Contents

1. Pursuing sustainable futures through LAMs
   Henrik Jochumsen, Jamie Johnston, and Andreas Vårheim
   Libraries, Archives, and Museums in Transition

2. Library Funding and Sustainable Development of Higher Education
   Clement Ola Adekoya
   International Information & Library Review

3. Fostering library usage among science students towards Sustainable Development Goals
   Femi E. Babalola, Sina J. Fakoyede, Folasade B. Ojobola and Foluke G. Abionâ
   The Reference Librarian

4. A New Lens for Evaluation – Assessing Academic Libraries Using the UN Sustainable Development Goals
   Roxanne Missingham
   Journal of Library Administration

5. Green Library Research: A Bibliometric Analysis
   Simin Li and Feng Yang
   Public Library Quarterly

6. African Libraries in Development: Perceptions and Possibilities
   Renee Lynch, Jason C. Young, Chris Jowaisas, Stanley Boakye-Achampong and Joel Sam
   International Information & Library Review
Introduction

The ideals of sustainability have become the twenty-first-century beacon for securing our common yet increasingly uncertain future. Sustainable practices are widely adopted amongst citizens, corporations, political parties, and governments in Scandinavia and throughout the world. The adoption of these practices has resulted from greater societal awareness of global interdependence as well as the climate crisis that drives the international agenda. Sustainability researcher Leslie Thiele emphasizes the gravity of the situation by stating that the consequences of our actions, and inactions, will cross borders and generations, span the globe, and cast long shadows into the future (Thiele 2016).

Sustainability is a broad concept that refers to the present and future generations’ environmental, economic, and social well-being. According to sustainability researchers Tom Kuhlman and John Farrington (2010), the concept was coined in German forestry in the early 1700s as Nachhaltigkeit, which means never harvesting more than what the forest yields in new growth. Sustainability as an area of study was later taken up by economists, including the classic and influential economist Thomas Malthus (1766–1834), who developed a theory connecting the scarcity of resources with population growth.

The widespread attention to sustainability can be attributed to the report “Limits to Growth” by the Club of Rome that was published in 1972. The report pessimistically predicted that many resources crucial to our survival would be exhausted in one or two generations. This was followed by the so-called “Brundtland Report” that was published in 1987. The report, named after the former prime minister of Norway, Gro Harlem Brundtland, was more moderate in tone and described sustainability as a worthy goal to be pursued through sustainable development, which was envisioned as the sum of natural and man-made
resources remaining constant so that the well-being of future generations would not decline (The World Commission on Environment and Development 1987). Sustainability, as defined in the report, was understood broadly as encompassing a complexity of economic, environmental, and social conditions, which are referred to as sustainability’s three dimensions, often known as the “pillars of sustainability.”

Integrating the three pillars of sustainable development, the 2030 “Agenda for Sustainable Development Goals” (SDGs) was unanimously adopted by the United Nations member states in 2015. The 2030 Agenda serves as a universal call to action to end poverty, protect the environment, and achieve peace and prosperity for all. It recognizes that ending poverty and other deprivations must coincide with environmental and climate-friendly strategies that can also sustain economic growth and development. The Agenda’s 17 sustainable development goals (SDGs), known as the “Global Goals,” “provide a shared blueprint for peace and prosperity for people and the planet, now and into the future.”

The Nordic region is ambitiously pursuing the 2030 Agenda. The Nordic Council of Ministers baseline report “The NORDICS – A Sustainable and Integrated Region? Baseline Report for Our Vision 2030” (2021) designates three areas of strategic priority for the region: a green Nordic region, a competitive Nordic region, and a socially sustainable Nordic region. The report indicates that the Nordic region is starting from a solid base but reveals challenges and room for improvement in all three areas, especially concerning the green Nordic region. Specific areas of concern related to the environment are greenhouse gas emissions and the protection of nature and biodiversity. The region is competitive and innovative; however, school dropout rates and a widening education gap between men and women are major challenges, with men generally obtaining fewer qualifications and being at higher risk of dropping out. Social sustainability is challenged by the persistent gender segregation in the labor market and by integrating non-EU citizens into the workforce, especially women.

This chapter considers the ways libraries, archives, and museums (LAMs) are meeting the challenges that the Scandinavian societies face in the twenty-first century and the roles the institutions play in pursuing sustainable futures. The following two sections illuminate how the Scandinavian LAM institutions respond and contribute to central parts of the sustainability agenda. The focus in the first section is on how the institutions are advancing environmental responsibility, and the second section looks at how they promote social equity related to diversity and equality. The two sections offer typologies that broadly group LAMs’ activities in the related areas. A final section on the LAM institutions as part of the Nordic model provides a reflective perspective on the institutions as agents working on supporting sustainable futures. This chapter does not address economic sustainability directly. This is because the education-, innovation-, and inclusion-related activities and work being done associated with environmental and social sustainability provide support for economic sustainability and are more central to the role of the LAMs.
Sustainability and the sustainable development goals

Until the adoption of the 2030 Agenda, sustainable practices within LAMs were primarily connected to the attention given to the greening of LAM buildings, practices, and services. This was seen in the advent of what is commonly referred to as “the Green Library Movement” in North America in the 1990s. Nowadays, the universal imperative for action and goals for achieving sustainable development are prioritized in LAM strategy documents. For example, this is seen in the International Federation of Library Associations and Institutions’ (IFLA) strategy “Global Vision” that calls upon libraries and librarians to act and “initiate the change that is urgently needed confronting climate change, poverty, hunger, gender equality, etc.” (Hauke 2018, 1). This call for action is central in the 2021 IFLA World Library and Information Congress theme: “Let’s work together for the future.”

The call or readiness to act can be seen in the context of broader developments in the library field. The first development is the increased focus over the past two decades on the users, the role of the library, and the value it brings to the citizens, community, and society. As stated by researcher Anne Goulding, the public library has been repositioned not just as a place to borrow or read books or access digital materials, but as a key resource and facility that can act as a venue for community events and an access point connecting individuals with one another, their local communities, and the wider society (Goulding 2009). The second development is the increasing focus on librarians as proactive change agents and drivers of change. Being a driver of change is not new to librarians. Librarians have always worked to make the world a better place by improving the lives of individuals and communities by supporting enlightenment, literacy, democracy, and social mobility, and by giving free and equal access to information and services. This has been based on a widespread understanding of librarians as being neutral, whereas nowadays there appears to be a growing recognition that librarians should be proactive change agents working for a better world, thus moving away from a tradition as neutral guardians of public sphere ideals.

The library researcher David Lankes has been one of the more forthright promoters of librarians shifting from a position of neutrality to one of advancing social equity and the well-being of their communities (Lankes 2016, 2020). In his influential book on “new librarianship,” Lankes poses the compelling argument that “librarians are agents for radical positive change who choose to make a difference” (Lankes 2016, 1). Thus, according to Lankes, to be a librarian is not to be neutral or passive but to be a radical positive change agent within one’s community (Lankes 2020). Libraries’ and librarians’ engagement in sustainability and the SDGs clearly fits within this development.

In museums, there has been a similar move toward an increased focus on the users, the institution’s role in the (local) community, and the value it creates for citizens, the community, and society. The changes underway in understanding the role of the museums are reflected in the work to update the International
Council of Museums’ (ICOM) definition of museums. The proposed definition states that museums “are aiming to contribute to human dignity and social justice, global equality, and planetary well-being.” Although not accepted in the presented full form, it signals a shift in the way the relationship between museums and the surrounding world is understood.

These changes in the role of museums are seen in the writings of the American museum director Nina Simon. Simon’s two influential books (2010, 2016) concerning user participation in museums and the museum’s relevance in a community context advocate a shift from an authoritative and one-way communicative museum toward a more dialogue-oriented, inclusive, and less collection-centered museum. This shift began around the turn of the century and has been termed “new museology” (Vergo 1989). As with libraries, there is a movement away from an understanding of the museum as being neutral. The British museologists Robert Janes and Richard Sandel observe that “[p]osterity has arrived – the necessary emergence of museum activism” and argue for a more normative and ideologically driven museum practice that works for change. Accordingly, museum activism is seen as a “practice, shaped out of ethically-informed values, that is intended to bring about political, social, and environmental change” (Janes and Sandell 2019, 1).

Similar developments have been witnessed in archives to those seen in libraries and museums. Archives have an increased focus on their societal value as collections and institutions as well as on how they can strengthen their relationship with society and their social relevance in general. Their increased social role has largely resulted from technological developments that have facilitated archives’ increased interaction with their users, such as through crowdsourcing and metadata creation initiatives. Participation has become a central concept to archives (Jensen and Røsjø 2016), as well as the adoption of a more activist approach (see Chapter 16, this volume) to being inclusive and open to all, increasing the visibility of marginalized groups and creating opportunities for community members to be represented on their own terms (Sjögren Zipsane 2016). In particular, there has been an increased focus on the relationship between archives and social justice and on how archival work can serve social justice goals (Duff et al. 2013).

The international adoption of the SDGs, the national and local governmental focus on the goals, and the widespread interest from civic society and NGOs have prompted LAMs, especially libraries and museums, in the Scandinavian countries to pursue sustainability and sustainable development. The Danish Museum Association (ODM) proclaims it will lead the Museum 2030 initiative, building on the SDGs, to advance a shared vision of sustainable museums. Similarly, the Norwegian Museum Association states that it is actively engaged in increasing museums’ focus on sustainability in the future. In Sweden, Formas – a government research council for sustainable development – has provided considerable funding to several museums to disseminate knowledge and research regarding the SDGs. The Danish Library Association created the DB2030 network for
libraries working with SDGs to ensure that the public library sector can serve as an anchor for this work. Furthermore, the Danish Agency of Culture and Palaces made supporting the SDGs a central criterion for libraries to receive funding for projects. Currently, the Scandinavian archival sector does not seem to have made a commitment to sustainability and the SDGs at the associational level like the library and museum sectors have.

Museums and libraries in Scandinavia have taken different approaches toward sustainability and the SDGs. In Denmark, the Danish Museum Association has spearheaded a process with the aforementioned Museum 2030 initiative to create a shared vision of sustainable museums. The focus is largely on how to make museums sustainable by using sustainable energy, supporting research in sustainable solutions, preserving biological diversity, and creating equal opportunities for all citizens. Additionally, several goals aim to support the development of a sustainable society in a broader sense. A similar focus on sustainability has been adopted by the Swedish National Museum, which states that sustainable practices are incorporated in all the museum’s activities and operations. Furthermore, the museum reduces traveling with the help of digital couriers and works with sustainability in its shops and cafés.6

Libraries appear to take a more practical approach to sustainability. Arguably, the modern public library is the quintessence of the sharing economy. The library was one of the first sustainable infrastructures in our present-day society to support a circular economy and collaborative consumption. Many libraries in Scandinavia have further promoted these practices by lending such things as tools, fishing gear, bicycles, laptops, knitting kits, and seeds. Some libraries provide sewing machines that can be used to repair or upcycle clothing and other textiles, and some libraries provide repair stations to fix one’s bicycle. Several libraries have followed with activities such as repair cafés or upcycling workshops, and some libraries aim to be local hubs for citizen-generated ideas and activities related to sustainability by providing space and facilities. Other examples from Scandinavian libraries include programs focused on sustainability such as reading clubs about the Global Goals and specific issues related to sustainability. A major Scandinavian research project entitled UPSCALE is underway that investigates how public libraries can be used for upscaling collaborative consumption by organizing the lending of things such as tools from the local hardware store via the library system.7

The following typology encapsulates the broad range of LAM activities, practices, services, and programs related to sustainability:

**Buildings and operational solutions:** LAM institutions incorporating sustainable goals in their own buildings, activities, and services, or when they optimize existing resources.

**Advocacy and promotion:** LAM institutions advocating sustainability or acting as change agents in the local communities.

**Discovery and dialogue:** LAM institutions creating space for the public to learn or debate about sustainability and sustainable solutions.
Experimentation and development: LAM institutions using their facilities as laboratories to develop and explore new types of services to support the circular economy and sustainable consumption or providing space for new activities for the user and citizens connected to sustainability.

The activities within these areas will develop in the coming years as there will be continual political pressure on LAM institutions to incorporate, promote, and develop sustainable solutions. Working with sustainability also offers the LAM institutions an important way to legitimize their activities in their communities and to various stakeholders.

Diversity, unity, and equality

Scandinavian societies have undergone dramatic sociocultural changes due to greater cultural and ethnic diversification resulting from immigration, greater awareness and acknowledgement of ethnic minorities, and inclusion and empowerment of gender and identity-based groups. This is happening within the context of an increasingly interconnected and globalized world that brings with it new and varied cultural influences from beyond the region. Social anthropologist Thomas Hylland Eriksen (2019) observes that, as with other liberal states, the Nordic countries are striving to find a balance between similarity and difference and between equal rights and the right to one’s own cultural identity. LAMs adopt this approach in responding to the challenges related to diversity. Increasing the visibility and equality of different groups can have far-reaching implications for how societies balance the various, and sometimes conflicting, societal ideals related to sustainability, as well as for their own institutional legitimacy.

Historically, the Scandinavian countries have appeared to be relatively homogeneous based on the dominant national narratives and the cultural representations that they have presented within and beyond their political borders. However, these narratives and images of the nations have been selective and have generally not acknowledged the cultural heterogeneity and diverse identities that have existed in the countries. The national museums and libraries that emerged in the context of the nation-building period of the 1800s played a central role in the creation of the national narratives. The narratives of the respective nations that were formed at that time largely favored the dominant ethnic groups (Danes, Norwegians, and Swedes), thereby excluding the narratives of the diverse groups inhabiting the region (Newby 2019).

These national narratives were challenged in the last half of the twentieth century when various groups began developing and institutionalizing themselves in new and independent cultural forms of expression. This occurred during the cultural upheaval and subsequent emancipation of the late 1960s, when groups from the upcoming generation questioned the existence of a monoculture and championed the acceptance and acknowledgment of greater cultural diversity and lifestyle choices. Labor migration in the 1960s and 1970s, much of which came
from non-Western cultures, accelerated this process and gave it new direction and depth (Audunson 2005).

Since the 1980s, the awareness and acknowledgment of ethnic minorities and their histories have increased worldwide, including in the Scandinavian countries. Groups within Scandinavia who have national minority status include the Jews, Finns (Kvæner, Forest Finns, Tornevalians), Roma and Romani (tatere/tattare), as well as Germans in southern Denmark. The indigenous peoples of Sámi and Greenlandic Inuit also inhabit the region. Many Sámi live in their traditional territories in the north of Norway, Sweden, Finland, and Russia. They are a separate nation that spans the political borders of the countries.

There are also many other ethnic groups that do not have the legal status of being a national minority but who are considered minorities as they constitute less than half the population in their respective countries. These include groups that came to the region in the 1970s and 1990s, such as the Turks in Denmark and Sweden, Pakistanis in Norway, and Yugoslavs in Sweden (Eriksen 2019). However, in the period 1990–2018, most migrants to the Nordic countries, which include Iceland and Finland, came from Poland, the United States, Germany, and the United Kingdom. Migration from countries such as the United States is likely characterized by return migration, Nordic citizens returning home, and therefore may not contribute significantly to the ethnic or cultural diversity of the region. The largest refugee groups coming to the region during this time have come from Syria and Iraq. These groups are followed, in descending order, by migrants from China, Turkey, Thailand, Somalia, France, Romania, India, and Iran. Documentation of migration from countries formerly part of Yugoslavia or the Soviet Union has been varied and inconsistent, thus resulting in some ambiguity over the exact number of migrants who have come from these countries (Østby and Aalandslid 2020, 23–26).

Overall, the largest number of migrants to the region have gone to Sweden, except for during the latter part of the 1990s when most of the migration was to Denmark. Since 1990, Sweden has consistently been the main Scandinavian country of destination for those coming from Africa, Asia, and Latin America. Migration from the new EU countries has been most significant for Norway, and migration from western Europe and the United States has been most significant for Denmark (Østby and Aalandslid 2020, 51).

The struggle for equality and visibility, particularly for women and people identifying as part of the queer community, has paralleled the developments and trends related to cultural and ethnic diversity. The support for gender equality gained momentum in the Scandinavian countries at the end of the nineteenth century. Women progressively obtained equal rights in terms of education, government posts, voting, and political positions in the years leading up to 1920. By 1929, equality within the institution of marriage had also been obtained in each of the countries (Melby, Wetterberg, and Ravn 2008). Yet, while the countries are moving closer to gender equality and greater gender diversity in the workforce, some of the underlying societal attitudes are slow to change, and,
as touched upon in the introduction, there persist gaps in social and economic life, especially concerning pay and representation in management positions (OECD 2018).

For most of the twentieth century, the Scandinavian countries were not generally tolerant nor accepting of queer identities, though there were known pockets of tolerance in the larger urban areas, most notably in Stockholm and Copenhagen. However, a dramatic shift has taken place, especially in the past couple of decades with the legalization and increased acceptance of same-sex marriages, and now the region is regarded as exceptionally tolerant, even being referred to as a *queer utopia*. However, there is still discrimination and unequal representation, especially for the trans community (Benediktsdóttir et al. 2020; Del Mar 2021). The numerous identities within the queer community overlap with other cultural and ethnic identities; thus, recognition of, and support for, diversity in the Scandinavian countries has many different and overlapping aspects.

The new wave of refugees arriving in the region in 2015 again brought cultural diversity to the forefront of social and political debates. This has resulted in recent policy initiatives in the three countries that have aimed to tackle segregation and growing social inequalities; however, these initiatives have taken different approaches. The Danish strategy has emphasized measures related to housing and the settlement patterns, while Norway has had a stronger emphasis on the labor market and education, especially policies targeting children. The Swedish strategy has designated five areas of intervention, namely housing, the labor market, education, crime, and democratic participation (Balke Staver, Brekke, and Soholt 2019). These policies and the issues they target all have implications for the work and activities of LAMs, especially those around education and democratic participation (see Johnston and Audunson 2019).

Against this backdrop, the library researcher Ragnar Audunson (2005) stated that one of the significant challenges for public libraries in late modern society is to contribute to creating a shared understanding and societal coherence and, at the same time, stimulate diversity and tolerance. This challenge is not solely related to public libraries. Museums and archives also face challenges connected to diversity and its significance for development in the Scandinavian societies. Audunson aligns the LAMs’ roles to the sociocultural aspects underpinning Eriksen’s observation concerning the countries’ strivings to find the balance between similarity and difference. Accordingly, the LAMs in Scandinavia are engaging to varying degrees with minority groups who historically have been marginalized and oppressed, immigrants and their descendants, and other groups who seek greater visibility and equality. Recent examples include the Danish Women’s Museum’s name change to Gender Museum Denmark and the MultiAalborg project by the Department of Sociology and Social Work at Aalborg University and Aalborg’s City Archives in Denmark that aims to explore the different lived realities of being an Aalborg resident by including the life stories of immigrants and refugees in the archive’s holdings.
The idea that culture should be considered an additional component or pillar within sustainable development agendas has recently gained more widespread recognition. With reference to UNESCO (2013), the researchers Loach, Rowley, and Griffiths (2017) argue that protecting cultural heritage is crucial for cultural sustainability and that sustaining culture has an impact beyond social, economic, and environmental concerns. The four components of sustainability are shown in Figure 16.1, which is a diagram inspired by Loach, Rowley, and Griffiths and developed by Danish library science researchers Høj Mathiasson and Jochumsen (2022).

Expanding upon the social and cultural pillars of the diagram, and with emphasis on the institutions’ role in fostering an inclusive cultural heritage, the following is a typology of LAMs’ core activities related to diversity and social sustainability:

**Inclusion:** Activities include those related to LAM professionals selecting and mediating materials, documents, or objects that represent and reflect diverse cultures, perspectives, and lifestyles. These activities fall under the banners of inclusive collection development and promotion of diversity. Archive and museum-related examples include the proactive collection of materials connected to underrepresented communities or around particular events.

**Connection:** Activities include those related to organizations creating arenas for people and groups of diverse backgrounds to meet, engage in dialogue, and
exchange knowledge. Relevant examples include human libraries (aka borrow a person), conversation-based programs (e.g., language cafés, story sharing, etc.), makerspaces and themed workshops, as well as artist- or scholar-in-residence programs (see Chapter 15, this volume).

**Participation:** Activities include those related to institutions incorporating diverse experiences, perspectives, understandings, and knowledge through such things as crowdsourcing, co-creation, co-curation, and user innovation (see Chapter 13, this volume).

**Representation:** Activities include those related to community-based collections and/or institutions (e.g., community-based libraries, archives, or museums). These types of collections or institutions make communities’ autonomous representation and narrative (re)construction possible.

The activities within these areas are, and will continue to be, central in determining the LAM institutions’ success in meeting the challenges of their increasingly diverse and fragmented societies, including their ability to support the formation of an inclusive and sustainable public sphere.

**LAMs in the Nordic model: Challenges, communities, and empowerment**

Increased migration since the 1970s, and especially since the millennium, has made immigration and integration policies contentious issues in Scandinavia. Large parts of the population in Europe and the Scandinavian countries see climate policy as a top-down strategy negatively affecting ordinary people’s daily lives (Otto and Gugushvili 2020). Especially in rural areas, populist counter-movements, such as France’s yellow vests and the electoral success of the farmers’ party (the Centre Party) in Norway, have gained traction. Even in the progressive Scandinavian countries, holding a favorable view toward both welfare state policies and climate change policies is only attractive to about a third of the population (Otto and Gugushvili 2020). Considering the strict government immigration policies and climate populism, it might appear fruitless for LAM institutions to engage in programs directed at immigrants and socioecological sustainability-related activities. However, in the LAMs’ roles as universal welfare state institutions and community hubs, Scandinavian LAM institutions meet the challenges of migration and climate change by supporting community activities and local organizing. What is the rationale behind this persistence? What are the mechanisms supporting the notion that LAMs matter in creating a sustainable society and the inclusion and integration of migrants?

Cleavages regarding immigration and sustainability have neither eroded trust in government nor interpersonal trust. In the Scandinavian countries, trust levels are still amongst the highest worldwide (worldvaluessurvey.org). Breidahl and Fersch (2018) developed a theoretical model for explaining how welfare state institutions influence migrant integration processes through influencing migrant values and attitudes. Several studies have found that fair and impartial
public institutions that treat all people equally positively impact institutional and interpersonal trust (Kumlin and Rothstein 2005, 2010). Kumlin and Rothstein (2010) discovered that the effect is especially strong for immigrants. Trust in the welfare state institutions can even counter negative experiences with individual welfare state officers (Fersch 2016; Fersch and Breidahl 2018). As regards public libraries, they are consistently ranked among the most highly trusted public institutions (Höglund and Wahlström 2009; Vårheim 2014a; Söderholm, Ögland, and Gunnarsson Lorentzen 2021). A handful of studies find that libraries positively influence institutional and interpersonal trust in the general population and amongst immigrants (Vårheim, Steinmo, and Ide 2008; Vårheim 2014a, 2014b).

