholarly journals from various disciplines.

This study examined the coverage of animal health information on the web, particularly in the online databases, both subject specific and multidisciplinary. Websites and online databases which offer agricultural information were included in the analysis, but the main focus was on research, education and extension of information in the core areas of animal health. It also focused on the challenges and opportunities of disseminating and accessing that particular information on the web.

To define what constitutes animal health information, a broader view of the term is adopted that includes: animal hygiene, animal pests and diseases, animal genetics, animal biotechnology, breeding and taxonomy, animal nutrition and feeds, animal production systems and veterinary medicine.

Methodology

Content analysis was conducted between December 2004 and January 2005 to determine what agricultural online databases have in terms of researched animal health information published from Africa or about Africa. In the first stage, two major search engines (Google.com and yahoo.com) and the agricultural web indexes, lists and directories were used to identify online databases that contain animal health information. The agricultural lists and directories include the National Agricultural Library (NAL), Food and Agriculture Organization of the United Nations (FAO) and International Network of Availability of Scientific Publications (INASP).

The use of search engines, agricultural lists, and directories led to the investigation of many subscribed and open access online databases in both full-text and bibliographic format. Finally, a total of 27 online databases were selected for the study based on their size and coverage in terms of animal health information. This included 19 academic indexing services and 8 international organizations' online databases.

The criteria used to determine the African animal health information included the content available on the web, how easy it is to locate information once the site has been located, how current and up-to-date the information is and other useful information about the visited sites. Generally, combinations of several search strings were used to retrieve the required articles, these included: animal health, animal hygiene, animal diseases, animal genetics, animal biotechnology, animal nutrition, animal production systems, veterinary medicine and Africa. The currency of animal health information was also examined by using the advanced searching for the publication date.

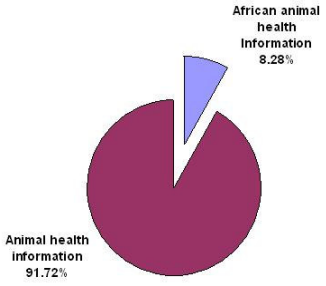
In assessing how easy it was to locate information on the sites, the following functions were examined: search, what's new, help, Frequently Asked Questions (FAQ) and E-mail alerts.

Others include external links, events, information format, access mode and feedback. These other functions were thought to be important because they help users to easily access and retrieve information on the web.

Results and discussion

Animal health information

Figure 1: The representation of African Animal Health Information



Findings in Figure 1 indicate that there were about 36,054 articles (8.28%) on African animal health information. This includes about 32,517 articles (7.47%) from academic indexing services and 3,537 articles (0.81%) from the international organizations' online databases. This shows that animal health information from Africa is less represented on the web as compared to the information published from outside Africa. Additionally, the results show that the African animal health information is indexed more in academic indexing services than in international organizations' online databases. This is probably because academic indexing services are commercial based and they tend to publish e-journals that in most cases are a replacement of traditionally print journals. International organizational online databases mainly publish research reports from their own projects as well as papers which are not published in journals.

Figure 2: Representation of African Animal Health Information in African and Non-African Online publishers

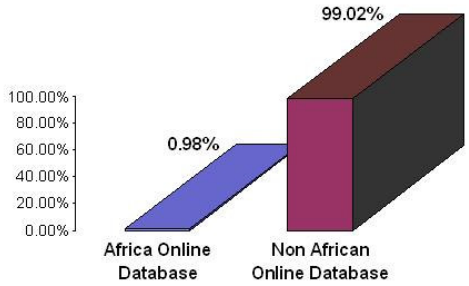
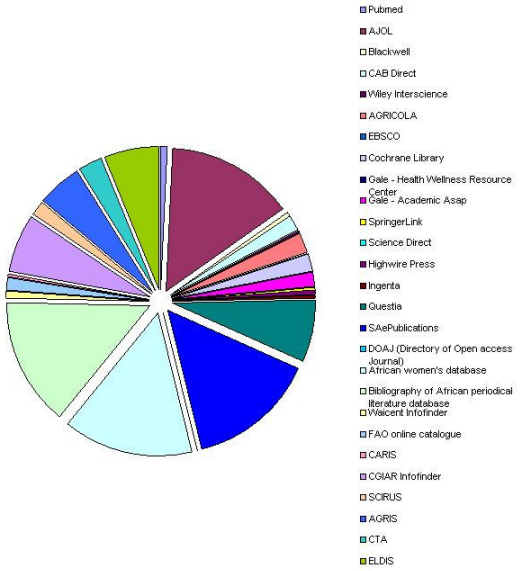


Figure 2 indicates that about 353 articles (0.98%) on African animal health were found in African-based online databases while 35,701 (99.02%) were found in non-African online databases. The African based online databases include the African Journals Online (AJOL), South African e-publications (SAePublications), African Women's Database, and Bibliography of African Periodical Literature Database. This implies that an effort should be made to attract more scholars from Africa to publish their research findings in African-based online databases.

