Chapter 2
Open Access Initiatives in Ethiopia’s Higher Learning Institutions

Melkamu Beyene
Addis Ababa University, Ethiopia

Solomon Mekonnen Tekle
University of Pretoria, South Africa

Daniel Gelaw Alemneh
University of Pretoria, South Africa

ABSTRACT

Ethiopia is one of the world’s oldest civilizations with a population of about 120 million (2022 estimate). Ethiopia suffers from declining higher education quality, resulting from the rapid growth in the number of institutions (from three in 1990s to 50+ public Universities and 327+ private higher education institutions in 2022), the rapid expansion in tertiary student enrollment, as well as the lack of basic entrance qualifications. The quality of education in Ethiopia is further impacted by their limited access to critical content or knowledge as evidenced by limited subscriptions to scientific and technical databases. In recognition of open access’s (OA’s) potential to fill disadvantageous access gaps and enhance the overall educational quality, Ethiopia adopted a National OA policy in 2019. Among other enforcement mechanisms and guidelines, the policy requires universities to deposit all publicly funded publications in the National Academic Digital Repository of Ethiopia as well as in an institutional repository. In this chapter, the authors outline the state of OA policies and practices in Ethiopia’s higher learning institutions.

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INTRODUCTION

Knowledge is universal and it must be disseminated without time and space limitations. Open Access (OA) is acclaimed to remove time and space barriers for disseminating research outputs. It has the potential to positively impact research, teaching and learning in Higher Learning Institutions (HLIs) by facilitating knowledge and information sharing within academic communities. Although OA became an important agenda for HLIs in the late 20th century in developed countries, it is even a more recent phenomenon in developing nations. Because OA is a recent issue for developing nations, knowledge and data sharing policies and procedures are in their infancy.

With further development of OA policies and procedures, greater visibility of HLI research products can be achieved. As it is now, sub-Saharan African countries contribute less than 1% of the world’s publications (Piron et al., 2019). Ethiopian universities and research institutions experience a multitude of challenges disseminating scholarly research results. Some of these challenges are technical such as bandwidth, economical (e.g., budget constraints, low staff salary, poor incentive mechanisms) and others are mainly social (e.g., research culture) The lack of infrastructure for science communication significantly hinders developing nations’ ability from both actively participating in knowledge generation as well as from enhancing the visibility of their scholarly works. Nonetheless, OA policies and procedures show promise for eroding the barriers experienced by developing nations.

The Ethiopian government has been working ambitiously to expand HLIs and to equip universities with the required teaching, learning and research materials. For example, the government allocated some fund to pay for the subscriptions and/or purchase of books and journals at all public universities and research institutions. This budget is, however, very limited and, hence, does not cover subscriptions to international journals. As the number of journals and cost of journal subscriptions continue to climb, let alone to add new items, it is not possible to maintain even same subscription with the allocated budgets. Accordingly, universities are searching for more access options to meet the needs of scholars (Getaneh, 2009; Chuan & Kaur, 2009). That is not to say that traditional subscription models are ineffective; just that their costs are prohibitive and that supplemental models are needed to overcome financial barriers. Given the overwhelming cost and access issues, the focus on developing OA systems is the concern of MOE and all HLIs. Without increased accessibility and visibility, researchers will not gain recognition nor contribute to the world’s scientific outcomes. Likewise, scholars in developing nations will remain distant from scientific knowledge produced by the rest of the world. The transformation from the traditional journal subscription models to OA models is therefore a timely and necessary endeavor.

