



THE CONTRIBUTION OF LIBRARIES TO
**EDUCATION FOR
SUSTAINABLE
DEVELOPMENT**

A GLOBAL KNOWLEDGE COMMONS FOR SUSTAINABLE DEVELOPMENT

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Acronyms

CC	Creative Commons
CARE	Cooperative for Assistance and Relief Everywhere
EIFL	Electronic Information for Libraries
ESD	Education for Sustainable Development
FAIR	Findable, accessible, interoperable, reusable
FOREST	Financial and Organizational Sustainability, Openness and Interoperability, Representative Governance, Equity, Accessibility, and Anti-Oppression, Sharing of Knowledge, Transparency
IFLA	International Federation of Library Associations and Institutions
KEN	Knowledge Equity Network
LIBER	Ligue des Bibliothèques Européennes de Recherche – Association of European Research Libraries
OER	Open Educational Resources
OpenAIRE	Open Access Infrastructure for Research in Europe
POSI	The Principles of Open Scholarly Infrastructure
SDG	Sustainable Development Goals
SDG Academy	Sustainable Development Goals Academy
SDSN	UN Sustainable Development Solutions Network
SPARC	Scholarly Publishing and Academic Resources Coalition
SPARC Europe	Scholarly Publishing and Academic Resources Coalition Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization.
SPR	Secondary Publishing Right
ROI	Return on Investment

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Executive Summary

This research has explored the background and identified the building blocks for the achievement of education for sustainable development (ESD), particularly through libraries. It has analysed the literature to show the connections between ESD and open educational resources, and the contribution that libraries can make to these and to open science generally.

The analysis of global case studies shows the multiple and varied activities of libraries worldwide in contributing to ESD. The opinions on libraries and education for sustainable development that were garnered from experts and thought leaders also globally point to the potential of libraries to help realise sustainable development. It also lists some of the extensive, powerful global networks that connect libraries to policy, to technological and legal developments, and to standards for categorising and describing knowledge. This highlights the global connections of libraries and their partnerships, dedicated to enabling, optimising, and accelerating the sharing of high-quality knowledge resources openly and freely worldwide. These networks are the components of an extraordinary well-established infrastructure that is poised and ready to support a Global Knowledge Commons for Sustainable Development.

The contribution of libraries to ESD is unique – and not just because it is largely unreported from a policy perspective – locally in individual academic institutions, nationally at government level, or internationally. It is unique because the contribution of libraries to ESD is pervasive, multi-layered and multifaceted. It involves a physical presence in almost every corner of the earth with deep community engagement from remote rural villages to advanced research-performing organizations. And it involves enabling access and discoverability of knowledge resources both on a simple face-to-face basis and virtually, at the cutting edge of the digital revolution.



Libraries' involvement in teaching, formally and informally, is extensive and rapidly growing and evolving. Libraries teach and support digital literacy and information literacy – and they also build capacity. Libraries are unique in that their presence on the ground with dedicated professionals, expert in making knowledge accessible in a physical sense, is matched by a powerfully interconnected network of digital repositories and online archives and platforms discoverable via portals, web-based harvesters and other technologies. These digital resources are underpinned by internationally recognised standards for knowledge description and interoperability. The fact that these library-based suppliers (and increasingly, creators) of high-quality knowledge, expertise, and centres of learning are almost entirely publicly owned and funded makes this network all the more powerful in an era of rapid commodification and monetization of knowledge and education. This position paper maps the activities and attributes of libraries to the ESD 2030 Framework's¹ five Priority Action Areas and suggests a model of alignment with this strategy which would clearly and demonstrably align the work of libraries with global efforts on education for sustainable development.

It is proposed here that this network of global libraries should get more recognition for the contribution it offers to education for sustainable development.

Libraries should be recognised in this role by policy makers, by governments, and by the institutions in which they may operate; and they should be included in policies and strategies in this area as key participants. Taking up the challenge posed in 'Reimagining our futures together: a new social contract for education' (UNESCO, ICFC, 2021) libraries should be galvanised, supported, resourced and recognised to work alongside other stakeholders and agencies to develop a publicly owned, intergovernmental-supported, high quality, standardised, interoperable global knowledge commons for Sustainable Development. This Commons should be built on the CARE, FAIR, Helsinki Initiative on Multilingualism in Scholarly Communication^{FOR}, and POSI Principles and on the FOREST. Research performing organisations should consider signing the AmeliCA Principles and the Barcelona Declaration.

A set of recommendations is provided for policymakers, libraries and institutions such as universities. These cover inclusion in policies, investment and recognition.

1 The ESD for 2030 roadmap underlines the implementation of the Education for Sustainable Development: Towards achieving the SDGs (ESD for 2030) framework, which aims to increase education's role in building a more just and sustainable world.

1. Introduction

This position paper was commissioned by Stichting IFLA Global Libraries, via IFLA, in order to explore and explain the role of libraries worldwide in supporting ESD and to reflect the perspective of the SDSN and its education division, the SDG Academy. It reviews the existing evidence of libraries' contribution and places it within a framework that supports engagement with the wider education for sustainable development community, as well as within the proposal for a Global Knowledge Commons for Sustainable Development (outlined below).

Education for Sustainable Development (ESD) is defined by UNESCO² as, 'An approach to education that emphasizes the knowledge, skills, values, and actions needed to create a sustainable world.' UNESCO emphasizes that ESD is a lifelong learning process and an integral part of quality education. ESD enhances the cognitive, socio-emotional and behavioural dimensions of learning and encompasses learning content and outcomes, pedagogy and the learning environment itself. Given the deep and holistic nature of ESD, it is important to make a distinction between education for sustainable development and education about sustainable development. Beyond simply providing information about sustainable development, education for sustainable development equips learners with the tools, lifeskills, knowledge, competences, attitudes and attributes necessary to achieve sustainable development. This study focuses on libraries' contribution to education for sustainable development rather than education about sustainable development.

While ESD supports all 17 SDGs, it is embedded in SDG 4 Quality Education: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all," and is specifically embodied in Target 4.7:

"By 2030, ensure all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development."

Focusing on Target 4.7 and ESD, Mission 4.7, a global initiative advocating transformative education was launched in December 2020 by Global Schools and the SDG Academy (both flagship programs of the UN Sustainable Development Solutions Network), in partnership with the Ban Ki-moon Centre

2 UNESCO, "Education for Sustainable Development Goals: Learning Objectives" (2017).

for Global Citizens, UNESCO, and the Center for Sustainable Development at Columbia University. In addition to advocating for the achievement of SDG Target 4.7 at global, national, and local levels, Mission 4.7 also aims to curate and create relevant educational resources, push countries for greater investments in quality education, and identify ways to train and support educators around the world.

A Global Knowledge Commons for Education for Sustainable Development

UNESCO and the SDG Academy have jointly proposed a large-scale initiative to share quality-assured, peer-reviewed, standardized, OER in support of the UN 2030 Agenda to advance learning for sustainable development that is free, easily accessed and can be repurposed. This proposal is built on the outcomes of the UN Transforming Education Summit (TES) 2022 session entitled ‘Transforming Education for Sustainable Development (ESD): Implementing the UNESCO OER Recommendation within Multi-Stakeholder Partnerships’, and harnesses the UNESCO 2019 Recommendation on OER. This OER platform will act as a digital manifestation of the Global Knowledge Commons for Sustainable Development and will curate and create high quality, validated content about sustainable development which will be openly accessible, adaptable, and shareable globally. The platform will be founded upon established ethical and behavioral principles, on local, national and trans-national partnerships and networks, on existing and developing standards and infrastructures. In particular, it will leverage global developments in Open Research and Open Educational Resources and the content that is made openly and equitably accessible through these sources.

Connecting Open Research and OER to ESD and its Global Knowledge Commons



IFLA, UNESCO and the SDSN recognise the importance of partnerships with libraries to create Open Science, Data, and Educational Resources for use in education and training for sustainable development. They urge policymakers at the governmental, inter-governmental and institutional levels to acknowledge the essential role of libraries and support them to advance education for sustainable development.

Libraries can be a key partner in a **Global Knowledge Commons for the Sustainable Development Goals (SDGs)** contributing ethics, standards, systems, processes, and practices including quality assurance processes, discoverability, interoperability, archiving, preservation, copyright, licensing and rights retention, skills and training and equity in curation and access. Specific applications of these building blocks would include: libraries' public distribution of content (through creation, publishing and/or making openly accessible) to support in SDG 17 partnerships for distance and open teaching and learning; capacities across nations, parliaments/governments and in low resourced communities; and in Citizen Science. In particular, the sharing of openly licensed digital content in support of the UN's Agenda 2030 and its 17 Sustainable Development Goals supports the United Nations Secretary General's Road Map for Digital Cooperation, and Commitment #7 of 'Our Common Agenda': "Improve digital cooperation", actions that are feeding into the Global Digital Compact³ currently being negotiated.

At the same time, the Global Knowledge Commons for the Sustainable Development Goals is not simply a digital platform for collating and providing access to a collection of high quality reusable learning resources. It is a dynamic global partnership for ESD that we call the 'Diamond Engagement', a concept that is presented more comprehensively in Chapter 9.

Before we come to that, we will explore the contribution of libraries to ESD, a contribution that is not always recognised by policy-makers at government or institutional levels. And yet libraries operate worldwide, within schools and communities, within hospitals and research performing institutions, within parliaments and government departments, within enterprise – and all of them, even the most isolated, local or specialised, are connected by expertise, commitment, standards and by far-reaching networks that are dedicated to education and to knowledge.

3 The purpose of the **Global Digital Compact** is to establish an inclusive global framework, essential for multi-stakeholder action required to overcome digital, data and innovation divides.

2. Methodology

This research began with a review of the relevant literature. The resources used to support the work are described below. Further desk research was conducted in order to find apposite reports or policies from government agencies, lobby groups and social media companies along with any legal or other case studies in this area. The literature review was conducted to examine current research and thinking on the topics of education for sustainable development (ESD) and of the contribution of libraries to ESD. The complementary area of Open Educational Resources (OER) was investigated to determine the connections between ESD, OER and libraries.

Conducting the full literature review involved a literature search of ERIC, LISS (Library & Information Science Source), Scopus, Google Scholar and Overton. The search strategy used the terms 'Libraries' OR 'Library' OR 'Librarian*' AND 'Education for Sustainable Development' OR 'ESD': Negligible results emerged from the searches on libraries and ESD and the search was broadened to substitute the terms 'Sustainable Development Goals' or 'SDG' for 'Education for Sustainable Development' OR 'ESD'. The numerous results from these searches in the LISS (Library & Information Science Source) were filtered for relevance.

A limited search of selected government and quality media sites was conducted to identify relevant surveys and reports not covered by the scholarly databases. A major challenge was to filter the large number of results for relevance. The saved search results were hand-analysed using Zotero and a smaller number of key papers identified for inclusion in the literature review. Those with specific reference to the contribution of libraries to ESD were flagged.

During the extended literature search the initial research questions were condensed to 4 themes for in-depth analysis:

1. **Education for Sustainable Development: Background and Policy Landscape.**
2. **Challenges and issues for Education for Sustainable Development.**
3. **Open Educational Resources and Education for Sustainable Development.**
4. **Libraries, Education for Sustainable Development and Open Educational Resources.**

Each of these themes is analysed in (2) below with reference to a selection of key secondary sources identified.



A series of interviews was conducted (18 in total) to investigate views on the research questions from a number of individuals with particular experience or expertise in this area. Those contacted with requests for interviews were influencers, educators, policy-makers, librarians, SDG experts and others. Interviews were conducted via Zoom and the interview questions were provided to the subjects in advance of the interview. The interviewees were recorded during the interviews with their permission. The interview responses were analysed, tagged and copied to a spreadsheet, where they were mapped to the research themes identified in the literature review. The findings of interviews and case studies were compared with the research from the literature and the results are reported in the conclusion . A selection of global and regional networks is presented, networks that have connections with libraries and their work in the knowledge sphere. along with a set of recommendations for policy-makers, libraries and institutions.



3. Analysis: Literature

Education for Sustainable Development: Background and Policy Landscape

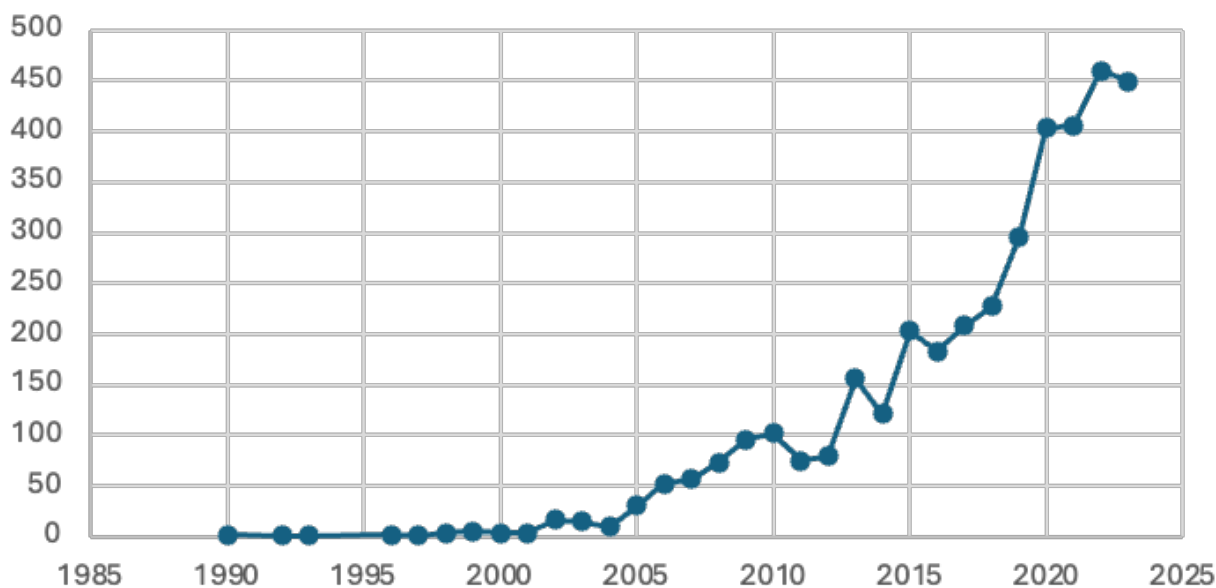
Education for Sustainable Development is acknowledged in multiple public policies as being a fundamental enabler for sustainable development, as expressed by UNESCO in May 2024:

“Education for sustainable development (ESD) gives learners of all ages the knowledge, skills, values and agency to address interconnected global challenges including climate change, loss of biodiversity, unsustainable use of resources, and inequality. It empowers learners of all ages to make informed decisions and take individual and collective action to change society and care for the planet. ESD is a lifelong learning process and an integral part of quality education. It enhances the cognitive, socio-emotional and behavioural dimensions of learning and encompasses learning content and outcomes, pedagogy and the learning environment itself.”

(UNESCO, 2024)

A recent bibliometric analysis of the ESD literature (Mira Esti Kusumaningrum et al., 2023) revealed interesting results on the scholarship in this area, albeit using the limited coverage resource, Scopus, and that exercise was repeated for the purposes of this review. Table 1 shows the growth in the number of publications on Education for Sustainable Development.

Table 1: Publications on Education for Sustainable Development, by Year

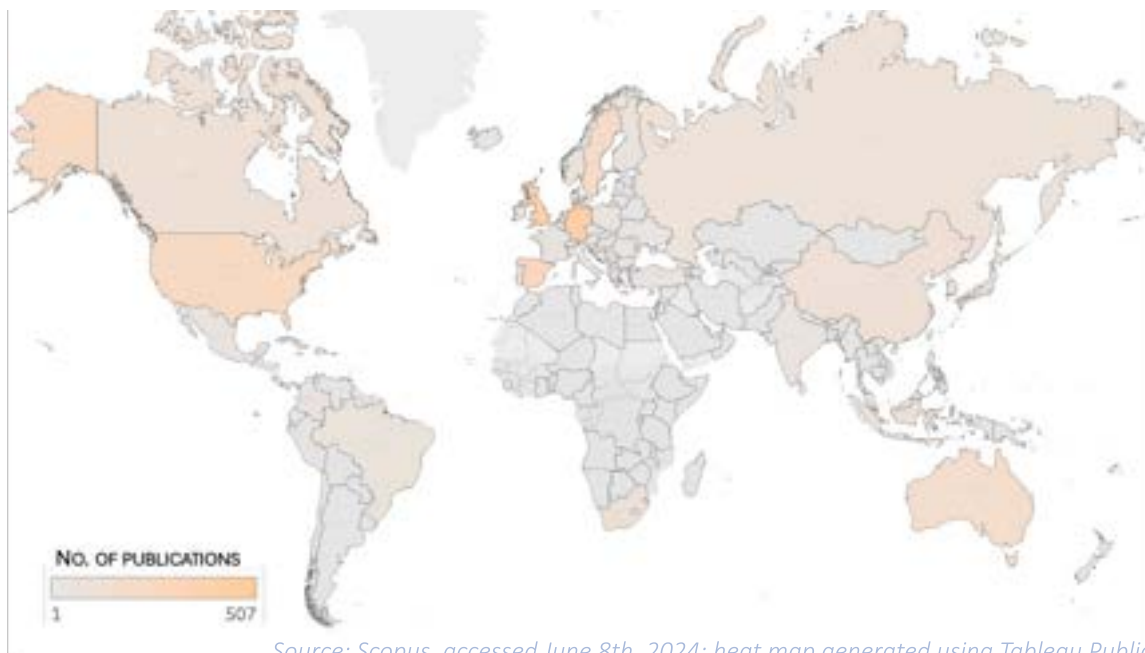


Source: Scopus, accessed June 8th 2024.



A total of 3,962 publications was found, demonstrating a sharp increase over the past ten years. The number of publications on the topic in 2020 was quadruple that of 2010. The subject areas covered were dominated by Social Sciences (39%) which of course includes Education, followed by Environmental Sciences (18%), Energy (9%), Computer Science and Engineering (at 7% each) and Business and Economics/Finance (at 5% each). An array of other disciplines was represented by very small percentages of publications. Of the 138 countries worldwide with authorship of these publications, the largest percentage came from Germany (10%), followed by the UK (9%), Spain (6%), US (5%), Sweden (5%), Australia (4%) and China (3%). Most of the other 121 countries involved were responsible for very small numbers of publications. Table 2 shows the source of these publications on ESD by country.

Table 2: Publications on Education for Sustainable Development, by Country of Authorship



It is not only the scholarly realm that shows this increase in the number of publications on ESD. Indeed it is likely that the growth in scholarship and research has been stimulated by the heightened activity and focus on ESD in the policy domain since the early 1990’s, as evidenced by searches in Overton and other policy document sources as well as within the succession of policy documents themselves.

A timeline of ESD policy development is available in Annex 1 and shows the increased recognition of ESD since the 1992 UN Conference on Environment and Development (UNCED) in Rio de Janeiro (a.k.a. the Earth Summit), the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa; and the 2012 UN Conference on Sustainable Development (UNCSD),

also in Rio de Janeiro, Brazil. ESD is also recognized in other key global agreements, such as the Paris Agreement (Article 12).

The United Nations Decade of Education for Sustainable Development (2005–2014) (DESD) aimed at integrating the principles and practices of sustainable development into all aspects of education and learning. It also aimed to encourage changes in knowledge, values and attitudes with the vision of enabling a more sustainable and just society for all (Leicht, J. Heiss and W. J. Byun (eds), 2018).

ESD is explicitly recognized as part of Target 4.7:

Target 4.7 of the SDGs

By 2030, ensure that all learners acquire knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

(UN, 2015)

However, ESD's importance for all of the other SDGs should also be recognised. It aims to develop cross-cutting sustainability competencies in learners, thereby contributing to all efforts to achieve the SDGs. ESD enables individuals to contribute to achieving the SDGs by equipping them with the knowledge and competencies they need, not only to understand what the SDGs are about, but to engage as informed citizens in bringing about the necessary transformation (UNESCO, 2017).