A number of individual online databases were also visited and analyzed. This was done to give an overview about some specific online databases as far as African animal health information is concerned.

Figure 3 indicates the coverage of African animal health information in the individual online databases. In case of academic indexing services, Questia had the highest number of articles (48.92%) followed by AGRICOLA (14.54%), Cochrane Library (12.55%), Gale-Academic Asap (12.55%), and PubMed (5.13%). The international organizations' online databases were as follows: CGIAR (46.43%), ELDIS (42.21%), AGRIS (34.45%) and CTA (20%).

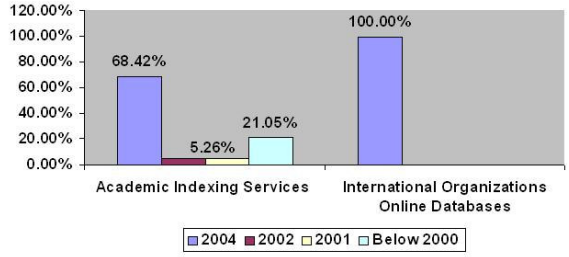
Figure 3: Representation of African Animal Health Information According to the Online Publishers



Currency of animal health information

As indicated in Figure 4, all eight international organizational databases had African animal health information updated up to 2004/2005 while only 13 academic indexing services (68.42%) had articles up to 2004/2005. This implies that African researchers participate well in adding new knowledge to the online databases.

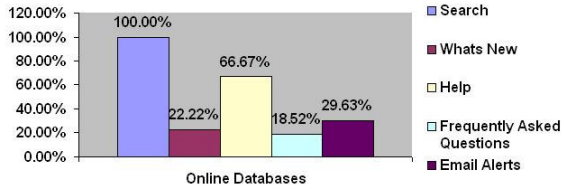
Figure 4: Currency of African Animal Health Information



Locating animal health information

Results in Figure 5 show that all selected sites had 'search' facilities that help their visitors to locate information easily. Many sites had both simple and advanced searching mechanisms which allow the users to search the desired information by using different fields. 'Help' facility was available in 13 (72.22%) academic indexing services and 5 (27.78%) international organizations' online databases. The 'email alert' facility was ranked third as it was included in 8 (29.63%) sites representing 50% for both academic indexing services and international organizations' online databases categories. Six (22.22 %) sites, including 4 (66.67%) academic indexing services and 2 (33.33%) international organizations' online databases, had 'what's new' facility on their websites. Only 5 (18.52%) online databases of academic indexing services had the 'Frequently Asked Questions (FAQ)' facility.

Figure 5: Location of African Animal Health Information

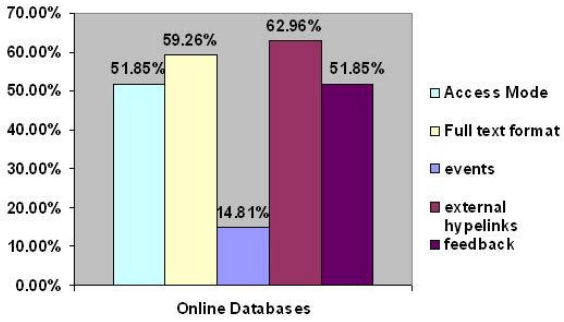


These findings show that different online databases have varying facilities to help users to easily locate information. Despite the fact that most users depend on these facilities for easy information accessibility, some important facilities like FAQ, email alerts and what's new are not given enough consideration in many online databases.

Other useful information

In studying other useful information as shown in Figure 6, the type of information format was also considered.

Figure 6: Useful Information for Accessing African Animal Health Information



Sixteen (59.26%) sites, including 13 academic indexing services and 3 international organizations online databases, had full-text information. In terms of subscriptions, more than half (51.85%) of the academic indexing services required user's subscriptions while all international organizations databases were free.

Although animal health information is highly indexed in academic indexing services, most of them do not provide free access to information. Therefore, there is a need for promoting the establishment and accessibility of more Open Access Journals which are geared to disseminating research information from Africa.

Seventeen (62.96%) sites, including 12 academic indexing services and 5 international organizations online databases, had external links to help the user locate other related information. For example, for every article in the Wiley Interscience that is also found in PubMed, a related link to PubMed database was created to help the user search the related information.