Although many stakeholders argue that access challenges in low- and middle-income countries are often related to infrastructure, OA would indeed, boost access for researchers at poorer institutions. The introduction of OA in developing countries like Ethiopia has several advantages for scholars and their HLIs. First, OA increases access so that other researchers can use and cite the works of Ethiopian researchers and scientists. Second, the openness of their publications increases the visibility and impact of their scholarship across the globe. Third, with greater visibility should come increased opportunities for networking and international collaboration for Ethiopian scholars. This in turn, promote interdisciplinarity may provide greater professional development and partnership opportunities that ultimately benefit the students they mentor and raises the general quality of education. Fourth, OA reduces journal paywalls that severely inhibit the quality of research, teaching, and learning at Ethiopian HLIs (Ezema & Onyancha, 2006). The promise of OA systems is striking. There is little doubt that mandatory OA
projects amongst Ethiopian HLIs will enhance the visibility and recognition of their scholarship and accommodate the ever-increasing internal needs.

Libraries around the world are at the forefront to call for a shift to new scholarly communication approaches, mainly due to the excessive subscription costs under existing publication models. In the same way to the experiences of other countries, open access initiatives in Ethiopia can also be attributed to Libraries’ effort in higher learning institutions of Ethiopia. The existing efforts and success stories in Open Access was begun by combined efforts by Electronic Information for Libraries (EIFL) and the consortium of Ethiopian academic and research libraries. The issue of OA as a main target of discussion in Ethiopia was started in 2014 by AAU with the support of many stakeholders like EIFL. The main goal of the initiative is to share information and knowledge among the academicians and the public at large by making theses, dissertations, research outputs, journals and any data that could be used as source for academicians and researchers. To further the main goal of sharing information and knowledge globally among academics, we strive to further stimulate conversations and innovation by providing a detailed appraisal of the current status and progress of OA initiatives in Ethiopia.

BACKGROUND

The discussion about openness in Ethiopia started in 2000 when scholars from Addis Ababa University participated in the Database of African Thesis and Dissertations Research (DATAD-R) project (Mary, 2003) led by the Association of African Universities. The objective of DATAD-R was to develop a regional database of theses and dissertations. The project culminated in the launch of an online database of thesis and dissertation abstracts from Universities in Africa in 2003. Though DATAD-R was not specifically an open access project, it stimulated conversations about open access benefits among African academicians, including those in Ethiopia. The success of DATAD-R project helped birth an open access project at Addis Ababa University (AAU) in 2007 called Electronic Thesis and Dissertation (ETD). Following the AAU-ETD model, other Universities and research institutes, including the Forum for Social Studies, St. Mary (private) University, and Haramaya University, opened their own repositories.

In addition to the launch of the first few institutional repositories, the Consortium of Ethiopian Academic and Research Libraries (CEARL) offered training and workshops on OA. While this helped disseminate information about OA, encouraging others to follow suit, several universities reported that the lack of OA policy hindered progress in their OA repository projects. To address policy issues, in 2014, Addis Ababa University in collaboration with Electronic Information for Libraries (EIFL) hosted a workgroup on OA policy development. The workgroup developed an AAU OA policy, which was later shared to all members of CEARL for adoption. Jimma University is the first University in Ethiopia to have approved policy in 2018 followed by Adama University, and Arbaminch University in the same year and then Hawassa University in 2019. Parallel to the creation of institutional OA policies, CEARL proposed a national OA policy to Ministry of Education (MOE) in 2017, which was adopted and put into effect in 2019.

The success of OA repositories at AAU and other Universities sparked enthusiasm among the publishing community. Local journals started working to open publications to the world, eventually leading to the launch of the Ethiopian Journals Online (EJOL) project by AAU and EIFL. The EJOL platform was launched in 2014 with six open access journals. After moving to MOE’s national platform, the participating journals increased four-fold to 25.
METHOD

For the current review, appraisal procedures from the Budapest Open Access Initiative has been adopted (BOAI, 2002). In the BOAI, scholars employed a variety of metrics to help ascertain the maturity of OA initiatives. They applied a set of criteria for assessing OA initiatives related to infrastructural development, OA policy, and awareness of OA systems among the academic community. When examining OA initiatives from the perspective of infrastructure development, institutional repositories and their functionality are standardly considered. Moreover, the extent to which the generation and implementation of OA policies ensure fair use of copyrighted information for educational and research purposes is assessed. Finally, appraisals of OA initiatives often rely on researchers’ collaboration with HLIs and in alignment with OA publishing principles.