Thirty years after the Earth Summit and repeated endorsements in policy papers, national and international, the Berlin Declaration on Education for Sustainable Development (ESD) was adopted in 2021. The Berlin Declaration emphasizes the crucial role of education in achieving the Sustainable Development Goals (SDGs) and in fostering a more sustainable, equitable, and peaceful world. The key elements of the Berlin Declaration are summarized and presented here as the clearest possible articulation of the centrality of ESD to the achievements of the SDGs.

The Berlin Declaration on Education for Sustainable Development is a call to action for integrating sustainable development principles into education systems worldwide, aiming to equip individuals and societies with the tools and knowledge necessary for fostering sustainable and equitable growth. It recognises and champions the transformative power of education in addressing global challenges and promoting a sustainable future for all. (Berlin Declaration, 2022).



Berlin Declaration Key Elements

1. **Commitment to Sustainable Development:** All countries need to commit to integrating ESD into their educational policies and systems to achieve the SDGs, particularly SDG 4.
2. **Transformative Education:** ESD is a transformative approach that empowers learners to make informed decisions and take responsible actions for environmental integrity, economic viability, and a just society.
3. **Inclusivity and Equity:** Promote ESD that is inclusive and equitable, ensuring that all learners, regardless of their background, have access to quality education that equips them with the knowledge, skills, values, and attitudes needed for sustainable development.
4. **Integration Across Sectors:** ESD needs to be integrated across all educational levels and sectors, including formal, non-formal, and informal education, and calls for collaboration among governments, educational institutions, civil society, the private sector, and other stakeholders.
5. **Global Citizenship and Local Relevance:** Education needs to promote global citizenship, encouraging learners to engage with global challenges while also recognizing and addressing local and regional contexts and issues.
6. **Critical Thinking and Problem-Solving:** Critical thinking, problem-solving, and decision-making skills need to be developed, enabling learners to contribute to sustainable development through innovative and responsible actions.
7. **Sustainable Practices in Education:** Educational institutions need to adopt sustainable practices, operate sustainably and serve as role models for learners and communities.
8. **Policy and Financial Support:** Governments and international organizations must provide adequate policy frameworks, resources, and financial support to implement and scale up ESD initiatives effectively.
9. **Monitoring and Evaluation:** Robust monitoring and evaluation mechanisms are needed to track progress in ESD implementation and to share best practices and lessons learned globally.
10. **Urgency and Collective Action:** Global challenges such as climate change, biodiversity loss, and social inequalities must be addressed urgently, collective action through ESD is required to create a more sustainable and resilient future.

The Berlin Declaration is important to the topic of this position paper and will be discussed later. However, it should be noted that throughout the burgeoning published literature and expanding public policies on education for sustainable development, the role of libraries as educators, knowledge providers and capacity builders is almost entirely absent. This is an issue that, through this position paper, we hope to address.



Challenges and Issues for Education for Sustainable Development

In ‘Can we meet the sustainability challenges? The role of education and lifelong learning’, Wals & Benavot (2017) reported that the evidence, while uneven, suggests that education-based responses to environmental challenges have been influential. They provide as examples the fact that the vast majority of 15-year-olds in Organization for Economic Cooperation and Development (OECD) countries are familiar with environmental issues, including air pollution, energy shortages and extinction of plants and animals (OECD, 2009) and that more educated adults express greater concern about environmental matters. Education encourages pro-environmental political behaviour, e.g., supporting environment-friendly policies, voting for green parties or causes, and becoming involved in environmental activism. But they also argue that the picture is far from uniformly positive and that significant issues and challenges remain.

First of all, not all are able to realise their right to education. Repeated United Nations and UNESCO publications have voiced concerns about the challenges to education access and participation over the past years. As expressed recently in the Resolution adopted by the UN General Assembly on 19 December 2023 [on the report of the Second Committee. Education for sustainable development in the framework of the 2030 Agenda for Sustainable Development⁴:

“ ... 250 million children and youth aged 6 to 17 were still out of school in 2022, more than half of children and adolescents are not meeting minimum proficiency standards in reading and mathematics and teacher shortages persist, with an estimated global gap of 44 million additional qualified teachers, that, while rapid technological and digital changes present opportunities and challenges, the learning environment, the capacities of teachers and the quality of education have not kept pace, with only half of countries having standards for developing teachers’ information and communications technology skills, while, globally, only 40 percent of primary, 50 percent of lower secondary and 65 percent of upper secondary schools are connected to the Internet, and that refocused efforts are needed to improve learning outcomes for the full life cycle, especially for women, girls and people in vulnerable situations.”

The same report noted the critical importance of expanding investments and international cooperation to ensure all children, especially those in vulnerable situations, complete free, equitable, inclusive, and quality education from early childhood onwards. The issues and challenges for ESD described in this document are presented in the following table.

4 <https://www.undocs.org/A/RES/78/156>

Reaching Vulnerable Groups	Prioritizing children in extreme poverty, rural areas, with disabilities, migrants, refugees, Indigenous children, and those in conflict/post-conflict situations.
Inclusive Learning Environments	Creating safe, non-violent, inclusive, and effective learning environments.
Literacy and Numeracy by 2030	Ensuring all children, youth, and adults achieve these basic skills.
Improving Education Facilities	Making them attend to the needs of children, those with disabilities, and gender considerations.
Increasing the Numbers of Qualified Teachers	Especially in developing countries.
Gender Barriers	Addressing the higher likelihood of girls being excluded from education.
Science, Technology, and Innovation	Integrating these into national development strategies to enhance knowledge-sharing and collaboration.
STEM and Digital Literacy	Investing in these areas alongside vocational and tertiary education, and distance learning.
COVID-19 Impact	Highlighting the severe negative effects of the pandemic on education, including global school closures, learning losses, and increased dropout rates, especially affecting vulnerable groups and exacerbating existing inequities..
Accessible Learning Platforms	Investing in digital learning, internet access, teacher training, and online resources to mitigate COVID-19 disruptions and facilitate safe school reopenings.
School Feeding Programs	Implementing these as platforms for development and re-engagement of children and youth.
Holistic Education for Sustainable Development	Promoting an integrated approach across economic, social, and environmental pillars, and raising public awareness on issues like poverty eradication, sustainable consumption, climate change, biodiversity conservation, disaster resilience, and peace.
Education Financing Gap	Addressing the \$97 billion annual shortfall for low- and lower-middle-income countries to achieve Sustainable Development Goal 4 by 2030, with a significant portion of this gap in African countries.
Impact of COVID-19 on Education Spending	Recognizing the compounded fiscal pressures on education budgets due to the pandemic.
Underfunding Risks and Humanitarian Emergencies	Highlighting the need for support in early childhood, tertiary, skills training, and vocational education during crises, where education serves as a critical driver for recovery and rebuilding.

Issues and challenges associated with the digital world

The challenges of ensuring digital literacy and accessible, high quality digital platforms, online resources and teacher training are all linked to the overall issue of the 'digital divide'. Tackling the digital divide means more than supporting universal access to technology. Education systems are justifiably striving to develop the digital skills and competencies that learners need to make meaningful use of technology. There is nothing 'native' or 'natural' about these abilities. They are constructed and refined over time through intentional educational interventions alongside various forms of informal and self-directed learning (United Nations, 2021).

The skill sets and critical outlooks required to understand technology and harness it for good are also in constant flux, changing at the pace of new technological development. This should not, however, imply a one-way street of education contorting to accommodate the latest technological advancements. Education must additionally play a role in steering technological innovation and the digital transformation of societies. Curricula should support teachers and students to act together on technology and help determine how it is used and towards what purposes (*ibid*).

Knowledges (plural) should be recognized as assets for shared well-being, challenging homogenization and unequal distribution across regions. University research should prioritize new possibilities, recognizing multiple forms of knowledge and using diverse languages. Universities should support publicness in education, but also address enclosures through cost barriers and intellectual property claims.

The digital revolution brings challenges, but similar to past technological revolutions, it can support publicness, inclusivity, and common purposes in education. It is necessary to ensure that key decisions about digital technologies as they relate to education and knowledge are made in the public sphere and guided by the principle of education as a public and a common good. This implies addressing the private control of digital infrastructures and defending against the anti-democratic capture and enclosure of the digital knowledge commons that increasingly threaten education ecosystems (*ibid*).

Returning to the article discussed at the beginning of this section (Wals & Benavot, 2017), in answer to the question, 'How does education best support sustainability', the authors propose that education best supports sustainability when it:

- **Draws on diverse viewpoints, particularly indigenous knowledge and practices**
- **Emphasises learning that crosses boundaries**
- **Helps learners acquire new skills and competencies for life**

They caution that there is no single model of education and learning for environmental sustainability, nor should there be. Different communities and institutions should tailor content and pedagogy to the interests of different audiences, as well as different political, economic and social circumstances and geographic locations. Learning can take place in formal, informal and non-formal settings. It can promote indigenous knowledge systems, (re)connect learners with nature, embark on a whole institution approach and develop the agency of learners to act in meaningful ways towards the environment.

“What is clear is that neither ‘business as usual’ nor ‘education as usual’ are adequate. Given the scale of humanity’s environmental crisis, education for sustainability will require efforts from many sectors, with many actors and at many levels. To ensure pro-environmental outcomes, schools must be embedded in their communities, seeking to influence not only the views and actions of learners who walk their halls, but also the decisions made by policy makers in government and business to ensure that they have the long-term interests of their citizens and the planet in mind”.

(UNESCO, 2019)

Open Educational Resources and Education for Sustainable Development

Open Educational Resources (OER) are learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, re-use, re-purpose, adaptation and redistribution by others (UNESCO, 2019).

The UNESCO Recommendation on OER goes on to state that one key prerequisite to achieve SDG 4 is sustained investment and educational actions by governments and other key education stakeholders in the creation, curation, regular updating, ensuring of inclusive and equitable access to, and effective use of high quality educational and research materials and programmes of study.

It also notes the benefits of OER in introducing significant opportunities for more cost-effective creation, access, re-use, re-purpose, adaptation, redistribution, curation, and quality assurance of educational materials, including translation, adaptation to different learning and cultural contexts, development of gender-sensitive materials, and the creation of alternative and accessible formats of materials for learners with special educational needs. It adds that the judicious application of OER, in combination with appropriate pedagogical methodologies, well-designed learning objects and the diversity of learning activities, can provide a broader range of innovative pedagogical options to engage both educators and learners to become more active participants in educational processes and creators of content as members of diverse and inclusive knowledge societies.



OER can contribute to Education for Sustainable Development in many ways:

Accessibility and Inclusivity. OERs are freely accessible and openly licensed, which promotes inclusivity and ensures that educational resources are available to a wider audience. This aligns with the goals of ESD, which aims to provide quality education for all, thereby fostering equity and inclusion. (UNESCO, 2020), (United Nations, 2015).

Lifelong Learning. OERs support lifelong learning opportunities by providing free resources that individuals can access at any point in their lives. ESD promotes lifelong learning as a means to empower people to make sustainable choices (UNESCO, 2014).

Collaboration and Sharing. The open nature of OER encourages collaboration and the sharing of resources among educators and learners globally, which fosters a sense of global citizenship and collective responsibility—core tenets of ESD. (Hodgkinson-Williams & Gray, 2009), (United Nations Economic Commission for Europe, 2012).

Innovation in Pedagogy. OERs enable innovative teaching methods, such as blended and online learning, which can incorporate ESD principles effectively. This flexibility in pedagogy helps integrate sustainability topics into various educational contexts (Wals & Benavot, 2017).

Sustainable Practices in Education. The use of OER reduces the cost of educational materials and minimizes the environmental impact associated with the production and distribution of traditional textbooks. This supports the sustainable use of resources in education (Hilton, 2016).



The UNESCO Recommendation on OER calls for action in the five areas:

- i. Capacity building:** developing the capacity of all key education stakeholders to create, access, re-use, re-purpose, adapt, and redistribute OER, as well as to use and apply open licenses in a manner consistent with national copyright legislation and international obligations;
- ii. Developing supportive policy:** encouraging governments, and education authorities and institutions to adopt regulatory frameworks to support open licensing of publicly funded educational and research materials, develop strategies to enable the use and adaptation of OER in support of high quality, inclusive education and lifelong learning for all, supported by relevant research in the area;
- iii. Effective, inclusive and equitable access to quality OER:** supporting the adoption of strategies and programmes including through relevant technology solutions that ensure OER in any medium are shared in open formats and standards to maximize equitable access, co-creation, curation, and searchability, including for those from vulnerable groups and persons with disabilities;
- iv. Nurturing the creation of sustainability models for OER:** supporting and encouraging the creation of sustainability models for OER at national, regional and institutional levels, and the planning and pilot testing of new sustainable forms of education and learning;
- v. Fostering and facilitating international cooperation:** supporting international cooperation between stakeholders to minimize unnecessary duplication in OER development investments and to develop a global pool of culturally diverse, locally relevant, gender-sensitive, accessible, educational materials in multiple languages and formats.



Thus, high quality OER are encouraged, utilising suitable technology solutions and open formats and standards along with sustainability models, maximising access and support for diversity and minimising unnecessary duplication.

The literature review, 'Educação ambiental, questões raciais e Agenda 2030: Diálogos necessários com África e América Latina : Environmental Education, Racial Issues, and the 2030 Agenda: Necessary dialogues with Africa and Latin America, Silvana Santana dos Santos, Rita, Costa, Rafael, Chenquel Nogueira, Nicolás [10.5281/zenodo.10553089](https://zenodo.org/record/10553089) [Zenodo, accessed June 10, 2024] examines the literature on environmental education and OER from the perspective of Latin America and Africa. The difficulty of discovering and locating publications from these countries is a problem for those wishing to analyse and understand the work taking place in this area.

Discoverability of OER is an issue in its own right. Otto and Kerres (2022) acknowledge that, at present, OER are not available in a sufficient amount worldwide but note that studies demonstrate an increase in repositories and a growing number of resources. However, a critical distinction is needed regarding availability between a resource's existence and its discoverability. If a resource exists, but its existence is not detectable by search engines or portals (due, for example, to poor or absent metadata), it is not available for potential users as such. "Only learning ecosystems based on mechanisms of opening their contents to other repositories and referatories can unfold their full potential for OER in the context of open learning".

The authors focus on the need for high quality OER and propose a distributed 'learning ecosystem' utilising technical solutions, including metadata standards and plugins, to link contents in repositories and referatories within ecosystems. The overarching objective is that the different repositories and referatories expand and improve the sustainable use of OER by merging into a distributed learning ecosystem.

The current OER landscape is highly fragmented. The discoverability of OER is a major challenge. To increase the discoverability of available resources at the different locations and platforms, which currently are visible to only a limited number of teachers and students, the focus needs to shift from creating and growing new and competing platforms and repositories to intelligent ways of linking and increasing their interconnectedness. In 'Increasing Sustainability in Open Learning: Prospects of a Distributed Learning Ecosystem for Open Educational Resources', Otto & Kerres, present case studies demonstrating how technical solutions, including metadata standards and plugins, can link content in repositories within ecosystems. The overarching objective is that the different repositories expand and improve the sustainable use of OER by merging into a Digital Learning Ecosystem.

If Otto & Kerres provide a blueprint for the development of a sustainable global infrastructure for OER, the open access report ‘Reimagining our futures together: a new social contract for education’ from the International Commission on the Futures of Education (United Nations, 2021) provides the ethical foundation for OER for sustainable development.

‘Reimagining our Futures’ provides examples that underscore the fragility of education’s digital infrastructures today. One reason why digital platforms with their algorithmic mode of knowledge curation have risen to the top in so many domains, including in educational ecosystems, has to do with the absence of a viable public answer to the challenge of systematically organizing and curating the rapidly growing volume of global knowledge. Finding long-term solutions to problems like ‘fake news’ and the crisis of faith in science and in public institutions that we presently witness in many places, requires our informed, collective engagement with truth and expertise, and the democratization of knowledge curation.

It states that while better digital instruments can and must be engineered,

“ ... the best strategy for bending the digital disruption in the direction of supporting education as a common good is to ensure its democratization within a robust public sphere”.

Many digital communities and early internet technologies were developed through open-source, collaborative efforts. The continued development of digital technologies in education in directions guided by sustainability, justice, and inclusion will require action from governments, support from civil society, and a broad public commitment to treating education not as an arena for profiteering, but as a space for public investment in sustainable, just, and peaceful futures.

It is necessary to ensure that key decisions about digital technologies as they relate to education and knowledge are made in the public sphere and guided by the principle of education as a public and a common good. This implies addressing the private control of digital infrastructures and defending against the anti-democratic capture and enclosure of the digital knowledge commons that increasingly figure as part of educational ecosystems. (United Nations, 2021)

Libraries, Education for Sustainable Development and Open Educational Resources

Libraries play a crucial role in Education for Sustainable Development (ESD) by serving as information hubs that support both formal and informal education and drive growth and development, and yet this role is rarely articulated explicitly in the literature on ESD and is commonly discovered only implicitly in publications discussing libraries' contribution to overall or specific SDGs, environmental education or sustainability.

As noted in the earlier section on Education for Sustainable Development, there are few if any mentions of libraries in the literature and policy documents on ESD. A search of the Scopus database using the terms 'Libraries' OR "Library" OR "Librar*" AND "Education for Sustainable Development" yielded six results, only two of which were relevant. Scopus proved more fruitful when the search was expanded to include the terms "Libraries" AND "Sustainable Development Goals", resulting in ninety publications.

The domain-specific database, Library and Information Science Collection (LISC) yielded 80 results (59 peer reviewed) using the search strategy described above. When filtered for relevance and currency (within the last ten years), 24 publications remained. The following themes were covered: professional LIS education, (Balogun, 2020), (Rowan et al., 2024), (Voskoboinikova-Huzieva, 2020); ICT (technological and human) and sustainability (Doan, 2017), (Clement, Fasae and Alade, 2024), (Hossain, Xu and Nurunnabi, 2019); Libraries' contribution to achievement of the SDGs (Balogun, 2020), (Mojapelo, 2018) and case studies in this area (Ochôa, Silva and Silvestre, 2021), (Michael-Onuoha, Nkiko and Omorodion, 2020), (Parasca and Balaban, 2021), (Pyrini, Varonis and Varonis, 2017); Achieving sustainability in libraries and higher education including the concept of the 'Green Library' (Giovanni Di Domenico, 2020), (Shah et al., 2022).

A selection of the most relevant documents was analysed to assist our inquiry into the contribution of libraries to ESD. Inevitably these included some studies from the broader area of libraries and SDGs or sustainability, some examples of which are included below.

In the paper, 'Libraries as agents for development: the potential role [of] Egyptian rural public libraries towards the attainment of sustainable development goals based on the UN 2030 agenda, Mansour (2020) discussed the ways in which Egyptian rural public libraries can include and meet the 17 UN Sustainable Development Goals. Challenges facing libraries in the provision of information (poor infrastructure, inappropriate collections and related facilities and services, high levels of illiteracy, lack of funding and cooperation between related agencies, inappropriate training of library and information professionals, lack of studies and surveys, as well as analyses of information needs

of rural communities) were emphasized. They have tried as much as possible to integrate and adapt to the surrounding community in light of the common economic, political and social factors and conditions. Despite these challenges, these libraries showed a good response that is characterized as ‘somewhat positive, though not sufficient, toward the achievement of these goals’.

Abubakar (2022) addresses ESD and libraries directly when describing the restoration of quality teaching and learning in Nigeria’s education system. While significant epistemological efforts have been made on teaching methods/models, student learning styles, and curriculum content reforms, the role of academic libraries has not been given any significant consideration. The author states that “sustainable development depends profoundly on the availability of information provided and accessed through a well-managed library for effective teaching, learning, and research” and offers recommendations to address the issue.