Like the general population, migrants meet with the welfare state at street level. They are in contact with a variety of trusted welfare state institutions, ranging from social services to public schools and libraries. These institutions are important in people’s daily lives and contribute to forming values and preferences. The general positive attitudes toward LAM institutions are important, but even more important might be the migrants’ everyday experience with LAMs. Not only libraries but also museums are frequently visited. As frequently visited and highly trusted community organizations, Scandinavian LAMs are important informal points of contact and places for meeting other local people. This includes attending and participating in museum exhibitions and activities, and library programs for the public or specially targeted groups, such as language cafés for newcomers (Johnston 2018) or programs for sharing tools, bikes, or skis. LAMs alone or in cooperation with voluntary community organizations create initiatives for integration and socioecological sustainability from below, thereby empowering individuals and communities.

Seen from an inside perspective of the LAM institutions, incorporation of the diverse groups’ experiences and perspectives is not a straightforward process. It requires navigating in the larger political and social debates, both current and past. Ultimately, LAM institutions must decide which groups or communities are to be included in their collections and activities, and how the groups are to be represented (Gabriel and Jensen 2017). The institutions must decide how and to what degree they involve various groups in developing the collections and activities, the nature of the groups’ participation, and how much power is shared. SDGs, on the other hand, do not require quite the same navigation for the LAMs. SDGs are adopted by all the UN member states and working for sustainable development has extensive and worldwide political support, at least rhetorically. Moreover, many organizations representing civic society are engaged in sustainability activities, and large parts of the business community are involved in creating a more sustainable production. Nevertheless, major concerns related to sustainable development such as individual freedom, private consumption, economic growth, national wealth, the rural population decline, and the time frames of CO₂ emission reduction objectives await solutions.
An essential role for Scandinavian LAMs going forward will be to initiate a community-based debate and make space for democratic discussion concerning challenges. As Thiele (2016) warns, sustainability does not just refer to the long-term survival of a specific practice, relationship, or institution; it entails an expanded scope that requires management of the scale and speed of change and the use of imagination, innovation, and creativity. The ways LAMs navigate toward sustainability in their communities will contribute to the long-term development of the Scandinavian region.

Notes
6 https://www.nationalmuseum.se/om-nationalmuseum/n%C3%A5gra-fakta-rader-fr%C3%A5n-%C3%B6verintendenten/kultur-och-ett-h%C3%A5llbart-samh%C3%A4lle. Accessed 2 February 2022.

References


Henrik Jochumsen et al.


Library Funding and Sustainable Development of Higher Education

Clement Ola Adekoya

University Library, Olusegun Agagu University of Science and Technology, Okitipupa, Nigeria

ABSTRACT

The curiosity to produce manpower to accelerate the actualization of educational and developmental goals in Sub-Saharan Africa has necessitated the clamor for the sustainable development of higher education. African leaders have realized that higher education stimulates the development of the capabilities of the existing and future generations to accomplish sustainable livelihoods and well-being within peaceful and democratic societies. This study investigated the role of library funding in the sustainable development of higher education, using a descriptive survey research design. A descriptive survey research design was used for the study. A questionnaire was used to obtain data from librarians in tertiary institutions in Ekiti and Ondo States, Nigeria. The study found that library funding is a must in ensuring the sustainability of higher education. The major source of library funding is from the founding bodies (founders). Other sources of funds are not adequately exploited. The frequency of getting funds for major library projects and the extent of budgetary provision for the acquisition of information resources to corroborate sustainable development of higher education are low. It was recommended that higher educational institutions should continually devote a substantial proportion of their budget to the procurement of library information resources and infrastructure that are germane to the current trends in education and industry.

KEYWORDS

Higher education; higher education institutions; library; library funding; sustainable development; sustainable development goals

Introduction

Across the nations of the world, higher education (HE) is an expensive enterprise that entails considerable human, economic and technological resources. Currently, there is heavy anxiety to enhance access to and ameliorate the quality of HE in Sub-Saharan Africa more than any other continent across the world. This is because African leaders have realized that HE stimulates the development of the capabilities of the existing and future generations to accomplish sustainable livelihoods and well-being within peaceful and democratic societies (Tikly, 2019). Acknowledging the fact that higher education institutions (HEIs) can fuel national growth and development by providing advanced education for the advancement of manpower through teaching, learning, and research, the Federal Republic of Nigeria (FRN) (2013), on the National Policy on Education, claimed that HE shall make an invaluable contribution to national development by intensifying and diversifying its programs for the improvement of higher-level manpower within the framework of the needs of the nation. However, due to frail political will, the economic catastrophe of the mid-1990s, several African HEIs find it difficult to function at a tolerable altitude of academic competence that can make them compete in the global knowledge economy of today (Abdulkareem & Fasasi, 2012).

In a bid to foster African development and enable African educational institutions to compete with other institutions in the developed world, the need for sustainable development (SD) of HE is non-negotiable. More so, there is a high expectation on African HE to model and foster good governance, conflict resolution, respect for human dignity (Abdulkareem & Fasasi, 2012) and progressively put African countries on the path of scientific and technological development of HE is an issue of immense concern to all nations, international organizations such as the United Nations (UN), UNESCO, United Nations
Environment Programme (UNEP), as well as regional organizations such as the Economic Community of West African Union (ECOWAS), African Union (AU), European Union (EU), etc. SD is “development that meets the needs of the present without compromising the ability of the future generation to meet their own needs” (World Commission on Environment and Development, 1987). SD of HE is therefore a durable fundamental educational initiative that tackles several problems related to human development and equips students with the required knowledge, skills, and attitudes to construct a sustainable future.

Academic libraries are the central organ of HEIs. Academic libraries can never keep on expanding, producing, digitizing, and consuming without serious consideration of the impacts of their actions on the academic society around them (Jankowska, 2008). To elucidate on paradigms for SD of HE, there must be a proper definition of how HEIs fund their libraries. Literature on SD of HE abounds. However, the issue concerning how library funding impacts the SD of HE is blurred as there is a dearth of literature explicitly devoted to library funding and SD of HE. More so, the adoption of SDGs for transforming to a sustainable society by the year 2030 has resulted in commencing novel vistas of sustainability research in HE. Meanwhile, libraries within the framework of educational institutions are typically encumbered with an array of activities that entail sufficient funding to augment the teaching, learning, and research mandate of their parent bodies. This study therefore aims at investigating the role of libraries in SD of HE, the sources of funds available to libraries for SD of HE, the frequency of getting funds for major library projects to facilitate HE, and the extent of budgetary provision for the acquisition of information resources to facilitate of HE.

**Literature review**

The 2030 Agenda for Sustainable Development is a global agenda designed for every person to occupy and develop in a sustainable and flourishing world. During the General Assembly of the UN held in New York in September 2015, Sustainable Development Goals (SDGs) were adopted by 193 governments, civil societies, and the private sector. All the 17 goals and 169 targets that the participating countries intended the role/contribution of libraries to SD of HE to achieve by 2030 were equally ratified (Lorren & Nikki, 2019; Pedro, 2018). SDG 4 aims at “ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all” (United Nations, 2015). Target 4.3 of SDGs is to “by 2030 ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university” (Australian Library and Information Association, 2018). The reason for the inclusion of broad educational target in the 2030 Agenda for Sustainable Development is for participating nations to offer education to an enormous number of people through which they can acquire the knowledge required to be dynamic participants in the process of achieving tasks to support the Paris agreement and SDGs (Erickson et al., 2016).

One fundamental rationale for the establishment of HEIs across the world is to acquaint students with complex ideas in an academically inspiring setting and so prepare them for prospective careers by developing their ingenuity, insights, and analytical skills aimed at stimulating and cheering scholarship and community service, thereby augmenting national and global advancement through appropriate manpower training (Ogonor, 2016). The set strategies chosen for the accomplishment of the goals of HE comprise research and development, together with the generation and dissemination of knowledge and scholarly information (FRN, 2013). However, for HE to be effective in the modern era in which there is massive deployment of disruptive technologies in the delivery of educational deliverables, the concept of SD has to be wholly entrenched within the institutions.

Sustainable development, as it relates to HE, covers significant areas of society and human life. SD is a central concept within worldwide development policy and agenda as it offers a system that affords the society to interact with the environment without damaging the resource for the future (Abubakar, 2017; Dernbach, 1993; Mensah & Casadevall, 2019; Stoddart et al., 2011). SD is all about “meeting the
needs of the present without compromising the ability of future generations to meet their own needs” (United Nations Environment Programme (UNEP), 2006). Within the education sector, there is a need for SD of HEIs as they train teachers, professionals, and potential leaders and also help in the creation of an informed and engaged citizenry, thereby upholding a democratic culture. However, the challenges of the paucity of funds, insufficient infrastructure, stern dearth of qualified staff, and unproductive research productivity clearly define the backwardness of HE in Africa in tiding the path of SD.

In recent years, African educational leaders have been proactive in setting the motion for the enhancement of HE within the continent. For example, The African Union’s Agenda 2063 Framework Document: The Africa we want, and the Continental Education Strategy for Africa (CESA) reel out a pan-African plan of transformative SD (AUC, 2015). The Continental Education Strategy for Africa 2016–2025 (CESA) developed by the African Union provides stability on the fundamental responsibility given to education in Agenda 2063. The documents which are Africa’s responses to the SDGs specify a transformative vision for SD and Education for Sustainable Development (ESD) (Tikly, 2019). The documents are targeted at transforming African educational systems so that they can hasten African development. Central to Agenda 2063 and CESA is the actualization of SDG4 which is to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

It is impressive to note that fundamental to SD of HE is the fact that starting from the 21st century, the HE system has become a global venture as students and faculty exchanges are ameliorating worldwide (Doles, 2008; Glenwood, 2011; Jaschik, 2009). For instance, the cross-border educational partnership between the Federal University of Technology, Akure (FUTA) and Florida Agricultural and Mechanical University (FAMU), Tallahassee, Florida, USA, based on student exchange has strengthened research collaboration in the two institutions. The partnership signed in 2013 ameliorates the intellectual and research capabilities of the students to proffer solutions to the global food shortage and alleviate poverty through scientific research and technological inventions. With these, Egwunyenga (2016) is justified that the intention of HE now transcends mere developing high-level human resources, intellectual capacity, scholarly and community services. HE has progressively become the chief contributor to the panacea to the principal impediments confronting the world today at the global, regional, and local levels, such as removing inequalities, alleviating poverty and environmental degradation, improving health, and arresting large scale pandemics such as AIDS (UNESCO, 2009) and COVID-19.

One essential unit of educational institutions that has a direct relationship with the SD of HE across the globe is the library. The increasing commitment of HEIs to national and global development necessitates the devotion of vast literature to the role of libraries in SD of HE. The objectives of academic libraries are to promote scholarship, undertake research, teaching, and learning (Eze & Uzoigwe, 2013). Libraries that are the reminiscence of the human race cannot function effectively if they are not well funded as the provision of sufficient information resources for teaching, learning, and research and their efficient utilization are crucial to the value of education (Afebende, 2017). The worth and amount of information resources and library infrastructural facilities in HEIs go a long way in determining the quality of HE and the accreditation of university academic programs.

Academic Staff Union of Universities (ASUU) has been protesting against the insufficient funding of Nigerian universities ever since the 1970s. The controversy has been to rebuff underfunding which weakens the capability of universities to sustain educational standards to any enviable extent. On this, the Federal Government of Nigeria and ASUU entered an agreement in 1992. The agreement was a spring of vital resolution and intrepid policy initiative targeted at tackling financial problems affecting the university system (Adegbesan et al., 2016). This led to the creation of the Education Trust Fund (ETF) to fund some educational projects such as library development, and the purchase of teaching facilities. Also, UNESCO (2009) berated the low funding of HEIs as it noted that public financing is not keeping pace with the growing costs of HE.
Egwunyenga (2016) agitated for a forceful retooling of HEI funding in Nigeria to meet global best practices. He further scolded the present levels of financing of HE in Nigeria and several other countries in the developing world which is below the 26% of the total national budget recommended by the UN.

Library funding is crucial to the SD of HE because information resources and facilities have to be acquired, personnel have to be paid, and running costs have to be met. Funding is therefore the adhesive that fastens the building, collection, and staff together and enables the library to accomplish its goals (Ubogu & Okiy, 2011). Nigerian educational sector is not well funded these days (Egwunyenga, 2016). This is seen in the faces of academic libraries. This may be due to the increasing number of schools (primary, secondary, and tertiary) and the dwindling economic situation of the country. Even though education currently gets a great share of the education budget in Nigeria, the proportion of the federal budget allocation to HE has lessened (Saint et al., 2003). Consequently, the HE sub-sector has experienced a continuous decline in funding.

It is difficult to provide library services without adequate finance (Adu-Sarkodee et al., 2016). For libraries to fulfill the purpose of their establishment which is to provide information resources for human and national development, there is a need to devote a considerable amount of money for the procurement of information resources and infrastructure. At the 14th General Conference and Golden Jubilee Celebration of the Association of African Universities (AAU) held in Accra, Ghana in June 2017, HE managers were advised to leverage the proficiency and entrepreneurial fortitude within their institutions to produce considerable finances for the operations of their institutions. This is more important as the budding ICTs, mounting information needs of users, and rising operational costs of libraries have led to disproportions that pressed libraries toward a more goal-oriented commercialized model which suffers long-term SD planning (Jankowska & Marcum, 2010).

The responsibility of libraries in encouraging the global sustainability of HE by stimulating and disseminating literature on relevant topics and providing information literacy needs requires a huge financial commitment. A paradox of contemporary academic libraries is that their struggle to launch new technologies to react to evolving user information needs is usually hampered by the paucity of funds (Ubogu & Okiy, 2011). Without an amplified base of funding, the mounting costs of acquiring information resources and meeting other financial needs could harmfully crash major libraries’ values as structured by the International Federation of Library Associations and Institutions (IFLA) in Glasgow in 2002 (Jankowska, 2008).

Adequate funding is a fundamental requirement for the effective growth of academic libraries (Bamigboye & Okonedo-Adegbaye, 2015). Funding is the principal fraction of the set of tools and other governance instruments to attain efficiency, quality, and competitiveness in HE. Sources of funding for libraries are limited. In a study conducted in Ghana, Adu-Sarkodee et al. (2016) claimed that aside from funds from the government which is the major source of finance available to academic libraries in Ghana, other sources of fund include bindery/photocopy services, short courses, and training programs, data analysis and presentation of research findings, proposal writing for individuals and institutions, charging on the internet and other ICT services, and proof-reading and editing of the manuscript. Also in Nigeria, the level of funds available to academic libraries these days is worrisome. University libraries are experiencing low budgetary allocation for education (Eze & Uzoigwe, 2013). Management of the institutions of higher learning has been hamstrung by poor funding by their proprietors (Eberghwa, 2016). The poor funding has led to poor/inadequate library information resources and infrastructure facilities.

The academic well-being of HEIs relies heavily on the condition of their libraries. HEIs cannot facilitate academic excellence without high-quality and functional libraries to support their teaching, learning, and research functions (Uzoagba & Okiche, 2018). Oladosu (2011) emphasized that as the intellectual heart of HEIs, the library has the responsibility of obtaining and providing access to information resources that make available the knowledge of years of civilization. As a
major player in the determination of the success or failure of accreditation of academic programs in HEIs, libraries have to increase their stock with up-to-date relevant information resources (Agbetuyi et al., 2017; Odukoya et al., 2015). Accreditation of HEIs’ academic programs depends majorly on the fund expended on the acquisition of information resources. Inadequacy of funds has nearly strangulated and sounded death kneel of some of the HEIs in Nigeria as they cannot afford the library information resources that can guarantee the accreditation of most of their programs by the university regulatory bodies. Most academic libraries in Nigeria are operating in a period of dwindling finances where resources are not forthcoming (Abubakar, 2011). Okiy (2005) claimed that of all the diverse libraries in Nigeria, only university libraries have a visibly defined policy of funding as they are thought to be allocated 10% of the recurrent annual budget of universities, even though such allocations are not being disbursed as most university administrators tend to defy the decision.

To ensure that academic libraries play a definite role in SD of HE in Nigeria, Nigeria Universities Commission (NUC) had in 1993 directed that 10% of the university official recurrent annual budget should be for library development (Ishola, 2014). Unfortunately, the policy is barely implemented in the majority of the universities. Some Vice-Chancellors acknowledge library funds as a subset of their statutory control to ensure accountability as the principal financial officers of the universities. In 2001, the 10% of the approbated recurrent budget set aside for the development of federal university libraries as agreed upon in 1993 was canceled (Achebe, 2012). As at present, there is no explicit minimum standard financial assistance to federal higher institution libraries (Ishola, 2014). The pitiable funding of higher institution libraries and the blurred execution of the annual budget for some Nigerian higher institutions affect the extent of contribution to SD of HE in Nigeria. However, the cancelation of the 10% of the university official recurrent annual budget for the development of the libraries led to the establishment of the Tertiary Education Trust Fund (TETFund) to salvage academic libraries and universities in general (Bamigboye & Okonede-Adegbaye, 2015).

Tertiary Education Trust Fund (TETFund) is today a significant source of financial support to the diverse institutions in Nigeria. The majority of the capital developments in academic libraries in Nigeria are sponsored by the fund. The recent event in the TETFund is the founding of National Book Development to assist the revival of scholarly journals, starting with the journals of professional associations (Tertiary Education Trust Fund, 2013). Nigerian government-owned university libraries get their funds from the government allocations, library fees, gifts, endowment funds, and other miscellaneous sources (Ubogu & Okiy, 2006). Ifidon (1992) claimed that in Nigeria, most academic libraries obtain the larger component of their funds from their universities, whose main source of finance is the government. Also, libraries get philanthropic donations to fund some of their projects and acquire information resources (Schatteman & Bingle, 2015).

Stoffle (1991) proposed the following means of funding library projects: Leveraging, grants, fundraising, fees, and entrepreneurial activities. IFLA (2001) identified block grants, donations from funding bodies or private individuals, revenue from commercial activities, revenue from user fees, such as fines, revenue from charges to users for personal services, e.g., printing and photocopying facilities, and sponsorship from external organizations as sources of funding available to libraries for their major projects.

Due to the rarity of the fund, an unprecedented era of financial stringency (Adu-Sarkodee et al., 2016) and the scourge of the COVID-19, SD of HE will continue to face some imminent challenges for several years. Fiscal challenges threaten HE leading to a shrinking budget. As HEIs encounter shrinking budgets, mounting demand for services, waning revenues, and expensive academic infrastructure upkeep, the allocation for the purchase of library infrastructure also reduces. As such, they have to rely on funds from their founders (mostly government) which are also constantly inadequate to meet library needs.
Objectives of the study

The objectives of the study are to:

i. examine the role of library in SD of HE;
ii. find out the sources of funds available to libraries for SD of HE;
iii. investigate the frequency of getting funds for major library projects to facilitate HE; and
iv. ascertain the extent of budgetary provision for the acquisition of information resources to facilitate of HE

Methodology

A descriptive survey research design was used for the study. The entire 97 librarians in public HEIs in Ekiti and Ondo States, out of the 36 states in Nigeria, formed the population of the study (see Appendix ii). A total enumeration sampling technique was adopted for the study. Egbule and Okobia (2001) recommended the use of the entire population if the population is manageable. The instrument of data collection was a questionnaire (See Appendix ii). The research instrument was validated by a professor of educational psychology at the University of Ibadan, Ibadan. The reliability test conducted on the research instrument got a Cronbach Alpha reliability coefficient of 0.69. The questionnaire was divided into four parts. Part A examined the role/contribution of libraries to SD of HE. Part B was on the sources of funds available to libraries for SD of HE. Part C investigated the frequency of getting funds for major library projects to facilitate SD of HE. Part D finds out the extent of budgetary provision for the acquisition of information resources to facilitate SD of HE. Data were elicited for Parts A and B using Agree and Disagree; a 4-Likert scale of Very Frequently, Frequently, Rarely, and Very Rarely was used for Part C; and a 4-Likert scale of Very High Extent, High Extent, Low Extent, and Very Low Extent was used for Part D. The researchers and two research assistants administered the questionnaire to the respondents. Out of the 97 copies of the questionnaire administered, 63 were retrieved representing 65% response rate. Descriptive statistical tools were used to analyze the data collected. Statistical Package for Social Sciences (SPSS) version 20 was used for the analysis.

Results

Table 1 reveals that the library plays an important role in SD of HE through the provision of information resources (61, 96.8%), support for research (57, 90.5%), keeping the university community abreast of discoveries and scientific breakthroughs (55, 87.3%), and provision of information/media literacy programs for the user community (54, 85.7%).

Table 2 shows that the major sources of funds available to libraries for SD of HE include funds

<table>
<thead>
<tr>
<th>S/N</th>
<th>Sources</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Fund from the founders</td>
<td>62</td>
<td>1</td>
</tr>
<tr>
<td>ii</td>
<td>Philanthropic donation</td>
<td>61</td>
<td>2</td>
</tr>
<tr>
<td>iii</td>
<td>Sponsorship from external bodies</td>
<td>58</td>
<td>5</td>
</tr>
<tr>
<td>iv</td>
<td>Short courses and training programs</td>
<td>57</td>
<td>6</td>
</tr>
<tr>
<td>v</td>
<td>Fund-raising</td>
<td>55</td>
<td>8</td>
</tr>
<tr>
<td>vi</td>
<td>Revenue from charges to use for individual</td>
<td>54</td>
<td>9</td>
</tr>
<tr>
<td>vii</td>
<td>Charging on the Internet and other ICT</td>
<td>50</td>
<td>13</td>
</tr>
<tr>
<td>viii</td>
<td>Bindery/photocopy services</td>
<td>47</td>
<td>16</td>
</tr>
<tr>
<td>ix</td>
<td>Entrepreneurial/commercial services</td>
<td>43</td>
<td>20</td>
</tr>
<tr>
<td>x</td>
<td>Leveraging</td>
<td>17</td>
<td>46</td>
</tr>
<tr>
<td>xi</td>
<td>Lottery funds</td>
<td>8</td>
<td>55</td>
</tr>
</tbody>
</table>

N = 63.
from the founders (62, 98.4%), philanthropic donation (61, 96.8%), sponsorship from external bodies (58, 92.1%), short courses and training programs (57, 90.5%), and fund-raising (55, 87.3%). However, funds from leveraging (17, 28.6%) and lottery funds (8, 12.7%) are meager.

The frequency of getting funds for major library projects to facilitate SD of HE as revealed in Table 3 is high, except for fund-raising (X = 1.98).

As revealed in Table 4, the extent of budgetary provision for the acquisition of information resources to corroborate SD of HE is high as all the mean values are above average (X = 2.00).