To conduct this investigation, data were extracted from publicly available secondary sources such as HLIs’ websites, official letters, policy documents, and observations during the authors’ participation in OA workgroups and committees. We employed the BOAI framework to appraise four main issues pertaining to OA initiatives in Ethiopian HLIs. First, we examined the extent to which OA policies have been adopted; second, we explored the availability of the infrastructures, in terms of connectivity and software platforms, that are necessary to bring about sustainable OA outlets; third, we surveyed researchers’ and other stakeholders’ awareness via OA campaigns and training programs; and finally, we computed the number of research outputs from Ethiopian HLIs in OA journals and explored the use of Gold OA routes. We report our findings in the subsequent sections, organized according to these four overarching issues.

OA POLICIES AND IMPLEMENTATION

The aim of OA policy is to provide free online access to HLI outputs in the areas of research, capacity building training, and the like. University research outputs are deposited into established repository systems. Repositories allow for the research products to be accessed without cost immediately and ensure long-term preservation and ongoing dissemination (IIfPHC, 2020). OA policy documents drafted by the respective HLIs govern the procedural and administrative issues related to the OA systems.

Electronic Information for Libraries (EIFL) played critical role in introducing OA policy to Ethiopian HLIs. EIFL, a nonprofit organization, took the leading role in advocating for changes in systems of scholarly communication most importantly in developing countries such as Ethiopia. Due to the support of EIFL, many new OA policies have been established in universities and research funding agencies in developing countries. These policies are increasing access to knowledge and making it possible for institutions and scholars in these countries to share their research outputs to the world, which in turn increases the visibility of their work.

Realizing that OA scholarly communication benefits from clear policies and implementation strategies, the Ethiopian Ministry of Science and Higher Education (MoSHE) established a policy system by which the OA model is monitored. The MoSHE policy applies to all research outputs produced by employees of Ethiopian public universities. The national OA policy proposed by the Ethiopian Consortium of Ethiopian Academic and Research Libraries was drafted in 2017 and then circulated to all public universities for adoption. The MoSHE OA policy was officially adopted in Ethiopian in 2019.
The Ethiopian Ministry of Science and Higher Education (MoSHE) in collaboration with Addis Ababa University implemented the National Academic Repository of Ethiopia (NADRE), which is a national repository that harvests publications from local repositories maintained by individual institutions in Ethiopia. Universities are continuing to implement and support their own institutional repository system and contribute their deposited products to NADRE. As shown in Figure 1, the procedures for opening access and depositing research products into the repositories, including dissertations and theses, are clearly outlined in the National Repository policy (MoSHE, 2019).

Jimma University was the first university to have approved OA policy (see Figure 2). Other public universities such as Arbaminch University and Hawassa University have also approved their own respective OA policies. Jimma University’s OA policy, for example, addresses OA policy statements; selection, retentions, replacement and withdrawal of data; types of publications that should be deposited; information needed and submission deadlines; the version of the manuscript that needs to be available; the embargo period; quality control; management; compliance with the policy; data of enforcement; and policy review (Jimma University, 2018).

Hawassa University’s OA policy, similarly, states that research outputs and data available in the repository can be accessed via the university’s website or in any search engines (e.g., Google) and presents the specifications for any work that could be made available in the repository system (Hawassa University, 2020). It is believed that the new national OA policy encourages open science practices by including ‘openness’ as one of the criteria for assessment and evaluation of research proposals. The policy addresses issues related to data submission, data handling and data sharing.
Researchers who receive public funding are supposed to submit data management plans to university libraries for approval. Plans should outline how the data are handled in accordance with international data handling principles such as accessibility, interoperability and reusability. At the same time, the NADRE and universities are responsible for ensuring that all publications based on publicly-funded research are deposited in their archives. Although OA policy is an important issue for HLIs, to date only 3 of the 47 universities under the MoSHE (i.e., Hawassa University, Jimma University and Arba Minch University), have so far adopted/created OA policies.

