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Contribution of East Africa Region to Open Access Literature: The case of OpenDOAR

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Abstract

This paper is based on the findings of a study that evaluated the initiatives taken by East African countries to embrace the open access movement. Specifically, the study analysed the position of East African countries in disseminating open access literature in Africa and globally; determined the contribution of each East African country to global open access literature; identified the type of document as well as Open source software they used. Moreover, the study analysed the subject content of OARs and identified the language for the archived items. The study first used literature review to determine current status of open access in East Africa, then the Directory of Open Access Repositories (OpenDOAR) were accessed to get the required data. The results revealed that East African counties make only a miniscule contribution to Open Access literature of about 0.022 percent of items found in global OARs and 1.2 percent by number of repositories. The study concluded that East African countries with a slight exception of Kenya lag far behind in open access literature. The study, therefore, recommends more efforts to be made by individual East African countries to make necessary arrangements required to adopt and use OA repositories to enhance free access to knowledge and information and, consequently, boost socio-economic development in the region.

Key words: Open access, Repositories, Scholarly communication, East Africa.

Introduction
The advancement of Internet technology has provided academic and research institutions with a high level of visibility on the web. As a result, teaching, learning and research are widely improved in the global society today. The intellectual call for knowledge and information dissemination by countless organisations and educational meetings has led to the emergence of 'open access' movement (Oluwasemilore, 2013). This initiative is aimed to bring about the knowledge society to a state of free access to all kinds of information and learning material using the Internet and ICT tools (Das, 2008).

Open Access is a generic term that refers to knowledge resources made available for public consumption without any restriction of a subscription fee or access charges (UNESCO, 2015). The term came out of the Budapest Open Access Initiative (BOAI) in 2001. Suber (2012) defines Open Access "literature" as digital, online, free-of-charge, and free of most copyright and licensing restrictions. The primary purpose of Open Access is to make intellectual outputs more visible, accessible and useable by any information user with access to the Internet. This free access approach accelerates research, supports education, and enhances knowledge sharing among nations (Bhat, 2010). Open Access increases the authors' prestige and the institution at large (Lind & Williams, 2013). Initiatives such as BOAI, the Bethesda Statement on Open Access Publishing (BSOAP) and the Berlin Declaration have been put in place to advocate for Open Access (Lone, Rather & Shah, 2008). These initiatives have resulted in various Open Access information resources and services for journals (i.e. DOAJ), for books (i.e. DOAB) and repositories (i.e. DOAR).

On the whole, the development of Information and Communication Technologies (ICTs) and electronic publishing has opened new opportunities up for scholars to communicate and disseminate their research findings. Open access institutional repositories are one of the many channels besides peer-reviewed journals which can increase the visibility, readership and consequently impacts of the research outputs. Christian (2008) explain OAR as electronic archives that may contain post-published articles, pre-published articles, thesis, manuals, teaching materials or other documents that the authors or their institutions wish to make publicly available without financial or other access barriers

Status of Open Access Literature in East Africa
Recently, Open access literature has increasingly become the base of scholarly communication worldwide. On the contrary, many East African countries still lag behind due to reasons such as lack of open access platforms, lack of awareness and readiness of some researchers to publish in open access outlets (Dulle, 2010; EIFL 2017). To overcome the challenge occasioned by lack of open access platforms and improve awareness in Eastern Africa, Electronic Information For Libraries (EIFL) with support from the Open Society Foundations conducted an Open Access (OA) workshop in Kenya to advocate for open access (OA) in the region (EIFL, 2017).

Since then several research and academic institutions have established open access journals and institutional repositories where researchers (re)publish their research outputs. A study conducted by Dulle (2010) however found that, although 62 percent of the researchers consume free online contents only 20 percent were found to disseminate their research findings through open access outlets. The reasons often include lack of awareness and preparedness of some researchers to publish in open access outlets. The projects conducted by EIFL in 2013 and 2016 for Tanzania, Kenya and Uganda, respectively, revealed a remarkable increase in the understanding of open access among faculties, students and researchers. In addition, there is an increase in the number

of institutional OA repositories and the amount of OA digital content from the region by over 300 percent since 2013 (EIFL, 2017).