Also in Nigeria, Clement et al (2024) conducted a literature review examining support for ICT and academic libraries to ensure sustainable higher education development and facilitate global development. Identifying some challenges for academic libraries, the paper concludes that while sustainable higher education development is central to global development, the role of academic libraries and the use of ICT should be unanimously embraced by all the stakeholders in education.

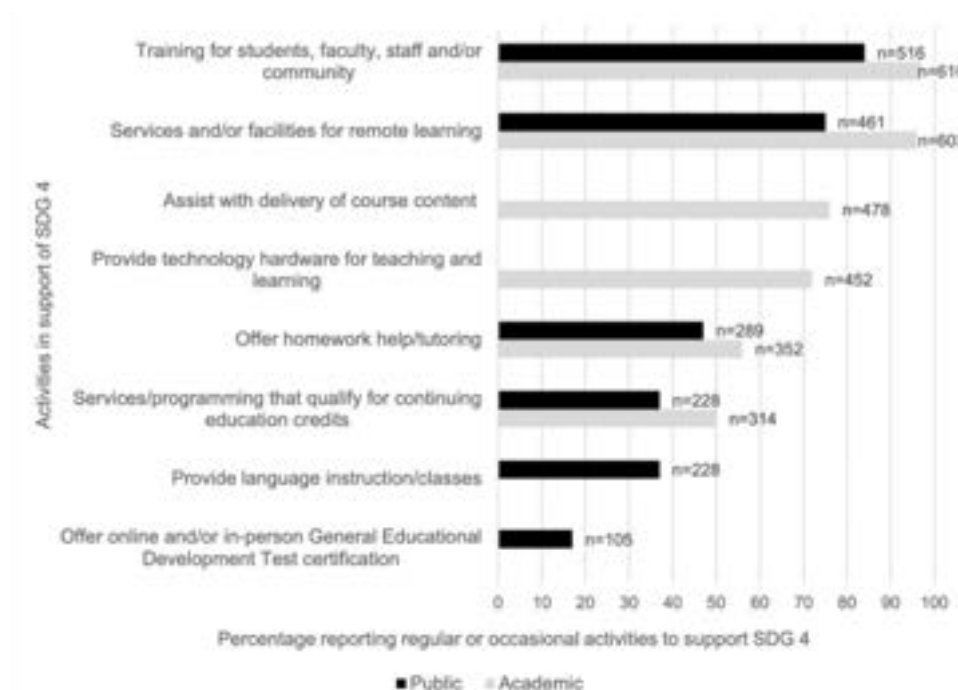
‘Education as a global ‘soft power’ for sustainable development (Sayamov, 2013) discusses ESD in the context of higher education but makes no mention of libraries. Of direct relevance, ‘Environmental education in libraries – theoretical foundations and practical implementation (Fedorowicz-Kruszewska, 2020) notes that libraries have been undertaking activities related to all aspects of ESD: environmental, social and economic for many years. The author helpfully provides examples of these activities: actions to prevent discrimination in accessing information and collections, education in the field of intellectual property rights protection, engaging in animating cultural life, education and integration of local Environmental Education communities, cooperation with local authorities, organizations and institutions, creating opportunities for access to new technologies, satisfying the library and information needs of disadvantaged users, demonstrating attention to minimizing negative impact on the natural environment through proper library management, green buildings and a number of services, programmes and projects targeted at users, the goal of which is to increase environmental awareness (Fedorowicz-Kruszewska, 2020). While these activities may support ESD in a broad sense, they do not specifically constitute ESD.

A global survey of over 1,700 library staff worldwide was conducted by Connaway et al. for OCLC in 2023. The survey report highlights the substantial work done by libraries in supporting various SDGs, including education-related goals, even though the majority have not yet incorporated these goals into their strategic planning (Connaway, et al., 2023).



SDG 4: Quality Education was the top SDG that respondents of all library types thought libraries could have an impact on. Almost all of the respondents said they offered training, instruction, classes, or courses. Seventy-six percent of the academic library respondents said that they regularly offered training, instruction, classes, or courses for students, faculty, and staff, and another 21% said that they did so on occasion. In the open-ended section of the questionnaire, the respondents were asked to describe examples of their library’s activities that related to Quality Education. The most mentioned example was library or information literacy instruction.

The following table from the survey results shows the breakdown of library activities reported under support for SDG 4 (Connaway, et al., 2023):



Country- and region-specific case studies and examples of libraries work in support of sustainable development generally are well-represented in the literature, not least arising from the work of IFLA via its Global Vision, Library Map of the World (IFLA, 2019a) and Sustainable Development Goals stories (IFLA, 2019b). A number of these examples appear as case studies in this position paper (see Analysis: Case Studies).

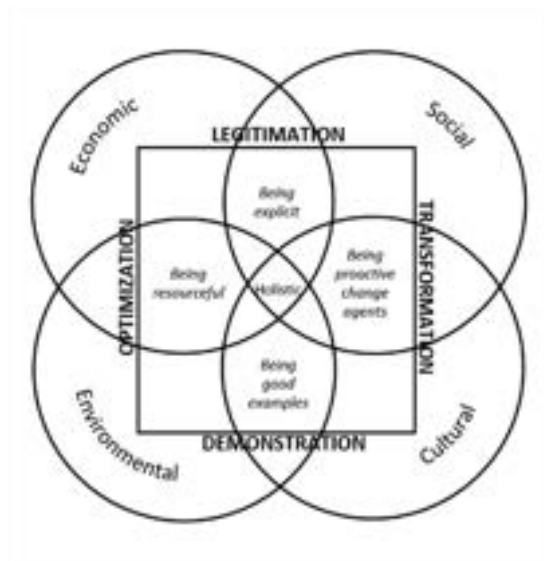
For example, (Adekoya, 2023) demonstrates how sustainable development of higher education in Sub-Saharan Africa relies heavily on adequate library funding to procure relevant information resources and infrastructure, emphasizing the critical role of libraries in advancing education for sustainable development.

Academic libraries in South Africa have been found to contribute significantly to Sustainable Development Goals (SDGs), particularly SDG 4 on quality education and life-long learning, through initiatives like information literacy skills training, promotion of reading, and donation of educational resources to schools (Bangani, 2023), (Ogunmodede, et al., 2023).

In the context of this position paper, a useful categorisation of libraries’ activity in support of sustainability is presented in the 2022 literature review by Mia Høj Mathiasson and Henrik Jochumsen, ‘Libraries, sustainability and sustainable development: a review of the research literature’ (Mathiasson & Jochumsen, 2022). In it the authors present a useful model demonstrating the different categories of activity of libraries in relation to sustainability.

At its heart is the sustainability framework proposed by Loach & Rowley (2021), Loach, Rowley & Griffiths (2017), consisting of the four components, environmental responsibility, economic viability, societal equity and cultural vitality. These components have been enhanced by the authors to incorporate underlying motives or ‘rationales’, Demonstration, Optimization, Legitimation and Transformation with a set of associated implications for librarians (being resourceful, being explicit, being good examples, being proactive change agents).

(left) Model for conceptualizing the different understandings of sustainability and sustainable development, the rationales behind them and their possible implications for libraries and librarians (Mathiasson & Jochumsen, 2022).



In this model the activity of ensuring equal access and accessibility to information, education and possibilities as a way to secure and improve collective and individual development through social innovation and social entrepreneurship is categorized under “Transformation” – defined as “Providing possibilities for action and serving as agents for change”. And it is this which we will return to in the next section on Libraries and OER and, later on, in the proposal central to this position paper “Towards a Global Knowledge Commons for Sustainable Development”.

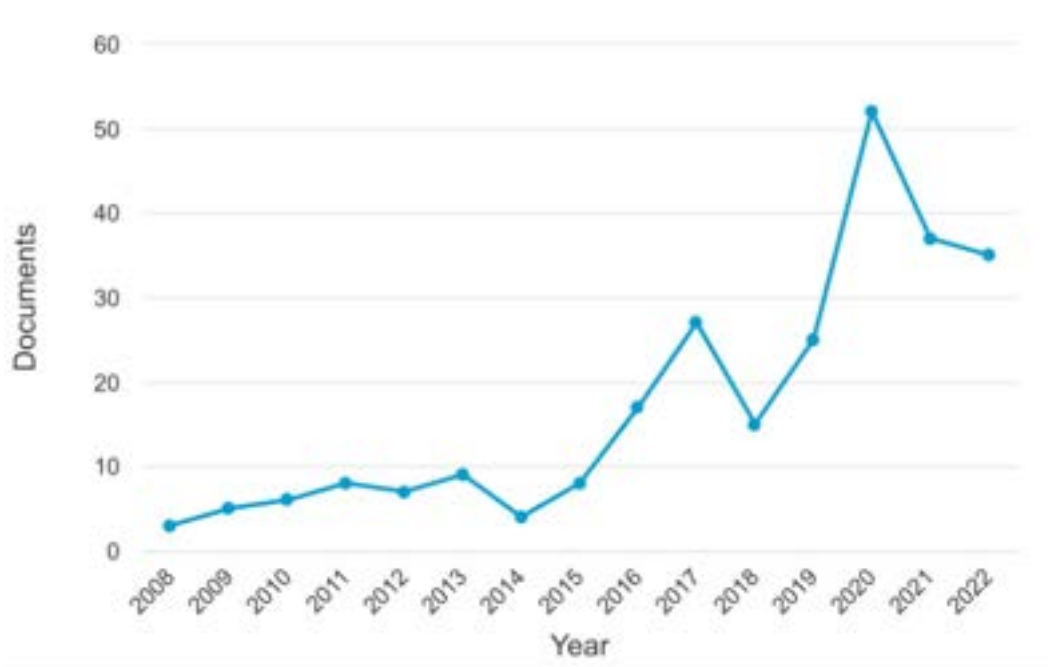
“ (...) transformation necessitates, among other things, a certain level of disruption, with people opting to step outside the safety of the status quo or the “usual” way of thinking, behaving or living. It requires courage, persistence and determination, which can be present at different degrees, and which are best sourced from personal conviction, insight, or the simple feeling of what is right.”

(Para 4.2, Framework for the implementation of ESD for 2030)

Libraries and OER

As discussed previously, OER are seen as an important enabler of Education for Sustainable Development (UNESCO, 2019). OER does not feature prominently in the literature on libraries and sustainable development (see Table 3, above), or indeed in the body of literature reporting on libraries and education for sustainable development. Perhaps surprisingly, the rapidly growing Open Access and Open Science movement, with its radical impact on scholarly communication and publishing, access to information and changes to ownership, copyright and associated roles and dynamics of librarians, systems and processes is not as central in the published literature on libraries and sustainable development as one might expect. It is time for that connection to be made clearly and explicitly.

A search of Scopus using the keywords “Libraries” AND “OER” OR “Open Educational Resources” for the years 2013-2024 produces 311 publications. There has been a notable increase in the number of publications in this area over the past ten years, with a marked spike in 2020, as shown in the following table.



Results from Scopus, accessed June 10th, 2024

While many of these publications have an implicit relevance to ESD on the basis of their focus on openness and accessibility, for the purposes of this inquiry the search results were further refined for greater relevance using the terms ‘Sustainable’ OR ‘Sustainability’ as filters. Sixty-one documents resulted, 62% of which were published during or after 2020.

The LISC (Library and Information Science Collection) bibliographic database produced more than twice the results of Scopus for a similar search, with 653 peer reviewed publications on ‘Libraries’ AND ‘Open Educational Resources’ (2013-2024, filtered by document type). This included almost 40 case studies. This set of publications shows the same rapid pattern of growth per annum as seen with the Scopus set, but this is proportionately greater, with a similar spike in 2020-2021. The countries of origin and number of publications are: U.S. (125), India (39), United Kingdom (20), Nigeria (28), South Africa (12), Other African countries (12), China (12), Canada (11).

What we’re seeing is intensive and increasing activity in libraries globally in the area of OER, which is largely communicated via specialized disciplinary and professional publishing venues, much of which is not visible outside of those venues.

The search results outlined above were further refined to add the search term “Sustainable Development”, which resulted in 40 publications. Those publications were combined with the selection from previous searches and categorised as follows:

Case studies in OER (in India: (Choudhury, 2018)) (in Fiji and Mexico (Gómez Zermeño, de la Garza and LauraHosman, 2022) (in Sri Lanka: (Gunasekera and Samarakoon, 2020)); Resource creation and sharing (Lerski, 2022)), (Nic Giolla Mhichíl et al., 2015), (Woszczynski et al., 2021), Equitable online accessibility (Doan, 2017), (Altinay et al., 2021); the role of the library in OER (Kamble and Barad, 2021) (in Tanzania: (Mwinyimbegu, 2018)), (Okuonghae and Igbinovia, 2023); evaluation of OER in Ghana (Appiah, Essel and Amankwa, 2020), Infrastructure/OER repositories in Nigeria (Nasidi and Zakaria, 2023), Uganda/ agricultural indigenous knowledge (Okello-Obura, 2018), digital literacy tools and approaches (Ukwoma, Iwundu and Iwundu, 2016), (Huang et al., 2023), (Reddy et al., 2023), OER discoverability (Kordahi, 2022), OER and policies (SDGs: (Ossiannilsson, 2023), (for Agenda 2030: Spain: Santos-Hermosa et al., 2020) (in Latin America: Toledo, 2017) (in India: Kumar, Baishya and Deka, 2021), Open Data for sustainability (Deep and Das, 2019) (Chiwere, 2020).

The sheer scale and global spread of this activity is well-summarised in the policy brief ‘OER and Libraries’ in which IFLA identifies the ways in which librarians support OER:

1. **Encouraging their creation and use**
2. **Ensuring their availability, accessibility and visibility**
3. **Curating and ensuring its quality**
4. **Advising on copyright matters**
5. **Training users’ ICT skills and encouraging digital literacy (IFLA, 2019)**



The strong synergies with library-based expertise in open access and open science in Reflections from the 5th AfLIA Conference and 7th African Library Summit in Accra, Ghana (Okuonghae and Igbinovia, 2023) which reports on OER Africa's encouragement of openness in academic libraries in Africa, addressing open licenses, OER, open access publications, open knowledge, open data and open science and reinforcing the need for academic librarians to equip themselves with knowledge of open practices to help build an open knowledge ecosystem within the African continent.

A study of OER infrastructures, policies and attitudes in Spain (Santos-Hermosa et al., 2020) observed that open educational resources (OERs) have become a key element in the development of quality education within the 2030 Agenda. They concluded that 'Interdisciplinary cooperation of the professionals involved is essential to create OER that can be found, shared and reused.'

(Ortiz-Repiso, 2022) also argues that information professionals can promote free access to information and knowledge and encourage reading and literacy in all its various dimensions, maintaining that these are values of prime importance if the goals of sustainable development are to be achieved worldwide.

However, a study of libraries and OER in Tanzania revealed that limited awareness on existing OER and lack of policy guidelines on the use of OER are major challenges facing librarians in promoting access and use of OER (Mwinyimbegu, 2018). The study recommends more OER awareness creation campaigns and formulation of institutional OER policies.

The SolarSPELL Digital Library is an educational innovation strategy for teaching climate change in rural communities of the Fiji Islands (Gómez Zermeño, de la Garza and Laura Hosman, 2022). SolarSPELL works with energy generated by an integrated solar panel, provides access through its own wireless network and offers a variety of open educational resources, selected for their educational value and the achievement of the SDGs. SolarSPELL contributes to the digital transformation of educational practices and the value of the librarians being able to provide a greater number of resources on climate change. SolarSPELL was followed up in rural communities in Chiapas, Mexico through the "Schools that Learn Post COVID-19" pilot.

"The results emphasize the need for the librarian of the future to incorporate into their work, actions focused on improving the quality of education that allow potentiating the sustainable development of their communities, improving collective knowledge and raising awareness."

Anasi, Ukangwa and Fagbe highlight the critical role of university libraries in bridging digital gaps by taking advantage of ICTs to accelerate the attainment of SDGs. ICTs have the capacity to accelerate the actualisation of SDG in all communities. However, illiteracy, lack of political accountability and

transparency, lack of financial resources and inadequate power supply were the major challenges impeding the achievement of SDGs in Ogun State, Nigeria (Anasi, Ukangwa and Fagbe, 2018).

Global, prolific, diverse, inclusive, community-led but often fragmented, bottom-up, sometimes isolated and unsupported by policies, frequently under-resourced and overall with no unifying framework, perhaps it is not surprising that libraries' contributions to OER, to Education to Sustainable Development and to OER for ESD are often hidden in plain sight.

It is clear that that contribution urgently needs to be backed by institutional, national and international policies, to be recognised, to be resourced and to be enabled to reach its full potential in support of ESD, in partnership with the other key stakeholders in this vitally important mission.

The authors of "A Case for Open Educational Resources (OER) for Liberation: Leveraging Librarians and Library Skills" (Coyne and Fitzpatrick, 2021) expressed it plainly when they called for OER to be de-institutionalized and embraced by the general populace:

"We need a dedicated space for public OER, and these OER should be for change, for liberation, for good. We need a collection of resources that can give our citizens the information they need to grow, to foster and to excel."

(Coyne and Fitzpatrick, 2021)

Findings from the Literature

The literature review supported further primary research by this study into the key themes presented above.

- None of the general literature on education for sustainable development refers to libraries in any meaningful way (or at all, in almost all cases)
- Very little library literature addresses ESD specifically, despite the fact that Goal 4 is the ‘top SDG’ for libraries and that library literature on activities enabling the SDGs is plentiful. This may be due to the ESD terminology not being universally adopted.
- In the library literature that addresses the ESD, the focus is on information literacy instruction, physical space provision, bridging the digital divide through provision of computers, etc.
- The library literature on support for the SDGs is largely disconnected from the strong efforts libraries are making worldwide in the areas of open access, open science and open educational resources. For example, in the OCLC survey (OCLC, 2023) there is no mention of open access or OER.

This literature review directly informs the research question, ‘the contribution of libraries to education for sustainable development’. The themes identified and associated knowledge informed the planning of the interviews from experienced / expert individuals and the identification of the global case studies. Those analyses are presented in the following sections.

4. Analysis: Expert Interviews

The aim of these interviews is to identify and document opinions from a variety of stakeholders on best practices and innovative approaches employed by libraries worldwide on SDG education and OER development (including integration of digital technology, community engagement strategies, and partnerships). This report is therefore based on a large weight of qualitative evidence, gathered from interviews with a range of key stakeholders and carefully analysed and cross checked.

Such evidence is based on individual perceptions and experiences, but we believe that in the aggregate, the evidence of the value of libraries in the area of Education for Sustainable Development and innovative approaches could enhance the realisation of the full potential of libraries' contribution to ESD. Libraries provide information and communication technology (ICT) infrastructure, help people develop the capacity to effectively use information, and preserve information to ensure ongoing access for future generations. They provide a safe and trusted network of local institutions that effectively reach new and marginalised populations.

Interviews took place with 18 individuals in order to elicit expert and professional opinions on the contribution of libraries to education for sustainable development. Interviewees were selected to represent significant regional or global networks with links to, or an interest in, libraries and ESD. Represented networks include technical/digital, legal, infrastructural, policy, academic, other educational, library. A list of the questions asked and the interviewees who participated appear in Annexes 2 and 3 respectively. The responses were analysed, aggregated and summarized and are presented here.

4.1. How does your organisation contribute to Education for Sustainable Development (ESD)? In what ways are libraries involved?

“When we talk about education for sustainable development in relation to developing and transition economy countries, we need to take a different approach towards ESD. When we talk about the global south, we talk about targeting inequalities and this means that any education that allows people to get skills and make resources for themselves and their families enabling them to live a better life constitutes as part of education for sustainable development.”

– EIFL

EIFL supports awareness raising activities for sustainable development goals (SDGs) in libraries. Rima Kupryte, Iryna Kuchma, and Ramune Petuchovaite suggested that education for sustainable development should focus on targeting inequalities and providing skills to improve lives for individuals and their families. Open educational resources (OER) are essential for ensuring equitable access to educational resources, and CC licenses are used to make OER open.