### Discussion

The robust position library occupies in HE defines its inevitability in stimulating educational progress and scientific discoveries across the world. This study finds that the role of the library in the SD of HE includes the provision of information resources, support for research, keeping the university community abreast of discoveries and scientific breakthroughs, provision of information/media literacy programs for the user community, giving out instruction on the most efficient use of appropriate library resources, preserving and providing access to the world’s culture and heritage, provision of adequate and up-to-date information, formation of consortium on resource sharing, organization of programs on data use, data sharing, and data analysis, and keeping information resources for posterity. This agrees with the position of Eze and Uzoigwe (2013) that the objectives of academic libraries are to promote scholarship and undertake research in different departments.

Higher educational institutions all over the globe have made SD one of their policy objectives by procuring the appropriate information materials. Libraries, therefore, play a vital role in meeting the needs of their funders by providing the services that meet the information needs of the clientele. They do this in the contemporary era of ICT through the adoption of hi-tech innovations in delivering their services. As an element of HE, the library deploy ICT in providing information and information resources for the library community (Akarah & Achugbue, 2016; Bradley, 2016; Tyonum & Ezeogu, 2021). This finding also agrees with that of Okuonghae and Igbinovia (2019) that libraries provide access to information needed for intellectual development. FRN (2013) claimed that the specific strategies for the accomplishment of SD of HE include research and development, and generation and dissemination of knowledge and scientific breakthroughs. The results of research and innovative knowledge are presented to society via library information resources such as textbooks, journals, patents, etc.

The generalization on the sources of funds based on questionnaire responses is that libraries secure funds from their founding bodies for the greatest proportion of their financial support, as well as a philanthropic donation, sponsorship from external organizations, short courses and

### Table 3. Frequency of getting funds for major library projects to facilitate SD of HE.

<table>
<thead>
<tr>
<th>Funds</th>
<th>Very Frequently</th>
<th>Frequently</th>
<th>Rarely</th>
<th>Not at all</th>
<th>Mean (X)</th>
<th>Standard Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funds from the founders</td>
<td>20</td>
<td>20</td>
<td>18</td>
<td>5</td>
<td>2.87</td>
<td>.959</td>
</tr>
<tr>
<td>Sponsorship from external bodies</td>
<td>11</td>
<td>18</td>
<td>15</td>
<td>19</td>
<td>2.35</td>
<td>1.080</td>
</tr>
<tr>
<td>Grants</td>
<td>17</td>
<td>9</td>
<td>10</td>
<td>28</td>
<td>2.25</td>
<td>1.270</td>
</tr>
<tr>
<td>Philanthropic donations</td>
<td>16</td>
<td>10</td>
<td>8</td>
<td>29</td>
<td>2.22</td>
<td>1.263</td>
</tr>
<tr>
<td>Short courses and training programs</td>
<td>10</td>
<td>16</td>
<td>7</td>
<td>30</td>
<td>2.13</td>
<td>1.171</td>
</tr>
<tr>
<td>Fund-raising</td>
<td>8</td>
<td>15</td>
<td>8</td>
<td>32</td>
<td>1.98</td>
<td>1.154</td>
</tr>
</tbody>
</table>

N = 63.

### Table 4. Extent of budgetary provision for the acquisition of information resources to facilitate SD of HE.

<table>
<thead>
<tr>
<th>Budgetary provision</th>
<th>Very High Extent</th>
<th>High Extent</th>
<th>Low Extent</th>
<th>Very Low Extent</th>
<th>Mean (X)</th>
<th>Standard Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textbooks</td>
<td>21</td>
<td>15</td>
<td>14</td>
<td>13</td>
<td>2.69</td>
<td></td>
</tr>
<tr>
<td>Journals</td>
<td>20</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>2.65</td>
<td></td>
</tr>
<tr>
<td>Reference sources</td>
<td>11</td>
<td>16</td>
<td>13</td>
<td>23</td>
<td>2.24</td>
<td></td>
</tr>
<tr>
<td>E-books</td>
<td>11</td>
<td>15</td>
<td>14</td>
<td>23</td>
<td>2.22</td>
<td></td>
</tr>
<tr>
<td>E-journals</td>
<td>9</td>
<td>17</td>
<td>11</td>
<td>26</td>
<td>2.14</td>
<td></td>
</tr>
<tr>
<td>Newspapers and magazines</td>
<td>7</td>
<td>13</td>
<td>19</td>
<td>24</td>
<td>2.05</td>
<td></td>
</tr>
</tbody>
</table>

N = 63.
training programs, and fund-raising. A link exists between this finding and that of Saint et al. (2003) that HE institutions currently get a great share of their funds from the federal budget allocation. The major sources of fund to libraries, according to Ubogu and Okiy (2011), are government allocation, philanthropic donation, endowment funds and library fees. A study by Ishola (2014) revealed that the government is the sponsor of the major projects in HEIs in Nigeria. This includes the library projects since the largest percentage of annual budget of libraries emanates from the government which is the founder and funder of the public libraries. The failure of the government to commit a vast sum of money to capital projects in HEIs will make it very hard for libraries to embark on developmental projects and satisfy other financial commitments.

Schatteman and Bingle (2015) emphasized that donations from philanthropists would be useful for libraries as non-governmental organizations are prepared to contribute to the accomplishment of libraries. The position of IFLA (2001) that income from commercial events and income from charges to clientele for specific services are sources of funding for libraries are in line with the findings of this study. Adu-Sarkodee et al. (2016) posited that added to the funds from the government which is the main source of finance to libraries, funds from bindery/photocopy services, short courses and training programs, and data analysis and presentation of research findings can be used to finance some of the library projects. The finding also corroborates the position of Schatteman and Bingle (2015) who acknowledged philanthropic donations to libraries for funding some of their projects. Okuonghae and Igbinovia (2019) are of the opinion that library is one of the units that contribute immensely to SD of HE. As such, mobilizing funds from diverse sources for the acquisition of library resources will enhance research and educational advancement. Afebende (2017) averred that there is need for continuous funding of libraries in order to procure the information materials in both print and electronic forms for learning and research.

Ensuring SD of HE requires that funds are promptly and consistently released to libraries to finance their major projects. The response to the question on the frequency of getting funds for major library projects to facilitate SD of HE revealed that the frequency is high. The ability of academic libraries to regularly mobilize funds from other sources within the libraries may be because the current economic situation in the country does not hamper income generating capability of most universities. This negates the position of Okere and Ol İzunfemi (2018) that fiscal challenges threaten universities, leading to budget shrinks as universities face dwindling budgets, mounting demand for services, waning revenues, and expensive academic infrastructure maintenance. Stoffle (1991) was of the view that potential economic problem may require libraries to map out plans for regular mobilization of funds as funds from the funders may not be adequate to meet the needs of the libraries. Nonetheless, Stoffle warned that the libraries that generate much funds may not certainly be the most efficient or resourceful at meeting the needs of the users.

This study also reveals that the extent of budgetary provision for the acquisition of information resources to stimulate the SD of HE is high. This is a testimony to the commitment African HE leaders were charged to display toward the rebirth of HE. AT the 14th General Conference and Golden Jubilee Celebration of the Association of African Universities (AAU) held in Accra, Ghana in June 2017, HE in Africa managers were advised to leverage the proficiency and entrepreneurial fortitude within their institutions to produce considerable finances for the operations of their institutions. As most universities realize that the federal budgetary allocation to HE may decline in future, most of the HEI managers devise means of generating funds internally (Saint et al., 2003). The finding, therefore, disagrees with those of Eze and Uzoigwe (2013) and Ebereghwa (2016) who claim that university libraries are experiencing low budgetary allocation for education as management of the institutions of higher learning has been hamstrung by poor funding by their proprietors.

**Limitations of the study**

Some limitations are observed in this study. These will make the generalization of the findings of the study difficult. The study covered only two states out of the 36 states in Nigeria. The librarians in
private HEIs within the two states covered were not included in the study. This made the coverage and the study population very small. Meanwhile, Adekoya and Fasae (2021) have cautioned that the findings of the studies whose population is low should be used with caution. More also, the response rate of the study was 65%. This may not proportionately express the minds of the remaining 35% that did not respond to the study (Adekoya et al., 2022). These limit the level to which the findings and responses of the respondents represent the entire population. As such, future studies should cover all the librarians in academic libraries in high number of HEIs in the country to give much more representative opinions. Similarly, the study is exploratory. Therefore, further studies are needed to validate the findings of the study.

**Conclusion**

The need for the development of skillful manpower for national and global development necessitates continuous investment in the SD of HE. This study offers some insights for researchers and managers of HEIs on how library funding facilitates the SD of HE. The study emphasized that SD of HE has its root in Goal 4 of the United Nations SDG (ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all) and Target 4.3 of the SDGs which is to “by 2030 ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.” Given the importance and persistently changing roles of libraries in society, it is complex to attain the SD of HE without the contributions of academic libraries. Therefore, HEIs have to properly fund their libraries so that they can procure the necessary information resources and infrastructure that are germane to the current trends in education and industry. University administrators should be honest with the policy documents regarding the 10% of the university official recurrent annual budget meant for library development.

**Recommendations**

Based on the findings of this study, the following recommendations are made

1. Higher education administrators should prioritize the SD of HE in a bid to ensure that HE contributes significantly to national and global development.
2. Higher education administrators should effectively implement a policy regarding the proportion of the university official recurrent annual budget meant for library development.
3. Higher education institutions should fund libraries sufficiently to prepare personnel for developmental functions.
4. Alternative sources of funding should be thoroughly exploited so that the libraries can have sufficient funds to meet their financial obligations.

**References**


Okoonghaye, O., & Igbinnovia, M. O. (2019). The role of academic libraries towards the attainment of Sustainable
Appendix i: Questionnaire

University Library
Olusegan Agagu University of Science and Technology,
Okitipupa,
Ondo State
26th December, 2021.

Questionnaire on Library Funding and Sustainable Development of Higher Education

Dear Respondent,

I am a librarian at the above named institution. I am conducting a research titled “Library Funding and Sustainable Development of Higher Education.” I hereby solicit your help in completing the questionnaire objectively so as to enable us do a quality research work. All responses are for research purpose only and will be treated confidentially.

Yours faithfully,
Adekoya, C. O
07060906490

INSTRUCTION: Please read carefully and tick (·) the appropriate option for all close ended items in the questionnaire.

1. What are the roles/contributions of libraries to sustainable development of higher education?

<table>
<thead>
<tr>
<th>S/N</th>
<th>Roles of libraries</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Research support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>Provision of information/media literacy programs for the user community</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Keeping university community abreast of discoveries and scientific breakthroughs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Preserving and providing access to the world’s culture and heritage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Organization of programs on data use, data sharing, and data analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Provision of information resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vii</td>
<td>Keeping information resources for posterity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>viii</td>
<td>Formation of consortium on resource sharing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ix</td>
<td>Giving out instruction on the most efficient use of appropriate library resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>Provision of adequate and up-to-date information</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. What are the sources of funds available to libraries for sustainable development of higher education?

<table>
<thead>
<tr>
<th>S/N</th>
<th>Sources of funds</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Bindery/photocopy services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>Lottery funds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Sponsorship from external bodies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Short courses and training programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Leveraging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Revenue from charges to use for individual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vii</td>
<td>Charitable donation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>viii</td>
<td>Fund from the founders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ix</td>
<td>Charging on the Internet and other ICT services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>Entrepreneurial/commercial services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xi</td>
<td>Fund-raising</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. What is the frequency of getting funds for major library projects to facilitate higher education?

<table>
<thead>
<tr>
<th>S/N</th>
<th>Funds</th>
<th>Very Frequently</th>
<th>Frequently</th>
<th>Rarely</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Fund-raising</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>Philanthropic donations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Funds from the founders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Sponsorship from external bodies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Short courses and training programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Grants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. What is the extent of budgetary provision for the acquisition of information resources to facilitate sustainable development of higher education?

<table>
<thead>
<tr>
<th>S/N</th>
<th>Information resources</th>
<th>Very High Extent</th>
<th>High Extent</th>
<th>Low Extent</th>
<th>Very Low Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>E-books</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>Newspapers and magazines</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Reference sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>E-journals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Journals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Textbooks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Appendix ii

Public HEIs in Ekiti and Ondo States

<table>
<thead>
<tr>
<th>S/N</th>
<th>Name of institutions</th>
<th>State</th>
<th>No. of librarians</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Federal University of Technology, Akure</td>
<td>Ondo</td>
<td>14</td>
</tr>
<tr>
<td>ii</td>
<td>Adeyemi College of education, Ondo</td>
<td>Ondo</td>
<td>14</td>
</tr>
<tr>
<td>iii</td>
<td>Ekiti State University, Ado-Ekiti</td>
<td>Ekiti</td>
<td>11</td>
</tr>
<tr>
<td>iv</td>
<td>Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti</td>
<td>Ekiti</td>
<td>9</td>
</tr>
<tr>
<td>v</td>
<td>Federal Polytechnic, Ado-Ekiti</td>
<td>Ekiti</td>
<td>9</td>
</tr>
<tr>
<td>vi</td>
<td>Federal University, Oye-Ekiti</td>
<td>Ekiti</td>
<td>8</td>
</tr>
<tr>
<td>vii</td>
<td>University of Medical Science, Ondo</td>
<td>Ondo</td>
<td>6</td>
</tr>
<tr>
<td>viii</td>
<td>Adekunle Ajasin University, Akungba-Akoko</td>
<td>Ondo</td>
<td>5</td>
</tr>
<tr>
<td>ix</td>
<td>Federal Polytechnic, Ile-Oluji</td>
<td>Ondo</td>
<td>4</td>
</tr>
<tr>
<td>x</td>
<td>Olusegun Agagu University of Science and Technology, Okitipupa</td>
<td>Ondo</td>
<td>4</td>
</tr>
<tr>
<td>xi</td>
<td>Ekiti State College of Health Science and Technology, Ijero</td>
<td>Ekiti</td>
<td>4</td>
</tr>
<tr>
<td>xii</td>
<td>School of Nursing, Akure</td>
<td>Ondo</td>
<td>3</td>
</tr>
<tr>
<td>xiii</td>
<td>Federal college of Agriculture, Akure</td>
<td>Ondo</td>
<td>3</td>
</tr>
<tr>
<td>xiv</td>
<td>Ekiti State College of Agriculture and Technology, Isan-Ekiti</td>
<td>Ekiti</td>
<td>3</td>
</tr>
</tbody>
</table>
Fostering library usage among science students towards Sustainable Development Goals

Femi E. Babalola, Sina J. Fakoyede, Folasade B. Ojobola, and Foluke G. Abiona

Department of Science Education, Federal University, Oye Ekiti, Nigeria

**ABSTRACT**

This study explores high school libraries and science literacy in South West Nigeria. Availability of human and material resources, attitudes of science students toward the use of libraries, and possible suggestions for improvement of school libraries were examined. Data were collected from six high schools in two states in the south-western part of Nigeria. Quantitative surveys were carried out with three hundred (300) science students. Qualitative data were gathered from student focus groups and semi-structured interviews with thirty (30) students. Illustrative quotes are reported extensively in the paper. The comments were transcribed and coded to identify common themes and factors. The study confirms that there is a wide gap between policy and implementation. This gap is attributable to; lack of resource, inadequate reading space, limited reading time, non-digitization of the libraries etc. The study shows that there is a need for effective implementation of government policies to achieve improved scientific literacy rates.

**KEYWORDS**

Library; student attitudes; resources and facilities; e-library; Sustainable Development Goals

**Accessing library use by students toward Sustainable Development Goals (SDG): A case study**

Ensuring that the world is transformed through Science, Technology, Engineering, and Mathematics (STEM) is a goal of the United Nations. This goal is backed by policies such as the Sustainable Development Goals (SDGs) framed by the United Nations in September 2015 which, in Agenda 2030, asserted that the world would become universally science literate. According to National Science Education Standards (National Science Educations Standards, 2005) scientific literacy is the ability to apply scientific concepts, knowledge, and understanding to civic affairs and enable effective participation in cultural and economic productivity. Agenda 2030 asserts that “by 2030, all youth and a substantial proportion of adults, both male and female, will achieve literacy” (United Nations, 2015). A prerequisite to this is providing functioning libraries in schools as well as ensuring that such libraries have relevant science literacy materials. Libraries should also be inclusive of people living in suburban, rural, and other vulnerable areas. Various governments
have enacted national, state, and local policies and have also built infrastructure for the achievement of this literacy goal. Researchers (S. F. Samsuddin et al., 2021) have already asserted the relevance of such ideas to peri-urban areas in South West Nigeria where this research was carried out. They comment that citizens of suburban communities should be included in the drive to being informed and science literate. They further assert that the rural areas should consistently be linked with their urban counterparts regarding access to digital networks.

Nigeria has the responsibility of increasing science literacy levels among its citizens guided by Agenda 2030 and has adopted the specific goal of promoting the “establishment of libraries and other such resources that will enhance effective learning” in its National Policy of Education (National Policy of Education, 2020). Seven years after the 2015 United Nations meeting and with eight years remaining for the completion of Agenda 2030, how accessible and inclusive are libraries, etc. for high school learners in the south-western region of Nigeria?

In S. F. Samsuddin et al. (2021) study of literacy rates in digital reading, it was shown that differences in educational level affected the literacy capabilities of young minds. Hence, high school learners were selected for this study. It is believed that by their age, these learners should be accustomed to using the library and the resources therein, optimally. In an earlier work (S.F. Samsuddin et al., 2018) it was suggested that when science literacy resources in libraries are provided to younger minds, there is a resultant effect of increased science literacy levels and improved scientific outcomes among these students. These included the students’ attitudes toward and interest in science studies. Prompted by these results, this study critically investigates the present status of school libraries in the context of high school learners and literacy resources in the school-based library. Parameters that are studied include (i) critical factors influencing effective use of school libraries, (ii) attitude of the learners, and (iii) possible suggestions for effective library usage.

**Literature Review**

The school-based library has been thought of as both a context and a space. In countries such as Nigeria, a high proportion of libraries are sited in schools, especially high schools. School-based libraries are not open to the public while public libraries are open to everyone. In a community or peri-urban area, the ratio of public to school-based libraries is likely to be 1:10. While there has been a lot of focus on public library use, there have been very few studies of high-school-based libraries, especially in the Nigerian context (Ahenkorah-Marfo & Osei-Boadu, 2013; Ibe, 2014; Okafor, 2020). This remains true for the period between the creation of the United Nations agenda in 2015 and the present.
According to Ntui and Udah (2015), library resources contain information in both print and non-print formats such as textbooks, journals, indexes, newspapers and magazines, reports, internet articles, videotapes, diskettes, and microforms. Library resources are the raw materials that provide vital support to the teaching and learning process. Such library resources are important for the preparation of lesson plans by teachers and for educational advancement in order to achieve the set instructional objectives. A library helps the secondary school teachers to achieve the objectives of producing students that are information literate and are prepared for lifelong education. Hence a library should provide access to available library resources and expert professional support to facilitate effective utilization of those resources.

To summarize briefly, libraries in schools are intended to play a major role in the literacy of students. They provide print and digital materials, and library space that should complement and extend the learning experiences provided directly by teachers who have a critical role in helping learners to use the library effectively. Through these mechanisms they facilitate both scientific literacy and academic success, as shown by a study of library use in first year undergraduates (Soria et al., 2017).

Unfortunately, despite the push for science literacy in developing countries such as Nigeria, and the provision of some infrastructure, it appears that the extent and effectiveness of library usage may not be encouraging, even in the schools (Merga, 2020; Oluwatosisin & Akporhonor, 2021). To date there are relatively few relevant studies emanating from high schools in the southwestern part of Nigeria (Chukwueke et al., 2018; Lulu-Pokubo & Akanwa, 2017). Several possible reasons are recognized for a lack of success in these students regarding scientific literacy and the Sustainable Development Goals. They include limited student engagement, poor curriculum linkage, policy deficiencies, and resource limitations.

The education system in Nigeria has been in crisis for many years largely due to the fact that the sector is poorly funded (Olufemi et al., 2018). These authors further stated that this has led to a shortage in the supply of learning materials and human resources, whether teachers or relevant support staff, such as library assistants. This is still being experienced in the system. In the 2018 study by Olufemi et al. (2018), it was reported that 30% acknowledged that they do not have a comfortable place to study. The economic crisis experienced in Nigeria impacted on the education system and played a major role in the decline of the quality of education offered in the country (Olabiyi & Abayomi, 2010).

King stated that creating humanizing spaces within schools to access STEM resources is important in the push for black liberation (King, 2022). The same article also discussed creating positive science identities through informal STEM learning. This is important because there have been negative narratives
and stereotypes of black students that do not position them as scientifically or mathematically talented (Pringle et al., 2012).

In the 2015 work of Nuti and Udah (cited earlier) it was stated that when students can access and utilize library resources, an enabling environment is created and effective learning will be enhanced. These authors recommended that school libraries should stimulate the utilization of their resources by making accessibility of these resources their priority and also considering the comfort and aesthetics before use.

The school or government may not have made library usage fascinating to enable increased students' interest in the use of library as asserted by Banda and Chewe (2021). Another possibility is that learners place little value on literacy or that literacy seems irrelevant. Perhaps library funding is inadequate (Agodi & Obasi, 2016)? The word ‘value’ here indicates the priority that the community authorities have placed on the library as an important tool toward the growth of the society. Many young minds prioritize entrepreneurial activities that allow rapid access to wealth over education that takes longer to provide economic benefit. Do learners see scientific literacy as important in their lived-world? When students have positive experiences toward the use of a library, they will most likely improve on their rate of library use. There appear to be few studies of the impact of school-based libraries on scientific literacy among students. The libraries provide print and digital materials to enhance the literacy of students but are these resources fully accessible to students in this 21st century?

According to Abdulsalami (2013), a library should have both digital and print resources. Do our high school libraries have such resources? The availability is just one concern. Another is the accessibility of the resources by everyone, whether living with impairments or not. Do all students, including the intellectually impaired, have equal access to content, connectivity, information education, and support? According to Benard and Dulle (2014), ensuring that everyone has equal access and optimal use of these resources requires an amount of effort to be demonstrated. If the United Nations’ goals seem to be on the forefront in our agenda, school-based libraries should have demonstrated the willingness to create an enabling environment for the growth of scientific literacy. Of course, the reality is that libraries in the developing and underdeveloped world struggle to meet up with these laudable goals. Oftentimes, library users (whether fully able or living with impairments of any sort) need to be enlightened on how to use the library, its referencing, lending and information services, and the use of audio-visual tools and equipment.

Ntui and Udah (2015) assert that the library can enhance the teacher’s capacity to train students to become information literate. In different studies, Whitmire (2002) and Alokluk (2020) state that the library provides a cognitive space that enhances the advancement of knowledge. This is potentially true
since the library brings information together in a place that is potentially accessible. However, library effectiveness is influenced heavily by the extent to which it meets the needs of the students and teachers. How far have these needs been met in the high schools?

Policy-wise, Ohegbu (2008) states that policies are guidelines toward regulating interactions with library materials. These materials can be in print or digital. It might be expected that library policy guidance would promote effectiveness. However, Yakubu et al. (2022) pointed out that in Nigerian libraries operate without an overarching specific policy framework. Those libraries that have locally generated policies do not always update or implement them.