The EIFL (2017) conducted a number of projects aimed to improve the status of open access literature. The first project titled 'OA in Kenya, Tanzania and Uganda' was undertaken from 2013 to 2014. The project increased the number of OA repositories from seven in 2013 to 31 by 2014. The second project dubbed 'OA policies in Kenya, Tanzania, and Uganda' was carried out in 2016. This second project works with 16 research intensive universities in the three countries to develop institutional OA policies geared towards increasing content in the new institutional repositories. The two projects facilitated the increase in the understanding of open access among faculty, students and research members; increase in the number of institutional OA repositories in the three countries to 68 by 2016 (with 27 yet to be registered by OpenDOAR); increase in the amount of OA digital content from the region by over 300 percent since 2013. Moreover, one open access journal was launched in the region.

In Kenya various institutions have adopted OA policies to make research work carried out accessible openly. Most of Kenyan universities run e-repositories where research conducted by their students and faculty is deposited (Kabungu, 2013). Moreover, there are a number of OA research journals that have been launched in Kenya, one of them is run by Kenya Medical Research Institute and another by the University of Nairobi (Matheka *et al.*, 2014).

Objective
The main objective of the study was to investigate the contribution of East African countries to global Open Access literature in terms of Open Access Repositories. The study highlights the current state of open access repositories in academic and research institutions in East Africa. Specifically, the study analysed the position of East African countries in disseminating open access literature in Africa and the globe in general; determined the contribution of each East African country to open access literature; identified the type of document and Open source software in use. Moreover, the study analysed the subject content of OARs in addition to identifying the language for the archived items.

Scope of the Study
The study was based on six East African countries, which are members of East African Community (EAC): Burundi, Kenya, Rwanda, South Sudan, Tanzania and Uganda. The study was limited to the Directory of Open Access Repositories (OpenDOAR), which archives books, theses, journal articles, monographs, patents, learning objects, and unpublished papers.

Methodology
Literature review was conducted to reveal current status of open access literature in East Africa region. Then, the Directory of Open Access Repositories (OpenDOAR) were accessed to get

data on the position of each country in Africa, the number of its repositories, the software in use, document type, subjects and language (s) in use. In the final stage, the data were interpreted and analysed to get the right picture of contribution of East African countries' repositories to Open Access literature.

Results and Discussions

Position of East African countries in terms of OARs
First, the study sought to determine the position East African countries in Open Access Repositories for Africa. It found that only two countries appears in the top ten: Kenya (18%) being the second and Tanzania (7%) the fifth. Other African countries in top ten are South Africa in first position with (21%), Nigeria in third with (14%), Algeria in fourth with (8%), Zimbabwe in sixth with (6%), and Sudan in seventh with (6%). Egypt and Ghana were tied with three percent each. This positioning is based on the number of repositories without considering the number of items contained therein. The results are presented in Figure 1.
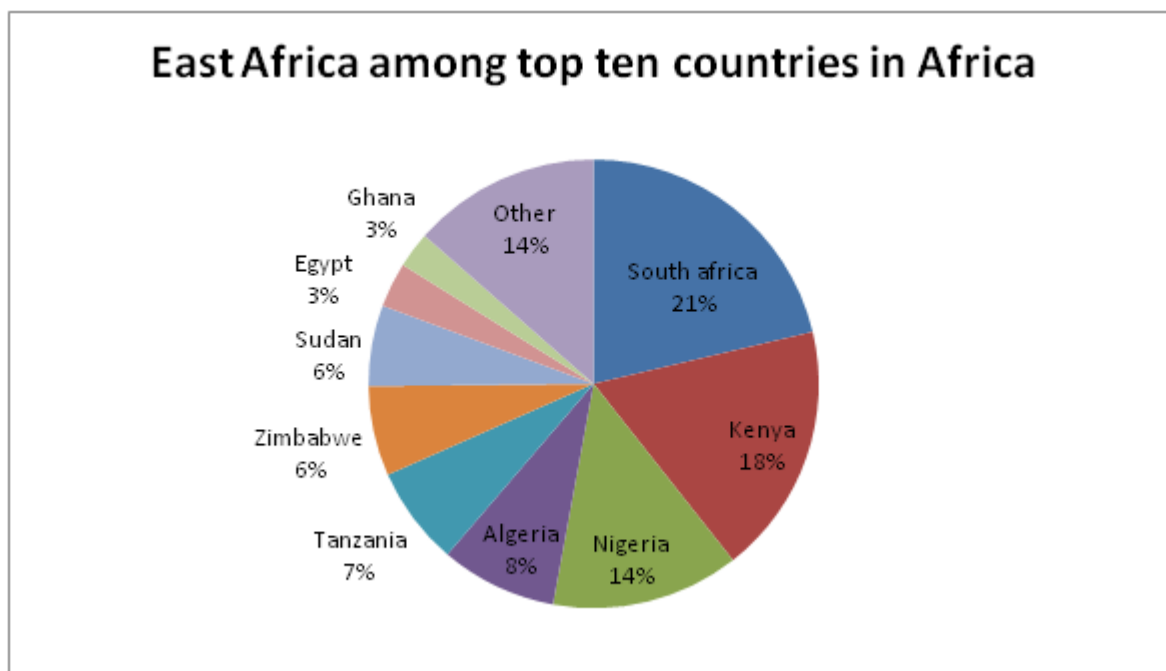
Source: OpenDOAR (September 2017)
Figure 1: Top ten countries in Africa