New OA policies are expected to increase the visibility of Ethiopian research within national and international research communities and raise the quality of Ethiopian research as researchers will see and verify each other’s work. The adoption of an OA policy and system helps practitioners in organizations to access research outputs. Sharing research and data openly makes duplication monitoring possible, thereby saving costs, time, and effort.

OA system and policy adoption in most of Ethiopian public universities, particularly second, third and fourth generation universities is, however, still not implemented. Despite their growing recognition for the need for OA policies and procedures, many universities are hindered by the lack of basic infrastructure. They are limited in terms of hardware and software. Nonetheless, second, third and fourth generation universities are working diligently to expand their infrastructure that can be leveraged to support OA policies and practices.

INFRASTRUCTURAL DEVELOPMENT

Infrastructure refers to the hardware and software needed to realize an effective OA program in the country. In these category, two issues are explored. The first is the data center and network connectivity issues and the second is the software platform issues.
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Data Center and Network

Despite the fact that a rapid expansion of higher education is observed in the last two decades and the number of public universities grew to 46, there are still insufficient supplies of textbooks and reference materials, laboratories and workshop equipment, and access to Information and Communication Technology (ICT) facilities. One of the major efforts of Ethiopian higher learning institutions is the implementation of a National Research and Education Network (NREN). According to the statistical framework proposed during the World Summit on the Information Society (WSIS) in 2011 (Peña-López, 2011), a NREN is: “a specialized Internet service provider dedicated to supporting the needs of the research and education communities within a country. NRENs usually administer and support a high-speed backbone network; often offering dedicated channels for individual research projects” (p. 24). NRENs are supposed to solve the spread over of HLIs in wide geographical area across the country. The existing ICT infrastructures in Ethiopian HLIs are insufficient to support NREN services. Furthermore, the absence of ICT facilities supporting researchers and instructors hinders the exchange of viable educational material among members. The goal is to connect scholars to each other and with their global counterparts to share resources and collaborate to solve complex challenges of research and scientific issues.

Ethiopia, which is both a least developed country (LDP) and a landlocked developing country (LLDC), has been successful in creating EthERNet, which can enable Ethiopian researchers, scientists and educators to collaborate and work together with each other and with their colleagues in the rest of the world to develop a common and integrated solutions that can solve their common challenges (Bankole & Assefa, 2017). EthERNet was initiated by the government of Ethiopia in 200 as part of a national capacity building program. EthERNet is an Ethiopian NREN (national research and education network) and a member of UbuntuNet Alliance, which is a regional association of NRENs in east and southern Africa. It initially focused on the development of ICT infrastructure for public universities to share educational resources locally and globally and providing tele-education and tele-medicine that enabled the delivery of many types of trainings, classes and meetings.

EthERNet was launched to build and deliver highly interconnected and high-performance networks for universities and other educational and research institutions in Ethiopia. More specifically, EthERNet was aimed to build and deliver high performance networking that connected institutions with each other and similar institutions in the world, and by doing this to enable them to share educational resources and collaborate both within Ethiopia and globally and helping address and overcome the critical shortages of resources (Bankole & Assefa, 2017).

Currently, all Ethiopian universities are not benefitting from EthERNet because they do not have standard campus network infrastructure. Hence, member institutions should have to have a standard campus network to use the service provided by EthERNet and to serve their campus communities.

Campus networks are the foundation for any effort in building national and regional research and education networks. They should be designed in a way that supports learning, teaching and research, as well as administration. It should also support network and data management issues including like data protection, bandwidth reservation and management, helpdesk services, training, documentation, applications, security and authentication take place at the campus levels. To benefit from the investment made by EthERNet, member institution needs to have their own standard campus network to be connected to other institutions through EthERNet. However, EthERNet has limitations that prevent it from maximizing its potential.
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The EthERNNet limitations include lack of computing infrastructure in data centres; EthERNNet is not yet connected to the Global NREN; security and reliability of the network; lack of application services for teaching and learning; lack of application and infrastructure service for researchers such as collaboration tools, high performance computing, large file sharing, etc.; insufficient Internet bandwidth; lack of standard campus network infrastructure in some of the member institutes; lack of access device such as computers or smart mobiles sufficiently; and unavailability of last mile connectivity for remote campuses.