“When I looked at the SDGs five, six years ago, I looked at them through the lens of open education and its values and principles, which overlap heavily with ESD and thought, what does this mean for OER? Well, some things are obvious. There should be OER about all of the SDGs so people can learn about them, like the the SDG Academy. All of the knowledge, data and culture about the SDGs should be open so people can learn about the SDGs and countries can run public information campaigns about them.”

– Dr Cable Green (Creative Commons)

Open access research is available to learners, professors, and teachers worldwide, including open data and knowledge. The values and principles of ESD overlap with those of open education, and the SDGs should be considered in relation to OER. The Global Knowledge Commons should be established, and all knowledge, data, and culture about the SDGs should be open for public information campaigns.

Multiple programs are currently being run to address this issue, such as the four-year Open Climate Campaign, which aims to open knowledge about climate change and biodiversity preservation. Additional campaigns aligned with other SDGs are also being considered.



However, the pace of progress can't be achieved if research is closed or educational resources are expensive, leading to universities not using them or students not learning about them. Open knowledge about the SDGs should be seen as a baseline core knowledge infrastructure, with values and principles separate from legal openness.

The core values and principles of ESD and OER are essential for collective sustainability but there are concerns about a capitalist-driven, economic for-profit model.

OpenAIRE, the European open science infrastructure and equity initiative, is not directly involved in sustainable development education. However, it is aligned with libraries as archives that facilitate access to information and knowledge. The UN states that science contributes to all Sustainable Development Goals (SDGs), and OpenAIRE automatically classifies the projects, publications and data it harvests and aggregates with SDGs using the UN SDG taxonomy.

OpenAIRE's role in this is to make researchers and policymakers aware of SDG-aligned research. They support learning for sustainable development through courses and classes. This aligns with the Goals of quality education, innovation, smart cities, and commuting.

Dr Daisy Selematsela, University of the Witwatersrand Library, Johannesburg has a provost who looks at SDGs from the university level and how teaching, learning, research, and innovation links to all aspects of the university, including the library. They have appointed a cataloguer and metadata specialist to look at all outputs across the university and assign metadata to outputs linking to SDGs. They work with colleagues in the repository side to link everything that comes in on SDGs and report on the impact of SDGs. They are upgrading their library guides to include a library guide on SDGs, which reflects their involvement at the high level institution-wide. They are addressing the university's focus on the SDGs by supporting teaching and learning, understanding, and information literacy instruction. They also encourage postgraduate students to consider the impact of their research on the 17 SDGs when making proposals.

Dr Thanos Giannakopoulos, the U.N. Library's director (speaking in a personal capacity), discussed the challenges of collecting, disseminating, and offering information about the United Nations and the Sustainable Development Goals. He explained that the library has created a global repository, the United Nations Digital Library, which has attracted over 61 million downloads in 2023 from around 12,000 locations worldwide. The repository has also initiated a grey literature project, collecting content such as policy papers, issue briefs, and white papers on the SDGs.

Giannakopoulos emphasized the importance of learning from the Global South, particularly South America.



“We also need to accept that certain areas of the world are more advanced in disseminating information openly than the Global North. And the Global North should look at itself in the mirror, and not try to impose solutions about openly disseminating information, but rather learn from the Global South in certain areas.”

– Dr Giannakopoulos, UN Library

The UN Library has also been raising awareness about the work of UNESCO and its recommendations on Open Educational Resources and Open Science through the United Nations Open Science Conference in New York since 2018. Giannakopoulos mentioned the need to upgrade the library’s systems to make data visible and openly available, as well as train people on how to use data. He also noted the generative AI revolution, which is another area of focus. He emphasized the importance of capacity building, training, infrastructure creation, and data accessibility in the United Nations Library.

Dr. Tel Amiel is from the School of Education, Universidade de Brasília and is UNESCO Chair in Distance Education, editor-in-chief of the open access journal Linhas Críticas and member of the scientific board of ONDA: National Observatory for Copyright. Dr Amiel discussed the concept of education for sustainable development, which, he stressed, encompasses the goals of education in general. The interconnectedness of education for sustainable development is evident in social justice, inclusion, and accessibility. Dr. Amiel is co-lead within the UNESCO IGF/OER Dynamic Coalition, a branch of studies focusing on sustainability, working with government stakeholders to map issues related to open educational resources and sustainable development. A recent literature review commissioned by the Chair, mapped global literature related to environmental education from an Afrocentric and Latin American perspective. That review found that there is an issue of discoverability of research in these fields from Africa and Latin America. His university has an SDG forum that connects people working on projects related to SDGs.

SPARC Europe has created a network of European Open Education Librarians (ENOEL) in 2019 to advocate and promote Open Education in Europe. ENOEL collaborates with academic librarians from over 20 countries and national libraries to implement the UNESCO Recommendation on Open Education and follows a targeted strategy: Librarians as agents of change. Their webinars and workshops bring together experts from across the world to upskill librarians on the policy and practice of Open Education.

ENOEL co-created open educational resources, which are shared with a CC BY licence to encourage reuse for anyone, everywhere within diverse local contexts. Libraries are at the heart of their work, collaborating online to enhance Open Education for All, despite cultural and language challenges.



Dr. Arianna Becerril García, Autonomous University of Mexico, leads two initiatives in Latin America, Redalyc and AmeliCA Open Science for Public Good. Redalyc is an infrastructure for diamond open access journals, providing services to non-commercial organizations. AmeliCA Open Science for Public Good aims to address global south challenges by disseminating knowledge and promoting inclusive participation in science.

The approach is based on the model of science as a public good, working closely with libraries to make content discoverable for communities and ensuring collective sustainability. Knowledge sharing is viewed as a public good and Dr Becerril García states, “if treated as such, collective sustainability, preservation, protection from private interest, and equitable access must be achieved.”

The initiative leverages technology to develop services for sustainable access to journals, data, repositories, and books. They believe that education for sustainable development requires equity in knowledge access and knowledge generation. They contribute to education for sustainable development by building non-commercial open infrastructure for knowledge sharing with the aim to make knowledge from the Global South visible so that education and science systems can benefit from diverse sources of quality information.

With over 1,500 diamond open access journals published by more than 700 higher education institutions from 31 countries in production and almost one million full-text open access articles published, Redalyc provides interconnected knowledge services and tools for editorial workflows enhanced with AI and semantic technologies. Redalyc provides discoverability services for libraries which allow their communities to find and access open scientific information.

Jayashri Sarah Wyatt, is Chief of Education Outreach at United Nations Department of Global Communications. She explained that the United Nations Academic Impact (UNAI)’s purpose is to promote engagement with the Sustainable Development Goals (SDGs) with Higher Education Institutions (HEIs), emphasizing how sustainable development and education are fundamentally interrelated. UNAI works with over 1,600 member institutions in more than 150 countries, and one of the principles of the UNAI is a “commitment to promoting sustainability through education.”

“Overall, our commitment to ESD is evident through our multifaceted approach to fostering a generation of environmentally conscious and socially responsible global citizens.”



UNAI's SDG hubs promote universities' direct engagement with the principles of sustainable development through the HEIs teaching, course offering, degree granting, research, publications, lectures, student-led initiatives, and across campus operations. UNAI, co-published with UNESCO the SET4HEI General Guidelines for the Implementation of Sustainability in Higher Education Institutions⁵. This resource is shared with HEIs to support their strategic work in implementing the 2030 Agenda on their campuses.

The Education Outreach Section (EOS) at the Department of Global Communications (DGC) leads the UN Model United Nations (MUN) Programme. It encourages MUN clubs and simulations to “take concrete action to support UN values and the SDGs.”

One of the three pillars of the University of Leeds' institutional strategy is global impact, says Masud Khokhar, University Librarian and Keeper of the Brotherton Collection, Chair, Research Libraries UK (RLUK), Knowledge Equity Network. With that in mind, one of the key things that they have been thinking about is what are the different ways in which they generate that global impact. With that view, they started the development of a global initiative called Knowledge Equity Network. At its core, Knowledge Equity Network is a call to action for higher education organisations, for individuals, for other organisations to radically collaborate rather than compete in pursuit of solving or reducing the impact of global challenges.

“The key distinction that we wanted to make was that [the Knowledge Equity Network] cannot be another initiative that is looking at a single strand of knowledge equity. So it cannot be something that is only focusing on research, or that is only focusing on education, or on infrastructures. It has to be a whole scale commitment towards openness and openness as a means to knowledge equity, not an end in its own right ... And from the get-go, the libraries were a really core part of it.”

University of Leeds Libraries has a strategic area of focus called Open Higher Education, which explicitly talks about opening up higher education for the benefit of our society and our communities, and goes above and beyond open research practices into open educational practices and open infrastructures as well.

“We are very lucky that at Leeds we have both institutional support and institutional initiatives, but also that the libraries are considered a key integral component in supporting that and leading on that.”

5 https://www.un.org/sites/un2.un.org/files/unai_sdgs_guidelines_updated.pdf

4.2. How do libraries generally contribute to Education for Sustainable Development?

Libraries can play a vital role in addressing climate change by implementing policies that highlight climate and biodiversity research. The EIFL Public Library Innovation Program has two major activities supporting libraries in developing sustainable development education programs. First, is building capacity of public libraries in Africa to use technologies to address the most critical community needs. This focuses on digital skills and training programs for communities and digital skills development. EIFL also has a public library innovation award. Last year, the call targeted three global challenges: climate change action, online safety and displaced populations. This program highlights the key role libraries play in these key areas.

EIFL, together with Creative Commons and SPARC, also implements the Open Climate campaign which aims to make more research available in open access on the topic of climate change and biodiversity and the new emerging activities surrounding this. This campaign aims to encourage more universities to focus on this topic and prioritise its content to be deposited in institutional repositories.

According to Dr Cable Green (Creative Commons), librarians at primary and secondary schools, universities, community colleges, and TVETs (Technical and Vocational Education and Training) have been the primary advocates for open access research and open educational resources (OER) for the last 20+ years. Librarians often create vetted OER library guides for different disciplines, such as chemistry OER, and have been instrumental in progressing the open access movement to address the high costs of journal subscriptions and inequitable article processing charges.

OpenAIRE's Natalia Manola emphasised the importance of targeted programs, community engagement, and campaigns for the public and for researchers. She observed that academic libraries offer access to information, curated collections, and educational and training programs for the public and researchers. Educating young researchers and freshmen in universities about the UN Sustainable Goals is essential for addressing the need for responsible research integrity. This can be achieved through open science and citizen science, which links with responsible research integrity.

Dr Giannis Tsakonas, Library Director at the University of Patras, has started collecting university data to provide evidence of their sustainability practices. He has gathered information from official UN resources, government reports, and statistics to identify best practices from countries, universities, or research groups contributing to the Sustainable Development Goals. The goal is to build a thematic collection of research in Greece or about Greece for sustainable development, which can be achieved by allocating resources and effort over time.



Dr. Daisy Selematsela, (Library Director, University of the Witwatersrand Library, Johannesburg), discusses the digital divide and access divide in South Africa, particularly in the city’s feeder zones. She emphasized the need for libraries to address these issues by addressing the bridging gap between students from different locations and schools.

Selematsela highlighted the importance of social cohesion in addressing the Sustainable Development Goals (SDGs). Libraries need to move towards inclusivity and impact, encompassing social justice. She also highlights the need to address university marketing and corporate communication structures, such as training information desk colleagues to follow specific steps to bridge the gap between library users and those who do not have access to public libraries. Another example she gives is the implementation of literacy days in the month of May (as part of global 1 May Workers Day) to help university workers and students learn more about the library’s mission.



University gardeners and ground staff training, University of the Witwatersrand Library

The library is working with corporate communications and marketing to highlight the importance of reading for academic purposes and promoting critical thinking. Libraries play a crucial role in addressing the digital divide and access divide in South Africa. By bridging the gap between students and libraries, libraries can contribute to a more inclusive and effective learning environment for all.

Dr. Thanos Giannakopoulos, Director of the U.N. Library, emphasized the need for libraries to be more than just buildings: they should also focus on the digital frontier, where there is fragmentation that serves disinformation and misinformation campaigns rather than science.

Librarians play a crucial role in providing a holistic view of information, linking it to meaningful content. They can create Open Educational Resources, e-training modules, and journals that are created by experienced subject librarians. Policymakers can provide funding to support the community, ensuring that it goes towards libraries rather than to legacy corporate publishers. Librarians have an ear to the ground, understanding the needs and requirements of their patrons, users, clients, students, or the public. The SDGs taxonomy was developed by the UN Library. This taxonomy can be used to tag content from websites and news pieces as well as research and resources in the library. The taxonomy is available in six official languages of the UN and can filter content based on specific language filters. Librarians help this type of work by using structured data and metadata.

Librarians can raise awareness and make information meaningful, especially in the face of disinformation and misinformation happening on the digital frontier, such as ‘SDGs-washing’ Librarians can serve as guardians of facts about institutions, SDGs, and specific programs. They can also train trainers to continue the cycle of information sharing, including online.

Dr. Tel Amiel, (Universidade de Brasilia, UNESCO Chair in Distance Education), noted that while he is not a sustainable development expert, his long-term interest lies in his work with UNESCO within the Chair program. He reiterated the importance of librarians in providing reliable and trustworthy information. Dr. Amiel believes that libraries are becoming increasingly valued in education due to the rapid changes in the digital culture. He argues that libraries are essential places for knowledge access and for constructing knowledge, as they help people find good sources of information and find evidence for what they need.

From the perspective of SPARC Europe, librarians play a crucial role in bridging the gap between open access, open science/scholarship, FAIR data, and open educational resources. They aim to improve the quality of publicly-funded education and access to it for all, forming the basis of a more inclusive and diverse education ecosystem. Librarians play an important role in empowering students and teachers by supporting Open Education practices and helping create, curate, and locate Open Educational Resources (OER). Their strong service-oriented approach supports students, researchers, and teachers in finding and sharing educational resources for the benefit of many. In the context of the ENOEL, librarians facilitate learning paths for others to expand education sustainable development community efforts by creating the basic knowledge necessary to apply the same process to other SDGs content-related resources.

“ I think that libraries are game changers in this landscape”

- Dr Arianna Becerril Garcia (AmeliCA, Redalyc)



Historically, libraries have been in charge of purchasing licenses and access to information. Now they recognize that the open movement is a reality. However, it is crucial to value the quality of information beyond business models, so that open resources can be fairly assessed in terms of their quality and contribution. The myth of “higher subscription costs or higher APC charges mean better science” is very damaging for non-commercial open information. Dr Becerril García urges libraries to be more active in bringing their communities closer to open knowledge. It’s also important for libraries to monitor the usage of open resources in order to recognize their contribution. Libraries are becoming agents for the sustainability of open mechanisms. They are now including in their portfolios not only commercial databases but also support for open infrastructures and repositories, and in some cases they act as publishers. This is a very valuable contribution from libraries to the landscape.

Jayashri Wyatt (United Nations) views libraries as providing a critical resource for disseminating public educational information, including about sustainable development/SDGs and their importance, as well as toolkits and guidelines for mobilization. Additionally, libraries often host workshops, seminars, and events focused on environmental awareness and sustainable living, providing opportunities for learning and discussion.

Masud Khokhar, University Librarian and Keeper of the Brotherton Collection, University of Leeds, Chair, Research Libraries UK (RLUK), Knowledge Equity Network suggested that libraries can look at what they already do and how that contributes in supporting SDGs. The role of libraries in providing information literacies, media literacies, critical thinking, health literacies in some cases, is an absolutely crucial element to development of literacy, to development of understanding how information is presented. And in a world where information is rich and knowledge is limited, libraries need to start playing a more active role around these literacies.

In more recent times, there has been a lot more support for open access and open data, open access to publications, and open education. That is also helping democratize access to education and to support more contextual development of educational and research initiatives that are often otherwise forgotten if you only look at it from a global West or global North perspective and not a wider perspective. What libraries can do is far bigger and greater than that. There are some very interesting initiatives happening around shifting the mindset about why we are doing this and really thinking about open not as the end of the discussion, but as the means to the end. And within that framework, one of the key considerations for libraries is what would be the future infrastructures which will enable openness to be fully harnessed? And in particular, what would be the infrastructures that would remain community driven and community bounded and not being monopolized by larger corporate entities, which is usually the case in this environment. There is a ownership of the public good stance on not just the knowledge itself, but how that knowledge is produced and disseminated and shared as well.



4.3. What are the characteristics of the most effective ESD programs and interventions led by or involving libraries?

EIFL is working to build the capacity of librarians and to change public library services by conducting community needs assessments and developing programs and services that are relevant to the communities. EIFL emphasized the importance of understanding community needs and showing the impact of the libraries' work on the community.

Dr Cable Green, Creative Commons, believes that the characteristics of successful ESD programs include training opportunities to develop persuasion skills, leadership, and a mix of boldness and diplomacy in the creation, adoption and implementation of open policies. He noted that SPARC has done some training for young researchers in becoming open access advocates, while Creative Commons ran the Institute for Open Leadership, where people from all over the world came together to learn how to enact open policies in their institutions and governments.

The key to success in ESD programs is having the right people at the table, having an advisory group that is global in nature, and building content that is accessible to everyone, especially those with digital divide issues. People are starting with equity in mind, and the change was not driven by a few leaders, but rather by librarians and other actors.

Libraries are making progress in incorporating ESD into their services by being in touch with their communities, conducting community needs assessments, and developing programs and services that are relevant to the communities. The importance of community involvement and the development of principles and values is crucial for successful ESD programs.

Natalia Manola, OPenAIRE, stressed the importance of differentiating between public and academic libraries in terms of targeted programs and outcomes. Public libraries focus on members of the public, while academic libraries focus on researchers or faculty. Targeting programs should be personalized and practical, with tangible outcomes. Researchers can showcase their work by showing examples of successful initiatives.

Dr. Giannis Tsakonas from the University of Patras discussed the importance of open educational resources (OER) in universities and how they can relate information to sustainable development goals. He emphasized the need for collaboration between libraries and other departments to ensure at least one SDG is attributed to university teaching modules. OER should be embedded in university policies, and the SDGs should be attached to educational material.

Dr. Daisy Selematsela (University of the Witwatersrand Library, Johannesburg) emphasized the importance of defining what libraries want to achieve in relation to sustainable development goals and linking it to education. Libraries should consider the characteristics and elements that communities need to know and understand, such as historical events or primary sources. By making people aware of their collections, libraries can inform their collection development strategies and collection management policies with users in mind.

The issue of decoloniality is also important, as libraries must consider the diverse range of users and how they have transformed or transitioned historically. For example, the William Cullen Library, a heritage library, can provide a vast array of knowledge and resources. By decolonizing collections and digitising them, librarians can address issues like access for physically challenged individuals and provide more literature from the African continent. By focusing on these aspects, libraries can contribute to a more inclusive education for sustainable development.

Dr Thanos Giannakopoulos, U.N. Library Director, believes that the International Federation of Library Associations (IFLA) has successfully raised awareness on the Sustainable Development Goals (SDGs) amongst libraries and librarians. He emphasized the importance of simplicity in communicating the SDGs to researchers and the general public, as they are often overwhelmed with information.

Giannakopoulos suggested that libraries should work with academia to introduce the SDGs to laypeople, as seen in De Montfort University in the UK, which has labeled all its curricula with the SDGs. This approach can help raise awareness about the impact of plastic bottles on water quality and other environmental issues for example.

Giannakopoulos repeated the need to tackle misinformation and disinformation, which can be addressed by raising awareness through simple, understandable campaigns and using technical and digital skills to push forward specific campaigns on the SDGs. By addressing misinformation and promoting simple, understandable campaigns, libraries can contribute to a more inclusive and effective approach to achieving the SDGs.