Contribution of East African countries to OARs
Second, the study intended to determine contribution of each East African country in terms of number of repositories and items deposited in their respective repositories. Findings in Table 1 indicate that East African countries combined have 161,066 items in their OARs with Kenya

alone accounting for 138,575 of items or 18.1 percent of the OARs tally in Africa, Tanzania has 14,963 (7.1%) whereas Rwanda and Uganda have only two repositories which accounts for only 1.3 percent (see Table 1 for the distribution of OARs for each East African countries). Moreover, the study findings indicate that East African countries cumulatively have 43 repositories, which accounts for a mere 1.2 percent of the global tally. In other words, East Africa makes a very low contribution to OA resources as compared to other parts of the world. Findings from DOAR indicate that the United Kingdom alone has 256 OARs, which accounts for 7.5 percent of all OARs whereas German has 202 or 5.9 percent of all OARs.

Table 1: Contribution of East Africa countries to global OARs

Countries	Number of repositories	Percent in Africa	Contribution to World	Items	Percent in Africa	Contribution to World
Burundi	0	0.0	0.0	0	0	0.0
Kenya	28	18.1	0.81	138,575	13.5	0.019
Rwanda	2	1.3	0.05	5,175	0.5	0.0007
South Sudan	0	0.0	0.00	0	0	0.0
Tanzania	11	7.1	0.32	14,963	1.4	0.0020
Uganda	2	1.3	0.05	2,353	0.22	0.0003
Total	43	27.7	1.2	161,066	15.6	0.0221

Source: OpenDOAR (September 2017)

Contribution of OARs from East Africa by number of subjects
Third, the study to determine the subjects covered in each OARs. The summary of results on the subjects covered by OARs in East Africa presented in Table 2 indicate that about 62.7 percent of East Africa repositories in OpenDOAR are multidisciplinary with only 37.3 percent being subject specific. Subject specific repositories are mostly related to science and technology rather than social sciences and humanities.

Table 2: Contribution of OARs by number of subjects

No.	Subject	Repositories

1.	General science	2
2.	Ecology & Environment	4
3	Biology and biochemistry	2
4	Earth & Planetary science	2
5	Law & politics	6
6.	Health and Medicine	4
7	Architecture	2
8	Civil Engineering	2
9	Computers & IT	2
10	Geography & Regional studies	3
11	Business & economics	5
12	Education	3
13	Library & information science	3
14	Management and Planning	3
15	Social Science General	3
16	Philosophy & Religion	2
17	Agriculture, Food & Veterinary	6
18	Multidisciplinary	27