The role of teachers and the integration with teaching and learning seems to be absent from policy discussions. One of the responsibilities of the teachers in getting students literate with the use of a library is enabling the students to acknowledge and have positive experience regarding the use of the library. Despite the provision of infrastructure, the positive attitude of students toward the use of a library to achieve their goals appears not to have always been met. These goals are the present needs of the students as described in Ran (2022). Many times, the libraries perform a ‘social responsibility’ as well as a cultural role. According to Li et al. (2018), the impact of library space is intriguing. Socially, students tend to visit the library for peer tutoring or collaborative learning in the library space. They need both human and material resources to share knowledge from within the collaborative area. The library can function as a meeting place. In practicality, this happens in public or in the university-based libraries. However, in high school libraries, the students are much younger in age, hence most times the collaborative area is not explored because of the noise that may emerge from students’ discussions. This crosses ethnic, cultural, social and generational lines. Culturally, the library houses artifacts, storylines with a cultural flavor, and other relics that fulfill the mandate to provide cultural information. Hence, the library should meet the demands of being socially enabling and academically functional, while providing seamless technology and print usability, as well as being attractive.

In one study (Baro & Keboh, 2012) it was reported that a lack of interest by many African students has been a barrier toward achieving scientific literacy in the 21st century. They further mentioned that human library resources were insufficient and that there was low use of distant learning library resources. Maepa and Mhinga (2021) stated that approximately thirty three percent (33%) in the Limpopo province (one of the nine provinces in South Africa) only have access to a functional school library. This is a low proportion compared to the sixty-seven percent (67%) that may lose out on being scientifically literate. Is the situation the same in Nigeria today, after 7 years of working toward the Agenda 2030 goals?
Scientific literacy as the sort of positive transformation envisaged by the United Nations by the year 2030 must involve digital resource material. Akueveso and Adeleye (2010) stated that students who only use textbooks and classroom content may not become science literate. The student must refer to the e-library for more content. Benard and Dulle (2014) state that the functionality of any school library depends on how the learners utilize the resources in the library. When students have access to their library digitally, they will have been furnished with opportunities for seeking information in the school, in the comfort of their classrooms, or in their homes. Gbadebo et al. (2016) state that when libraries are frequently updated and reconditioned to suit the needs of today’s students, transfer, access, and retrieval of information will be enhanced. How many of our high school libraries are frequently updated for students to enhance their science literacy? With the use of phones, tablets, and technological devices, students tend to be more technologically inclined than their teachers. This attitude and interest of the students in the use of technological devices can be exploited to create the attitude of seeking for relevant information related to scientific literacy.

Baro and Keboh (2012) suggested that if usage statistics are to improvethe there should be collaborations among libraries in Africa. Internet connectivity is essential. In Venda province in South Africa, Tlakula and Fombad (2017) found that the level of use and awareness of electronic resources is low and rudimentary among undergraduate students. If this result has emerged from undergraduate students, it may be lower in high school students. Are our schools internet-connected and infrastructure-enabled?

This study is intended to provide insight into the present status of school-based libraries in South West Nigeria and the factors that have led to the present position. The study is centered on user (student) opinions as student attitudes may be central to library effectiveness and the acquisition of science literacy. The study attempts to answer the following research questions.

(1) What are the critical factors affecting effective library usage among high school students?
(2) What attitudes do students possess toward their use of the library?
(3) What can be done to develop student interest in making use of their school library?

Research methodology

Overview: The researchers adopted a mixed mode approach of both quantitative and qualitative techniques for data collection. The researchers recruited three hundred (300) high school students from two states in the south-western part of Nigeria. Six schools (four coeducation schools, one boys’ school, and one girls’ school) were purposely selected for this study. Consent from the
Table 1. Key characteristics of the schools visited with student survey numbers.

<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th>Suburban</th>
<th>Rural</th>
<th>TOTAL (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Coed.</td>
<td>45</td>
<td>50</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>Male only</td>
<td>35</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Female only</td>
<td>0</td>
<td>45</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gendered subtotal</td>
<td>80</td>
<td>95</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL (%)</td>
<td>175 (58.3%)</td>
<td>70 (23.3%)</td>
<td>55 (18.3%)</td>
<td>300 (100%)</td>
</tr>
</tbody>
</table>

students was obtained after being informed about the purpose of the study and research objectives at the start of the interview. Privacy and confidentiality were explained in the consent process and data anonymity was practised. Table 1 provides data on the type of school attended by the students and their location. It can be seen that the large majority of participants came from coeducational schools. Views were obtained from rural, urban, and suburban schools.

Survey Protocols: A short survey was carried out on 300 students (47.3% male, median age 17 years). The students were enrolled on the same breadth of courses and were grade 12 secondary science students. Most of them were very enthusiastic in responding to the questionnaire which centered on the resources available in their school library and their attitude to library usage. The students’ surveys were completed in scheduled class times. The selected students were 16–18 years old. The response rate from the 300 students was 100%. There were 142 boy and 158 girl participants as shown in Table 1. The survey data are presented using descriptive statistics of frequency and percentage. Quantitative inferential analysis would be inappropriate without greater control of variables and larger samples. Some of the survey items invited open-ended response.

Interview Protocols: The students’ Interviews were conducted face-to-face and typically were brief, lasting 10–15 minutes. The students who were interviewed were rapporteurs from student focus groups organized within the schools visited to discuss the interview questions. Rapporteurs were asked to voice the collective views of their groups. Each focus group was comprised of 10 students making 30 groups altogether. There was no time limit on the focus group discussion; the duration depended on the discretion of the rapporteur.

The interview protocols were developed through informal discussion and simulated interviews with colleagues followed by a pilot in another high school that did not form part of the study. Only minor changes were required after the pilot. The interviews were conducted around two questions that asked for their opinions on (i) their views on their school library and (ii) ways of
cultivating good reading culture. These questions were elaborated to clarify any opinions that had been expressed.

The audio recordings were transcribed and coded into thematic nodes by the researchers initially independently, but with iterative convergence in node definition. This approach was essentially ethnographic. Each confirmed node contained a range of opinions. The quotes used in this paper are representative of statements made by several respondents.

Results

Survey Data: A total of 300 students participated in the survey. The student questionnaire was fairly short and was based on their personal experiences of their school library. It solicited their responses on availability of library resources and their attitude toward library usage. Students’ views on resources and facilities in the school library is shown in Figure 1

The overall view is that resources are not adequate. Although about 60% of the students surveyed assert that they have a dedicated library, there are major concerns about the adequacy and state of other resources like furniture and relevant textbooks. Though the students claim that their library has well labeled shelves, they don’t believe that the available science textbooks are

![Figure 1. Science student views on resources and facilities in the school library.](image-url)
Figure 2. Attitude of students toward library usage.

adequate to cater for the needs of the students. A clear majority of the students assert that their school is lacking an electronic library with internet facilities. About 60% of the students claim that their school library is deficient in scientific journals. Most of the schools have a librarian who assists the students.

Students were asked about their attitude to library usage by indicating their level of agreement with nine statements. The responses are presented in Figure 2. They reported that they enjoyed going to the library often. Going to the library helps them to become more interested in science, and they prefer to read in the library rather than in the classroom. The library has helped them to improve their understanding of science and their teachers motivate them to use the library. In spite of such (aspirational?) endorsements, few of them actually visit the library frequently. A large majority claim that the science textbooks are inadequate and irrelevant and that there is insufficient time to use the library. They note that their teachers don’t read in the library.

**Interview Data:** Following the node sorting process, the interview responses were sorted into three themes that influence learner’s attitude toward library usage in high schools. They were; resources and facilities, the attitude and motivation of both teachers and school authorities and suggestions for improvement (TABLE 2).
Table 2. Overall themes and number of responses on each theme.

<table>
<thead>
<tr>
<th>States</th>
<th>Ekiti</th>
<th>Ondo</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Number of interviewees)</td>
<td>(17)</td>
<td>(13)</td>
<td>(30)</td>
</tr>
<tr>
<td>Resources and facilities</td>
<td>17</td>
<td>13</td>
<td>30</td>
</tr>
<tr>
<td>Attitude and motivation</td>
<td>15</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Suggestions for improvement</td>
<td>17</td>
<td>11</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>34</td>
<td>83</td>
</tr>
</tbody>
</table>

**Resources and Facilities:** The researchers interviewed the students by asking questions on the state of the school library and its facilities. Some students claimed that their school doesn’t have a functional library for students. Others asserted that the furniture materials in the school library are not adequate for all the students. Some of them also commented on the lack of relevant science textbooks. Some of them argued that their school library is always noisy due to lack of enough space to contain the students which hinders them from acquiring the necessary information from the library. None of the school libraries include e-learning facilities. Here are some representative examples of the student comments offered:

“We have a school library but the science textbooks on the shelves are not enough” (School A)

“We have enough textbook in our library, just that if you didn’t come to the library early, you won’t find a place to sit” (School B)

“Unfortunately, I have not been to the library before because we don’t have it in our school” (School C)

“We have a classroom designated as library but the books there are very scanty” (School D)

“We have a library in our school which has been locked up sometimes because we don’t have a school librarian” (School E)

“We have a functional library in our school but sited close to a noisy class, this normally hinders our concentration when we are studying in the library” (School F)

When asked whether their school library has access to electricity and e-learning facilities, there were mixed reaction from the students on access to a stable power source. Some claim that their school is well connected to a power grid while other asserted that their school relies on a generator to get power. However, most of the students interviewed claim that there are no e-learning facilities in their school library. Below are representative comments made by the students.

“For now, our school is not having electricity connection and our library is not well ventilated.” (School D)

“We don’t even have electric poles in our school, talk less of having electricity in the school library.” (School E)
“In our school, (the) library is well connected to a power source but we don’t have access to e-learning facilities.” (School A)

“We have some set of computers in our school library and the library is connected to a power source but the school librarian has not shown us anything about e-learning facilities and we are not allowed to even access the computers.” (School B)

“Our school has a generator which is mainly used in the administrative block. It is not connected to the school library.” (School F)

“There is electricity in our school library but no e-learning facilities” (School A)

Attitude and Motivation: The students were asked on how often they visited the library and what motivated them in using the library. A large majority of the students claimed that they were motivated by their teachers to use the library to gain additional knowledge to what they had been taught in the classroom. However, they asserted that they visit the library often; when asked how often they visit the library; the majority of them claim to visit the library once a week – a rate that is limited by time constraints. Below are representative comments made by the students.

“Our teachers always ask us to go and read in the library but we hardly see them (teachers) in the library.” (School A)

“We are motivated to visit the library by our teachers and we do visit the library once in a week.” (School B)

“We don’t visit the library because we don’t have one” (School C)

“Our science teacher always encourages us to gather more information in the school library but there is not enough time to use the library.” (School F)

“There is no time to use the library because the timetable is occupied . . . When one teacher finishes his/her lesson with us, another teacher will take over.” (School A)

“Our teacher used to tell us to use the library but due to time factor we visit once in two weeks or when we have a free period which is very unusual.” (School D)

Suggestions for Improvement: The students were asked about their ideal library, in the sense of a library that would be well used and would help to create an effective reading culture. Most of the students called for more and more relevant science textbooks. Some claimed that having a state of the art library where students could access e-learning facilities would go a long way in developing their reading culture. Others asserted that more time should be provided by the school for students to use the library. Some called for librarian support that would help to run the library activities and the provision of adequate furniture to cater for the students. Here are representative examples of relevant comments.

“We need a state of the art library with e-learning facilities.” (School A)
“Our library need to be well equipped with relevant science textbooks and also the school authority should provide more sitting space.” (School B)

“We need a school librarian who will be in charge of the school library so that the library will always be open for students’ use.” (School E)

“Presently, I do visit the library once in two weeks because we don’t have enough time. We prefer a situation where there will be library time on the school timetable – at least twice a week.” (School D)

“Our school library needs to be connected to electricity and internet facilities.” (School F)

“The science textbooks are not adequate for all the science students . . . we need additional and updated science textbooks.” (School C)

Some of the students believe that seeing their teachers reading in the library would be a morale booster for them and also develop their reading culture. They opined that the school authority needs to encourage them to see the advantages of using the library and that was particularly important for science students.

“We love a situation where our teachers will also read in the library with us – this will serve as a source of motivation.” (School A)

“We need to be motivated by the school authority – they should educate us more on the advantages of library usage to science students.” (School C)

**Discussion**

The discussion will be informed by the results of the study as well as contextual information. The participants have identified many critical factors, and the initial discussion will be structured around the themes uncovered and the reform suggestions made. The overall picture of library usage among the high school science students is discouraging. The libraries appear marginalized in the school experience of the students. Why is this? What are the critical factors (Research Question 1) that underlie the broad pattern established by the results?

**Resources and Facilities**: Lack of resources of all types and lack of time-tabled and informal time are the most obvious factors. Students in this study asserted that their school libraries lack relevant and contemporary science textbooks and journals. The students report no effective access to e-library facilities. Some libraries had no access to an electricity supply while others relied on generators. Sitting spaces and furniture were not adequate to meet the needs of the students. At the most extreme, some students were not provided with a dedicated library. Given these deficiencies, it is not surprising that school authorities do not schedule time for students to access the library, and teachers
do not incorporate library activities in their pedagogy. Lack of resources and explicit study relevance implies lack of importance to the wider reading and investigation that libraries can provide. The situation is further exacerbated by the lack of adoption of electronic resources which students use extensively in their personal lives. The findings are in line with previous research results cited earlier. Olufemi et al. (2018) had asserted that there is a shortage of both human and material resources whether teachers or support staff such as library assistants. Agodi and Obasi (2016) argued that library funding is inadequate while a related study in South Africa also indicated that approximately thirty-three percent (33%) in Limpopo province only have access to functional school library

There are several factors that could give rise to the library resource and time issues. Generalized funding limitations are obviously relevant, and it might be that teachers and school leaders have limited understanding of how the classroom curriculum can be complemented and enriched by a well-resourced library. Further back in the chain of influences on the library and the delivery of science literacy are the formation and delivery of relevant policy at school, state, and national levels. Data on these factors are beyond the scope of this study.

**Attitude and Motivation:** In spite of the difficulties outlined above, this study suggests that students have a generally positive attitude to library activities (Research Question 2). Their most positive response to the survey question on attitude indicated that the large majority enjoyed going to the library. Teachers encouraged them to use the library, and it was a preferred place in which to read. Many students assert that the library has helped them to develop more interest in science and has improved their understanding of science concepts. However, they clearly feel time pressures as few students make use of the library often. There is also frustration about resource constraints. The students say that usage does not match their aspirations. These student views are consistent with those in the already cited works (Alokuk, 2020; Whitmire, 2002), who asserted that the library provides a cognitive space that enhances the advancement of knowledge but also reflect Ran’s (2022) comments on the need to ensure that library delivery can support such goals.

**Suggestions for Improvement:** Unsurprisingly, student views on how the use and perceived value of libraries could be improved center on dealing with the disincentives caused by lack of resources and time (Research Question 3). Providing a state of the art library in each high school would be a panacea. Such a library would be of adequate size and would include both paper resources and networked access to electronic resources. It would underpin the science literacy envisaged by the Sustainable Development Goals.
Of course, such library provision would not be possible without supporting policies that channel funding and promote necessary professional expertise, curriculum reform, and student engagement. The present position is that existing government policies for scientific literacy and for educational sustainability have remained as aspirational goals without mechanisms for implementation. In Nigeria, individual libraries operate for the most part without policies, and those that do have policies do not necessarily update or implement them (Yakubu et al., 2022). Similar findings come from other African countries. For example, in a related study in South Africa, Maepa and Mhinga (2021) found that just one-third of students in Limpopo province have access to a functional school library.

Although Tlakula and Fombad (2017) found out that the level of awareness of relevant electronic resources is low among students, the present study indicates that there is student interest in such possibilities. This is critical to the development of literacy. Akueveso and Adeleye (2010) asserted that students may not become science literate if they rely on education by textbooks and classroom content alone. Students must access e-library resources for more content. Samsuddin et al. (2018) suggest that when science literacy resources in libraries are provided to younger minds, there is resultant effect of increased science literacy levels while creating a literate society and improved scientific outcomes among these students.

**Conclusion**

This study confirms that library provision and library use in the schools visited are not capable of supporting the levels of science literacy envisaged by national policies. Given that these schools are unremarkable within the spectrum of schools in South West Nigeria, it is reasonable to assume that these conclusions have broader validity. Inadequacies in resources and student time are apparent but the attitudes of students provide a more optimistic viewpoint. They seem aware of the potential of libraries in their studies and are enthusiastic about the possibilities of using enhanced libraries.

This enthusiasm includes the exploitation of e-libraries. Digitization of the school library can include both acquisition of digitized science textbooks and curated access to external science resources. Many of these resources are aimed at high school students and substantial fractions have been provided by donors for use without charge. This could be a cost-effective panacea and could help to enhance scientific literacy. However, to implement such a reform effectively, there needs to be an enabling environment including adequate equipment and more space found in the school timetable. In turn this requires curriculum reform and professional development of all those involved. These
changes would involve government in drafting detailed policies and ensuring that these policies are implemented effectively.

This study was limited to the south-western part of Nigeria with findings on high school students' attitudes toward library usage in line with Sustainable Development Goals to enhance scientific literacy. There is need for further study to accommodate students’ perceptions of the school library in tertiary institutions across the country. Finally, additional research is encouraged to investigate the obstacles and difficulties that students living with disabilities encounter when they attempt to use the library.

**Acknowledgments**

We are highly indebted to all the stakeholders who participated in this study.

**Disclosure statement**

No potential conflict of interest was reported by the author(s).

**ORCID**

Femi E. Babalola [http://orcid.org/0000-0002-8161-8544](http://orcid.org/0000-0002-8161-8544)

**References**


Affecting Students’ Academic Performance in Colleges of Education in Southwest Nigeria.pdf


GLOBAL PERSPECTIVES

Peggy Nzomo, Global Education Librarian, Kent State University, Kent, OH, USA

COLUMN EDITOR’S NOTE
The “Global Perspectives” column gathers views on current topics of global interest from authors worldwide. Contributions from across the globe are valued and encouraged as they add a richness that is the voice of today’s global information infrastructure. Interested authors are invited to contact the column editor at pnzomo@kent.edu.

A New Lens for Evaluation – Assessing Academic Libraries Using the UN Sustainable Development Goals

Roxanne Missingham
University Librarian, Australian National University, Canberra, Australian Capital Territory, Australia

ABSTRACT
Library evaluation has evolved across the decades to take account of the role of services and collections within their institutions. The framework of the United Nations Sustainable Development Goals (UN SDGs) enables consideration of the value and benefits of libraries within national and international development. Taking this approach, based on the theory of change, provides different insights to the work of libraries. The article provides an overview of library assessment and information on the development of the UN SDGs. Australian academic library activities are assessed using four SDGs to reveal a contribution beyond the walls of their institutions. Methodological comparisons frame a discussion about the nature of value.

KEYWORDS
Academic libraries; evaluation; digital scholarship; statistics; library services; United Nations Sustainable Development Goals (UN SDGs); assessment; Australia

Introduction
Academic libraries have spent decades assessing their value through a wide range of methodologies. They have focused on recording the contribution made by their activities to their institutions. The theories behind the methodologies have generally been adopted from economics rather than theories of knowledge. The measures adopted reflect the actual use of the library and its collection, representing a transactional assessment, rather than the potential power of the knowledge and capabilities provided by libraries. More recently social value has been added to the repertoire of assessment, using an economic base.

A new means of assessing and understanding of value has emerged through the framework of the United Nations Sustainable Development Goals (UN SDGs). This methodology reflects concepts of national and international outcomes that create a

CONTACT Roxanne Missingham Roxanne.Missingham@anu.edu.au University Librarian, Australian National University, Level 3, JB Chifley Building 15, Acton ACT 2601, Australia. © 2021 The Author(s). Published with license by Taylor & Francis Group, LLC
sustainable world where knowledge is part of the powerhouse for economic and social transformation. Taking a deeper view at the performance and measurement of libraries through this lens positions our services within a framework based on a theory of change.

In this article an overview of the nature of library assessment is undertaken. The application of the economic and social methodologies is summarized within a sector wide frame to provide a context to establish where and how the UN SDGs could be used. A case study of applying the methodology to Australian academic libraries allows for identification of opportunities the SDGs to highlight the contribution of academic libraries. The evaluation has found that the methodology enables the important role that university libraries play in national and international development and education to be highlighted. The article concludes with a discussion of the implications of using the theory of change to assess academic library performance to create new knowledge regarding the activities of these libraries.

**Background**

Academic libraries are a vital element of the infrastructure of a modern university, built on centuries of practice and theory. Within the changing environment of academic institutions, libraries have evolved their collections and services to maintain their relevance through grasping opportunities and challenges. Libraries are strongly focused on maintaining their relevance in an increasingly digital world. New forms of learning and pedagogies have affected the services provided to support education. Research in universities is increasingly data driven. Library services have both supported and shaped the new agenda in scholarly communication and education.

Understanding the nature of the 21st century academic library and its contribution to education and research has been a major focus of work within the sector. Other library sectors have assessed how they can provide value to their individual communities. As early as 1994, it was clear that assessing libraries and information needs in research and academic fields was already a vast discipline. For one component of scholarly communication evaluation the literature was extensive:

There have been hundreds, perhaps thousands, of studies involving scientific and technical information communication performed over the last 25 years. (King & Jones, 1994, p. 2)

It is rare to read a library journal or magazine in recent years that does not include a report on library assessment, whether of libraries in a particular sector or of a particular service, be it resource sharing, research data management, digital library services, or collection building. Library, Information Science & Technology Abstracts (EBSCO, 2020) records more than 11,700 articles on the topic of libraries with the term value. Many thousands more are recorded in Google Scholar.

The changes and intensity of research into libraries and library services evaluations can be seen over at least six decades. The evolution of the methodologies has been significant. Research has developed from recording patterns of use of the collection, a characteristic of the studies in the 1970s (reflected in evaluation texts such as Busha & Harter, 1980) through to economic and social value methodologies in the 1990s. The
increased sophistication of methodologies has a parallel in application of evaluations in institutions in higher education themselves.

For the higher education sector there are highly developed evaluation tools. The international ranking systems produce comparative assessment based on extensive research. The results of each evaluation feature prominently in news, on university websites, and in marketing campaigns. Universities believe that these rankings influence applications from students and increase positive outcomes from applications for research funding. Well established evaluations include the Academic Ranking of World Universities (Shanghai Ranking Consultancy, 2020), The World University Rankings (Times Higher Education, 2020), and QS World University Rankings (Quacquarelli Symonds, 2020). Impact is also assessed in new ways in terms of influencing public policy (Becker and Vanclay 2003).

University and research evaluation has become a fundamental aspect of assessment by governments. In the United Kingdom the Research Excellence Framework reports on the quality of research in UK higher education institutions (UKRI, 2020). In Australia the Excellence in Research Assessment (Australian Research Council, 2019) provides a similar independent evaluation. Many other countries have similar programs.