He also underlined that libraries must own their efforts and connect with policymakers and policymakers. They have the ability to reach policies and policymakers through networks and can connect with political offices working on the [UN High Level Political Forum on Sustainable Development] Voluntary National Reviews⁶. Giannakopoulos urges librarians worldwide to connect with those working on their Voluntary National Reviews and ensure that their work on the SDGs is included in their National Review.

6 <https://sustainabledevelopment.un.org/vnrs/>

Libraries need to have a voice in the political arena to be involved in discussions on the Sustainable Development Goals (SDGs). They should focus on simple, understood, and engage in performative campaigns that align with the United Nations' schedule. Librarians can use their technical capabilities and digital skills to push forward campaigns on the SDGs.

Dr. Tel Amiel (Universidade de Brasilia and UNESCO Chair, Distance Education) emphasized the important potential contribution of libraries to open educational resources in Brazil. While librarians are very active in open access of scientific publications, they are less involved in open education resources. Latin America has been a great example of how open access can work, but there is a need to include libraries within the ecosystem of Open Education and OER.

Vanessa Proudman, SPARC Europe, emphasized the importance of collaboration in the work and success of ENOEL. Collaboration builds trust, confidence, and capacity among librarians across Europe, who are now initiating activities in the network despite limited resources. This is partly due to the stimulation and encouragement of diversity and inclusion in the design of meetings and activities. Sharing knowledge openly is central to an effective program, respecting local efforts in context.

Dr Arianna Becerril García suggested that the most effective way is to include open educational resources along with content from open venues of information, such as journals and books but in a structural way. When universities are designing new educational programs, they should include open educational resources from open infrastructures and platforms and not only resources from commercial solutions. This can be effective for universities and higher education institutions but also, in general, for schools and other educational programs.

Jayashri Sarah Wyatt (U.N. Academic Impact) observed that effective Education for Sustainable Development (EDS) programs should integrate multiple disciplines, as sustainable development issues are inherently interconnected. EDS programs can enhance their reach and impact by collaborating with educational institutions, non-governmental organizations (NGOs), government agencies, and private sector partners. Libraries often have existing networks that can be leveraged for these partnerships. Libraries can play an impactful role in raising awareness about sustainability issues and advocating for sustainable practices within the community. This can include hosting awareness campaigns, sustainability fairs, and public lectures.

“What makes libraries really interesting or unique in this context, and in particular academic libraries, with my lens on, is the advantage of us being interdisciplinary and transdisciplinary hubs.”

**– Masud Khokhar, University Librarian and Keeper of the Brotherton Collection,
University of Leeds, Chair, Research Libraries UK (RLUK), Knowledge Equity Network**

Khokhar expanded on the above, saying that there is almost no one else in higher education, which has the same level of breadth of discussions going on, either based on their collections or based on the support they provide or based on the research that they conduct. But what is also interesting within that is that libraries are also strongly civic-minded and civic-focused. They believe in doing the public good. They care about ethics. They care about civil rights and making things happen. Libraries can translate research from a conceptual entity to a delivery entity, to an impact entity. Obviously that's not just libraries, but libraries are able to do it in an interdisciplinary and transdisciplinary way, which is often what other parts of the institution cannot provide. In his opinion, the characteristics of most effective ESD programs would be to go back to why we are doing it in the first place, the purpose of them.

Focus on co-production rather than self-production so that any educational entity is delivered in the local context would make it a lot more useful. And do it genuinely co-produced, not here is something we have, and you adjust it, actually start in a co-production model from the very beginning. Then also develop it in a way that is context driven but widely applicable wherever possible. It's also critical how libraries and networks of libraries can support the sustainability of these initiatives over a long period of time. So, co-production, values driven, sustainability oriented, and with proper equal footing in the delivery of initiatives.



4.4. What are the challenges and barriers faced by your organisation and/or libraries in effectively contributing to SDG education and OER development?

From EIFL's perspective, language is a significant issue to take into account in contributing to Sustainable Development Goals (SDG) education and Open Educational Resources (OER) development. Some countries have hundreds of languages and often it's quicker and easier to create new educational and training materials in local languages than reuse existing ones created in other languages. Public libraries face language barriers when providing training to communities, as there is not enough relevant content in local languages. Local language content needs to be targeted and accessible, and public libraries should provide information that addresses knowledge gaps rather than just academic achievements. In Africa, where these resources are not available, libraries are looking for methods that can help them produce content or develop resources that are readily available.

Dr Cable Green, Creative Commons, noted that many countries have systematically deinvested in public education, especially higher education, over the past two to three decades. The US has experienced systematic disinvestment in education since Richard Nixon's presidency, leading to increased tuition and textbook costs. This has resulted in a five-fold inflation rate in the cost of education and a lack of equity in education. Libraries struggle to keep basic services running due to the cuts.

Creative Commons has worked with various groups on campus, such as student leadership, faculty senates, president's offices, VPs, deans, librarians, and instructional designers. They have also discussed the potential ROI of cutting materials costs with Open Educational Resources (OER) and providing more access to research with open access. Collaboration between nonprofit spaces, civil society, and public institutions is key to achieving these goals.

Community involvement is essential. By working together, libraries can innovate and prepare students for the world, ultimately improving their ability to solve problems and become problem solvers.

Open Science and Open Educational Resources (OERs) have a vital role in educating about the 17 Sustainable Development Goals (SDGs). However, they face challenges such as lack of funding, skilled personnel, and a lack of connections between universities and libraries.

Dr. Giannis Tsakonas from the University of Patras felt that people think the UN is distant and not affected by the application and implementation of SDGs. He also noted that some academics live

in their own academic existence and don't feel the issue is relevant to them. Additionally, there is a conflict with the artificial intelligence hype, which undermines the interest in SDGs and aims to set out business or research that can be done with artificial intelligence [in support of SDGs], while at same time AI has a serious environmental footprint.

Dr. Daisy Selematsela from the University of the Witwatersrand Library highlighted the need for information literacy coordination.

A further constraint at the moment is the way that intellectual property is regulated and managed. The U.N. Library is working on updating its licensing regime, and Dr. Thanos Giannakopoulos, U.N. Library Director, believes that the UN should move to a Creative Commons license for all of its content. Giannakopoulos suggested creating a global campaign with libraries and institutions under the motto "the right to read and publish." This should be embedded into policymaking and daily work, ensuring that everyone has the right to read and publish without needing additional financial resources.

The intellectual property regime in science is important: knowledge is a public good, and it is crucial to redesign legal regimes to suit research and researchers rather than corporate publishers. A global campaign for the right to read and publish should be organized, including the re-engineering and re-envisioning of intellectual property regimes, especially for publicly funded research.

There are challenges in coordinating initiatives in this space, and it is essential for libraries to be vigilant about data protection and the application of FAIR and CARE principles. Libraries must also be vigilant as the landscape changes, as there will be new ways for limitations and for monetisation to come in.

Transformative agreements⁷ do not guarantee open access. Universities with well-resourced budgets can pursue these financial models, but not those without.

The United Nations Open Science Conference is an example of a network that connects people and shares materials, focusing on the environment and climate change. However, there is a lack of focus on education for sustainable development (ESD) within UNESCO's group.

From the perspective of SPARC Europe, the main barriers to progress and institutional action and

7 Transformative agreements are those contracts negotiated between institutions (libraries, national and regional consortia) and publishers that transform the business model underlying scholarly journal publishing, moving from one based on toll access (subscription) to one in which publishers are remunerated a fair price for their open access publishing services. COALition S, <https://www.coalition-s.org/faq/what-is-a-transformative-agreement/>.

support include lack of time, funding opportunities, and skills at the local level. There is no clear vision or policies on Open Education or connecting it to Open Science and Open Access, which can hinder institutions from taking concrete action. Librarians need time and resources to upskill and integrate new perspectives to share knowledge more effectively.

Leaders and decision-makers need to be more mindful of the benefits of Open Education and actively ignite and nurture opportunities for cultural change while recognising and rewarding the efforts of those who contribute. By addressing these challenges, we can work towards a more inclusive and sustainable future for science and technology.

Dr Arianna Becerril García identified two major challenges for the Open movement, particularly the non-commercial solutions: under-valuing and under-recognition. Firstly, there is a tendency to value knowledge from the commercial sector as higher quality. There is an industry of prestige that values solutions for disseminating knowledge as brands (while knowledge should be considered a public good that is key for inclusive education and for sustainable development).

Secondly, we need to recognize knowledge that is generated in the Global South. Although knowledge from the Global South is not circulated in the so-called mainstream, it is quality knowledge. Particularly in Latin America, knowledge is shared in non-commercial channels that are more representative of local research agendas, local languages and local challenges. Some of our top queries in Redalyc are on topics such as dengue disease or rural migration, current problems that Global South countries face. These are not necessarily the research agendas of commercial OA journals or subscription journals. It is very important to acknowledge open and community channels of circulation of knowledge to achieve equity and diversity and to have education capable to address local challenges that fosters local creativity.

We are living in a very biased world, and very often “equity” is only assessed in terms of access, but not in terms of participation in knowledge production. So, the main challenge for the development of open educational resources is for it to be based on a more inclusive knowledge cloud.

How can children address their own challenges if they only have access to knowledge on problems from other parts of the world?

Jayashri Sarah Wyatt (UN Academic Impact) noted numerous challenges in actualizing SDG 4 and Open Educational Resources (OER) development. According to UNESCO, disparities in the global funding of education and poor support for training teachers are the two most significant challenges for SDG 4. The primary challenge for OER development – which is critical to the overall achievement of SDG 4 – is what UNESCO describes as “mainstreaming,” or the integration of OER into educational

frameworks from childhood education into lifelong learning.

Emergencies from conflict and the rapidly worsening climate crisis have posed an unprecedented strain on access to education in affected communities. According to UNESCO, between 2000 and 2019, 60 disasters disrupted education for over 11 million children. This concern is paramount because the number of large-scale disasters is predicted to increase by 2030.

From the work of the U.N. with Higher Education Institutions (HEIs) it is clear that strategic approaches to mainstreaming SDGs in teaching, research, operations and community engagement are uneven across institutions. Inside individual HEIs the teaching and research side of a university can oftentimes be at odds with the operations side of HEIs, creating barriers to progress across the university. When the administration of an HEI changes, commitment to the implementation of strategic engagement with the SDGs across teaching, research, operations and community engagement can change significantly. Leadership at the highest levels of HEIs is required to convene stakeholders and define strategic approaches in order to engage in transformative approaches to mainstreaming the SDGs. Co-creating knowledge with students and community members and other relevant stakeholders who are arguably the main stakeholders of higher education are critical. Bridging the teaching and research nexus to policy and practice is also critical to the implementation of strategic engagement with the SDGs.

Masud Khokhar, University Librarian and Keeper of the Brotherton Collection, University of Leeds, Chair, Research Libraries UK (RLUK), Knowledge Equity Network emphasized budget as the first challenge. Strongly following financial challenges is the issue of where this sits as an agenda or as a priority within institutional or library landscape or strategy. One of the issues faced with OER development is that it does not have the same funding mandates associated with it as are associated with open access for research. That means that OER has not seeped through the organisational memory in the same way and it does not get onto the prioritisation list. So, if it can be made a financial imperative, that would be an important first step. In addition to the financial imperative, it would be important to have a strong policy imperative. That could be an important element in how the local, regional, national policies might impact around this, linking them up into global policies. One of the barriers is the capacity and change fatigue that is currently going on. But in terms of opportunity, libraries do have amazingly passionate colleagues. ESD is a topic that is fundamental to why we are in higher education in the first place. It is a topic that generates social and psychological resilience in us.

“So, with all of those things in mind, I think I have huge hope. And all it needs is more collective work and strong, supportive work around policy, policy leading into funding mandate changes, which leads into local prioritisation changes.”



4.5. What are the issues related to funding, infrastructure, digital divide, and policy that impede the realisation of the full potential of libraries' contribution to ESD?

Public libraries in Africa face numerous challenges, according to EIFL, including lack of access to computers and internet access, and a gap in knowledge and skills to use technologies. High costs of internet connectivity, lack of equipment, and power cuts hinder libraries from reaching their potential. Policies related to ICT are not recognizing the needs and roles of libraries and this also creates barriers. The barriers encountered by public libraries in Africa also include a focus on short-term performance and statistics over meaningful impact.

Dr Cable Green, Creative Commons, advocates for public funding for education and science as public goods and for publicly funded resources being open by default. He argues the public should have access to what the public paid for. When working with governments, he suggests they should ensure the highest return on investment (ROI) when spending public funds, and open education, open access and open science are more efficient, higher ROI options than their non-open counterparts.

The big conversation around infrastructure is around diamond open access, which has been a topic of discussion. Open access research has gone through various colours, but Gold (publishing open access) has become a common one. [While 66% of Open Access journals indexed in the Directory of Open Access Journals (DOAJ) charge no fees to authors, a significant proportion of Open Access journals charge Article Processing Charges (APCs) to authors. Many publishers now prefer article processing charges, shifting the focus of the inequity from the reader to the researcher, exacerbating the gap between rich and poor researchers or institutions. Diamond open access publishing advocates call for free access both to read the work and to write and publish it, along with full transparency of finances.

Open access journals and open science research are a public good that should be supported by public money and funded by universities. Advocates argue that “diamond open education”, which focuses on social justice, interdisciplinary solutions, and achieving the Sustainable Development Goals (SDGs), could be a viable solution for education. Policymakers need to be more aware of the importance of funding infrastructure and policies that allow for this education, they should educate themselves on these issues.

Librarians have many fronts to work on, but they can collaborate with organizations like the Sustainable Development Solutions Network (SDSN) to take the full potential of academic and

scholarly libraries towards this goal. The ‘people infrastructure’ and synergies with those who care about these issues are crucial factors in achieving this goal.

Technical infrastructure is another critical factor, as it requires the (digital) preservation and accessibility of resources. Libraries are used to perform operations to provide access and to preserve material long-term, but organizational factors (including resourcing) play a role in determining the success of these initiatives.

Policy is not necessarily policy, but rather an attitude towards libraries’ role in promoting SDGs. External factors can impede the realization of the potential of libraries to promote and deliver on the SDGs, but internal factors can also play a role. Dr. Daisy Selematsela from the University of the Witwatersrand Library highlights the challenges of libraries in achieving SDGs, particularly in institutions which, unlike her university, lack buy-in and management at the senior levels.

A challenge lies in reaching out to students in the final years of their first degrees and sharing an understanding of the new environment. By providing information literacy instruction, librarians can support students, researchers, and postdocs, helping them align their research with the SDGs. By embedding themselves in information literacy instruction, libraries can help promote the adoption of open access journals and education in a more sustainable and inclusive way.

Dr Thanos Giannakopoulos, U.N. Library Director, highlighted the need for funding to support campaigns and initiatives focused on the Sustainable Development Goals (SDGs). He acknowledged that 90% of the Library’s budget goes towards resource acquisition or maintenance, leaving insufficient money for new campaigns and initiatives.

Giannakopoulos also highlighted the importance of creating leaders for tomorrow, so that they are 100% skilled for the future. He acknowledged that young librarians coming from universities today have an amazing talent and capacity, and suggested that libraries should foster more of this talent by utilizing it to develop electronic resources and content.

Giannakopoulos also discussed the need to address the digital divide, which he believes needs to be tackled at both the library level and higher levels. He highlighted the need to adapt services to accommodate different regions, such as Africa, by offering telephone or mobile phone services instead of Zoom meetings. This would allow for better understanding and engagement with other knowledge systems.

Giannakopoulos also highlighted the importance of considering Indigenous knowledge systems, which are not only important for indigenous populations themselves but also for all of us to learn about other knowledge systems and how they might work. He emphasized the importance of

listening to marginalized voices within the Western system and addressing the issue of who is left behind.

Dr Tel Amiel (Universidade de Brasília & UNESCO Chair), also highlighted the need for a more inclusive and equitable world. Funding has always been a challenge for the development of Open Educational Resources (OER) in Brazil, and it is essential to develop resources and get people to adopt them. Amongst his group, during the past 15 years over a hundred resources have been created in the area of OER and related teaching methods. However, there is still a divide between the global South such as Latin America and Africa and other regions.

The issue of discoverability and knowing where resources are is also critical. UNESCO has tried to establish networks, but on a wider scale, and they aim to focus on public platforms and on a Global Knowledge Commons. That repository-based initiative is an acknowledgement that people don't know where resources are, and librarians are needed to help create good repositories and metadata.

A recent literature review written by Amiel and colleagues highlighted the importance of listening to African and indigenous epistemologies for environmental and climate change solutions. If these people are not heard, OER becomes a constant influx of information from the North. This is an insufficient approach in the climate debate.

Vanessa Proudman (SPARC Europe) suggests that a supportive Open Education policy can set the formal direction for progress, and appropriate funding is crucial for implementing this policy. Infrastructure issues can be solved through funding and by sourcing help from experts and building it together for more efficiency. Upskilling to fill the digital divide is also essential, and more projects to apply, share, and expand upon.

Dr Arianna Becerril García highlighted lack of investment in the non-commercial open sector, because of the attitude towards open resources, "it is already open, there is no need to contribute to its sustainability, because somebody else does it." Some of the library budgets should be redesigned according to the usage of resources. Also, it is very important to tackle the copyright policies. A lot of content that is being shared, even though it is open, is published under copyright policies or licences which do not favour processability of the content or long-term open access. Copyright and licencing policies also affect the level of openness. This level ranges from resources shared in flat PDF files to structured semantic full-text with enriched metadata, and open data in machine-readable formats. This is something that the commercial sector is very restrictive of.

Jayashri Sarak Wyatt (UN Academic Impact) echoed the concerns of other interviewees, stating that the issues impeding libraries' contributions to Education for Sustainable Development exist due

to persistent underfunding, which limits their ability to update resources and maintain services. Many libraries, especially in rural areas, face inadequate physical infrastructure, such as poor buildings and outdated technology, making it challenging to offer learning environments conducive to their community. The digital divide further exacerbates this problem by restricting access to digital resources and internet connectivity in underdeveloped areas. Additionally, countries' lack of supportive policies and failure to integrate libraries into national ESD frameworks prevents libraries from being fully recognized and utilized as critical educational resources.

The issue of funding was further developed by Masud Khokhar, University Librarian and Keeper of the Brotherton Collection, University of Leeds, Chair, Research Libraries UK (RLUK), Knowledge Equity Network. Quite often libraries are funded directly through institutional funding and the diversification of library income streams is quite minimal. Some university libraries are very good at philanthropic fundraising, some are very good at generating research income, but that is not common. When a financial squeeze happens, you start becoming quite insular and start thinking about what is very important to you at that time. Making a global impact and global difference, or even national level difference or regional difference automatically get deprioritised when those funding crunches happen. We need to think about how we can generate critical funding streams that do not depend on libraries operating within the organisational context that they are in. Libraries need to be independently supported in supporting these global initiatives so that they can continue contributing regardless of the changing landscape around them.

We need to start seriously thinking about what the future of open educational infrastructure will be. We may have the greatest opportunity if we start thinking global from the beginning. The Global Knowledge Commons could be a highly interesting approach around what it could look like if we unite on this from the outset. Perceptions and realities on the digital divide can be different. We need to start thinking about how we sustain an infrastructure at a global level without it feeling that it's the Global North is doing it to the Global South. In the Knowledge Equity Network we are all equal partners and for every project, whichever partners come together to do it, they are on equal footing. So if we can do something similar around that on infrastructure that could be really exceptional.



4.6. What are your recommendations for libraries, policy-makers and other stakeholders in order to enhance Education for Sustainable Development?

Public libraries are often overlooked in ICT-related policies, digital policies, and digital transformation policies, which hinders their full potential. Libraries should be included in these policies and considered a stakeholder in policy planning and infrastructure planning. They have unique expertise in licensing, open licenses, creative commons licenses, and material reuse, making them an essential part of these activities.

Libraries need to collect and present more data and information to effectively communicate their contribution to sustainable development. Policymakers should consider libraries as public digital infrastructure, allowing people to access online content services and access new opportunities in the digital world.