Fourteen (51.85%) sites, including 10 academic indexing services and 4 international organizations' online databases had a feedback facility while four (14.81%) sites (2 academic indexing services and 2 international organizations' online databases) had an event facility. 'Events' informs the scholars about upcoming events such as conferences while 'feedback' informs the publisher about the users' responses and opinions. However, both facilities (event and feedback) were given low priority in almost all sites.

Challenges that face African animal health information

Lack of recognition of the value of information services

Most African countries still lack a clear and coordinated information infrastructure with the resources for processing and disseminating information such as web indexes and abstracting services. A few countries demonstrated the presence of these facilities, such as South Africa with SABINET and Ghana with Ghananet. This is mainly due to the failure to prioritize the information sector and its contribution to national development. This situation has led to the inclusion of African information on the web to be mostly dependent on the substantial investments made by the online database publishers from developed countries. Online databases publishers mostly obtain African information which has been published in journals in developed countries.

Africa's information and communication technology (ICT) environment

Poor infrastructure indirectly affects the efforts of African scientists to publish online. The infrastructure in this context includes the telecommunications, electricity, transport and support infrastructure of trainers, trouble-shooters; system designers and implementers; and the technical capability of people using ICT (Adam, 1999: Chowdhury, 1998). These problems present very strong constraints to effective use of publishing research results online by putting limitations on the Internet to be a reliable, dependable service and constantly available to researchers (Okunoye and Karsten, 2003). As a result, many researchers have not been able to cope with such changes. However, the situation is slightly changing due to the efforts being made by governments, private sectors and donors to improve Africa connectivity, ICT infrastructure, facilities and technical expertise. This situation can improve the contribution of Africa to the online animal health information if the morale of information professionals to take action is boosted and revitalized.

Perceived misconceptions of actual causes

Some scholars from developing countries have been blaming international database publishers as being unconcerned and therefore insensitive to the valuable information that originates from Africa. On the other hand, foreign databases publishers have continuously believed that, given the low rate of research and publishing activities in many developing countries, not much relevant literature or information can come out of them (Katundu, 2000). This wrong perception of the actual causes from both sides has misled the African scholars into believing that the responsibility for this concept is externally generated without critically analyzing the African information environment specifically, the process involved in information generation, and the organization and dissemination of information on the web. So there is a need for a serious assessment of Africa's information environment if the actual causes of this problem of misconception of African information professionals and those from developed countries are to be identified and dealt with.

State of Africa's bibliographic and abstracting tools

Bibliographic and abstracting tools play a major role in disseminating research information on the web. They help the scholars to know the publications that are available in their fields through union catalogues, national bibliographies etc. However, there have been problems in the compilation and dissemination of these tools in Africa. Agoulu (1990) states that limitations in knowledge – linguistic, subject, or bibliographic –, time constraints, manpower and finance, and legal deposit evasions are the actual causes of the lack of such bibliographic and abstracting tools. Additionally, most African libraries and information systems lack proactive professionalism, creativity and enthusiasm. A hidden reluctance among information specialists to provide these information services also complicates the problem (Nawe, 1996 and Cabezas, 1995). Therefore, African information professionals are challenged to actively develop these tools by taking the advantage of the technologies which can speed up the organization and dissemination of union catalogues and national bibliographies.

Inadequate funds

Inadequate funding inhibits most African researchers in conducting research. Most of them depend on donor support which is limited to certain disciplines, and is not sustainable. Furthermore inadequate funds prevent many African scholars and researchers from attending international conferences and workshops. As a result their research results are not being disseminated globally as conference proceedings. Many initiatives such as the Library of Commons publish the conference papers and other research papers online. African scholars could benefit from this if they were able to attend conferences or conduct research.

Lack of ICT literacy, awareness and mindset

ICT awareness involves knowing about the existence and importance of the ICT tools and their application. Many researchers in Africa still lack ICT awareness and necessary skills of deploying ICTs. As Tusubira and Mulira (2004) explain, "there tends to be some vague knowledge about ICT, interpreted as simply an advanced technology that requires a lot of expertise, a lot of money, and very advanced skills". It is not appreciated as a means of creating efficiency and cost-effectiveness. Some people's minds are still stuck to the

old ways of doing things. Formally organized awareness workshops, real systems demonstrations and visitations, exhibitions and conferences could help in addressing awareness and mindset problems. As a result, African scholars and researchers would be able to deploy ICTs in order to access and publish research information online, including animal health information from or about Africa.

Opportunities for African animal health information

Improving ICT infrastructure

Leaders of governments and organizations should be committed to continuous provision and development of Internet services by improving infrastructures, providing funds for training, and developing local capabilities to support ICTs in general, and especially the Internet (Okunoye and Karsten, 2003). However, the opportunity still remains for academic and research institutions in Africa to actively begin to explore the existing and evolving Internet applications to publish on the web and in e-journals to ensure wide accessibility of their information on the web.