In an environment where evaluation is a lingua franca for discussions of higher education institutions, it is not surprising that academic libraries are evaluated. Libraries have continued to evolve their assessment activities, applying methodologies from a range of fields to understand the “value proposition”.

This article journeys through themes to review the assessment of the value of academic libraries using the economic and social lens that has been fundamental to research in the past decades. Recognizing that the contribution of academic libraries in a modern university goes beyond traditional concepts of research and collection-based services, the application of the theory of change through the United Nations Sustainable Development Goals is used to provide new insights. This approach situates libraries within an international framework and assesses the contribution made to powering the economy and reshaping nations through contemporary activities. This approach encompasses an understanding that society is transformed through the power of research, teaching, and learning. It situates University libraries within a paradigm that understands their role as essential knowledge and information infrastructures which enable student success and research excellence.

Value of academic libraries

In taking an historical view of academic libraries, it is important to note that the libraries have always been a defining feature of universities. Libraries have been recognized both as the keepers and disseminators of knowledge. Histories of libraries identify Middle Eastern university libraries dating back to the ninth century. The House of Wisdom in Bagdad, a university supporting scholarship and the translation of scholarly works has been identified as the initial academic library (Murray, 2009, p. 2). It is not surprising that information about early libraries indicates that their value was in their collection - the number of titles and disciplines represented.
Understanding the value of libraries has been a question considered from many angles. Users/readers have been an important locus — information seeking behavior of students and academics has been the subject of extensive research. Tenopir et al. (2013) had studied reading and library behaviors to understand who is using the collections and in what context — a value in use approach.

Assessing the depth of our collections has seen methodologies rise and fall. From simple measures of numbers of titles to sophisticated assessment. The conspectus methodology was one complex and ultimately unsuccessful approach led by the research Libraries Group in the 1980s (Stielow and Tibbo (1987) provide a mild rebuke and Munroe and Ver Steeg (2004) report on a lack of adoption and problems).

Emerging from these service and collection level assessments has been a clear need for more holistic assessment. These have developed as libraries have created more complex services. The narratives of libraries have expanded requiring an expanded set of methodologies to assess the nature and delivery of value. Value assessment have been unpacked into many dimensions by a recent report which concluded that the current measurement of value and understanding of theories required considerable action:

When academic librarians learn about their impact on users, they increase their value by proactively delivering improved services and resources — to students completing their academic work; to faculty preparing publications and proposals; to administrators needing evidence to make decisions. Indeed, the demonstration of value is not about looking valuable; it’s about being valuable. (Oakleaf, 2010, p. 140)

In summary, the academic library assessment has evolved to look beyond collections or individual services. The two-key lens, used for meta-level assessment of value of are now “economic and social.” Borrowing methodologies from economics has been a feature in the overall environment of management and managerial focus on the financial costs and benefits of libraries.

Studies on the economic benefit of academic libraries have primarily used the concept of return on investment. This frames the evaluation within a financial context that recognizes the significant investment in libraries and the need to assess the nature and extent of the return to the university. This approach aligns with the economic assessments occurring in government and business through the 1990s.

Contingent valuation methodology has been the tool of choice — estimating the value placed on a service or good. It assesses passive use and has been applied to a wide range of libraries in national, state, public, and academic sectors. Studies of the British Library, South Carolina Public Libraries, Florida Public Libraries, St Louis Public Library, Canadian national union catalogue, and New Zealand Te Puna services have found a return on investment of between 2.5 and 35, depending upon the type of service and particular segment of the population served (Missingham, 2005). Compared to these industries, the investment return figures indicate that the benefit is much greater than the investment in the service. A study of university libraries found financial Return on Investment (ROI) of 136% to derive from centrally provided collections provided by the libraries (Outsell Inc, 2009).
Contingent valuation methodology has been criticized as limited and lacking depth. We believe that contingent valuation is a deeply flawed methodology for measuring non-use values, one that does not estimate what its proponents claim to be estimating. The absence of direct market parallels affects both the ability to judge the quality of contingent valuation responses and the ability to calibrate responses to have usable numbers. (Diamond & Hausman, 1994 p. 52)

The high variance in results in its application in libraries gives rise to concerns. In terms of providing a true understanding of value, the limitation of assessment to specific services, such as access to a collection or in the case of Canada and New Zealand a shared database, speaks to the methodology providing only partial insight into the benefit of libraries.

A newer body of work has emerged to assess the social impact of libraries including Social Return on Investment (SRI). This methodology has been applied to museums and galleries as well as libraries. SRI is based on collecting and analyzing information about the social value of resources consumed by programs. The methodology is founded on outcomes that are identified by the stakeholders, with data collected through interviews, focus groups, and workshops. Data analysis identifies key themes. The results are both qualitative and quantitative, drawn from a broad interpretation of the theory of change. Built upon program evaluation, theory of change “applies critical thinking to the design, implementation and evaluation of initiatives and programmes intended to support change in their contexts”. (Vogel, 2012, p.3)

While these methodologies have been applied in a range of studies, their overall focus means that the results are limited to a particular goods or services. The approach is characterized by conceptual limitations with regards to the value of culture.

The fact that economic valuation techniques cannot capture the whole of cultural value is well-established amongst many cultural economists… (Crossick & Kaszynska, 2016, p. 138)

Oakleaf (2010) also notes the development of frameworks to attempt to establish social value are limited. She poses questions about the value assessing the transactional activities of the library in improving intra institutional outcomes such as student learning. Insights from the studies are within an organizational framework, owing most to grounded theory and lack assessment of the value or impact of the sector.

Given the limitations of the major assessment tools used so far to establish value, there is a need to continue to review new methodologies. The emergence of the UN SDGs provides an opportunity to view academic library services from a different theoretical and developed methodology.

**UN SDGs**

The 2030 Agenda for Sustainable Development was agreed by the United Nation’s 193-member states on September 25, 2015 in New York. The SDGs replaced the Millennial Development Goals and continued a program designed to lift the quality of life of people across the globe. The historic agreement was negotiated to allow for a program of interconnected activities that would be delivered within individual countries and across countries through programmatic activity.
The 2030 Agenda has 17 Sustainable Development Goals and within these, 169 targets (Figure 1).

Based on the theory of change, the goals were the subject of significant international negotiation. The draft position paper notes that:

The central hypothesis that underpins the ‘theory of change’ presented is that in order to effectively support implementation of a transformative, universal, integrated and rights-based 2030 Agenda, and to meet the expectations of Member States, the UN development system must more effectively ‘function as a system’ in an integrated and coherent manner, at the global, regional and country level.’ (United Nations, 2016, p. 1)

The theory combines concepts from environmental, management, and organizational psychology with an underpinning theme of capacity building. Complexity theory (see for example Cairney, 2012; Geyer & Rihani, 2010; Mitchell, 2009), program theory (see Bickman, 1987; Funnell & Rogers, 2011), program evaluation (see Burch, 2016; Shackman, 2020) and psychology (organizational psychology and organizational change) are used to create action focused concepts that will ultimately build economics, social and political systems that will deliver human rights and economic growth (United Nations, 2017). Weiss, a member of the Aspen Institute Roundtable that facilitated the development of the theory of change, notes that the approach requires clarification of long-term goals as a necessary precondition to engage stakeholders in complex community initiatives (Weiss, 1995). Briant (2015) traces the origin of the goals to Keynesian economics where state regulatory agencies (which must include in the case of the SDGs operational agencies) adopt a neoliberal economic approach to archive national benefits within an international system that requires economically democratic processes.

Libraries are a key element in the economic, social, and educational structure within nations. They deliver public, educational, health, and state services that enhance community well-being and economic outcomes. Expanding the understanding of the value of libraries through exploring the SDG5s had become a significant activity by the library sector.
International Federation of Library Associations (IFLA) Secretary General Gerald Leitner has commented:

I am convinced that there is a space for libraries in the world envisioned by the UN 2030 Agenda. Not just that there can be a space, but that there must be. We cannot achieve the SDGs without libraries. (IFLA, 2019, p. 1)

The Development and Access to Information report (International Federation of Library Associations and Technology & Social Change Group University of Washington Information School, 2019) focused on the need to approach an understanding of the value of libraries from the point of view of meaningful access. They identify the SDGs as the first framework that fully recognizes the potential of libraries and information to achieve transformation in civic, social, and economic activities across the world.

A review of Australian University libraries using the SDG framework (Missingham, 2019) provides an opportunity to assess the relevance of the approach to academic universities and consider value within a new light.

**Case study: Australian university libraries**

In Australia, university libraries provide services that are essential for education, research, and the full range of scholarly communication activities. There are 39 Australian university libraries supporting the education of 1.5 million students in 2017, and the research and teaching undertaken by over 1,20,000 full-time equivalent staff.

University education is a very significant component of the Australian economy, the third largest industry which added an estimated $140 billion to the Australian economy in 2014 (Deloitte Access Economics, 2015).

Academic libraries support the SDGs through a wide range of activities including:

- Promoting literacy, including digital, media and information literacy, and skills, with the support of dedicated staff.
- Closing gaps in access to information and helping individuals in all aspects of their life understand information needs better.
- Providing a network of delivery sites for government programs and services.
- Communicating knowledge created in our universities.
- Serving as the heart of the research and academic community.
- Building global partnerships and collaborations that provide greater access to digital collections and information capability programs.
- Preserving and providing access to the world’s culture and heritage.

In relation to the SDGs, four emerge as highly relevant to the academic library sector— quality education (Goal 4), gender and equity (Goal 5), industry innovation and infrastructure (Goal 9), and sustainable cities and communities (Goal 11). The goals were chosen because they are directly linked to education and the equity of access to education. While other SDGs such as inequities are relevant this subset provides the opportunity to testing measures in a clear manner.

An assessment of national achievement against these goals identifies values that have not previously been expressed through economic and social analysis. Data from the
Council of Australian University Libraries report (Missingham, 2019) and updated information gives a range of insights below.

**Goal 4: Quality education**

Australian academic libraries provide support for education that results in informed citizens who contribute through activities around the globe. Innovation in service and education underpins library practice, fostering outcomes of student capabilities, and educational practices.

Students and academics significantly benefit from services provided – in 2017 (Council of Australian University Libraries, 2018):

- 47,748,189 users visited university libraries.
- 8,056,573 books were borrowed.
- more than 214 million uses of electronic resources occurred.
- 955,218 enquires from students and academics were answered – providing a transfer of knowledge building capabilities for the future.
- 481,381 members of Australian universities attended information literacy training sessions that build skills as diverse as searching, writing, data management, and using technologies.
- 21,127 group sessions were held to engage with the academic community and those outside the university to build knowledge.

The power of knowledge developed through university libraries is transforming individuals, families, communities, and nations.

Patrons occupied 92,857 seats and were provided with services 24 h of every day through access to information resources and physical library spaces.

These activities change lives – the outcomes can be seen in the contribution students made through their work in industry, educational institutions, government, societies, families, and local communities through their careers.

The footprint of universities is expanded through activities such as through exhibitions and public events, connecting the community and visitors to the knowledge of the world, thus increasing knowledge to enhance economic potential.

Innovation in affordable access to text books has been achieved at Western Sydney University through the Accessible text books project (Western Sydney University, 2019). The University recognized that for many the cost of textbooks is prohibitive, particularly those with social and economic disadvantages. The initiative reaches across disadvantages to provide all students enrolled in first-year subjects with free digital textbooks, established in 2017, the initiative continues.

The University was the first in Australia to provide free digital textbooks for its students. Western’s ground-breaking initiative is one of the world’s largest provisions of free textbooks for commencing students. With the average cost of a textbook being $100 per book, our commencing students receive up to $800 worth of value. The library undertakes a key role in establishing and enabling the initiative which transforms access to information and education for the students. Rather than
carrying bulky textbooks, students have easy access to fully searchable digital textbooks, with the ability to highlight and mark notes on-screen for future reference. For students with a disability, the books are completely accessible to screen readers and other support tools. This program is in direct response to student feedback indicating that covering the cost of purchasing textbooks was one of the biggest financial hurdles when starting university.

**Goal 5: Gender and equity**

Libraries support gender equality by providing safe meeting spaces, programs for women and girls on rights and health, and ICT and literacy programs supporting women to build their entrepreneurial skills.

University libraries have in particularly developed support programs that have been integral to the response of universities to addressing the findings of the Human Rights Commission study into sexual violence and sexual harassment in universities.

Library initiatives have included developing staff knowledge in preventing and supporting situations of sexual harassment, use of libraries as safe spaces, and information activities conducted through library services such a drop in sessions.

Library employment has also been an area of initiatives in equity and diversity. Libraries have adopted the Aboriginal and Torres Strait Islander Protocols for Libraries, and Archives and Information Services first published in 1995 by the Australian Library and Information Association. The Protocols were most recently updated in 2012 and endorsed by the Aboriginal and Torres Strait Islander Library and Information and Resource Network.

The Protocols are intended to guide library and information practitioners in the provision of appropriate services and management of resources about Aboriginal and Torres Strait Islander peoples and cultures. The Protocols offer a path to reconciliation, a guide to culturally appropriately managing collections and services. Broad in scope and principle based they cover governance and management, content and perspectives, intellectual property, accessibility and use, description and classification, secret and sacred materials, staffing, developing professional practice, awareness of Aboriginal and Torres Strait Islander peoples and issues, copying and repatriation of records, and the digital environment (Aboriginal and Torres Strait Islander Library, Information and Resource Network, 2012).

An initiative that reflects the valuable contribution of libraries is the partnership of Charles Darwin University Library with researchers to sustain and preserve Aboriginal languages and culture (Godfrey et al., 2016). The Library has contributed to the Living Archive of Aboriginal Languages by assisting in building a repository, web application and digitization program to preserve endangered Indigenous resources and facilitate both Indigenous community engagement and international linguistic research. The project serves as a rich case study demonstrating how academic libraries can work with researchers to support the archiving of cultural heritage. A key contribution to the project was the Library’s expertise in knowledge and resource organization and its management in relation to creating, storing, preserving, and sharing the type of materials included in the Living Archive. Furthermore, the Library played a crucial role in the
establishment of the Archive by providing ongoing technical information management support needed to ensure its success and sustainability. The Library hosts the Archive in its institutional repository.

**Goal 9: Industry, innovation, and infrastructure**

Australian University Libraries support industry and infrastructure through a range of initiatives including the Government’s National Collaborative Research Infrastructure Strategy (NCRIS). A major initiative of university libraries has been developing research data capabilities and access to this data. Australian university libraries have developed services that (2017 data; Council of Australian University Libraries, 2018):

- provide access to 569,927 openly accessible research outputs.
- resulted in 30,651,406 downloads.

In addition, university research is communicated by publishing. One in four university libraries in Australia is publishing original scholarly works in some form (mostly journals), with most available online and are open access.

An example of achievement of publication and dissemination of scholarly works is the Australian National University (ANU) Press, which sits within the ANU Library. At the end of 2019, the Press had published more than 880 titles – all of which are available via open access. The reach of the ANU Press is significant – 4,662,755 downloads in 2019. Highly influential works reach all corners of the globe, particularly developing nations, in a way that print books could never have achieved. Prof Adam Shoemaker’s award-winning book “Black words white page: Aboriginal literature 1929–1988” has been for almost a decadence been one of the top read works. It has influenced thinkers and researchers in nations as diverse as South Africa and India. If the work were in print there would not have been a copy in a library in either continent – the open access digital publication enables scholarship to have impact and contribute to innovation and learning around the world. In addition, a new textbook series is dramatically opening-up education materials to all across the world.

**Goal 11: Sustainable cities and communities**

University libraries support their communities and cities through removing barriers to information.

- Libraries offer members of the community access to their collections through opening their doors to visitors.
- Access to information and collections is enhanced through online and physical exhibitions and public lectures.
- Online digital literacy resources and training is made available freely to increase the knowledge and skills of the community.
The documentary history of the nation and the world is held in libraries. University library activities include:

- Digitization programs that are increasing access to these important resources.
- Sharing of these resources through national and international databases such as Trove and WorldCat.
- Work with national, state, and public libraries to develop greater digital access.

Libraries deliver programs that make Australian research available to the world. Our open repositories enable research to be available overcoming paywalls and expensive subscriptions (Council of Australian University Libraries, 2018).

- 569,927 accessible research outputs including conference papers, journal articles, book chapters, and other research papers are made available openly.
- 63,883,120 accesses occurred to research outputs in 2017.

Australian universities support communities through making theses accessible. These are the result of extraordinarily deep research often unearthing discoveries that will change the way we live, work, and understand the world. Theses in this case refers to the products of doctoral research and masters by research.

In 2017, libraries achieved access to over 2,75,000 theses of which more than 95% were available openly. The theses were used by others in more than 190 countries around the world.

At the Australian National University more than 83% of the individuals who benefited from accessing the research came from other countries. There was an average of over 78 downloads per thesis – with barriers to access overcome for the researchers and those who were able to use the outcomes of the research. An example is research into Timor Leste that is being used to reshape the agenda of non-government organizations in addressing ways to deal with violence.

In Tasmania, the City of Launceston’s Queen Victoria Museum and Art Gallery, University of Tasmania, State Government bodies Libraries Tasmania (including the Tasmanian Archives and State Library), and the Tasmanian Museum and Art Gallery are working together on the Digitized Cultural Experience sub project of the Greater Launceston Transformation – Creating our Digital Future Project funded by the Australian Government (Department of Infrastructure, Regional Development and Cities, Australia Government, 2019). This project will digitize and make discoverable the substantial cultural assets from Launceston and the region. The project will cumulate in development of two extended reality products for education and tourism.

The spirit of cooperation has resulted in a unique partnership, bringing together cultural institutions, local and state governments, and higher education to share technology, expertise, and knowledge to showcase Tasmania’s significant historical and cultural assets. By working together, the discovery and sharing of Tasmania’s treasures is delivered benefiting artists, remote communities, researchers, industry, tourists, and schools.
**Findings**

From the application of the SDG framework to Australian University libraries, it is clear that qualitative and quantitative measures can be integrated to provide insights into the value provided by academic libraries to the communities within their institution, city, and regional communities and national impact. The SDG framework was explored to understand the assessment of value to a level of complexity not available through other more widely applied methodologies. When the results are compared to that of economic (contingent valuation/ROI), SRI, and value in use (size and use of collection and information use studies) there are considerable differences. Assessing the major differences, the four methodologies fill particular aspects of reporting (Table 1).

Assessed by the author against these criteria, the SDG framework provides a multi-dimensional assessment not available from the other methodologies. The other methodologies have different strengths and weaknesses. Much of the difference stems from the theoretical base of the approaches. SRI and the SDGs are based on theory of change and thus have more in common that the other methodologies. Value in use comes from library ad information science while economic ROI comes from economics.

Comparing the methodologies enables consideration of the applicability of each system to different reporting and stakeholder information needs. Evaluation must be contextual to organizational situations.

**Limitations**

Evaluating alignment through the UN SDGS is increasingly a topic in scholarly communication and publishing. While this article is limited to the role of libraries, publishers are increasingly opting to commit to the SDGs and assessment their publishing against the goals. The recently introduced SDG Publishers Compact (United Nations, 2020) reflects adoption by major publishers of the need to ensure that research is published and available to support the goals. SpringerNature (2020) provides an example of the depth of evaluation of research using the SDGs. Understanding the broader impact in terms of dissemination of research will require the added dimension of publisher activities.
Conclusion

Academic libraries have explored evaluation methodologies for many decades. The major activity has been in the application of theories and tools borrowed from other disciplines such as economics and management. Studies from library and information science theory have focused on users (significantly information behavior). This work has formed individual reports that have sought to establish numeric indicators, consistent with the environment of university evaluation.

Understanding the value of library services is, however, a complex interplay of latent value (such as collections), research services (including data management), educational support services, and activities in the realm of scholarly communication.

Blending the qualitative and quantitative indicators to provide holistic reporting has been an aspiration not yet realized. Malapela and De Jager have suggested:

The concept of valuing a library service has concerned library and information professionals for more than three decades, there has however been little consensus on the best approaches to determine and measure the value of library services. (Malapela & De Jager, 2018, p. 276)

Situating the value of libraries within a complex system framework with the UN SDGs provides an opportunity to reflect on value that is experienced by multiple communities – library patrons, their institutions, the cities, and regions they are within, the nation and indeed to world (particularly in terms of reach in dissemination of their university’s publications and data). Such an approach provides new insights that identify the richness of activities and innovations of academic libraries.

Recent developments in the SDGS have identified new levels of reporting. These measures are focused on government and industry and as yet have little relevance to libraries, despite the best efforts of library associations to reinterpret them (for example Australian Library and Information Association, 2019; American Library Association, 2020).

The case study of Australian academic libraries establishes that the SDGs can be used as a reporting framework despite the lack of specific library measures. From the case study, it is clear that academic libraries provide a value to their stakeholders which goes beyond numeric measures of economic and social benefit. The values observed align to the critical roles of a modern university – of education, research, and national impact. The nature of the diverse benefits reflects the three levels of individual library, institution, and national benefits.

There is opportunity to rethink the identification of value of libraries and their associations to establish how the sector, and indeed the combined infrastructure of academic libraries, produce values in new and different ways as library practice evolves. There is also an opportunity to meet the challenge of understanding value by applying the theory of change and complexity theory that underpin the SDGs.

Consideration of the SDGs also raises the issue of how the assessments can be used to influence or create new objectives and activities for the sector. Establishing areas for change including commitments for governance for change requires a new approach to decision making (for governance aspects see Kemp et al., 2005).
Implications and future research

This article has outlined the opportunities to understand value from different theoretical approaches and methodologies. It has tested the application of SDGs to tell the story of the unique contribution that libraries make to higher education and their nations. It finds that the dimensions offered through the SDG framework fill a gap in library assessment. National and international impact have previously been generally assessed in terms of research outputs for the higher education sector rather than library services. The case study of Australian libraries provides a springboard for international comparisons in the future.

For Library administrators this article provides an example of how their libraries contribution can be presented using the four main goals most relevant to higher education libraries in a manner that both uses existing indicators and stories that describe impact. The methodology draws together traditional statistical information in a new way that provides an institutional, national, and international contest for their work.

Further work could be undertaken to enable analysis of the application of methodology to reshape governance and program delivery in academic libraries. The research could also provide comparative information between nations, potentially mapping to national reporting against plans for implementation of the SDGs.

Future research could also look at the nature of the role of libraries and publishers in making knowledge available to support the SDGs. The new compact between publishers and the UN around the SDGs in 2020 suggest that analysis and data will be available in the future to analyze the contribution of both these parts of the scholarly information ecosystem.