Besides the numerous barriers, there has been aggressive network infrastructure expansion and data-center infrastructure building in the last five years in collaboration with the MoSHE. Despite regular progress, there remains a long way to go to achieve the goal of sufficient infrastructures to realize OA initiatives in Ethiopia.

Open Access Platforms

The major OA repositories in Ethiopia were developed alongside the expansion of HLIs and the introduction of postgraduate programs in many universities. This has also come as a result of expansion of network connectivity and local data centers at different universities. There are many initiatives across HLIs to build OA platforms. A major initiative to build OA platforms came after the approval of OA policies in Ethiopia.

The former MoSHE in collaboration with Addis Ababa university initiated a project called “Developing Digital Platforms and Contents Project (DDPCP) for Public Higher Education Institutions use at EthERNNet Data Center.” The aim of this project was to design digital platforms at a national level and collect open access content from different universities in a central repository. The project also aimed to implement institutional repositories for 16 universities that have difficulty in establishing their own datacenter. As part of this project, a national open journal platform, Ethiopian Journal online (EJOL) (https://ejol.ethernet.edu.et), which was managed by Addis Ababa University has been implemented at EthERNNet data centers. The platform is ready to be used by local journals for online publication. Figure 3 below shows the snapshot of this portal. A redundant copy of this system is also archived in Addis Ababa University Datacenter. The migration of this system to the national datacenter and related trainings as part of this project brought significant promotional effect among the HLI community.
A national digital library based on the DSpace platform has been implemented at EthERNet data centers as shown in Figure 4. A total of 80,893 full text e-books have also been uploaded into the digital library with standard metadata. This digital library, containing reference and educational materials such as course syllabi, was the only source of information for universities in Ethiopia during the time of Covid-19 pandemic.

Figure 4. Ethiopian digital library
The national digital library was promoted through different media outlets and each university contributes their course materials based on OA licensing. Ethio-telecom allows students to download contents from this platform without accruing data costs. An example of how the platform was promoted in the news is shown in Figure-5 below.

**Figure 5. Ethiopian digital library promotion**

There were efforts to move contents from institutional repositories (IR) from regional universities such as Gonder, Jimma, Bahirdar and Addis Ababa into a central repository. As a result of this effort, significant amount of content has migrated to a national platform (Figure 6) especially from Addis Ababa University.

**Figure 6. National digital repository**
Despite the exceptional progress, these initiatives still require further efforts to make the work sustainable. For instance, only 12 out of 16 institutions implemented the IR. However, their data infrastructure capacity in the EthEРNet datacenter was insufficient and it was difficult for MoSHE to provide ongoing support. Moreover, the majority of institutions lack professionals in library and information sciences. Additionally, there is substantial turnover of library professionals which aggravate the situation even more, as such turnover requires frequent and recurrent training on the topics needed to sustain the systems. Another barrier is that trainees consist of individuals who vary in their knowledge of library sciences. Different classes for individuals with basic versus advanced levels of awareness have been recommended, but this increases the number of trainings trainers must prepare and deliver. The frequency and diverse training topics demand substantial time of the trainers, making them difficult to manage. Moreover, institutions were advised to select qualified and appropriate trainees. The national digital repository would only be sustainable if there is standard content acquisition mechanism. It is observed that some faculties openly resisted the use of institutional repositories and making resources freely accessible. More advocacy activities among faculty will be needed through a series of follow up trainings on the deployment of OA policy for the institutes.

Success stories in building institutional repositories especially for thesis and dissertation open access initiative are available at a number of universities. The Addis Ababa University Thesis and Dissertation Repository (etd.aau.edu.et) which contains more than 26,000 records is a good example (Figure 7). There are also ongoing efforts to digitize the existing hardcopy thesis and dissertation and to upload them into AAU’s IR.