Librarians have expertise in creating digital content, aligning with the latest trends and working with digital tools. They also know how to look for information and work with copyright, and bring essential insights into how to package content packaging, produce usable formats, and support reuse.

In discussions with politicians, it is crucial to note that libraries need investments to transform the system and support well-planned changes. Library networks can contribute to policy priorities and focus on what truly matters in each country, such as economic and social development goals.

Policymakers should make it mandatory for research to be available as open access resources when developing open access/open science policies for research. This will help libraries fulfil their potential and contribute to their country's development goals.

Natalia Manola (OpenAIRE) suggested that institutions should use ESG [Environmental, Social and Governance] as a framing concept when designing education systems, services, and investment. ESD can be a new concept for some, but it can be a strategic step to incorporating sustainable development into policies and decision-making processes. Libraries should also think of themselves as if they are commercial companies with an ESG focus, and make ESG part of their profile and mission. They should be more responsible and outspoken about their role in implementing SDGs and cultural change. Libraries should also develop skills in communication, advocacy and in building connections and trust.

Dr Cable Green (Creative Commons) argued that libraries (and other advocates) should also consider

the existing goals and challenges of their target audience; for example many governments care a lot about climate change and green energy. By tailoring their arguments to the existing objectives of policymakers, they can introduce open solutions, help solve problems for those policymakers, and help governments make more efficient and effective use of public funds. To achieve this, organizations like SPARC Europe research the objectives of the agencies and organisations they wish to get support from and, insofar as possible, present their principles and associated benefits in alignment with the goals and objectives of those organisations.

Collaboration is essential in identifying stakeholders and collaborating on the landscape. Libraries should build trusting relationships with educators and policymakers, as they have good evidence that libraries with minimal investments can provide maximum effects. Libraries are also trusted to use their expertise in organizing resources, providing long-term accessibility, and collecting meaningful statistics. They should also be trusted to keep records of their activities to ensure good implementation. The SDGs field is vast, and libraries can lead and be an example of how implementing SDGs can be for the benefit of the community.

Dr. Daisy Selematsela, Library Director of University of the Witwatersrand in Johannesburg, believes that libraries should make their valuable contribution to academic projects, teaching, and learning visible to institutions, as the focus on achieving these goals is increasing in South Africa. Dr. Selematsela emphasized the need for libraries to be represented through university Senate Committees – (which are decision making bodies) and push the agenda of addressing the SDGs. She believes that if academic libraries do not intensify their efforts here, it will have implications for students' career paths and outcomes. The tracking system of students is crucial, and libraries should focus on providing them with learning paths that would enable them to articulate their achievements.

The issue of Open Educational Resources (OERs) is also a concern due to the high cost of resources, such as electronic resources and subscriptions. Libraries can sensitize policymakers to the need for open educational resources and invest in tools to manage these resources effectively.

Dr. Selematsela highlighted the role of libraries in addressing different generations and communities. Libraries are more than just the smell of books; they are now essential for accessing information and finding jobs. She stressed the importance of social justice in all these elements, and both libraries and policymakers must consider holistic approaches to addressing the SDGs.

Dr. Selematsela has implemented 24-hour facilities for students to study overnight, providing a safe space for students from different locations. She also highlights the need for tea facilities, water, tea, sugar, milk, and coffee, which are essential for students who may be on grants or from one-household families.



Dr. Selematsela also noted the issue of health in her institution, where young women often ask for sanitary towels. By addressing these issues, libraries can help students focus on their education and avoid worrying about basic needs.

Dr Thanos Giannakopoulos, U.N. Library, suggested a global campaign for the right to read and publish as a human right, especially in the world of ‘publish or perish’. This would help not only the sustainable development goals but also other major missions of the organization. Libraries can help by mobilizing the community and connecting with them under one umbrella, which could be the right to read and publish.

The campaign should include funding modalities, open infrastructures, ways to address the divide, and consideration of non-Western knowledge systems. Open access scientific sources are even included in the constitutions of countries like Mexico. This approach will help push forward the Sustainable Development Goals (SDGs) and the agenda of science in support of the public good as well as the right to education for all expressed in the Universal Declaration of Human Rights.

Dr Tel Amiel, Universidade de Brasilia & UNESCO Chair, highlighted the need for re-engineering and re-thinking of the intellectual property regime, particularly in research assessment. Investing in initiatives like the SDG Academy and Creative Commons could help address some of these issues and promote a more inclusive and equitable world.

Not all libraries and their resources are open to the general public, e.g. university libraries, parliamentary libraries, government libraries. To rectify this, SPARC Europe suggests, libraries can contribute to the movement by promoting awareness and visibility of Open Educational Resources (OE) and Open Educational Resources (OER) among leadership and staff. They can grow OE in higher education with policies and task forces, incorporating incentives, recognition, and rewards to overcome cultural challenges. Library staff can develop skills in leadership and technical skills on learning design and making resources open. They can also engage in the reuse, adoption, adaptation, remixing, and co-creation of OER with faculty, creating Diversity, Equity and Inclusion (DEI) programs and strategies to ensure more equitable, diverse, and inclusive open educational content for all.

Librarians can work to create alliances with institutional stakeholders and international colleagues/networks to promote OE and develop policies and support services. They can collaborate on OE projects with colleagues within the institution and with others from outside the institution on regional, national, and international levels. Building and funding a more interoperable technical OE ecosystem between institutional repositories and other educational platforms for longer-term sustainability is also essential. Sustainable models to reuse, adapt, and create OER can include creating new budget lines, upskilling dedicated staff, establishing grant programs, and collaborating

with communities and membership associations.

Dr Arianna Becerril García, Autonomous University of the State of Mexico, Director AmeliCA, Redalyc, recommends that the paradigm of the public good nurtures Education for Sustainable Development. This vision requires responsibility from decision makers to achieve the status of public good for knowledge and to undertake actions to preserve it, but also to take advantage of and sustainably benefit from it. Inclusive and participatory knowledge ecosystems catalyze Education for Sustainable Development. The South-South collaboration between AmeliCA and the Angolan higher education institutions to train on Open Science topics for education purposes has taught us the value of open tools and platforms for equitable knowledge production and local development.

Jayashri Wyatt stated that it is critical that Governments and the international community increase funding to develop infrastructure and staff support at libraries worldwide to enhance libraries' contributions to Education for Sustainable Development (ESD). With adequate resources libraries can develop programmes that engage the community with the principles of Sustainable Development and train their staff in ESD content. Policymakers ideally integrate libraries into national ESD frameworks and promote collaborative networks. Partnerships between relevant ESD actors and libraries, involving local communities, can also provide resources and expertise. She recommended that libraries, policy-makers, and other ESD actors prioritize collaboration, knowledge sharing and community engagement to ensure that diverse perspectives and voices are included in sustainability efforts. And she noted that it is also important to invest in professional development and capacity building for educators and other stakeholders, in order to effectively integrate ESD into learning environments.

Masud Khokhar, University Librarian and Keeper of the Brotherton Collection, University of Leeds, Chair, Research Libraries UK (RLUK), Knowledge Equity Network recommended that we should always focus on why we are here in the first place and that is to support our users in having the best outcomes for them.

Knowledge sits right at the heart of every global challenge (knowledge meaning access to knowledge, lack of access to knowledge, understanding of knowledge, or lack of understanding of knowledge). If we are not developing policies that put education for sustainable development at heart of it, we are not setting the foundations right for solving any of these challenges. Or we're solving them in the short term, unprepared for the next set of global challenges.

At a policy maker level, I would be keen that knowledge equity is set as a foundational attribute to meet any global challenge and therefore it is given the right foundational level of support, importance, funding and policy emphasis behind it. In terms of libraries I would urge my colleagues to start focusing on open education more. We have seen a huge amount of progress around open access for research. There are far fewer institutions and libraries who are focusing on open education.



Findings from the Interviews

Libraries contribute to knowledge sharing, lifelong learning and cultural awareness of individuals and institutions in many different ways, even if the nature and extent of that contribution is not always visible to the wider world. A recurring theme we encountered in collecting evidence from stakeholders was at times a lack of visibility of the library and its services. This was further reinforced by calls for libraries to take action, use their voice and be part of policy and decision making process, build deeper collaborations with the wider community and education ecosystem, adopt a holistic view and approach on how we collect, disseminate and offer information, and looking to the future the need to create synergies with other stakeholders.



5. Analysis: Case Studies

A selection of global case studies was identified to illustrate the contribution of libraries to education for sustainable development. These case studies identified a representative set of existing library programs and initiatives that support education for sustainable development and the production of OER. They present the diversity of library services, resources, and initiatives in the area of SDG education and OER development and support, with a focus on content, impact, policies, standards, discoverability, inclusivity and accessibility. Particular attention was paid to traditionally under-represented countries and regions. 20 case studies were analysed to provide insights on these programmes in each of the following areas:

The case studies focused on:

1. Libraries' support for SDG activities inside academic (teaching, research, student societies, etc.), inter-government, government, local government, enterprise, NGO institutions.
2. Libraries' contribution (creation, publishing and/or making openly accessible) of content to the global public good.
3. Libraries' engagement with external partnerships for distance and open teaching and learning; capacities in parliaments/governments; in low resourced communities, in Citizen Science, etc.
4. Challenges and barriers faced by libraries in effectively contributing to SDG education and OER development.
5. Issues related to: funding, infrastructure, digital divide, and policy constraints that impede the realisation of their full potential.

Case study assessment and selection factors included:

- Type of library (public, academic, school, parliamentary, etc.)
- Type of library contribution (creation, publishing and/or making openly accessible) of content; teaching; providing space; etc.
- Type of partnerships (Citizen Science; local/national government, etc.)
- Aims
- Audience
- Access
- Use and re-use
- Societal/cultural/economic impact
- Educational outcomes
- Sustainability
- FAIR, CARE, FOREST and related principles
- Challenges/barriers (funding, infrastructure, digital divide, policy constraints)

These analyses are presented in the following tables, which includes a categorisation of the case studies according to the ESD for 2030 Priority Action Areas.

Selected case studies were analysed in-depth and profiled both by organization and by answers to a series of questions:

- **What:** Contributions/challenges of libraries implementing education for sustainable development
- **Why:** Motivations for change towards education for sustainable development
- **How:** Promoting education for sustainable development
- **When:** Development and implementation timeline
- Educational outcomes and impact

The aim of the case studies was to identify and document best practices and innovative approaches employed by libraries worldwide on SDG education and OER development (including integration of digital technology, community engagement strategies, and partnerships).

Two sample case studies are provided here. The full set of case studies have been analysed according to the data points listed in the previous sections and they have been mapped to the five ESD 2030 Framework Priority Action Areas. The results are presented in the charts that follow.



Case Study 1

Library as a Sustainability Leader: Creating sustainable Library and Resilient Communities – University Library of Southern Denmark, Denmark

Overview

Case Study File	Library as a Sustainability Leader: Creating sustainable Library and Resilient Communities
Date	2019- onwards
Author	University Library of Southern Denmark
Executive Summary	The University Library of Southern Denmark is acting as an inspiring role model for libraries to provide sustainable accurate information to help change the existing research and education environment to guide local communities in sustainable practices through the promotion and implementation of Open Science. The library has shown its commitment to supporting the SDGs in their establishment of the Green Corner, formerly named the SDG hub, which provides an open space in the library for students and staff to develop sustainable ideas which are supported and launched through the Green Corner.

Who: Organization Profile

Country	Denmark
Profile of Institution	Single Institute
Name/Logo of Organisation	University Library of Southern Denmark
Short Description of Collaborator	The University Library of Southern Denmark is changing the environment of research and education across universities
Number of FTE People Associated	n/a
Who is Involved	Librarians, community members, students, staff

What: What has changed and the primary components of that change

Introduction	The University Library of Southern Denmark is creating a culture which is embedded in sustainable and resilient practices to teach and educate community members. The library enables students and employees to transform ideas which promote sustainable practices by supporting their projects in the form of networking and advice through the establishment of an open space in which sustainability is at its core.
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<p>Objectives</p>	<p>The library aims to provide an open space for its members to obtain accurate information on numerous aspects of sustainability and help communities become more environmentally sound, socially equitable and economically feasible. The Green Corner enables collaboration between students, staff and the university by providing everyone with an equal opportunity to produce sustainable projects.</p>
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Why: Motivations for change towards education for sustainable development

<p>Challenge</p>	<p>Having the necessary background, structures, infrastructures and skills to become a local agency able to take part in developing a sustainable society.</p>
<p>Methodology</p>	<p>Raising awareness of sustainable achievements and implementing green transition across the library, university, and their members. By promoting open science on topics involving sustainability through a designated space which allows collaboration between library participants and functions as a space for workshops to be held on sustainability.</p>

How: Procedures and factors involved in fostering, executing, and overseeing change

<p>Recommendadtions</p>	<p>Libraries must become sustainable leaders to change behaviours in communities to help repair the planet. Libraries should provide spaces which can support sustainable ideas to be shaped, planned and launched.</p>
<p>Implementation</p>	<p>Libraries must have resources and content on sustainability which is accurate to ensure they act as role models for sustainability. The equipment, infrastructure and skills are necessary for the changing environment of research and education to be implemented. The role of the library to implement open science aspects is advocated through policies and roadmaps. The Green Corner has been designed to promote Green literacy through its extensive book collection and games.</p>

When: Development and Implementation Timeline

<p>Lifetime of activities and milestones</p>	<p>Established a Green Corner, formerly known as the Sustainable Development Goal (SDG) hub, to support the SDGs at the university. The SDU library was the first Danish university library to be certified as an SDG library. The Green Corner has successfully become a space for creative collaboration and a source for sustainable resources and services to be found at.</p>
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Outcome

<p>Impact</p>	<p>University Library of Southern Denmark is impacting the culture within libraries by changing the environment of research and education within the university. The library is encouraging students and employees to implement environmentally good practices and supporting communities in becoming more economically advantageous, environmentally conscious and resilient communities. The Green Corner is transformative in turning sustainable ideas into real projects.</p>
<p>Lessons Learned</p>	<p>The library gives access to educational materials on sustainability such as the green transition and global measurement, which informs and motivates students to implement green measures in their own everyday life. Eliminating the gap between students and staff allows everyone to equally participate in designing sustainable projects within a Co- design space.</p>

Conclusion

<p>Conclusion</p>	<p>The library plays an important role within the community. The SDU library became a hub for sustainability which promotes communities and citizens to support sustainable practices and education. The sharing of information provides a network of delivery sites which enhance citizen science and is advocated across the library.</p>
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References

<p>References</p>	<p>https://letsgogreen.nsk.hr/library-as-a-sustainability-leader-creating-sustainable-library-and-resilient-communities/</p> <p>https://www.sdu.dk/en/bibliotek/dit-bibliotek/soenderborg/greencorner</p>
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Case Study 2

Ust-Kamenogorsk: An eco-centre for environmental education created by librarians at Ust-Kamenogorsk City Library to enlighten people of climate change's impact on their city and the solutions.

Ust-Kamenogorsk City Library's Branch No. 2, Samruk-Kazyna-Trust, Kazakhstan

Overview

Case Study File	Ust-Kamenogorsk
Date	2022-2023
Author	Ust-Kamenogorsk City Library's Branch No. 2, Samruk-Kazyna-Trust
Executive Summary	An eco-centre for environmental education created by librarians at Ust-Kamenogorsk City Library to enlighten people of climate change's impact on their city and the solutions.

Who: Organization Profile

Country	Kazakhstan
Profile of Institution	Single Institute
Name/Logo of Organisation	Ust-Kamenogorsk City Library's Branch No. 2
Short description of collaborator	Eco-lessons and thematic meetings about biological sciences where educational books, material albums, and development games can be found.
Number of FTE people associated	n/a
Who is involved	Librarians

What: What has changed and the primary components of that change.

Introduction	The city in Kazakhstan is badly polluted and faces severe struggles which are accelerating due to global warming. A group of librarians established a plan to fight climate change by creating an educational eco-centre to enlighten people of Ust-Kamenogorsk.
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<p>Objectives</p>	<p>Inform people of the environmental problems; climate change, depletion of the ecosystem, desertification, species extinction and waste we are facing today and educate people of the solutions to these problems.</p>
<p>Why: Motivations for change towards education for sustainable development.</p>	
<p>Challenge</p>	<p>The loss of literacy in the environment and the culture created through this. The concerning effects of climate change on citizens and the threat caused by it.</p>
<p>Methodology</p>	<p>The climate action groups consisted of 66 secondary schools and 26 preschools. The study of the local environment is learnt through field trips and experimentation. The students are given access to scientific equipment to be used in ecological experiments, environmental recovery projects and to further their knowledge in more areas.</p>
<p>How: Procedures and factors involved in fostering, executing, and overseeing change</p>	
<p>Recommendations</p>	<p>Understanding the shared environmental struggles which are growing will unite people within the local area and promote collective action on solutions to its threat. Hosting events to engage citizens with the support of the local governments to clean cities has huge benefits for the people and their environment.</p>
<p>Implementation</p>	<p>The library relies on volunteers for teaching, mostly lecturers and teachers in the biological sciences and humanities from both schools and universities. Lessons and presentations on the environment are made available to all those who have access to the city’s educational institutions through the library eco-centres website.</p>



When: Development and implementation timeline

<p>Lifetime of activities and milestones</p>	<p>The eco-centre educates students on sustainable practices through practical skills taught including reducing electricity consumption, using water economically, recycling and waste management. Students also grow various types of plants in the eco-centre. The eco-centre has a project in which children contribute to an electronic book which lists and records rare and endangered species which has won recognition across the region for its work and been published in national media.</p>
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Outcome

<p>Impact</p>	<p>The library has created more than 50 environmental lessons and presentations to inform people of environmental problems. More people now understand environmental issues, and citizens are united through the action needed to be taken to reduce pollution and waste. Numerous events were held to clean up the city from garbage. School children are contributing to a list which tracks observations of rare and endangered species through an electronic 'Red Book of the East Kazakhstan Region'.</p>
<p>Lessons learned</p>	<p>The eco-centre in less than a year engaged with more than 1,800 students, including pre-schoolers and secondary school students. Children learn through theory, research, and hands-on experimentation. Students study the local environment during field trips which show how to behave, protect and care for the natural environment. They also learn practical skills for reducing electricity consumption, using water economically, recycling, and minimising waste.</p>



Conclusion

Conclusion

The eco-centre promotes accessible educational lessons to all the city’s educational institutions through the library’s eco centre website which are reused. The eco-centre is a collective benefit for the citizens with local events taking place to clean the city and volunteers from lecturers and teachers in the natural sciences and humanities from schools and universities. Students also volunteer their time to work with the children to create a culture which is environmentally educational through the eco-centre.