ORCID

Roxanne Missingham http://orcid.org/0000-0003-1881-8380

References


United Kingdom Research and Innovation. (2020). Research excellence framework. UKRI. https://www.ref.ac.uk/


Green Library Research: A Bibliometric Analysis

Simin Li and Feng Yang

Department of Information Resource Management, Sichuan University, Chengdu, Sichuan, China

ABSTRACT
This study uses the bibliometric method to analyze green libraries on a global scale. Additionally, it discusses the trends of article publication, research fields, authors, spatial and temporal distribution, and so on. The results of the study show that information technology applications and green practices in libraries are at the core of the study, and in terms of issued articles and cooperation in research, the United States and China rank among the top countries worldwide. According to the findings, cooperation among countries is poor. The article forms a multidisciplinary research posture with Library and Information Science as the core component. Furthermore, a keyword analysis revealed that research on the green library has shifted from pure environmental impact assessment to a multi-directional combination.

ARTICLE HISTORY
Received May 2022
Accepted August 2022

KEYWORDS
Green library; sustainable development; sustainable library; bibliometric

Introduction

Rapid economic development has led to resource shortages and environmental pollution. All sectors worldwide have begun to focus on ecological and environmental issues, and the concept of the green library has emerged. The Online Dictionary for Library and Information Science (ODLIS) defines a green library as one that is “designed to minimize negative impact on the natural environment and maximize indoor environmental quality by means of careful site selection, use of natural construction materials and biodegradable products, conservation of resources (water, energy, paper), and responsible waste disposal (recycling and others)” (ODLIS 2020). The United States has established the Leadership in Energy and Environmental Design (LEED) standard to define green buildings. The LEED specifies the form of a green library using more detailed standards, thereby laying the foundation for the development of the green library and the factors determining its formation. However, some scholars have pointed out that the green library should not be limited to a small number of LEED-certified libraries. Rather, it should include any library that promotes sustainability by setting an example and constantly seeking improvements (Jones and Wong 2016). These inconsistencies show, to a certain extent, that a green library is a relevant issue attracting the attention

CONTACT Feng Yang yangfeng@scu.edu.cn Department of Information Resource Management, Sichuan University, Chengdu, Sichuan, P. R. China
© 2022 The Author(s). Published with license by Taylor & Francis Group, LLC.
of the academic community and demanding the involvement of more voices in the discourse. However, the green library and its sustainable development are not recent topics. The green library movement started in the 1990s, advocating for libraries to reduce their adverse impact on the environment through their efforts (mainly constructing green buildings and establishing green programs) and for building environmentally friendly libraries. The International Federation of Library Associations and Institutions (IFLA) – representing the profession of library and information sciences – established the Environment, Sustainability and Libraries Special Interest Group (ENSULIB) to uphold and further develop the library movement. The group helps provide a voice to green librarians and library projects worldwide, and promotes discussion forums so that librarians can inspire communities to act in an environmentally sustainable manner. The ENSULIB also proposed the concept of green librarianship, which considers green information, library services, and social participation in the era of false information, alternative facts, and limited information skills and literacy (IFLA 2020). Additionally, IFLA also established the Green Library Award to reward libraries expressing their commitment to environmental sustainability worldwide (IFLA 2020), thereby attracting the attention of library academics on environmental issues and sustainable development.

However, what are green libraries? Why do libraries need to pay attention to green development issues?

To answer the first question: in addition to the explanations given above, some scholars have expressed their interpretations. Antonelli believes that “green” refers to supporting environmentalism, and the green library is a resultant extension of this concept: a library with low cost, efficient energy usage, and reduced carbon emissions (Antonelli 2008). The concept is not limited only to green library buildings, but also covers alternative energy, library services and practices, daily library operations, programming, and outreach (Antonelli and Mccullough 2012). Marcum (2009) regards “green library” as one with a healthier building and environment achieved by improving the library’s facilities and reducing environmental impact. Aulisio (2013) believes that a green library should be “any library that promotes sustainability through education, operations, and outreach.” Kurbanoglu perceives the green library as an environmentally conscious library that uses nontoxic materials, reduces energy use, and recycles waste (Kurbanoglu and Boustany 2014). Fedorowicz-Kruszewska (2020) summarized and analyzed predecessors’ research on green library. Based on the analysis of the environmental discourse of previous documents, Fedorowicz-Kruszewska extracted green libraries indicators for verification, and finally conceptualized the green library as one that aims to achieve environmental sustainability. Based on the above, a green library can be said to be one that is environmentally friendly and promotes environmental sustainability through its buildings, facilities,
services, and operations. Regarding building a “green library,” we may comprehend the process from the winners of the Green Library Award set by IFLA. By summarizing the characteristics of the winning projects of the previous award winners, we can find some common features: using nontoxic materials; cultivating green plants; using renewable energy; developing activities promoting people’s green awareness; focusing on garbage classification and recycling; and formulating long-term green development plans. If libraries conform to the above practices, they will satisfy the characteristics of green libraries.

To answer the second question: libraries and library practitioners worldwide are striving to find the relevance of paying attention to environmental protection and sustainable development. According to the American Library Association (ALA (American Library Association) (2020)) statistics, there are more than 160,000 public libraries in the United States alone, and in 2013, the number of librarians in various types of libraries in the United States reached 148,400. For user groups, the 2019 report shows that adults go to the library 10.5 times a year in USA, a large number of visits that exceeds the number of other leisure activities that Americans attend (by eight times). The library occupies a considerable proportion of people’s lives, and its development is of great significance to the entire society. Therefore, it is valuable to study green environmental protection issues and build green libraries for the sustainable development of the entire society.

Library construction is going green, and sustainability has become an inescapable trend. This is essential for maintaining the vitality of libraries. All countries, regions, and libraries should take the steps required to change the original extensive development method, actively practice green concepts, and strive to achieve sustainable development. Some scholars have already carried out research related to green libraries, and some more representative results have been achieved. However, after sorting through these results, we find that the existing studies are more focused on a specific research area, limited to case studies or a certain aspect of research, without an integrated analysis. But in fact, the existing studies have formed a certain scale, from which we can find some patterns.

To explore the laws that exist in existing research and advance the development of related theories and practices of the green library, knowing the current state of related research, and understanding past relevant research and present research hot topics and trends are crucial. Bibliometric is a good way to systematically sort out past research content, summarize research hotspots and key points, which can provide guidance for subsequent research through measurement results. Therefore, this article uses the bibliometric method to analyze the literature based on the geographical position of the authors, the regional distribution of publications, and the keywords. Furthermore, it draws conclusions about research directions, the research knowledge base, and researchers’ cooperation networks. Ultimately, the study aims to raise
awareness of the importance of green library development among relevant researchers and to help researchers develop an overall knowledge of current developments from multiple perspectives. It is hoped that this will motivate the library community to take positive actions to reduce the environmental impact of libraries as much as possible. It also provides some suggestions on research directions for subsequent research.

**Data and methods**

Since the field of the green library may involve multiple disciplines, including architecture, ecology, and engineering, to ensure the comprehensiveness and reliability of the collected resources, we choose the Web of Science Core Collection™ for paper retrieval. Web of Science Core Collection™ is the world’s largest and most trusted publisher-neutral citation index. This database can search the world’s leading scholarly journals, books, and proceedings in the sciences, social sciences, and arts and humanities, and navigate the full citation network. It contains more than 34,000 indexed journals, and the backfiles date to 1990. Although Web of Science Core Collection™ contains a considerable amount of literature, it must be acknowledged that it still does not cover all the literature. But Web of Science Core Collection™ still has its advantages that cannot be ignored. The data are edited and filtered, and the structure is consistent. In this collection, all cited references for publications are fully indexed and searchable. One can search across all authors and author affiliations, track citation activity with Citation Alerts, and graphically observe the citation activity and trends along with the Citation Report. Therefore, the Web of Science Core Collection™ can fully support our study. Using the Web of Science Core Collection™, we built our bibliometric database based on the following research strategy:

\[ TS = (\text{librar}^* \text{ AND (green OR ecological}^* \text{ OR low-carbon OR environment}^* \text{ OR sustain}^*)) . \text{ PY} = 1990-2022. \text{ Database} = \text{SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI, CCR-EXPANDED, IC}. \]

The criteria for inclusion included three main points: (1) papers published in the period 1990–2022; (2) papers which are related on sustainable development challenges and sustainability issues in libraries; (3) studies which focused on green, low-carbon, ecological, environmental and sustainable topics related to libraries. We also excluded some records with the following criteria: (1) papers on topics not relevant to the librarianship; (2) articles published in non-thesis form or for which the full text is not available; (3) articles with duplicate content. (4) papers that did not address “green, low-carbon, ecological, environment or sustainable development” either in the title, abstract, or full-text fields.

After filtering out records, we finally retained 134 records and information, including the title, author, keywords, abstract, and country, which were used
to analyze the annual research trends, international distribution, key areas, and highlights of green development in libraries. It can be said that these analyses are effective representations to show the research progress in the field. Additionally, citations were extracted, measured, and analyzed using Microsoft Excel, CiteSpace, VOSviewer, and DiTuHui.

**What is the current status of research in the green library field?**

*Fluctuation in the growth of related research: upward but still deficient*

A summary of overall trends can help researchers get a quantitative visual sense of the state of research progress in the field, clarify where current research is at and what the future trends will be. As shown in Figures 1 and 2, indicators, such as the number of published articles and the number of cited references, demonstrate a trend of fluctuation in the number of research results related to the green library. Before 2007, relevant research in this field was at an immature stage, with few research results and researchers. After 2007, more scholars began to focus on this field and published a series of papers; the number of published paper peaked in 2021, indicating that related research has steadily increased since 2007 and reaps the highest attention in 2021. Part of the research after 2017 was even supported through funding, such as the National Social Science Foundation of China and the Inner Mongolia Social Science Foundation. However, although the number of papers in this field has significantly increased since 2007, the overall number of articles published and related researches continues to be small; it needs further development. Table 1

![Figure 1. Statistics of the publication.](image-url)
From the perspective of the influence of published papers, a certain number of countries have paid attention to the sustainable development of libraries, which implies that research in this field has received some attention and impacted libraries worldwide. However, the citation of papers in this field is low, reflecting that the quality of research is uneven and the recognition of research results needs further consolidation. The average citation of papers published in 2010 and 2012 was the highest in the data obtained, indicating that the results published in the two years were of high quality, gained more approval, and had a relatively large influence.

The expansion of the number of publications and increase in the number of citations, in addition to the funding received by certain projects, indicate that research in the field of the green library has received increased attention, and the field is gradually expanding. In the future, it may become a research hotspot in library sciences and produce more influential academic results.

Table 1. Statistics on the output of papers by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>P</th>
<th>AU</th>
<th>INS</th>
<th>CT</th>
<th>NR</th>
<th>TC</th>
<th>FU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1991</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>23</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>1992</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1993</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1994</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1995</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1996</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1997</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1998</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1999</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>2000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2001</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>8</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2002</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2003</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>41</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>2004</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>2005</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2006</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2007</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>77</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>2008</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2009</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2010</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>3</td>
<td>108</td>
<td>69</td>
<td>0</td>
</tr>
<tr>
<td>2011</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>9</td>
<td>11</td>
<td>9</td>
<td>5</td>
<td>359</td>
<td>70</td>
<td>0</td>
</tr>
<tr>
<td>2013</td>
<td>5</td>
<td>8</td>
<td>5</td>
<td>2</td>
<td>18</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2014</td>
<td>7</td>
<td>18</td>
<td>11</td>
<td>8</td>
<td>98</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>2015</td>
<td>5</td>
<td>11</td>
<td>8</td>
<td>4</td>
<td>30</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>2016</td>
<td>7</td>
<td>12</td>
<td>8</td>
<td>5</td>
<td>203</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>2017</td>
<td>13</td>
<td>31</td>
<td>19</td>
<td>11</td>
<td>227</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>2018</td>
<td>6</td>
<td>13</td>
<td>8</td>
<td>5</td>
<td>168</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2019</td>
<td>8</td>
<td>16</td>
<td>10</td>
<td>4</td>
<td>77</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2020</td>
<td>11</td>
<td>19</td>
<td>16</td>
<td>8</td>
<td>565</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2021</td>
<td>34</td>
<td>64</td>
<td>52</td>
<td>20</td>
<td>998</td>
<td>30</td>
<td>7</td>
</tr>
<tr>
<td>2022</td>
<td>4</td>
<td>9</td>
<td>7</td>
<td>4</td>
<td>249</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

*P, AU, INS, CT, NR, TC, FU: number of publications, authors, institutes, countries/territories, cited reference, citations, funds.*
Establishment of core intellectual knowledge fields: IT applications and library initiatives

The citation status shows how well an article is recognized in a certain field, and the establishment of core knowledge areas can be developed based on the citation status of the literature. By establishing the core knowledge base of green development in libraries, it can help researchers to quickly understand the key supporting contents of the current research field and provide some inspiration to library subjects who want to make the transition to green development. To analyze the knowledge base in the field of the green library, we conducted a co-citation analysis based on the retrieved documents. Figure 3 shows the co-citation map and articles with a co-citation of 3 or more.

Table 2 shows that the top four cited documents have a citation count of 4, and the publications were concentrated in the period 2010–2011. This shows that the papers published in the three years from 2010 to 2011 have profoundly impacted related research, and follow-up research is carried out on this basis.

The content of these highly cited documents primarily involves two aspects. First, the impact of information technology (IT), especially cloud computing technology and digital preservation technology, on the green development of libraries is clearly stated. Chowdhury (2010) discussed the issue of digital preservation on the premise of efficient user utilization and environmental friendliness; the article focused on how digital resources can be easily accessed by future generations. In subsequent research, Chowdhury (2012b) introduced the idea of developing green information systems using cloud computing to avoid large amounts of greenhouse gas emissions from the information systems, services of universities, and research departments. The green information system reduces carbon emissions and negative impacts on the environment by sharing computing and network resources, digitizing paper resources, and better managing document. Baliga et al. (2011) used cloud computing technology to try and reduce the energy consumption of transmission and exchange networks. They believed that by using large shared servers and storage units, cloud computing can lead to energy savings in providing

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Journal</th>
<th>Year</th>
<th>Cited Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borggren, Clara; Moberg, Asa; Finnvede, Goeran Chowdhury, Gobinda</td>
<td>Books from an environmental perspective-Part 1: environmental impacts of paper books sold in traditional and internet bookshops</td>
<td>International Journal of Life Cycle Assessment</td>
<td>2011</td>
<td>4</td>
</tr>
<tr>
<td>Jankowska, Maria Anna; Marcum, James W</td>
<td>From digital libraries to digital preservation research: the importance of users and context</td>
<td>Journal of Documentation</td>
<td>2010</td>
<td>4</td>
</tr>
</tbody>
</table>
computing and storage services. They evaluated the energy consumption associated with three cloud computing services and compared it with the energy consumption of traditional computing methods. If the number of computationally intensive tasks is small, low-end laptops can be used for daily tasks and cloud processing services, instead of mid-range or high-end PCs; thus significant energy savings can be achieved. The application of IT, such as cloud computing, mainly reduces carbon emissions by reducing the use of paper resources, increasing the utilization of digital resources, and reducing equipment energy consumption, thereby reducing the negative impact on the environment. This approach is a relatively effective way to reduce carbon emissions at a time when IT is increasingly developing.

Second, the specific measures taken by the green library to reduce the impact on the environment is also highlighted. Jankowska and Marcum (2010) considered the high cost of digital formats and network services faced by libraries – as well as the large consumption of printed materials – and designed a comprehensive strategic framework for the sustainable development of libraries. In their article, the green library is mainly achieved through the construction of energy-efficient and low-carbon green buildings. They also designed specific indicators for measuring the library’s environmental impact. Baliga et al. (2011) explored the environmental impact of paper books, assessing the strength of the environmental impact of different methods of book acquisition. The study concludes that in addition to the paper used, the way books are purchased and distributed, including the means of transportation individuals may use, all play a role in the environmental impact of paper books. Book sharing can be effective in reducing their environmental impact. In a subsequent study, Brodie and Maxine (2012) took Macquarie University as an example, introduced the university library’s efforts in sustainable development, and designed a green library using externally verified environmental assessment methods. Specific measures include the use of thermal energy storage systems to reduce library carbon emissions, improve natural resource utilization, increase green area, and use automatic storage and retrieval system to reduce energy consumption. It refers to the “greening” of other libraries. This level includes the application of IT in libraries and provides suggestions for the construction of green libraries from a broader perspective. The second aspect primarily focused on reducing the library’s carbon emissions and improving the environmental quality through specific measures, including library greening, resource collection and the use of renewable energy.

Table 2 Distribution of top 4 co-cited references of green library research

From this article’s perspective, the authors who have influenced research in this field include Jankowska and Marcum (2010), Chowdhury (2010), and Antonelli (2008). These authors are among the top three in citations, indicating a relatively wider recognition of their research and demonstrating that their research results are important in the field of the green library. In
particular, Chowdhury ranks high in both author and paper citations. Chowdhury (2012b) has conducted in-depth research on the green library. The author led the development of green information services based on the principles of green IT. Jankowska and Marcum (2010) proposed the idea of establishing a green information system based on a cloud computing model, and Antonelli (2008) expanded the focus of green libraries from library buildings to library services, operations, and programming. They introduced their views on the green development of the library from different aspects; these highly influential authors and their well cited documents have become a reference for the follow-up green library research.

For follow-up research, we can continue to focus on the role of IT in reducing the energy consumption of the library and explore whether more advanced technologies can be applied. Furthermore, evaluating the green impact of IT and library green initiatives is essential for finding the optimal construction plan.

**Multidisciplinary research trends: LIS as the core**

By analyzing the disciplines and journals of the search results, we found that the obtained papers involved 64 subject categories, presenting a multi-disciplinary fusion research phenomenon centered on Information Science and Library Science (Table 3). A total of 71 journals have published articles in active support of green library research. The journal with the most published articles was the Bibliothek Forschung und Praxis, accounting for 9.7% of the total publications, implying that research in this field is still scattered, which bears a certain relationship with the current insufficient focus on this field. The journals ranked after the Bibliothek Forschung und Praxis include The Journal of Academic Librarianship, Library Quarterly, Electronic Library, Library Journal, and Library Management, each of which published articles no less than 3. In terms of the total journal citations, College & Research Libraries is cited most frequently (Table 4); moreover, the journal publishes articles with a significant academic influence in this field. The active journals and highly cited journals also focus on Library Science, indicating that research on the green library continues to attract the attention of Library Science.

<table>
<thead>
<tr>
<th>Table 3. Distribution of top 8 subject categories.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subject Category</strong></td>
</tr>
<tr>
<td>Information Science &amp; Library Science</td>
</tr>
<tr>
<td>Engineering</td>
</tr>
<tr>
<td>Construction &amp; Building Technology</td>
</tr>
<tr>
<td>Computer Science</td>
</tr>
<tr>
<td>Environmental Sciences &amp; Ecology</td>
</tr>
<tr>
<td>Computer Science, Information Systems</td>
</tr>
<tr>
<td>Energy &amp; Fuels</td>
</tr>
<tr>
<td>Science &amp; Technology</td>
</tr>
</tbody>
</table>
Different disciplines have their specific research priorities in the field of the green library. For example, engineering pays more attention to reducing the energy consumption of libraries and environmental pressure through modern technical means. Jayalakshmi and Sarangapani (1496-1499) consider integrating smart technology into the library building and, in turn, facilitating access to digital information and reducing the energy consumption. Information Science and Library Science – paying most attention to the green library – do not focus on practicing the library’s environmental protection concepts and sustainable development strategies through technical means, but through green management strategies and green information services. For example, Jones and Wong (2016) mentioned that the Chinese University of Hong Kong’s green initiatives do not just focus on building green buildings, but also include specific management measures, such as printing on both sides, reducing the power consumption of air conditioners, turning off unnecessary lights, and saving water. In addition, Guo, Chen, and Tao (2013, 150) shared an example of the Hefei Library construction at the Third International Conference on Green Building. The library demonstrated “a brand new design method highly fitting architectural design concepts with green building spirit” and “provide a new direction of thinking for the construction of university green buildings.” This is an example taken from the discipline of Construction and Building Technology, which discusses the architectural design of green libraries and is concerned with reducing the carbon dioxide emissions and energy consumption through architectural design. The proposed measures include using glass curtain walls to increase natural lighting, using a recirculating breathing system to circulate air in the embassy, and building a rainwater collection system.

Multi-disciplinary integration has enriched the research content in the field of the green library, and the existing published papers mostly cover two or more subject categories. This phenomenon provides abundant green library research, which is no longer limited to the research on resources and services within Library Science, but, from a broader perspective, extends to developing the library’s green and sustainable strategy for rendering the library with more vigor and providing better services to readers. Future research should not be limited to a single subject of Library Science. Rather, it needs to consider library construction in conjunction with engineering, economics, sociology, ecology, and other domains. The integration of disciplines will also inspire the
future construction of libraries, which should be an important matter concerning multidisciplinary disciplines and multi-level subjects. In the future library construction, libraries should be planned not only from the perspective of information use and management, but also from the perspective of the greenness of the building itself, the economic applicability of the building as a whole, and the efficiency and longevity of the service to the society.

**Decentralized and relatively concentrated research status: China and USA are far ahead**

To explore the global distribution of authors in the field of the green library, we use DiTuHui to draw their map. Figure 4 shows that the United States has published the most articles, with more than 20, followed by China. These two countries have contributed an absolute majority of articles in this field, making them the backbone of this research area. Other countries, such as Australia and Croatia, have also contributed more than five articles each, ranking higher than the other countries. In general, many countries have been involved in this field, but most of their research lack depth. To explore the output and influence of authors in this field, we have summarized the number of articles published by them. A total of 188 authors have published at least one research result. We counted the information of the top five authors. Among all the authors, Gobinda Chowdhury from Australia has the highest number of publications, followed by Kornelija Peter Balog and Ljiljana Siber from Croatia, and Yang Zengzhang from China.

![Figure 2. Statistics of the citation and countries/territories.](image-url)
Research in the United States, with the highest number of publications, focuses on relatively broader aspects, such as the green library movement, the standards of a green library, and the definitions of a green library. Research in the United States started early, paying close attention to the green development of the library and formulating relevant green building evaluation standards, such as LEED, which are quoted worldwide, thus leading the world in green library-related research. Existing related research in the United States has played a demonstrative role for other countries to carry out green library research. Under the guidance of relevant policies, China also recognized, early on, the need for the green development of libraries, and some scholars have emerged in this field. The studies are also divided into different categories, such as green-building-related and green-service-related. Among the records selected in this article, the number of papers published in China now ranks second worldwide, research on the green library in China is thriving. The analysis of global contributions makes it possible to see at a glance the countries that are making faster progress. For researchers, the analysis can be used to gain targeted insights into what advanced subjects are studying, their research progress, and to learn from their experiences and gain enlightenments about green development in libraries.