Figure 7. AAU’s repository

Currently, about 13 universities under the ministry have IRs. However, due to policy and technical issues, the repository system belonging to only four universities are functional. For the sake of improving OA in all HLIs of Ethiopia, the Ministry in partnership with Addis Ababa University, has launched a project, managed by Consortium of Ethiopian Academic and Research Libraries and EIFL coordinator, aiming to hasten the establishment of IRs at all public universities as soon as possible.
Other universities are also joining this initiative by implementing similar platforms. As shown in the subsequent figures Gonder (Figure 8), Haramaya (Figure 9), Bahirdar, Hawassa, Mekele and other universities offering postgraduate programs have implemented IRs.

Figure 8. University of Gonder IR
Recently, Addis Ababa University has joined a broad international movement. As shown in Figure 10, the initiative seeks to implement a new data repository (rdm.aau.edu.et) to share research data. Among other pushing factors, the data repository was primarily motivated by the approval of data sharing policy of Addis Ababa University (AAU, 2020). Another important initiative that promotes open access movement at Addis Ababa University is the requirement to archive publishable articles (i.e., currently a requirement for graduation) of PhD and Master’s students in AAU’s IR in the form of preprint archive.

Figure 10. AAU’s data repository
Despite many initiatives, sustainable open access infrastructure is yet to come. Platforms are not available 24/7. This is mainly attributed to lack of connectivity in different universities. As a result, many IRs from regional universities are not accessible at this time. Moreover, data curators and library professionals that can sustainably support platforms are not available. It is of paramount importance that building the capacity of library professionals is a mandatory prerequisite for building sustainable OA infrastructures in Ethiopia.

**Awareness and Training Initiatives**

Since the attempt to adopt OA systems started, it has become the concern of professionals in the field of information science to create awareness about OA among faculty and students. To increase awareness on OA Universities run series of workshops and trainings on OA. Some public universities in Ethiopia have introduced repository systems where theses, dissertations and any other data could be uploaded so that researchers or anyone else who needs can easily access them online. OA policy, which is believed important to the administration of OA systems, was also adopted by few first-generation universities.

To achieve the stated goal of OA system, providing targeted capacity building trainings for concerned bodies was found to be among the critical success factors. In 2019, Addis Ababa University and MoSHE conducted trainings on repository system management to repository managers, journal editors and researchers from respective public HLIs in Ethiopia. Meanwhile, online journal management training was given to journal editors. It is believed that the training helped repository managers and administrators to manage their new IRs. Training on “Institutional Repository Management” was delivered on 16-20, September 2019 to 57 participants representing Universities across the nation. Training on “Online Journals Management,” was delivered to 40 participants from September 30 to October 4, 2019. The participants reported that problems related to infrastructure; frequent power interruptions; unavailability of server; among other issues, hindered the success of their OA initiatives.

In addition, a number of trainings and promotional campaigns were also conducted at different times for different universities by CEARL, EIFL and Addis Ababa University. Even if one-time training on repository systems and journal management was given to all OA stakeholders, it would not be sufficient. Training and capacity building requires continuous effort to make OA systems functional. As a result, the capacity of HLIs to support ongoing training and professional development is a high priority. As there are newly established public universities under expansion and construction, training and capacity building on OA needs to be continuously offered.

The number of publications in OA journals in Ethiopia is rapidly increasing. This only includes journals that are published in Gold open access outlets. Figure 11 shows the increasing trend OA publications in Gold open access journals by Authors from Ethiopia. The number of preprint OA publications in preprint archives is also increasing as is shown in Figure 12.
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Figure 11. OA publications in Gold open access journals by Authors from Ethiopia

Figure 12. OA preprint articles publication by authors from Ethiopia
CHALLENGES AND OPPORTUNITIES

Challenges

The evolution of Ethiopian OA systems has been hampered by various challenges. In order to fully enjoy the benefits of OA, the challenges need to be addressed and overcome. The following challenges have been identified as the major bottlenecks that slowed the progress of OA initiatives.