Perhaps with donor and governmental support, academic and research organizations could form their own Internet provision network, in order to reduce the cost of connection and improve the reliability of the services. This would increase individuals' willingness to use and disseminate information.

To enhance the visibility of such issues and serve as a target for funding efforts, organizations could develop long-term ICT strategies, such as outsourcing in situations where managing ICT within the organization seems unrealistic. Okunoye and Karsten, (2003) note that some innovative solutions have emerged to infrastructural issues; for example, one ISP in Gambia has circumvented the unreliable electrical system by running their servers on solar power.

Wireless technologies can also be explored to enhance scholars' capabilities of disseminating their information on the web. Wireless technologies are easier to deploy and thus eliminate some geographical barriers and costs associated with wired telecommunication systems.

African academic and research organization

With donor support, most academic and research establishments such as universities, research organizations and regional and sub-regional organizations have improved their ICT infrastructure, and this has enhanced the wider accessibility of African information on the web. Most of these institutions own websites and some of them have even established electronic cooperative national academy or research information networks. Examples of these include Ghana (Ghananet) and the Republic of South Africa (SABINET).

Regional-wise, organizations such as African Bib, Pan African Development Information Systems (PADIS), the Association of African Universities (AAU) and African Academy of Sciences have the required ICT infrastructure and expertise which can be used to promote and disseminate the animal health information generated from Africa (Katundu, 2000). One example is the Database on African Theses and Dissertations (DATAD) project of AAU which can be used by young African researchers to publish their dissertations and theses online. African Bib can also be used by African scholars to publish their research publications in bibliographic format. African publishers can also take advantage of other initiatives, such as the African Journals Online (AJOL), to increase the quality and quality of this database. Currently AJOL has about 207 journals which definitely do not represent all the available journals in Africa.

International Organizations

International non-governmental organizations are increasingly supporting African scholars in publishing and disseminating African information on the web. Organizations include the Electronic Supply of Electronic Publications (eSAP) project, Technical Centre for Agricultural and Rural Cooperation (CTA), the International Network for Availability Scientific Publications (INASP), the American Association for Advancement of Science (AAAS), and Library of Commons. African scholars are thus urged to exploit and explore these opportunities, although as Katundu (2000) mentions one obstacle which inhibits Africans' involvement is that Africa's information still lacks a mechanism through which it can be effectively organized and processed for dissemination.

Establishment of institutional repositories

African institutions such as universities, can start digitizing their institutional-based information so as to form institutional repositories. Publication of such repositories on the Internet will increase the availability of African-based information on the web. Digitization efforts can start with the information which is already available in electronic format. There is a lot of information in African institutions which is produced in the electronic format. However, very little is being done to collect this kind of information and make it available online or even within the institutions' local area network (Intranet). Such documents include dissertations, lecture notes, and research reports.

Development of regional bodies, cooperation or association

Libraries in Africa can establish cooperative projects and associations to share information. For instance, the establishment of library consortia can help libraries to establish their own online databases by sharing their union catalogues, national bibliographies, and full text digital research information. This would motivate African scholars to publish their research findings online.

Role of information professionals

Information professionals are also urged to participate fully in this era of electronic information by being fully committed to their work to improve their role of acquiring, organizing, and disseminating information.

Conclusions

This paper assessed the representation of African web-based animal health information in order to determine the coverage of African animal health information on the web. The study was conducted between December 2004 and January 2005, and a total of twenty seven (27) online databases were surveyed. Both full text and bibliographic databases were included where the main focus of selecting these online databases was on research, education and extension in the core areas of animal health information.

This paper found that the representation of African animal health information on the web is still inadequate. This poor coverage emanates from the poor ICT infrastructure in many African countries, lack of ICT literacy, awareness and mindset, lack of recognition of the value of information services, the poor state of African indexing and abstracting services, inadequate funds and perceived misconceptions of actual causes of the problem. Thus the web is dominated by animal health information from developed countries.

Despite the challenges faced by African scholars and researchers in publishing their research findings on the web, African scholars were found to collaborate well with other international organizations in disseminating animal health information on the web.

This paper recommends that the accessibility of the Internet should be fully utilized to expand the Africans' ability to access and disseminate African information on the web and through e-journals. It also recommends that Africans should utilize the mentioned opportunities to expand their ability of publishing online. Those opportunities include development of regional associations, establishment of institutional repositories, improvement of ICT infrastructure, development of the role of information professionals, and cooperation with international bodies and other African academic and research organizations.

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