Independent publication features: weak inter-country cooperation

As already presented in Figure 4, in terms of the volume of articles published, the country with the most research in the green library field is the United

Figure 3. Co-cited reference.
States, followed by China. We further conducted a study on cooperation among the countries with published papers (Table 5), and found that among these 23 countries, only eight have cooperated with other countries to publish articles (with no more than two papers published), showing a high degree of independence in the green library field. In terms of the specific collaborative publication, the existing article distribution models are Australia + Malaysia, France + Turkey, and United States + Canada, and the collaborative publication model presents the characteristics of close geographical distance. Cooperation between neighboring countries is mainstream. However, since the collaborative publication appeared mostly in 2010, we can predict that in the future, cooperation between countries will increase, international cooperation will become closer, and cooperation between distant countries will emerge. Scientific research cooperation is actually a process of communication and mutual benefit between institutions and subjects, and extensive scientific research cooperation is to a certain extent conducive to promoting academic progress. For researchers and libraries themselves, they should actively cater to the trend of cooperation and seek more possibilities of multi-party cooperation to take advantage of their strengths and avoid their weaknesses, so as to bring their own greater benefits.

### 3.6 From pure environmental impact to multi-directional combination: green ideas, green initiatives are the focus

High-frequency words are an effective means of showing research hotspots, and clustering of keywords can provide a clear and unambiguous picture of key research areas. We extracted 218 keywords from the obtained documents using CiteSpace. Table 6 shows the top five keywords in frequency of occurrence. Green libraries and sustainable development of libraries are the most

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Library</td>
<td>15</td>
</tr>
<tr>
<td>Green Library</td>
<td>14</td>
</tr>
<tr>
<td>AcademicLibrary</td>
<td>11</td>
</tr>
<tr>
<td>Sustainable Development</td>
<td>10</td>
</tr>
<tr>
<td>Digital Library</td>
<td>6</td>
</tr>
</tbody>
</table>
discussed aspects in this field. In terms of the appearance of keywords (Figure 5), the initial attention was on the building and greening aspects, focusing more on public and university libraries. Over time, environmental awareness, environmental management, environmental protection policies, energetic efficiency and ecological environment education gradually captured people's attention, and the scope of library sustainable development research expanded. The timeline chart shows that the focus of green library research has shifted from concepts and formalization to action, such as the green library movement and specific library operation and management strategies. The bias has expanded from library buildings to library services.

Green library research has covered various aspects, such as library construction, library management, library green awareness training, and related policies and regulations. We will now make a simple classification of the design content. Thus far, green library-related research can be roughly divided into four dimensions. We have used a combination of pajek and vosviewer to cluster the obtained keywords, and the clustering results can be clearly seen in Figure 6. It is clear that sustainability, green libraries, and sustainable development of public libraries are the most popular topics, and library buildings, digital library construction, and library education also show some importance.
Figure 5. Evolution of keywords.

Figure 6. Diagram of term network.
To further investigate the characteristics of these clusters, we divided the specific study into four dimensions. The first dimension is library buildings, focusing on energy consumption and energy saving. For example, Yang (2017) discussed the use of green thermal insulation materials to construct library buildings, thereby reducing the energy consumption. Liu and Ren (2020) paid attention to the issue of green performance of the building and considered the influence of architectural planning and functional design on the architectural design strategy. They designed the library architectural strategy from various aspects, such as the layout, lighting, and ventilation to reduce library energy consumption. In this dimension, scholars are more concerned about reducing the energy consumption of the library through energy-saving and environmental-friendly architectural design and a reasonable spatial layout.

The second dimension is the green strategy of libraries, especially university libraries. This dimension primarily considers how a green strategy can be constructed from multiple views for realizing the sustainable development of the library. The representative views come from Jones and Wong (2016), who conduct research on the green strategy of the Chinese University of Hong Kong Library and believe that the pursuit of green buildings is not the focus of many university libraries adopting sustainable methods. Instead, sustainable strategies are effective measures for the library to achieve green development and sustainable vitality. The Chinese University of Hong Kong established the green governance committee and set up energy wardens in the group to create green project planning and supervise the implementation of green strategies. The specific measures are manifested in restricting library users in aspects such as personal energy consumption, greenhouse gas emissions, personal water consumption, and paper usage to realize energy savings, and emission reductions in the library. Research in this dimension tends to discuss the measures taken by the library to achieve green development from a more specific perspective, involving the daily management of the library, project operations, and so on.

In addition, there are principles and purposes of library construction, emphasizing the implementation of certain principles to reflect the library’s social responsibility and benefit users. Herrera-Morillas, Castillo-Díaz, and Pérez-Pulido (2014) summarized and analyzed the initiatives related to social responsibility and sustainability in 71 Spanish university libraries. The results showed that among the selected research objects, 85.9% of library activities were related to social responsibility and sustainable development, thus implying that most of the libraries in the survey were aware of the importance of green and sustainable development and had expressed this in their strategic planning in the form of vision, principles, or values. Additionally, libraries conduct relevant environmental protection activities under the guidance of this sustainable development concept. Research in this area emphasizes the consciousness level of libraries. It is believed that a library’s awareness of green
sustainability is a prerequisite for the library’s green development. Any green initiatives of the library should be carried out under the guidance of green awareness.

The final dimension is library service, which reduces the impact on the environment and improves the sustainability of the library by improving existing service methods. The dimension of library services includes many types of research, such as Chowdhury’s proposal to establish a green system to reduce the impact of Information and Communications Technology (ICT) applications on the environment through green IT and cloud computing technology (Chowdhury 2012a). Binks et al. (2014) believe that in addition to improving the building, the green development of the library should be achieved through more environmentally friendly practices and related education. A survey of German public libraries demonstrated that it is crucial to raise people’s awareness of the sustainable development of libraries, and therefore, it attaches great importance to education on and publicity of related topics for children. The library also supports the green library project in book provision with themes ranging from climate change and environmental management of companies to energy use in construction (Beutelspacher and Meschede 2020). Other scholars have mentioned the need to focus on people’s evaluation of the library’s green projects and to understand how satisfied people are with the activities. In addition, the management philosophy of the leadership is also involved in the transformation of the library’s green development. Furthermore, the field of library services is an area on which scholars have focused more in the recent years. In several ways, the green sustainability of libraries has gradually witnessed a change of focus on more specific aspects, thereby widening the scope of research. The implications of green library research for the development of libraries have become more widespread.

Overall, interest in the green library has gradually increased in recent years, and the research scope has expanded, showing a healthy development trend. However, there are some shortcomings in the current research. For example, the evaluation of green libraries focuses more on the environmental impact of library buildings, equipment, and other hardware facilities, and less on users. Future research can focus more on the needs of users of the green library and the social repercussions brought forth by it. Simultaneously, whether the construction of a green library requires the library to update its management policies and the impact of green library on the organization should also be considered.

**Conclusion**

In this article, we presented the research progress and characteristics of the sustainable development of the library, using Web of Science Core Collection™
to examine the academic output, academic impact, and collaboration of publications in the 1990–2022 period. We can summarize the relevant information from the research as follows.

Since 2007, the number of research achievements in the green library has steadily increased. Recently, some research achievements have also been funded. Thus, the green library field has a good momentum. The research presents interdisciplinarity centered on Library Science, which overlaps with disciplines such as Engineering and Construction and Building Technology. *Bibliothek Forschung und Praxis, The Journal of Academic Librarianship and Library Quarterly* and *College & Research Libraries* are important journals that have influenced the sustainable development of libraries. The research results involve many countries: the United States and China have published the most documents, and are far ahead of other countries; they are the most important research-based countries, giving relatively high importance to the green library. Gobinda Chowdhury has the most output. However, the number of publications continues to be small, there is a lack of in-depth research, and the research influence is not strong. The characteristics of independent research among countries are remarkable, and a small number of cooperative initiatives in publishing research has been observed between neighboring countries. Moreover, keyword analysis reveals the research trend of libraries’ sustainable development, which has transformed from pure environmental impact to the combination of library building, library green strategy, library services, and library construction. The research scope continues to expand.

In addition to the phenomenon demonstrated by the bibliometric method, we also found that specific text contents influence the research of the green library. These contents include IT represented by cloud computing and digital preservation in the library; low-carbon and energy saving design method of the library building; the daily operation and management strategy of the library for environmental protection; the activities of the library to promote environmental protection awareness, and so on. These contents form the foundation of the current research on the green library.

The results show that green library research is at a relatively nascent stage. Overall, there are few researchers, little output, strong research independence, and weak paper influence. However, it is gratifying to observe that in terms of trends, there is an increasing focus on this field. In the context of the global environmental crisis, green library research will gradually prove its value and contribute to global sustainable development. In addition, judging from the research results in this article, in future research, joint initiatives between regions and countries may become a new trend, using more practical methods for promoting the progress of research on the green library. The purpose of this research paper is to help understand the green development process of libraries around the world. The information about key journals, important authors, core knowledge areas, and main research directions analyzed in this
The paper provides interested researchers with a channel to quickly learn about this research area and guidance for follow-up research. For librarians, it is hoped to help librarians change their original development philosophy, increase their awareness of the importance of going green, and motivate librarians to take active steps to promote the transition to green library development. For the sustainable development process of the whole society, it is hoped that it can play a role in boosting the green development of libraries, which in turn can promote the global sustainable development process.

**Disclosure statement**

No potential conflict of interest was reported by the author(s).

**Funding**

This work was supported by the Innovation Spark Fund of Sichuan University [SKSYL201807].

**Notes on contributors**

*Simin Lis* is a postgraduate student at the Department of Information Resource Management, Sichuan University in China. Her research interests are green library and library management.

*Feng Yang* is a Professor at the Department of Information Resource Management, Sichuan University in China. His research interests are problems related to information society.

**References**


African Libraries in Development: Perceptions and Possibilities

Renee Lynch, Jason C. Young, Chris Jowaisas, Stanley Boakye-Achampong, and Joel Sam

Technology and Social Change (TASCHA), University of Washington, Seattle, Washington, USA; Research, African Library & Information Associations & Institutions, Accra, Ghana, USA

ABSTRACT
Across Africa, libraries are contributing to development in their countries. However, this work remains largely unrecognized by international stakeholders in development. To bridge this gap, this research examines the current perceptions of libraries among development organizations and asks how libraries may gain visibility as partners. Interviews with development practitioners indicate that perceptions of libraries remain low and limited but allow for possible roles for libraries as community-embedded institutions and development resource hubs. To engage these roles, the collection of output data is important in order to demonstrate the capacity of libraries to participate meaningfully in development work.

KEYWORDS
Africa; data; international development; perceptions; public libraries; united nations sustainable development goals; visibility

Introduction
A problem of perception
Across Africa, libraries are contributing to development in their countries in various ways. In Ghana for example, evidence shows that libraries are supporting UN Sustainable Development Goal (SDG) 3 on good health and well-being by engaging community outreach to enable healthy living (Dadzie et al., 2016) as well as SDG 4 on quality education by scaffolding skills for life-long learning (Atta-Obeng & Dadzie, 2020). The IFLA SDG Stories map (IFLA, 2020) offers additional examples from Kenya, Nigeria, South Africa, and Tunisia to showcase the work of libraries in development. From increasing employment opportunities for people incarcerated in Namibia (SDG 10 on reduced inequalities; Isaacks, 2020) to improving fish farming (SDGs 1 and 2 on eliminating poverty and hunger; Imoni-Atebafia, 2020) and organizing recycling programs in Nigeria (SDG 12 on responsible consumption and production; Ogunjimi, 2020), it is clear that libraries’ contributions cut across almost all SDGs as well as African Union (AU) Aspirations, demonstrating the capacity of libraries in development.

Despite efforts to amplify these successes, it is unclear whether this work is recognized by international stakeholders in development. Research carried out in 2012 (Fellows et al., 2012) indicated at the time that development organizations did not perceive libraries as partners, and that this was preventing them from gaining wider support. This becomes a larger issue as African libraries struggle to maintain support nationally in the form of funding and inclusion in national development plans. Library and information science (LIS) scholars and practitioners have called on libraries to raise their visibility through the use of data as a tool for self-advocacy (see Bundy, 2003; Sawaya et al., 2011). While libraries across the continent have affirmed the importance of this visibility, few studies have followed up to determine whether efforts have been successful at achieving it. Given the challenges that African libraries face in collecting and using data effectively (Lynch et al. 2020a; Moahi, 2019), the sector needs a more focused strategy that can speak to existing perceptions and understand which types of data would be most effective in shifting the narrative. This research thus illuminates the perception gap that exists between...
African libraries and development organizations and offers suggestions for how libraries can use data strategically for self-advocacy.

**African libraries in development**

Development can be defined as “improvement…of the social and material conditions for life” (Kingsbury, as cited in Appleby, 2010, p. 22), but it is a broad and contested term which also “defies definition” (Lawson, 2007, p. ix). With origins in colonial era Britain (Kanbur, 2006), international aid for development has been largely driven by the interests of the Global North and dispersed according to shifting philosophies over time (Lawson, 2007). The field of international development organizations has been similarly described as variable, a “fragmented…ecosystem and an ever-expanding cast of players” (Ingram & Lord, 2019, p. 5) with priorities that change to align with the latest socio-political trends. While some agendas look to partnerships with local institutions in order to increase local ownership of development (e.g. UN, 2015), critiques reveal that these relationships remain opaque, and the desired qualities of an ideal “development partner” shift over time in accordance with political agendas (Vavrus & Seghers, 2010). For libraries hoping to gain a foothold as recognized players in the field of development, this unstable ground is daunting to say the least.

Nonetheless, the work that African libraries do often matches the goals of development organizations expressed in agendas such as the United Nations SDGs and African Union Agenda 2063. From educational programming (Mahwasane, 2017) to community health (Emojorho & Ukpebor, 2013; Sow & Vinekar, 2012) to expanded access to information and communication technologies (ICTs; Ifijeh et al., 2016; Sears & Crandall, 2010), libraries and development organizations share common goals that make them natural partners in development.

However, African libraries have not historically been readily perceived as partners by the international development community (Fellows et al., 2012; Namhila & Niskala, 2013). As an example from Namibia, libraries were initially left out entirely from a World Bank 15-year strategic plan for education, in spite of the natural connection between schools and libraries (Namhila & Niskala, 2013). Advocates were able to mobilize quickly and lobby successfully for libraries to be added later, but specific plans for library development are also notably absent from the country’s Vision 2030 development plan, despite an emphasis on “equal access to knowledge,” to “transform Namibia…to a knowledge-based economy” (Office of the President, Windhoek, 2004). Though the situation of libraries varies widely across different African countries, they tend not to play central roles within long term national development plans (Benson et al., 2016; Kavalya, 2007) and this is both a symptom and cause of the lack of awareness of libraries in development.

Unfortunately, this tension between the potential of libraries and their lack of visibility is not new. African libraries have historically fought an uphill battle, wedged between external stakeholders and the communities they serve but not fully embraced by either. Many LIS scholars root these issues in the colonial history of African libraries; despite rich traditions of oral librarianship across the continent (Amadi, 1981a, 1981b), the libraries established by colonial administrations emphasized text-based practices and were built to replicate a European ideal, and this model gradually became accepted as the standard for modern African libraries (Mostert, 2001; Nyana, 2009). However, these libraries were not built to be relevant or accessible to the general population, and the negative effects continue until today (Albright & Kawooya, 2007; Kabamba, 2008; Moahi, 2019; Nyana, 2009; Sturges & Neill, 1998). While there is truth to this critique, the narrative of libraries as inherently colonial pigeonholes them and limits understandings of their role in supporting community-driven development. The perception of libraries as irrelevant and detached from the needs of their communities obscures their potential to act as intermediaries between communities and development organizations (e.g. Okojie & Okiy, 2019), to ensure that development is grounded in community needs. We need a better understanding of these recent efforts by libraries to re-align their programs to support their local communities in these ways, in spite of their history as colonial institutions.
Local perceptions, however, remain limited with real consequences for public libraries. Elbert et al. (2012) found that local government stakeholders in Ethiopia, Ghana, Kenya, Tanzania, Uganda and Zimbabwe perceived libraries as “lenders of books” and restricted in terms of technology, not necessarily as “agents for development and innovation.” Baada et al. (2020) similarly note a “lack of recognition of the importance of public libraries” as a significant barrier in attaining adequate resources for public libraries in Ghana, as politicians may pay lip service to libraries while failing to allocate proper funds. A lack of a defined role in national development plans exacerbates this issue by leading many libraries to be reliant on inconsistent and short-term funding (Benson et al., 2016; Kavalya, 2007; Moahi, 2019), and decentralization policies which shift power to local governments also result in decreased administrative and financial support (Stranger-Johannessen et al., 2015, p. 88).

Such challenges understandably lead African libraries to look internationally for other opportunities. After all, the region of Africa received almost $52 billion US in official development assistance in 2017, according to the OECD (OECD, 2019). These numbers do not include development funding from so-called “emerging donors” such as non-OECD countries, estimated between $11 billion US and $41.7 billion US per year, almost ten years ago (Waltz & Ramachandran, 2011). Private funding, though notoriously difficult to track, is acknowledged to “dwarf” traditional forms of development funding (Ingram & Lord, 2019, p. 9); for perspective, Lawrence et al. (2015) calculate that U.S.-based foundations gave $1.5 billion US to Africa in 2012 alone. This represents a literal wealth of potential for African libraries to connect their work with the larger goals of development-oriented organizations and agendas in order to access wider support.

Historically, the connection between African libraries and development organizations was built on the hope that libraries could assist in the mass education of the general population in the post-independence era (Moahi, 2019; Mostert, 2001). This led some development organizations to initially give direct support to African libraries, notably UNESCO (Sturges & Neill, 1998). Mostert (2001) notes that within this relationship, solidified by the 1953 UNESCO Public Library Manifesto, libraries were “to provide information to development agents and agencies, to support formal and informal rural education programs through the provision of materials to both students and teachers, and to serve as centers of community education and cultural activities” (np), effectively positioning libraries as implementers of development. In the 1970s, philosophies shifted to emphasize the role of “information for development” to enable developing countries to “maximize the utilization of their local resources” in order to compete in the world market (Bouri, 1994, p. 160). Instead of increasing support for libraries, however, resources were directed toward new science and technology information systems within governments and elite spaces rather than libraries for the public, reducing library support (Bouri, 1994). The 1980s brought economic downturn which further limited the resources allocated to libraries (Moahi, 2019) in accordance with structural adjustment policies and neoliberal attitudes in development which de-emphasized funding for public institutions such as libraries (Kanbur, 2006, p. 7). As a result, the relationship between international development organizations and African libraries became more tenuous as support for public services waned.

More recently, there has been a resurgence of interest in the role of African libraries in development, driven by the belief that development can be empowered by access to information. Related studies position libraries as contributing to development by virtue of acting as public access sites (e.g. Kavalya, 2007; Onoyeyan & Adesina, 2014) which provide ICTs (e.g. Akintunde, 2004; Chisenga, 2000) and physical space for community-based programming which furthers development goals (e.g. Ashraf, 2018). Supported by organizations such as the International Federation of Library Associations and Institutions (IFLA), Electronic Information for Libraries (EIFL), and African Library and Information Associations and Institutions (AfLIA), international and regional advocates are attempting to amplify the successes of African libraries.
libraries and increase roles for libraries in development worldwide (IFLA, 2015; AfLIA, 2019).

To advocate for libraries, Bundy (2003) and others (e.g. Sawaya et al., 2011) have emphasized that data is key to libraries being able to gain visibility and prove their community value in a world of neoliberal accountability. However, German and LeMire (2018) among others maintain that assessments of such value remain haphazard and challenging to implement, particularly in African contexts (Kabamba, 2008; Moahi, 2019). There is also a lack of consensus on which methods and types of data best demonstrate the value of libraries, with a general trend toward recommending surveys of users (German & LeMire, 2018; Kabamba, 2008). Many in the LIS field (e.g. Kabamba, 2008; IFLA, 2020) highlight the importance of narratives or stories to illustrate development successes, but this is accompanied by the awareness that anecdotes are not enough in the current neoliberal “climate of accountability and reduced public spending” (Hart, 2004, p. 114). Sawaya et al. (2011) recommend going further to combine “evidence from primary sources, including surveys and case studies, and secondary sources, such as government statistics and reports” (450) to comprehensively demonstrate how libraries contribute to funder goals. Young et al. (2020) have pointed out that official sources may lack necessary data, however, and so recommend novel data collection methods such as crowdsourcing to counter this challenge and enable libraries in Africa to fill gaps in official data sets. Overall, Moahi (2019) asserts that using any data effectively requires both qualitative and quantitative data, and crucially, analytic skills in order to weave together a convincing story about the value of African libraries in development.

However, evidence shows that African libraries face unique challenges in collecting and utilizing data for self-advocacy. A recent study indicated that library representatives from 16 African countries note challenges concerning data integrity in terms of completeness, accuracy, credibility, and relevancy; infrastructure; capacity; local investment in libraries; time; and participation of data collectors and respondents (Lynch et al., 2020a). Simply conducting a survey of library users requires more time and effort in order to build a relationship of trust with communities who have long been “socially excluded” from library spaces (Kabamba, 2008, p. 156). There is also concern that even if librarians have data, they themselves are not trained to “interpret data and integrate it with stories of impact” (Moahi, 2019, p. 242). Kabamba (2008) states that “many public libraries do not have the capacity for conducting systematic needs assessment surveys,” but “it is understandable that not all librarians will possess these skills.” (156) Instead, Kabamba and others (e.g. Igbinovia, 2016; Igbinovia & Osuchukwu, 2018) suggest that libraries solicit the skills and means of library schools, library associations, and development organizations to overcome challenges of capacity. This solution, however, still requires that groups such as development organizations want to work with African libraries as partners. Given the existing issues in library capacity, addressing this issue requires a more focused and strategic effort.

A 2012 study by Fellows et al. showed that the perception of global libraries among international development organizations was low, and public libraries “are typically overlooked as partners in development” (1). In interviews, many development leaders saw the “potential” of libraries but were wary of the perception of libraries as “repositories of books” that would challenge their efficacy as partners. This prompted us to ask if this is still the case and what insight more current perceptions may yield with regards to the use of data. We also sought to focus on the African context, given the unique challenges and possibilities for African libraries in development. To that end, this research asks the following questions to further investigate the issues of perception regarding African libraries in development:

- What are current perceptions among development organizations of African libraries as potential partners in development?
- How can libraries use data to effectively position themselves as potential partners?

**Materials and methods**

To answer these questions the Technology and Social Change Group (TASCHA), a US-based
research institution, and African Library and Information Associations and Institutions (AfLIA), an African library organization, undertook research as part of a larger, collaborative project called Advancing Library Visibility in Africa (ALVA). This project broadly examines the relationship between public libraries and development across sub-Saharan Africa.

The research team conducted interviews to understand how international development organizations perceive public libraries in Africa and how libraries might position themselves to take advantage of potential partnerships. We invited adults (over age 18) who are currently working for a development organization that funds or implements projects in Africa to participate. For the purposes of this study, definition of “development organization” was based on the following criteria:

- Organizational desire to create change aligned with development goals, such as those outlined by the UN (Sustainable Development Goals) or the African Union (Agenda 2063)
- Provision of funding or services to realize these goals, including research and policy advocacy efforts
- Focus on long-term change rather than short-term assistance (e.g. not humanitarian aid)

Our definition of development organization is purposefully open to account for the malleable definitions and debates around the term “development” as well as the broad range of levels of involvement with this work. For example, some organizations may advocate at a policy level for the realization of development goals while others may provide direct service through material support on the ground. We wanted to acknowledge this reality of the development landscape and be able to elicit the perspectives of a broad range of actors involved with this work.