Managerial and Professional Turnover

The Consortium of Ethiopian Academic and Research Libraries (CEARL) have conducted many trainings and workshops on OA to build the capacity of academic leaders and professional librarians. However, due to high turnover in managers and librarians, the trained professionals leave library environments without finalizing the OA projects they started at their respective libraries. The challenge is further complicated by the lack of scientific knowledge sharing practices, which limits the transfer of knowledge and skills to the new staff. This ultimately slows down or terminates OA initiatives until new staff can be hired and trained. The challenge of training and retention have been particularly detrimental to OA platform development and policy initiatives.

Dispersed OA Initiatives

Another challenge is lack of coordination among the number of organizations involved in OA initiatives in Ethiopia. Many different organizations have been supporting OA initiatives including CEARL, EthERNet, MoSHE, Higher Education Strategic Center (HESC), and Ethiopian Academy of Sciences (EAC). Although these organizations have contributed a lot toward OA successes in Ethiopia, some of their efforts overlap, which can result in wasting resources. The lack of coordination between and among these organizations slows down the decision-making process. Decision makers are often confused with the different initiatives and the various organizations that advocate for them. One of the areas of overlap was national policy development on which CEARL, HESC, and EAC were working separately. Eventually in 2018, CEARL, EthERNet and HESC established a coordinating committee to work on OA policy. This type of committee is considered best practice in OA collaboration. The collaboration also helped to implement the national repository and Ethiopia’s online journals project led by Addis Ababa University and EthERNet.

Restructuring of Universities and Government Ministries

Ethiopian Universities have been engaged in reform initiatives to improve efficiency and enhance quality of Education. Similar initiatives are taking place within the MoSHE. These reform initiatives moved the OA projects to new offices which delayed the projects as the offices didn’t have experience on managing projects. The restructuring of universities and the Ministry also required in the appointment of new managers which slowed the progress of OA initiatives as the newcomers took longer time to learn the values of OA initiatives and support it. Though we are discussing the challenges here, the reform also contributed positively to OA initiatives as most of the universities and the Ministry encouraged the implementation of library technologies and library automation, digital library and IRs.
Long Decision-Making Process

One of the major challenges in OA initiatives is that universities use a long and bureaucratic decision-making process, especially related to institutional OA policy. Some universities have been waiting for approval of their proposed OA policies for more than ten years, even though they are members of CEARL. The lack of approved institutional OA policy in some universities hinder the opening of their IR to the world, even though national OA policy mandates that OA shall be the default for research dissemination.

Awareness and Skill

CEARL, HESC and EthERNet have been conducting various training and workshops on OA targeting research leaders, librarians, editors, researchers and publishers to increase their awareness and skills. However, the dynamics of open science, staff turnover, and the emergence of new universities requires academic leaders, librarians, and researchers who need continuous capacity building training on OA.

Opportunities

The successes of OA initiatives in Ethiopia are the result of enabling opportunities with different stakeholders including MoSHE, CEARL and international partners.

Support from the Ministry

MoSHE through EthERNet has been supporting OA initiatives across Ethiopia by contributing policy support, capacity building, and infrastructure development resources. The Ministry adopted a national OA policy to enable the implementation of opening research to the public, which was a great opportunity for universities and research institutions in Ethiopia. In addition, the ministry provides infrastructure support in the form of software and training for HLIs to implement IRs and host OA journals.

Local and International Collaboration

CEARL is the first support centre to start OA initiatives. The consortium provides expertise for any OA project from its members who are located in different universities and research libraries. CEARL also connects libraries with its local partners including MoSHE, EthERNet, HESC, and others to get support on OA issues. Internationally, CEARL collaborates with Electronic Information for Libraries (EIFL), LIBSENSE initiative, and Directory of Open Access Journals (DOAJ), all of which create opportunities for members to take advantage of international expertise and learn best open science practices.