19	Other	8

Types of documents archived in East Africa's OARs

Fourth, the study also sought to identify type of document archived in the OARs of East African countries. Results show that 35 repositories archive articles, 34 archive theses and dissertations, whereas 28 archive conference papers and procedures. Unpublished reports are archived by 24 repositories whereas books, book chapters and sections are archived by15 repositories. Learning objects and multimedia are archived by 14 and 10 repositories, respectively. The findings imply that only a few repositories archive books and book chapters. In fact, a notable eight repositories do not even archive any journal articles, when these are supposed to be most common outlet of scholarly research and communication. The results are presented in Figure 2:
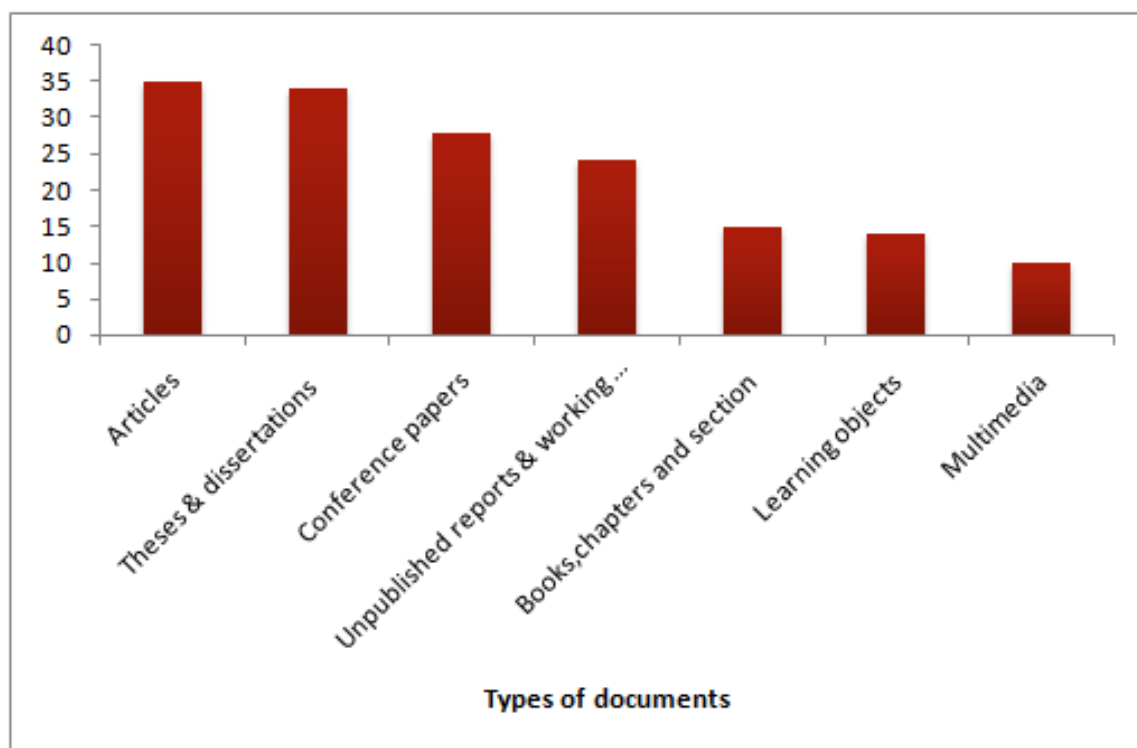

Figure 2: Type of documents archived in Repositories

Open source software used in Repositories

Furthermore, the study also sought to determine the type of open source software used by repositories in East Africa. The results indicate that the most popular open source software in

East Africa is DSpace used by 37 (86%) of the repositories in this sub-region, followed by EPrint used by only three (6.9%) repositories. The least used software are Greenstone and Drupal with one (2.3%) each. The preference for DSpace over other open source software may be attributable to its capacity to offer by default communities such as university departments and a wide range of collections. Moreover, it has sufficient workflow management support (Pyrounakis & Nikolaidou, 2009). Table 3 presents open source software used in East Africa:

Table 3: Type of open source software

No.	Type of software	No. of Repositories
1	DSpace	37
2	EPrint	3
3	Greenstone	1
4	Drupal	1
5	Unknown	1

N= 43

Language used in OARs in East Africa
Finally, the study also wanted to identify the language applied in the OARs of East Africa. The results show that all the repositories in Kenya use English with one of them also using French; two repositories in Rwanda use English exclusively; all the repositories in Tanzania use English with two of them also using Kiswahili; and, two repositories in Uganda exclusively use English. These results confirm that English is the most frequently used language in the repositories of East African countries. Strangely, Kiswahili, the lingua franca for Eastern and even some parts of central Africa appears to have limited applicability despite emerging second in terms of the languages used. The results are presented in Table 4:

Table 4: Language used by OARs

Country	English	Kiswahili	French
Burundi	0	0	0

Kenya	28	0	1
Rwanda	2	0	0
South Sudan	0	0	0
Tanzania	11	2	0
Uganda	2	0	0

N=43

Conclusion

The contribution of East African countries to the global open access literatures through open access repositories stand at a paltry 0.022 percent of the global items, or 15.6 percent of the African region share. This little contribution has been related to lack of open access journals from East Africa. The region has generally been relatively slow in coping with the rapid pace of global advancements in ICTs. However, among the East African countries, Kenya stands heads-and-shoulders above five other East African nations in terms of number of repositories at its disposal and items it contributes to the OARs. It is followed by Tanzania, then Rwanda and the fourth Uganda. South Sudan and Burundi have not made any notable contribution thus far. On the basis of these study findings, this paper implores individual East African countries to make necessary arrangements to adopt and use OA repositories in a scaled up manner to enhance free access to knowledge and information and, consequently, boost socio-economic development in the region.

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