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Case Study Analysis 1: Description

Title of Case Study	Country	Organisation/s	Time period	Local/ National/ International	Multiple or single institution	Type of Library	Type of library contribution	Types of partnership
The Green House of Boris Shcherbakov	Kazakhstan	Ust-Kamenogorsk City Library's Branch No. 2, Samruk-Kazyna-Trust	2022/2023	Local	Single institute	Public	Created an eco-centre for environmental education and culture of the people of UST-	Citizen science/ Local
Kenya National Library Service / Kibera public library: tablet computers support children's education	Kenya	KNLS Kibera Community	2012/2013	Local	Single institute	Public	The library initiated a project to support classroom teaching across all school subjects by using tablet computers with preloaded	Citizen science / Local
Community Engagement for Meaningful and Sustainable Digital Literacy Training in Uganda	Uganda	EIFL, National Library of Uganda, Peer 2 Peer University, and the Maendeleo Foundation,	2020-2022	National	Multiple institutes	Public	making openly and accessible digital skills training to libraries who already have computers specifically offering the training to women and unemployed youth and	National / government
EIFL Public Library Innovation Programme	Africa, Asia Pacific, Europe and Latin America	EIFL (Electronic Information for Libraries)	2014- ongoing	International	Multiple institutes	Public	The EIFL Public Library Innovation programme (EIFL-PLIP) addresses the challenge of developing	citizen science/local/national
Library as a Sustainability Leader: Creating sustainable Library and Resilient Communities:	Denmark	University Library of Southern Denmark	2019	Local	Single institute	Public	University library providing open access policies and roadmaps	Citizen Science
Open Climate Campaign	International	EIFL, Creative Commons, SPARC	2022-2026	International	Online resource	Public / Open Research	Making open and accessible	Citizen Science
Community Literacy Hubs	Bangladesh	IREX, Save the Children	2015	National	Multiple Institutes	Public	Access to reading and learning materials	local/ government
NLP book cart	Philippines	NLP, Library Renewal Partnership, 70 Degrees of Change Foundation	2017	Local	Single institute	Public Library	Creation of an accessible books and reading materials through the cart.	Local
Indian Institute for Human Settlements (IIHS) Library	India	Indian Institute for Human Settlements (IIHS) Library	2013 - onwards	Local	Single institute	Public library	Making urbanisation collection accessible	Local
Gladys Smith Library's role in education for the Roma Community	Argentina	Gladys Smith Library	2013 - onwards	Local	Single institute	public library	The library initiated a project which enabled Roma community	Local
Social Responsibility Programme	Costa Rica	Social Responsibility Programme	2019	National / Local	Multiple Institutes	public library	Providing a space for the general public and members to obtain	National / Government / Local
Global Climate Hub	International	SOSN Global Climate Hub	2022 - onwards	International	Online resource	Open research	Making openly accessible information on sustainable	Climate science

Case Study Analysis 2: Aims & Audience

Country / Organization	Aims	Audience	Access
Kazakhstan Ust-Kamenogorsk City Library's Branch No. 2, Samruk-Kazyna-Trust	Enlighten people of the environmental problems; climate change, depletion of the ecosystem, desertification, species extinction and waste and the solutions to these problems.	Target group is students of 66 secondary schools and 26 pre-schools in Ust-Kamenogorsk.	The eco-centre offers digital and scientific technologies such as digital microscope, instruments for measuring the parameters of air, soil and water quality; a soil-free germinator and equipment for hydroponic planting; an interactive platform for webinars; computers loaded with useful software; a virtual reality (VR) helmet and a three-D printer. For teaching, the library relies on volunteers, mostly lecturers and teachers in the natural sciences and humanities from schools and universities. Students also volunteer their time to work with the children. + lessons and presentations on the environment are available to all those who have access to the city's educational institutions via the library eco-centres website.
Kenya KMS Kibera Community Library	Objective of stimulating a desire for education among the younger population of the slum and to equalize opportunities for children from poor families to interact with technology to advance their learning and improve school performance, the Library began a project called "Kids on the Tab."	Children and families.	Improved access to education as the pre-loaded tablet was a resource for schools.
Uganda EFL, National Library of Uganda, Peer 2 Peer University, and the Maendeleo Foundation.	Up to twenty-five public and community libraries across Uganda will introduce or upgrade their digital literacy training programs. Aim to provide 11,500 people with basic information literacy skills or improve their existing skillset. At least two thousand learners will attend online courses to access knowledge and information that will be useful in their daily lives.	Women and unemployed youth	Access for women and unemployed youth to computers and the internet. Provide access to skills to use technology, build confidence and provide practical and marketable digital skills that are needed to compete in the labour market. Also, the project will access remote rural communities, organizing camps at which people will learn digital skills, including using mobile phones to connect to the internet and find information and services.
Africa, Asia-Pacific, Europe and Latin America EFL (Electronic Information for Libraries)	Aim to identify practical, sustainable, local solutions that generate real real change by sharing case studies of successful public library services and supporting public librarians' capacity to develop new and innovative services that meet community needs. EFL-PLUP offers learning and networking experiences internationally for young African public librarians to help innovate.	Library consortia in 38 countries in Africa, Asia, Europe representing more than 3,000 libraries.	EFL-PLUP targets public libraries that already or are about to receive computers and internet connections. Training programmes are adapted to local needs and environment, the curriculum is drawn on EFL's expertise in supporting development of innovative public library services. A participatory and practical training methodology approach is used by local and international trainers. EFL's approach includes a train-the-trainer method by identifying public librarians to become the trainers, deepen their knowledge, & build their technical skills.
Denmark University Library of Southern Denmark	Aims to provide accurate information on numerous aspects of sustainability and help communities become more environmentally sound, socially equitable and economically feasible.	Students and employees	Promoting Open Science within institutions and providing open access to research and education
International EFL, Creative Commons, SPARC	Open research in climate science and biodiversity to accelerate development of solutions to the climate crisis and the conservation of biodiversity.	Researchers, national governments, funders and environmental organisations.	Access knowledge-sharing, progress discovery, advocate research collaboration and combine global stakeholders efforts to open resources.

Country / Organization	Aims	Audience	Access	Use and re-use
Bangladesh WEK, Save the Children	To support community literacy specifically for early grade schoolers and address the need for greater community support.	Early grade children	Accessible educational content and material through public libraries.	The material used has been digitized on technology which is reusable. Appropriate books and games are used by the library and learned lessons are shared to promote a culture of practice in the library.
Philippines NLP, Library Renewal Partnership, 70 Degrees of Change Foundation	The objective of this programme was to promote reading and learning through sessions such as storytelling and read-aloud. Also to encourage the practice of good hygiene, socialisation and proper grooming by instructing the children.	Marginalised children and out-of-school youth	The programme was implemented through the provision of access to books and learning materials directly to children and youth through the park. The sessions hosted by the Book Cart in the park are held a week and last for 2-3 hours. The participation rates include a range from 10-30 children per session.	The learning material and books provided by the programme are reusable and the lessons learnt through the sessions held by the programme are impactful on the children for life.
India Indian Institute for Human Settlements (IIHS) Library	The library aims to develop the largest extensive reference library on urbanisation in South Asia.	Researchers, scholars, members, staff and the public	The urbanisation collection is made available is stored in the library's collection and remains available and reusable to its members, staff, scholars and the public.	The materials and resources are reusable and available for the members, scholars, public and staff. The information is used for teaching and learning. The library provides updates content and historical content.
Argentina Gladys Sordh Library	A project aimed at including the Roma community to teach reading and writing to adults. The aim of the programme is to improve the Roma community's civic awareness and literacy skills.	Roma community members with a special focus on women	The library is accessible to the public and provides information workshops and primary education to adults.	The materials and content in the workshops and library are taught by community individuals and organisation to the public.
Costa Rica Social Responsibility Programme	To encourage environmental education at all levels, manage consumption levels and address the community's environmental challenges.	community members, public and library	A space for the general public and members to obtain information	The library uses its resources i.e. its staff to engage the community to organise the events needed to meet the goals of the Social Responsibility Programme.
International SDSN Global Climate Hub	The main aim of the SDSN GCH is to provide science-based and appropriate recommendations for achieving sustainable societies based on financial solutions.	Leaders worldwide	Open Science and Open Access data and scientific infrastructures will be used for efficient and effective progress toward appropriate solutions	The information will be open access and reusable.



Case Studies Analysis 3: Impact 1

Country / Organization	Societal/cultural/economic Impact	Educational outcomes	Sustainability
Kazakhstan Ust-Kamenogorsk City Library's Branch No. 2, Samruk-Kazyna-Frust	The library has created more than 50 environmental lessons and presentations to inform people of environmental problems. Understanding of environmental issues has grown, and citizens are united through the action needed to be taken to reduce pollution and waste. Numerous events were held to clean up the city from garbage. School children are contributing to a list which tracks observations of rare and endangered species through an electronic 'Red Book of the East Kazakhstan Region'.	The eco-centre in less than a year engaged with more than 1,800 students, including pre-schoolers and secondary school students. Children learn through theory, research, and hands-on experimentation. Students study the local environment during field trips which show how to behave, protect and care for the natural environment. They also learn practical skills for reducing electricity consumption, using water economically, recycling, and minimising waste.	The eco-centre educates students on sustainable practices through practical skills taught including reducing electricity consumption, using water economically, recycling and minimising waste. Students also grow various types of plants in the eco-centre.
Kenya KNLS Kibera Community Library	The first group of students who benefited from the program took their Kenya Certificate of Primary Education (KCPE) examinations in 2013 and showed a considerable improvement in their mean grades compared to students in previous years. Remarkable improvements for students such as age-gains in mental calculations and increased confidence and motivation to learn are indicators of its success. Demonstrated the effectiveness of information and communication technology (ICT) in supporting classroom teaching. The library also works with teachers in the urban slum to	Before the project, no children from Kibera had ever gained admission to provincial and national high schools. As a result of the "Kids on the Tab" project, out of the five schools that participated in the first training, 35 children (almost 30% of the project participants) were admitted to national schools.	The use of technology provides a reusable sustainable method for providing educational content to children.
Uganda EIFL, National Library of Uganda, Peer 2 Peer University, and the Maendeleo Foundation.	A community needs assessment presented the need for the development of a digital literacy training program for librarians to provide them with the resources to deliver digital skills training to their communities. The impact of this community needs assessment showed that many librarians already had ICT skills however struggle to teach. The assessment provided insight to identify active community members potentially interested in promoting training youth and women through libraries and might volunteer to help librarians run and expand	Established a strong foundation for needs-based library service development. Provided an effective outreach strategy to the community which promoted the new library services.	This project used simple measurements to provide a detailed insight into the national public and community needs of libraries in relation to ICT equipment and digital literacy training.
Africa, Asia Pacific, Europe and Latin America EIFL (Electronic Information for Libraries)	The training has reached all public libraries in Ghana, Kenya, Namibia, Uganda and Zambia that have computers and internet connections, and which offer public access to this technology. 62 trainers completed our train-the-trainers programme in Kenya, Namibia, Uganda and Zambia and are being deployed in ongoing staff development strategies for public libraries in their countries. 45 young African public librarians from 13 countries have travelled to Europe, Southeast Asia and the USA as part of the EIFL Initiative for Young African Library Innovators (IYALI), bringing home new ideas, which they have implemented in their libraries African public librarians who have completed EIFL's capacity building and training-of-trainers programmes regularly join EIFL's virtual 'T-breaks' (knowledge sharing events to connect public library trainers from across the continent)	EIFL has inspired libraries to build the capacity of ICT, to improve lives, advocate for libraries to advance development, and reward innovative library services.	Reproduces and innovates good sustainable practices which have been learnt from previous successes. Promoting communities with educational services through libraries.
Denmark Helsingørsk Bibliotek of Southern Denmark is inspiring the	The library provides digital media and information		Access to educational materials on sustainability such as

Case Studies Analysis 3: Impact 2

Country / Organization	Societal/cultural/economic impact	Educational outcomes	Sustainability
Denmark University Library of Southern Denmark	University Library of Southern Denmark is impacting the culture within libraries by changing the environment of research and education within university. The library is encouraging students and employees to implement environmentally good practices and supporting communities in becoming more economically advantageous, environmentally conscious and resilient communities.	The library promotes digital, media and information literacy and skills that support sustainability.	Access to educational materials on sustainability such as the green transition and global measurement, which informs and motivates students to implement green measures in their own everyday life.
International EIFL, Creative Commons, SPARC	Open Access of climate science can impact society by producing solutions from shared research to policy. The environmental impact of open access is the shift from research to implementation. Open Climate Campaign impacts society by bringing researchers together by making content available in different languages and a cultural impact through the shared knowledge of regional perspectives.	The Open Climate Campaign will engage with commonly excluded geographical regions and educate researchers, policymakers, and universities on these issues	The programme is fundamental to the climate crisis and promotes sustainability through the content being shared openly and also as an online resource reusable and accessible to all
Bangladesh IREX, Save the Children	Children have better access to reading materials and enjoy spending time reading outside of school. The community demonstrated increasing support for young children's literacy rate.	Libraries offer children a safe learning platform outside of school which are enshrined in a community. They provide a space for children to spend time and fill a gap. Libraries capture community support for literacy. Improvement in reading practice and performance were noted for community library users.	Quality education is supported by the libraries by providing a safe space to learn outside of school and home.
Philippines NLP, Library Renewal Partnership, 70 Degrees of Change Foundation	Marginalised children and youth have learned to enjoy and appreciate books and reading. An increased interest in books and attending school has been testified by Parents. The programme's own evaluation presents improvement in participants' language and reading skills which supports transitioning into the education system. Additionally, children and youth in the park have increased respect for the environment as observed by the park guards.	Directly engaging with the youth and children through educational provision with activities and sessions has a positive impact on children's interest in reading and books. Teaching children lessons in personal hygiene promotes better health and development outcomes. The community impact of the NLP Book Cart is shown through the children's increased respect and consideration for the environment.	Through programmes such as this children's health and wellbeing is prioritised and the impact of this is acknowledged through parents and community members. Intervening in children and youth teaches them lessons for life and promotes education.

Case Studies Analysis 3: Impact 3

Country / Organization	Societal/cultural/economic impact	Educational outcomes	Sustainability
India Indian Institute for Human Settlements (IHS) Library	The number of library users has significantly increased institutional research output with 445 articles procured in 7 years; this correlates with the number of library users which has risen by 276% since 2013. The library has become a central hub for information on India's urbanisation and has played a central role in identifying resources and making them available.	Difficult-to find resources that are fundamental to the development of a country and need to be exposed. Material on key topics should be made available and accessible for researchers and library users to attain.	The library provides information on sustainability with the key topic focusing on urbanisation and continues to provide and promote solutions to development of India's cities through sustainable and successful examples. The urbanisation collection uses materials available, both historical and oral, and updated research from public statistics. The library is sustainable in its reusable content and the use of technology makes it accessible to its members.
Argentina Gladys Smith Library	Since its establishment the programme has taught over 60 people how to read and write. The development of workshops and activities to meet the needs of the Roma community has shown great success. In particular, a workshop on sewing has greatly impacted Roma women by teaching them how to sew their own clothes instead of buying them. The information workshops which centre on citizen's rights have improved the Roma community's civic empowerment. The work of the library and project partners has transformed the areas of literacy, health, and social inclusion for Roma people and specifically Roma women.	Social inclusion is imperative to transform the lives of ethnic minority groups. The need to meet the demands of community members is pivotal to allow civic rights to be met. The role of the library has been transformative for the lives of many Roma women and men.	The library supports good health and wellbeing practices through the workshops made available to community members. The work of the adult school allows individuals to receive and complete primary education. The library is reducing inequalities by aiming its work at minority group members and women who are often excluded in society.
Costa Rica Social Responsibility Programme	The organised community beach clean which consisted of 50 community members and librarians removed 3,000 kilograms of garbage from the beach. The event which aimed at improving the park in San José involved 25 librarians, the Board of Directors, and administrative staff of COPROBI. They planted 250 trees for the long-term plan of planting 5,000 trees.	Alliances with universities, libraries, students, community members and the cooperation of private companies and civil society organizations enable the programme to flourish.	The work carried out by the Social Responsibility programme was embedded in sustainable and environmentally good practices ensuring the community members and the local areas were positively impacted.
International SDSN Global Climate Hub	The GCH produces models and links these to the non-scientific community. These models provide useful tools for policy makers such as evidence based support needed to facilitate the development of technological, financial, and policy deliverables towards achieving climate based solutions and supporting sustainability transition.	Human-environmental and economic systems are complicated, however the GCH shows the feasibility of improving these systems through scientific resources, local stakeholders involvement, and cooperation between public and private sectors.	The GCH promotes sustainable practices for societies through the provision of science-based solutions for combating the climate crisis. A transition towards sustainably led communities



Case Studies Analysis 4: Principles & Problems

Country / Organization	FAIR, CARE, FOREST and related principles	Challenges/barriers: funding, infrastructure, digital divide, and policy constraints
Kazakhstan Ust-Kamenogorsk City Library's Branch No. 2, Samruk-Kazyna-Trust	The eco-centre fosters FAIR principles as it promotes accessible educational lessons to all the city's educational institutions through the library's eco centre website which are reused. CARE principles include the eco-centre as a collective benefit for the citizens with local events taking place to clean the city and volunteers from lecturers and teachers in the natural sciences and humanities from schools and universities. Students also volunteer their time to work with the children. FOREST principles include the conservational and educational behaviour fostered through the eco-centre.	The loss of literacy in the environment and the culture created through this. The concerning effects of climate change on citizens and the threat caused by it.
Kenya KNLS Kibera Community Library	A community library provides a space for all to acquire knowledge and information. The "Kids on the Tab" project encouraged equality and digital inclusion through the use of technology and skills to promote education from the library to	Challenges for this library included the low levels of participation in education, access to ICT, training and skills needed to use technology
Uganda EIFL, National Library of Uganda, Peer 2 Peer University, and the Maendeleo Foundation.	This case study looks at promoting inclusiveness through aiding its assessment on women and youth unemployed to improve their digital literacy skills and training.	Challenges and barriers include power supply and hardware, a lack of staff, and a lack of staff confidence in running digital literacy training, lack of free or affordable access to technology; a lack of computer and online literacy skills; and limited awareness about the wealth of information the internet has to offer on education, employment, communication, and other opportunities.
Africa, Asia Pacific, Europe and Latin America EIFL (Electronic Information for Libraries)	Issues in key areas which are advanced with EIFL through community development include agriculture, digital inclusion, education, employment, health, and women and girls.	The challenge of exclusion exists for those who are not given access to these necessary resources to avail of this major foundation to development. EIFL addresses this challenge by promoting the role libraries have in promoting the accessibility of the internet and by providing training and skills to work across vital development issues including digital inclusion and ICT.
Denmark University Library of Southern Denmark	The advocacy and use of Open Science materials supports all principles of FAIR. The sustainable commitments made by the library promote all FAIR, CARE and FOREST principles.	Having the necessary background, structures, infrastructures and skills to become a local agency able to take part in a developing sustainable society.
International EIFL, Creative Commons, SPARC	Universal access to research and data promotes FAIR principles	Breaking down the barriers to Open Access content by reaching governments, researchers, funders and environment organisations.
Country / Organization	FAIR, CARE, FOREST and related principles	Challenges/barriers: funding, infrastructure, digital divide, and policy constraints
Bangladesh BEX, Save the Children	The community based development programme is a collective benefit for the communities development by promoting children's education and participation rates.	Overcrowded classrooms and low literacy rates. The short period in schools (three hours a day) and the volume of students in the classroom has led to less time to learn to read and practice contributing to low development in literacy rates.
Philippines NLP, Library Renewal Partnership, 70 Degrees of Change Foundation	FAIR principles are considered in this programme as materials are made accessible to all children and youth. The CARE principles promote the education of marginalised children. FOREST guidelines are understood within the content taught and the positive lessons learnt about the	The barriers and causes of violations of children's rights. The deprivations and vulnerabilities faced by marginalised children which contribute to growing inequalities.
India Indian Institute for Human Settlements (IHS) Library	The content and materials fall under FAIR and CARE principles with the library promoting a collective benefit for the community and the accessibility of this information.	Rapid urbanisation and unsuitable infrastructure has become a danger to cities in India. Limited access to resources in this area have been a challenge to find information and use it to determine India's development.
Argentina Gladys Smith Library	The work of this library is inclusive of ethnic minorities and promotes accessible education for members of the Roma community.	The Roma community are often faced with social exclusion and barriers to access education, culture, justice and health service information.
Costa Rica Social Responsibility Programme	This programme is a collective benefit for the community members and the responsibility on society to adopt environmentally fair practices supports the principles of FAIR and CARE.	To replenish the ecological footprint of Costa Rica and address the problematic environmental challenges. To manage and guarantee the programmes objectives are reached through promotion of voluntary work.
International SDSN Global Climate Hub	The GCH is a centre for accessing sustainable providing science-based recommendations for combating the climate crisis and preventing further decline.	The social and economic consequences of climate change and the need for leaders globally to take immediate action on climate based solutions.