FUTURE RESEARCH DIRECTIONS

It is important to showcase the impact of openness in quality of Education to push the agenda of open access further in Ethiopia. Thus, one of the areas of future research might be assessing the impact of open access for quality of Education. In addition, different mechanisms of impact assessment matrix need to be explored so as to propose appropriate matrix for research assessment for open research. Ethiopia
is at the start of opening research data which is a new phenomenon so there a need to make readiness assessment for open research data which can also be one area of future research. Moreover, studying the knowledge sharing behavior of researchers will be useful to develop open access strategies and it should be researched further.

CONCLUSION

Scholarly communication and knowledge dissemination practices have changed over time. In the time and age we live in, open access plays a huge role in addressing inequities as well as broad-based and inclusive scientific progresses. Apparently, the COVID-19 pandemic highlighted the importance of transparency and reminded us of the importance of open and timely access to information so as to accelerate advances in finding solutions to societal issues in general.

This chapter presented the status of open access initiatives in Ethiopia with the associated challenges and opportunities. Despite the slow start, there is a significant progress with open access initiatives in Ethiopia, ranging from development of national and institutional OA policies to implementation of national and institutional repositories and to the implementation of national open access Journals platform to publish local journals online. The contribution of open access article in gold open access journals by Ethiopian authors is also increasing significantly. The success stories are the results of strong collaboration among various stakeholders, including CEARL, AAU, MoSHE, and HESC locally with our international partner EIFL. Although there are still resistance and skepticism like everywhere else, increasingly local OA Champions (researchers, librarians, and policy makers) joining the bandwagon and contributed a lot to the success of the OA initiatives. The fact that the OA initiatives in Ethiopia have been driven by local OA Champions should help for the sustainability of the initiatives.

REFERENCES


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**ADDITIONAL READING**


KEY TERMS AND DEFINITIONS

Consortium of Ethiopian Academic and Research Libraries (CEARL): CEARL is an Ethiopian library and research institute consortium that aims to assist and facilitate information access and use in Ethiopian higher learning and research institutes.

Creative Commons (CC): A nonprofit organization that offers freely available copyright licenses that provide a standard way to give the public permission to share and use scholarly work, under conditions of creator’s choice. Different licences allow a different degree of openness. The CC BY 4.0, for example, requires attribution of the author and is recommended for open scientific publications.

EthERNet: Refers to academic and research network of Ethiopia mainly focusing on technology infrastructure.

Ethiopian Academy of Sciences (EAS): EAS is a merit-based society of prominent scholars who wish to promote the sciences and bring about development, prosperity and improved health for the people of Ethiopia. The Academy was established on 27 March 2010 by forty-nine Founding Fellows elected by the scientific community. The Academy aims to advance the development of all the sciences, including the natural sciences, mathematics, the health sciences, agricultural sciences, engineering, social sciences and humanities, fine arts and letters.

Ethiopian Journals Online: Is a national journal publications platform for open access journals in Ethiopia.

Ethiopian Ministry of Science and Higher Education (MoSHE): The Ministry of Science and Higher Education (MoSHE), established by proclamation number 1097/2018 in October 2018, is responsible to lead the development of science, higher education as well as the technical and vocational education and training (TVET) in Ethiopia.

Gold Open Access: Refers to the Gold route to open access and is delivered via publishing an article in a journal.

Institutional Repository (IR): Is a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It includes an organization’s commitment to the stewardship of digital materials, including long-term preservation where appropriate, as well as organization and access.

National Academic Digital Repository of Ethiopia (NADRE): Is aggregated national repository for Ethiopia which is established to make open access to research works published by Ethiopian Universities and research intuitions.

Predatory Publishers: Publishers who offer open access for a charge but whose quality and services do not meet the standards set for scientific publications.

Research Data: Is any information that has been collected, observed, generated or created to validate original research findings (such as raw data captured from instruments sensors, visualizations, models, algorithms, images, audio and video files, etc.).