Based on this definition, we took a purposeful sampling approach and identified potential participants through (1) the preexisting contacts of the research team, based on their prior research experiences; (2) a survey of the websites of well-known development organizations; and (3) the recommendations of existing participants in the study via respondent-driven or snowball sampling. We invited potential participants via email, and the overall response rate was rather low; we contacted 178 people total, 50 people (28%) responded overall, and we completed 21 interviews (12% of total contacted). Many potential participants did not respond or replied that they did not know anything about libraries and so were reluctant to participate. We encouraged participants with all levels of library knowledge and experience to participate, but we believe this issue speaks to the overall lack of awareness of the potential role of libraries in development, as will be detailed in our results section.

We interviewed 21 participants who work on behalf of bilateral, multilateral, and non-governmental organizations including private foundations and faith-based organizations. These individuals were based in various countries in North America, Europe, and sub-Saharan Africa, and they reported having worked in development between seven and 45 years. Therefore, though the sample size of 21 individuals is small, there is variety in terms of organization type, geographical location, and professional history. While all are employed at development organizations, we classified five participants as “library advocates” because their work at the organization involved working directly with or on behalf of libraries. We included them as participants because of their unique insights into interfacing between libraries and development organizations. The other 16 participants do not regularly work with or on behalf of libraries.

In terms of limitations, it is important to note that this study is not representative of all development agencies and countries and also had a limited number of responses given the vastness of the development field. Nevertheless, our sample includes participants from organizations that vary in mission, size, and geographic base, and strong themes consistently emerged out of the interviews. This leads us to believe that this research provides a useful starting point for understanding the relationship between development organizations and libraries.

Interviews were semi-structured (see Appendix for guiding questions) and lasted approximately 60 minutes. Interviews were conducted in English.
via online video conferencing platforms and were audio recorded with participants’ permission. Participants also gave informed consent for their words to be used in this research. Interview questions focused on the participant’s professional background, their organization and how it selects local partners, their perceptions of libraries, and which types of data would be effective in shifting perceptions. Interviews were transcribed and anonymized to protect participant privacy, and in this paper, we have used numbers (e.g. Participant 1) as pseudonyms in order to attribute direct quotes.

Transcripts were then coded by two researchers simultaneously using the Dedoose software in order to cross-reference and triangulate analysis for consistency (Baxter & Eyles, 1997). Codes were developed inductively using a grounded theory approach (Glaser & Strauss, 1967) to identify common themes in interview responses. Given the research questions, we paid special attention to trends around current perceptions of libraries, data that development organizations use to assess potential partners, data that organizations want from libraries to gain visibility as potential partners, and other factors that influence organizations’ choice of partners. These trends were then analyzed to reveal insights, as discussed in detail below.

Results and discussion

The interview results and analysis revealed important insights for libraries interested in engaging with the development sector more formally. The first and second sections below detail current perceptions of development organizations. We find that these organizations do not readily think of libraries as partners but can imagine potential partnership roles when libraries are discussed. The final section then describes which types of data development organizations would need to be convinced that libraries could fill these partnership roles.

Current perceptions

Interview responses suggest that some development practitioners perceive libraries, but there is an overall limited perception of libraries and their role in development. Ten participants reported low or no professional experience with libraries, and nine participants reported low or no usage of libraries in their lives outside of work. In general, comments displayed a lack of awareness of libraries as potential partners in development. Participant 14 exemplified this sentiment:

[... ] I don’t even know if we’re aware and I’m not sure we have any situational awareness around libraries in any place that would work, that’s my hunch. I suspect, I wouldn’t speak directly for some of our program managers, but I’m pretty sure most would say they had no idea.

Other comments echoed this lack of perception, stating that a “[library] really is a new stakeholder I had not thought of in the context of Sub-Saharan Africa” (Participant 20) and that they had “never heard them mentioned in any of the programs.” (Participant 5). This lack of perception includes both an absence of any perception, as exemplified above, as well as the perception that libraries simply do not exist in the African countries where their organization works, as explained by Participant 13:

I mean to be frank, I am not sure there are any libraries in [African city]. I don’t believe that there are libraries in [city], because [country], I mean as you know, they’re really, the government and infrastructure in [country] leaves very, very much to be desired and there are really very few public services provided to the citizens of [country], and that includes electricity and clean water and sanitation, just the bare minimum [... ] and I am saying this not knowing if there is a library here, but I’m almost certain that there’s not, but a library would be so far beyond that basic service that is already not provided that I don’t think that it exists here.

This general lack of perception of libraries extends to a lack of awareness of their role in development, with seven participants saying they had no perception of how libraries contributed to development. As an example, Participant 1 reflected, “It seems like there’s got to be a connection, but I guess it’s just something I never really thought much about, honestly until the email came [to request an interview], and I was thinking, wow, this is an interesting topic.”
Likewise, Participant 14 commented, “I think the biggest thing is […] it would strike me as unusual, but not bad, but unusual for a library to take on that kind of operational role.” In addition, many participants expressed that partnership decisions are highly dependent on the project, and, as for Participant 12, choosing a library partner may not “make sense,” even if they are familiar with libraries as players in development. These comments illustrate that the role of libraries remains constrained in the eyes of development practitioners.

Those that did perceive libraries offered a limited perception, with a notable trend in associating libraries with books and literacy only, as mentioned by 13 participants. As a library advocate articulated, “Libraries are seen as areas, just spaces for academic - for reading and references. They’re not seen as spaces for interaction, you know as open and flexible spaces. That perception I think is one of the weaknesses.” (Participant 9) While for some participants, an association with literacy provided a natural connection to development goals and an “easy win” for libraries (Participant 15), for most participants, the notion of a library remained tied to physical books because “you walk into the library, you see books,” which can be perceived as “antiquated” (Participant 10). As Participant 3 noted, however, the reliance on physical materials may be necessary in African libraries which experience electricity shortages and so this issue “needs to be looked at in context.” Also, multiple participants recognized this as a “perception barrier to get over […] this somewhat caricature image that many of us would have of libraries. They’re just a place of books that you go to get books and return books, that’s so distant from doing ‘development work’ and it’s not even on your mental radar” (Participant 14). These responses resonate with previous research that libraries are overlooked as partners in development, and individuals who do perceive them tend to have limited perceptions of their work (Elbert et al., 2012; Fellows et al., 2012).

Overall, there is a persistent belief that libraries simply do not have capacity to be active partners in development. The most frequently mentioned perceptions of libraries among participants were related to issues of low capacity, citing outdated facilities, untrained staff, and lack of technology or technical expertise and other resources, among other potential challenges. Participant 14 summarized many of these concerns, explaining,

I’ll just take a real life example, if we went to our team that runs our out of school kids program in [region of Africa], and sort of asked the thought question or why are we not working or have we explored or should we explore working the libraries instead of just NGO implementing partners, and so there are people who would be like ‘why libraries, they’re not experts in the issues we care about, they don’t do kind of on the ground delivery and implementation of developing programs, or they don’t have the expertise we’re after, it’s a bunch of librarians, you know, they don’t know how the development world works.’

These concerns demonstrate that the perception of libraries as lacking in capacity limits the extent to which they can be seen as effective partners in development. Though some practitioners mentioned capacity building as an explicit or implicit part of their organization’s mission in partnerships, more expressed a preference for partners “who can do the work” (Participant 17) and have a “track record” (Participants 14, 15) to prove it. When asked what qualities their organizations look for in potential partners, participants most frequently mentioned expertise in terms of development sector, local context, and technical aspects, as well as being generally capable and functional. These insights reveal that demonstrating the competency and existing success of libraries in development is crucial in presenting libraries as effective partners, and this will be discussed later.

In spite of a lack of visibility, however, many development practitioners saw the potential of libraries. 12 participants perceived libraries as existent but just not visible as partners; as Participant 17 mused, “You know, we don’t really talk about it. I think that a lot of my colleagues, all of us are running around with multiple degrees, and I think we all probably grew up with a soft place in our hearts for libraries, but it’s just not part of the conversation.” Six participants also recognized the challenge of marketing libraries to development organizations, acknowledging that the issue is one of perception, as expressed by Participant 18:
... this is probably more of a weakness on my side as opposed to the library side [...] I have a little bit of a stereotype of what libraries bring to the equation, in terms of partnership, and so I guess, my gut is that there is a pretty kind of narrow and specific role for libraries and so that's probably not the case.

Comments such as these and others demonstrate that it is possible to shift perceptions of libraries. At least six participants reported a change in views over time to see libraries as development partners. For some, such as Participant 10, this occurred personally as a result of the interview; they talked about seeing the invitation for interviews and “hopping onto it” because they were struck that working with libraries was a “totally unexploited partnership opportunity.” For others (Participants 7, 8, 9, 12), the change was a result of contact with colleagues who had knowledge of and experience with libraries in development. Seven participants expressed that libraries would be eligible partners if they were visible, and though raising visibility was generally recognized as a challenge, some were hopeful that this was “very doable” through “messaging and using [development organization’s] language” and “knowing how to leverage the space [...] and then knowing how to message it to the donors.” (Participant 15) This outlook suggests that libraries can change their perception in the eyes of development organizations through strategic messaging which leverages their value, and we discuss some possibilities for this in the next section.

Roles for libraries

The optimism signaled above raises the question of how to exploit existing perceptions of libraries and work with what organizations are looking for in order to establish more concrete roles for libraries in development. This section offers the answers that emerged from our interviews. One possibility is promoting libraries as community-embedded institutions in order to gain visibility. When asked about the qualities desired in partners, the answers varied widely between participants and projects; however, one common theme was the importance of an established local presence. Participant 10 summarizes some of these related qualities:

I looked at libraries because of what we’re typically looking for in a partner is [...] that local context, right. We’re looking for a credible partner as well to get over that kind of threshold of being able to say yes, we can do this, and we’re working through trusted entities, right. Then that third piece, kind of that network community aspect of it is so crucial to the delivery of a lot if not all of what we do. [...] Standing up something, like a local group that is unmoored from any of the community at large is really hard to do. No one wants to join. They have no association with it. It typically goes away. There’s no sustainability plan for that group at the end of a project.

This desire for community-based partners, or those “steeped in certain communities” (Participant 15), was expressed by four other participants, and others mentioned linked qualities such as being trusted locally (3 participants), networked with local bodies (3 participants), and having local expertise (6 participants) as well as access to local data (2 participants). As Participant 14 explains, having insight into communities makes libraries effective in the eyes of development organizations:

I think there is the argument to be made that libraries and more importantly the people who work there potentially have really interesting insights into both sort of lived realities of the communities in which they work, which is really important oftentimes, the work we all do. Also probably have interesting ways of sort of diagnosing challenges in those communities would bring theoretically a very multi or intradisciplinary approach to both problem identification and solution design.

Interviews signaled that development practitioners may be predisposed to see libraries as community-embedded institutions, given commonly held perceptions of libraries as community spaces (10 participants), spaces for informal learning (7 participants), and places for people to access resources such as information and internet (8 participants). At least five participants mentioned using libraries with their own families, and so leveraging these experiences of community value may be an opportunity for libraries to make connections and gain recognition for their work.
Another role available to libraries is a hub for resources that development organizations need in terms of space, data, and research. This role is an extension of being embedded in communities and can be built on other existing perceptions of libraries as “data intermediaries” (Participant 9) and “democratizing” (Participant 11) sites of information access; for example, Participant 18 discussed being “really impressed by the focus on kind of local materials and local resources” they observed in African libraries and “kind of the presence and availability of different research.” These perceptions echo the fact that development practitioners already perceive libraries as places to access resources, as noted above, and this creates an opportunity for libraries to provide the resources needed by organizations for development work.

In some cases, participants indicated that the resource provided could be the library space itself. Many practitioners thought of a library as a “gathering place” or “venue” (Participant 5), “platform” or “collaboration space” (Participant 9), or simply “public space” that is sorely needed (Participant 15). Many were able to imagine possibilities for development programming that could take advantage of this space, for example, in hosting an “entrepreneurship club” for youth (Participant 16), a community-led radio station (Participant 6), or political information on citizen rights (Participant 18). This interest in the use of library space for development work is also reflected in the overall desire to know more about library capacity including available technology and connectivity (4 participants), staff training (4 participants), library networks (3 participants), other partnerships (3 participants), and general facilities data (2 participants). Given that the space met project needs, promoting libraries as venues for development activities would fit existing desires and perceptions.

It is also possible that libraries could provide the resource of data for development. When asked what data organizations would want from libraries, a common theme was the desire for data that addresses current gaps, expressed in terms of data that is unique from what is found in other official sources (4 participants), gender disaggregated (3 participants), locally focused (2 participants), and citizen-generated (1 participant). Put in other words by Participant 18, “I could see working with a library partner being really helpful and in that […] they have like resources at their disposal related to data that we would not otherwise have access to or know existed.” Participant 20 likewise mentioned interest in data that was “different” or “of higher quality” than that from national sources in-country. There is an opportunity for African libraries to meet this need through provision of data for data-oriented projects, as highlighted by 3 participants, such as Participant 16 who saw a role for libraries in “evidence generation” for governments working on disaster risk management and early warning systems. This role could also be fulfilled through joint data collection or “data collaborative work,” emphasized by Participant 20 as a priority in their project. Libraries engaged in data collection could also leverage access to local populations as “places where a lot of people go” (Participant 5), given some organizations’ interest in partners who serve specific populations such as women, youth, or refugees (4 participants). In this way, libraries could fill the gaps that exist in official data in order to furnish information development organizations want but find lacking in other official data sources, as African libraries have done via crowdsourced mapping (Lynch et al., 2020b; Young et al., 2020).

The role of libraries as a development resource hub could also be fulfilled via sharing development research. Three development practitioners cited disseminating research done by their organizations as an opportunity for libraries. As imagined by Participant 13, this could be done at the community level of “awareness raising” on research conducted by the organization on violence prevention. There were some examples of libraries successfully serving as institutional “custodians of knowledge” (Participant 9) and specifically African “local content and Indigenous knowledge” (Participant 7) within their organizations. In this way, fulfilling this role has allowed their libraries to carve out an organizational niche for their work and gain recognition as contributors to development.
Data for advocacy

Of course, it is not enough for libraries to have the potential to fill important roles – they also must prove to development organizations that they will succeed in meeting this potential. Overall, interviews emphasized the importance of library output data to advocate for libraries in development work. Output data, defined as information on the direct services and usage of the library, was seen by development practitioners as important to demonstrate the capacity and impact of libraries in development. In general, participants expressed a preference for impact data, but data which shows a direct connection between action and impact was acknowledged by many as a “holy grail” (Participant 14) and difficult to acquire reliably. Therefore, many expressed the utility of output data in order to make the case for impact. Both quantitative and qualitative data were discussed as useful, but there was a slight preference for quantitative data because, in the words of Participant 5, “the quantitative allows us to sell and to demonstrate undeniable success.” As such, output data was generally accepted among practitioners as a necessary proxy for impact data.

Output data was also most frequently mentioned as the type of data that organizations would want from libraries, including data on usage (9 participants), number of people attending library programs (4 participants), content or collections (3 participants), and number of staff (1 participant). For usage, participants wanted to know both numbers as well as demographics of users. As described by Participant 16, development organizations want to know “Is the library a place that has a lot of traffic? Is it a place for where we can reach women or adolescent boys or adolescent girls?” Participant 13 similarly expressed wanting “to make sure that we were able to touch a lot of our target populations” including “marginalized groups” as a guaranteed “benefit of work through a library.” Relatively, interviewees reported using quantitative data (9 participants) and monitoring and evaluation data (9 participants) most frequently in order to assess partners, with attendance at events (Participant 13) and growth of program participants over time (Participants 5, 17) mentioned as just a few examples. Taken together, these responses suggest that quantitative data on library output, and in particular users and demographics, would be effective in order to address the concerns of development organizations and promote the viability of libraries. This information could be used in combination with data on library capacity, as described earlier, to demonstrate that libraries are capable of contributing to development work in varied ways.

As an example of how output data can be used for library advocacy, Participant 19 described their success in establishing an African digital library project for a development organization. By collecting the number of downloads, web page use, user location and the resulting geographical spread, this output data allowed them to successfully make the case for the broader development impact of the library project. Similarly, Participant 9 detailed collecting statistics for a library within a development organization on the number of visitors, number of people accessing materials online, number of people sharing materials on social media, and monthly events. They report that this output data has “made [...] senior leadership to see the potential of how we are serving the community” to the effect of doubling the library budget over time. As an important caveat, however, this participant had hired a social media specialist for the library and spent considerable energy acting as a “champion” with “passion,” advocating and “fighting” for the library within their development organization. As other studies suggest (e.g. Lynch et al., 2020a), these opportunities are not available to all libraries, and the need to collect and use data for advocacy represents a significant burden for many African libraries as well as the necessity of capacity building to support these efforts if the benefits are to be realized.

Conclusion

Analysis of interviews suggests that perceptions of libraries among development organizations remain low and limited, associated with books and literacy and lacking capacity to participate meaningfully in development. However, there is
evidence that these perceptions can and have changed over time, and many development practitioners are willing to see the potential of libraries as players in development. Combining current perceptions of libraries with what organizations want from potential partners, two possible roles exist for libraries to fill: trusted, local institutions with insight into their communities; and hubs for resources that organizations need for development such as space, data, and research. To position themselves in these roles, it would be strategic for libraries to collect quantitative data on their output (e.g. services) with a special focus on usage and demographics of their users in order to illustrate their impact on communities and ability to fulfill the needs of other organizations in development.

While this message is largely optimistic about the ability of African libraries to use data to shift perceptions, it is necessary to qualify this optimism by underscoring just how much variety there was in responses overall. There were very few points that were agreed upon by a majority of participants, and given that this was a small sample, the field of international development seems increasingly complex for libraries to break into. The challenge remains for libraries to navigate their way through the fractured, ever-shifting sea of international development agendas and players.

In addition, data is not a magic bullet; interviews intimated that other factors beyond data influence the partnership decisions of development organizations, including networking, referrals, previous relationships with an organization, and others. Our additional analysis (Young et al., forthcoming) describes these factors in more detail. In the end, African libraries may have data and passion, but without well-connected advocates and the ability to wield data effectively, their potential as development partners may stall. This underscores the need for additional research into what capacity African libraries currently have for collecting and utilizing data in addition to advocacy for building that capacity in order to gain visibility going forward. In addition, there is a need for additional, in-depth research on African libraries that have been successful in attaining development funding so that we can learn from them and share practical strategies with libraries on the ground.

This research then has varying implications for different stakeholders. For African library systems, we recommend to start by acknowledging the development work that libraries are already doing. For those who are interested in attracting development organizations, we recommend framing this work in terms of connections to the local community, attention to marginalized groups, and past successes in implementing projects. Library systems can also consider collecting quantitative data on library usage and user demographics, if these data are not already collected, but a variety of other types of data may be useful for different organizations and goals. They can also continue to network with development organizations, and for international audiences, consider promoting library strengths as community-embedded institutions and hubs for development resources including space, data, and research while also continuing to network and advocate for libraries at the local level.

For development organizations, we likewise recommend acknowledging the development work African libraries are already doing. Organizations can contact a library directly in a country where they work; for library location and contact information, our map of African libraries (librarysites.io) can be a useful tool that is still expanding as more locations are added. Given the power of personal contact to shift perceptions, we also recommend discussing the possibility of partnering with African libraries with development colleagues to make it a reality.

For those who support African libraries, we recommend enabling libraries to connect with development organizations directly. Library support organizations can arrange networking events for library representatives and/or put libraries into direct contact with development organizations. Simultaneously, they must continue to build the capacity of libraries to connect with development organizations through supporting skills such as marketing, storytelling, basic analyzing and reporting of quantitative and qualitative data, applying for grants, and writing proposals with a focus on using data effectively. This should be in addition to continuing to
network and advocate for libraries at the local level. For researchers in this work, we recommend research on the data collection practices of public library systems across Africa, which we are currently conducting. We can also research and critically consider unintended consequences of aligning African public libraries with development organizations and how this affects libraries and their users, for example, how data about users are collected and used by development organizations. These efforts will help to sustain libraries’ capacity to use data effectively for self-advocacy.

Acknowledgments

We would like to recognize the people that made this research possible, including twenty-one confidential participants. We would also like to thank Dr. Helena Asamoah-Hassan, Chris Coward, and Karen Hirst for their support and guidance.

Funding

This project was funded by a gift from the Bill & Melinda Gates Foundation [Investment ID OPP1130103]. This research was approved by the IRB Human Subjects Division at the University of Washington, Seattle, IRB ID STUDY00007917.

ORCID

Renee Lynch http://orcid.org/0000-0003-0585-346X
Jason C. Young http://orcid.org/0000-0003-2537-4255
Stanley Boakye-Achampong http://orcid.org/0000-0002-3455-2538

References


Appendix

Guiding Questions for Interviews

1. What is your role in the organization?
2. What types of development projects are you currently funding or implementing?
3. What types of organizations or people do you fund or partner with at the local level?
4. How do you select these organizations for inclusion in your projects? What criteria or evidence did you use to determine that they would make good partners?
5. How do you evaluate the success of these partners?
6. Can you describe an impactful project that you carried out with a partner? What made it impactful?
7. Generally speaking, what are three words that you associate with libraries?
8. What is your perception of libraries located in the communities in which your organization operates?
9. What is your perception of the services that libraries provide to communities?
10. Has your organization ever funded or implemented a program that involved libraries? If so, describe the program and its results. If not, have you thought about libraries at all? Why did you choose not to work with them?
11. What is the likelihood that your organization will work with libraries in the future?
12. What strengths might you expect libraries to bring to this partnership?
13. What weaknesses might you expect libraries to bring to this partnership? What challenges might you need to overcome because you are working with a library?
14. What types of data (or evidence) could libraries collect that might help convince your organization that they would be effective development partners?
15. Libraries commonly collect data on number of library users, number of books that have been checked out, and the number of people who participate in programs. Is this type of data useful for you? Why or why not?
16. Is there anything else you would want to know about libraries?
17. Based on your perception, how do libraries compare to your current partners with respect to (a) their development impact and (b) the number of people that they can reach?
18. What skills do librarians need to attract the attention of organizations like yours?
19. Do you think your views about the potential of libraries are similar or different to those of your colleagues? If different, in what way?
20. What is your age?
21. How long have you worked in development?
22. How often do you use a library? For what purposes?
23. Can you think of anyone else we should talk to about this? What are their contact details? (We're trying to talk to a wide range of people who work in development - people involved in funding or implementing projects in Africa, ideally with experience in partnerships.)
24. Can we follow up with you if we have further questions?