Case Study Analysis 5: Mapping to ESD Priority Action Areas

	ESD Priority Action Area 1 Advancing Policy	ESD Priority Action Area 2 Transforming learning and training environments	ESD Priority Action Area 3 Building capacities of educators and trainers	ESD Priority Action Area 4 Empowering and mobilizing youth	ESD Priority Action Area 5 Accelerating sustainable solutions at local level
Country/Organisation					
Kazakhstan					
Ust-Kamenogorsk City Library's Branch No. 2, Samruk-Kazyna-Trust		✓		✓	✓
Kenya					
KNLS Kibera Community Library		✓		✓	✓
Uganda					
EFL, National Library of Uganda, Peer 2 Peer University, and the Maendeleo Foundation.		✓		✓	✓
Africa, Asia Pacific, Europe and Latin America					
EFL (Electronic Information for Libraries) Denmark		✓	✓		✓
University Library of Southern Denmark	✓	✓		✓	✓
International					
EFL, Creative Commons, SPARC	✓				✓
Bangladesh					
REX, Save the Children		✓		✓	✓
Philippines					
NLP, Library Renewal Partnership, 70 Degrees of Change Foundation		✓			✓
India					
Indian Institute for Human Settlements (IHS) Library		✓			✓
Argentina					
Gladys Smith Library		✓			✓
Costa Rica					
Social Responsibility Programme International		✓			✓
SDSN Global Climate Hub	✓		✓		✓

Findings from the Case Studies

The case studies examine how libraries play a significant role in education for sustainable development. These studies show us practical examples of how libraries across the world have contributed to educating communities, members, scholars, researchers, national governments, and the public on issues and solutions surrounding sustainable development and OER. An analysis across several countries showed us how libraries promote knowledge, awareness and action towards sustainable development. By examining these cases, we can learn how libraries can be powerful agents for positive change in education for sustainable development efforts.

The case studies identified cover a variety of countries, with particular interest in developing regions, this showcases the diverse ways in which libraries are contributing to education for sustainable development and open education resources globally. The innovative approaches libraries take to provide valuable resources to support education on sustainability and promote knowledge sharing are highlighted. The analysis enables us to understand the variety of challenges libraries are faced with to support sustainable education and the necessary recommendations to address these issues. It is apparent that libraries have been instrumental in supporting education initiatives and open education resources available on sustainable development. Libraries serve as a link between society and knowledge production. Their contributions have been significant in raising awareness and promoting shared knowledge.



6. Analysis: Networks

Libraries are deeply connected with national, regional and global networks that form an effective international community of expertise and advocacy. This community will be the bedrock of the proposed Global Knowledge Commons for Education for Sustainable Development. The following agencies and associations are part of this network; all are deeply engaged with libraries. The list is not comprehensive and can be developed further.

AmeliCA - South-South Network

AmeliCA Open Science is a collaborative initiative intended to promote and strengthen the development of Open Science from the paradigm of the commons focused on a scientific communication model of a non-profit scholarly nature. AmeliCA emerged in 2018 with the support of UNESCO, CLACSO, and Redalyc as AmeliCA Open Knowledge in the Latin American region with dozens of member institutions. In 2023, it advances and defines its action spectrum toward Open Science with a broader geographic scope to include other regions from the Global South, such as Africa and Asia. In this new stage, Latin American alliances are consolidated and diversified. Open Science AmeliCA members are non-profit scholarly institutions, government entities, infrastructures, and organizations.



COAR (Confederation of Open Access Repositories) - **Global Network Technical/Advocacy**

COAR is an international association with over 130 members and partners from around the world representing libraries, universities, research institutions, government funders and others. COAR brings together individual repositories and repository networks in order to build capacity, align policies and practices, and act as a global voice for the repository community. COAR’s vision is that of a sustainable, inclusive and trusted global knowledge commons based on a network of open access digital repositories



COAR members (<https://coar-repositories.org/about-coar/>)

Creative Commons - Global Network: Legal

Creative Commons (CC) is an international nonprofit organisation that empowers people to grow and sustain the thriving commons of shared knowledge and culture that is needed to address the world’s most pressing challenges and create a brighter future for all.

Together with the global community and multiple partners, building capacity and infrastructure, CC develops practical solutions, and advocates for better sharing: sharing that is contextual, inclusive, just, equitable, reciprocal, and sustainable. The CC movement is based on the notion of “some rights reserved”, providing a balance between creators and consumers of intellectual property. The concept allows clear indication of how work may be used, reused and distributed, while ownership remains in the control of authors and copyright owners.

‘ ... there are over 2.5 billion CC-licensed works online.’



IFLA - Global Network: Professional

The International Federation of Libraries Associations and Institutions (IFLA) is the leading international body representing the interests of library and information services and their users. It is the global voice of the library and information profession. IFLA promotes a strong and united global library field powering literate, informed and participatory societies. It provides a reference point across activities, both for IFLA and for the library field as a whole, providing direction and inspiration for all that they do. Its vision is to inspire, engage, enable and connect the global library field and this is reflected in the work that IFLA does in order to support its members and beyond, through providing tools and materials, a forum for discussion and learning and advocacy work. There are 2.8 M libraries in the world, as recorded by IFLA, broken down by National (319), Academic (86,350), Public (412,918), Community (29,229) School (2.2 M) and Other (42,196). 1.6 million full time staff work in them, with 620,740 volunteers.



IFLA World Map of Libraries (<https://librarymap.ifla.org/>)



Knowledge Equity Network (KEN) - Global Network: Advocacy

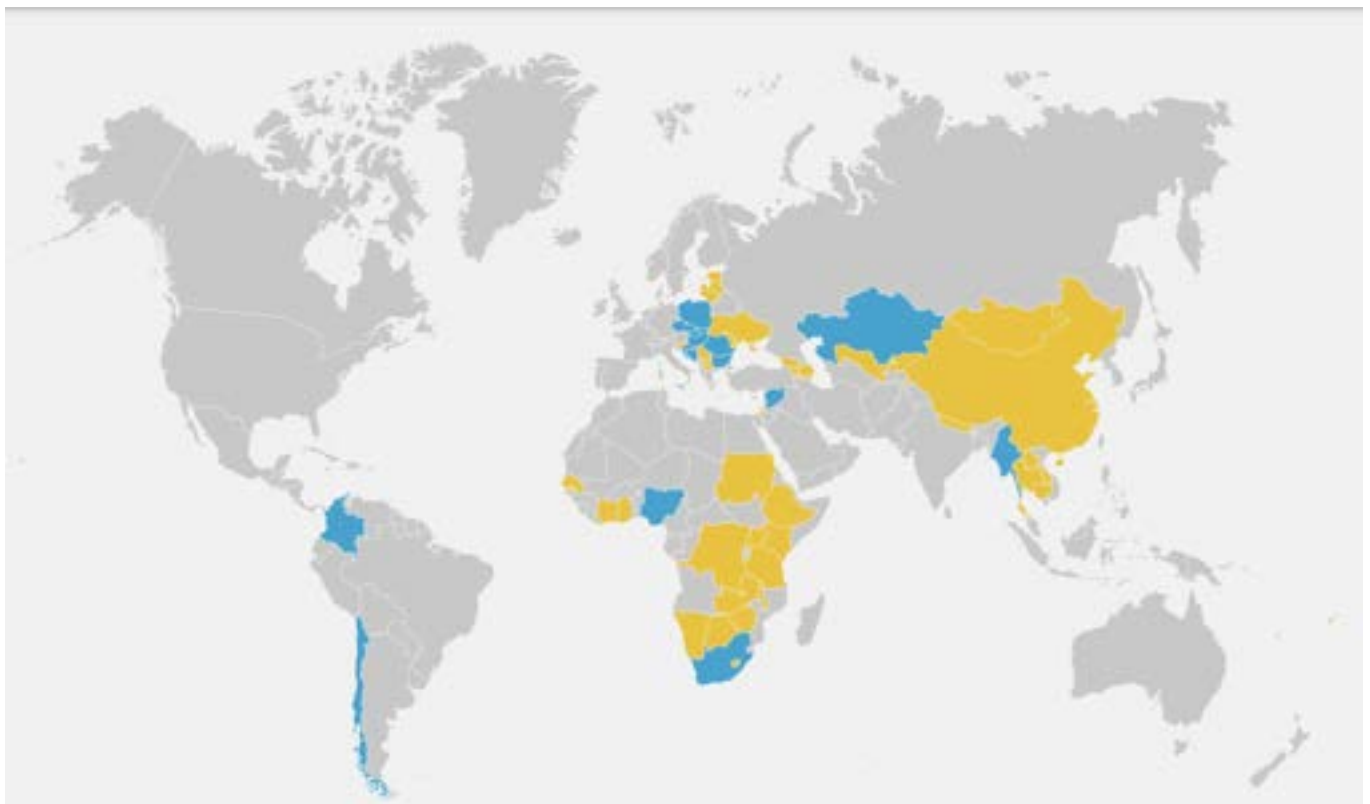
The Knowledge Equity Network (KEN) was prompted by the observation that limited access to knowledge is a barrier to finding and implementing solutions to the major global challenges facing the planet. KEN believes that global challenges require a collective response. Breaking down the barriers that prevent equitable access to knowledge across institutions and geopolitical boundaries, we can focus on open and collaborative practices of knowledge creation and dissemination. The network's ambition is to connect a large number of international knowledge institutions that share the same vision, emphasising in this the equality of education and research. The following map shows the location of the KEN signatories to date.



Location of signatories of the KEN Declaration (<https://knowledgeequitynetwork.org/signatories/>)

EIFL - Global Network: Advocacy, Legal, Support

EIFL (Electronic Information for Libraries) is a not-for-profit organisation that works with libraries to enable access to knowledge in developing and transition economy countries in Africa, Asia Pacific, Europe and Latin America. In a highly networked digital world EIFL’s activities help people to access and use information for education, learning, research and sustainable community development. Their vision is a world in which all people have the knowledge they need to achieve their full potential. In 2023, EIFL worked in partnership with library consortia in 37 countries and ran projects in additional 17 countries.



(<https://eifl.net/annual-report/2023/>)

Yellow: PARTNER COUNTRIES are countries where EIFL has a formal agreement with the national library consortium. EIFL partner consortia work with all EIFL programmes.

Blue: PROJECT COUNTRIES are countries in which EIFL works with libraries on specific projects.

LIBER

LIBER Europe (Ligue des Bibliothèques Européennes de Recherche – Association of European Research Libraries). LIBER manages a network of over 400 research libraries, in 40 countries, connecting stakeholders and networks, which gives a good footing to share knowledge between organisations within the scholarly communication landscape. LIBER is a member of IARLA, the International Alliance of Research Library Associations, which includes ARL (United States), CARL (Canada), CAUL (Australia and New Zealand) and RLUK (UK).



OER Africa

OER Africa is a ground-breaking initiative established by the South African Institute for Distance Education (Saide). OER Africa plays a leading role in supporting higher education institutions across Africa in the development and use of Open Educational Resources (OER) to enhance teaching and learning. The mission of OER Africa is to improve African universities' abilities to use OER effectively to support quality teaching and learning and to establish dynamic networks of African OER practitioners by sensitising and connecting like-minded educators – teachers, academics, academic librarians, trainers, and policy makers – to develop, share, and adapt OER to meet the education needs of African societies. By creating and sustaining networks of collaboration – face-to-face and online – OER Africa supports African educators and learners to harness the power of OER. In turn, they can develop their capacity and join emerging global OER networks as active participants who showcase Africa's intellectual property, rather than passive consumers of knowledge produced elsewhere.



(<https://www.oerafrica.org/>)



OpenAIRE

OpenAIRE is a key EU e-Infrastructure whose mission is to establish, maintain and operate an open and sustainable scholarly communication infrastructure and provide the necessary services, resources and network for supporting a common European e-science environment. It supports a set of services to facilitate the road to Open Science. OpenAIRE's operations and services seek to align policies by engaging all stakeholders for an effective Open Science implementation via our network of 34 National Open Access Desks (NOADs) operating a European Helpdesk. It also provides Open Science services by embedding Open Science into researcher workflows, via interoperability services that connect research and enable all stakeholders to easily adopt Open Science, links research by building global common standards and monitor (open) science by building the European Research Information system that encompasses all research and enables ready-made reporting, monitoring and analysis.

It trains for Open Science by fostering the culture change for Open Science practice and builds global bridges by connecting Europe to the global open research environment.



OpenAIRE members

Redalyc - Global South, Spain & Portugal Network: Publishing

The Redalyc project (Red de Revistas Científicas de América Latina y El Caribe, España y Portugal) is a bibliographic database and a digital library of Open Access journals, supported by the Universidad Autónoma del Estado de México with the help of numerous other higher education institutions and information systems. The project started in October 2002 with the general aim of building a scientific information system made up by the leading journals of all the knowledge areas edited in and about Latin America. Since its creation, its goal is: to give visibility to the scientific production generated in Ibero-America, which is underestimated worldwide. As of 2015, Redalyc is an information system that also evaluates the scientific and editorial quality of knowledge in Ibero-America. Redalyc indexes more than 1,400 Open Access peer-reviewed journals (70% of Social Sciences and Humanities) published by 670 institutions from 31 countries worldwide. Redalyc provides access to more than 700,000 full-text articles in different languages (mainly Spanish, Portuguese, French and English) from 1.8 million authors from 150 countries, with around 10 million article downloads per month from around the world.

SPARC (Scholarly Publishing and Academic Resources Coalition)

SPARC is an alliance of academic and research libraries established to address market dysfunction in the scholarly communications publishing system. Its focus has been on serving as a catalyst in the establishment of alternative mechanisms that take advantage of the networked environment to disseminate research. SPARC's roughly 250 North American members represent eight Canadian provinces as well as 47 States in the US and the District of Columbia. The membership includes several institutions from outside North America and affiliate memberships of four major library associations. In addition to SPARC's three global affiliates (SPARC Europe, SPARC Japan, and SPARC Africa), this broad and comprehensive representation from libraries helps reinforce the coalition's international focus. Through its projects, advocacy, and educational work, SPARC is demonstrating that it is possible to develop high-quality, affordable competitors to high-price commercial journals. It has also provided information and support to help motivated editors and authors to be their own agents of change.



SPARC Europe

SPARC Europe is a membership organisation for European research libraries and research organisations. Membership is open to National Libraries; Library Consortia; University Consortia; European Universities European University Libraries; European Research Institutes; Other Higher Education Institutes. Its mission is to create change and build a better scholarly communication system for the future. Its work is focused on achieving Open Access, where articles and data are digital, online, free of charge for everyone and free of most copyright and licensing restrictions which means users are free to reuse as long as they give appropriate credits to the creator. The Organisation's objects are promoting change in the process of scientific communication, stimulating competition and supporting new models of publications which serve the international research community better, and everything that is related or conducive to the foregoing, all in the widest sense.





7. Building Blocks for Education for Sustainable Development and Libraries

It is clear from the literature that libraries worldwide are deeply and widely involved in contributing to education for sustainable development at multiple levels. All types of libraries are involved (public, school, academic/research, parliamentary) and all of the competences and professional strengths of librarians are engaged. This activity is truly global and libraries in the Global South are strongly represented. There is a strong correlation between ESD and Open Educational Resources, another area in which libraries are also active as creators and disseminators of knowledge. Libraries are experts in copyright, licensing, metadata, digital identifiers, interoperability and on the development and management of online repositories and platforms. The connection between the power of Open Access, OER and ESD should be more clearly articulated and developed.

Our expert interviewees identified the need for quality information and knowledge, especially in the context of internet misinformation and disinformation. Libraries are seen as contributing to knowledge sharing, lifelong learning and cultural awareness of individuals and institutions in many different ways. A recurring theme encountered in collecting evidence from stakeholders was at times a lack of visibility of the library and its services. This was further reinforced by calls for libraries to take action, use their voice and be part of policy and decision making process, build deeper collaborations with the wider community and education ecosystem, adopt a holistic view and approach on how they collect, create, disseminate and broker information, and looking to the future the need to create synergies with other stakeholders.

The case studies demonstrated the significant roles libraries play in education for sustainable development, providing practical examples of how libraries across the world have contributed to educating communities, members, scholars, researchers, national governments, and the public on issues and solutions surrounding sustainable development and OER. It is clear that libraries can be powerful agents for positive change in education for sustainable development efforts. Libraries serve as a link between society and knowledge production. Their contributions have been significant in raising awareness and promoting shared knowledge.



Libraries do not act alone. This is important for the achievement of ESD, which requires collaboration on a global level. Our analysis of the networks that span the globe and reach right into the hearts of local communities shows that there is an existing coalition of expert stakeholders who are poised to work together for ESD. Professional networks, digital networks, policy networks, advocacy and support networks are all involved and are interconnected. Libraries are part of that network.

This study aims to identify a model to aid libraries to focus and unify their contributions to ESD. To achieve this, at a fundamental level, there needs to be a commitment to the principles of the Berlin Declaration for Education for Sustainable Development.



Berlin Declaration Education for Sustainable Development.

Commitment to Sustainable Development
 Transformative Education
 Inclusivity and Equity
 Integration Across Sectors
 Global Citizenship and Local Relevance
 Critical Thinking and Problem-Solving
 Sustainable Practices in Education
 Policy and Financial Support
 Monitoring and Evaluation
 Urgency and Collective Action

In addition, a set of complementary principles should be adopted. These should include the CARE Principles for Indigenous Data Governance⁸, the FAIR Principles⁹, the FOREST Framework¹⁰, the POSI Principles on Open Scholarly Infrastructure¹¹, the Helsinki Initiative on Multilingualism in Scholarly Communication¹² and the IFLA Code of Ethics for Librarians and Information Workers¹³. Local and institutional policies can then be aligned with these principles. Research performing organisations and their libraries should consider signing the AmeliCA principles, the Barcelona Declaration and the Manifesto on Science as a Global Public Good: Non-Commercial Open Access^[1], and should consider joining COARA (Coalition for Advancing Research Assessment).^[2]

Specifically regarding ESD, UNESCO’s Framework for the implementation of ESD is being adopted worldwide by governments, educators and all others involved in this effort. It should be adopted by libraries too and integrated within their policies, strategies and actions. The Framework is based on the 5 Priority Action Areas for ESD.

8 <https://www.gida-global.org/care>
 9 <https://www.go-fair.org/fair-principles/>
 10 <https://www.nextgenlibpub.org/forest-framework#:~:text=The%20FOREST%20Framework%20treats%20principles,regularly%20revisited%20by%20the%20community>
 11 <https://openscholarlyinfrastructure.org/>
 12 <https://www.helsinki-initiative.org/>
 13 <https://repository.ifla.org/handle/123456789/1850>



Priority Action Area 1: Advancing policy: mainstream ESD

Priority Action Area 2: Transforming learning and training environments: whole-institution approach.

Priority Action Area 3: Building capacities of educators and trainers

Priority Action Area 4: Empowering and mobilising young people.

Priority Action Area 5: Accelerating local level actions.

Our case studies analysis shows that library contributions to ESD can be readily and usefully mapped to these 5 Priority Action Areas. If libraries were to map all of their activities to these Areas, they may then consider themselves and their work as an integrated part of the ESD Framework and its supporting actions, as presented in ESD for 2030 (UNESCO, 2019) and subsequent publications.



Priority actions from Framework for the implementation of Education for Sustainable Development (ESD) beyond 2019 (UNESCO, 2019).

The supporting actions provided by UNESCO to member states presented in the chart above can be adopted and amplified by libraries and their representative organisations. They are listed below.



The 5 Priority Action Areas can be broken down into key objectives, which can then be used for monitoring and feedback purposes. Ireland’s Government has developed such a set of objectives (see chart below) which could be adapted with relative ease for libraries.



Adapted from: Government of Ireland ESD for 2030 Second National Strategy on Education for Sustainable Development Report on the key themes emerging from the public consultation process (<https://assets.gov.ie/228531/0813e72f-ce07-4efe-bd59-437bc39864f1.pdf>)

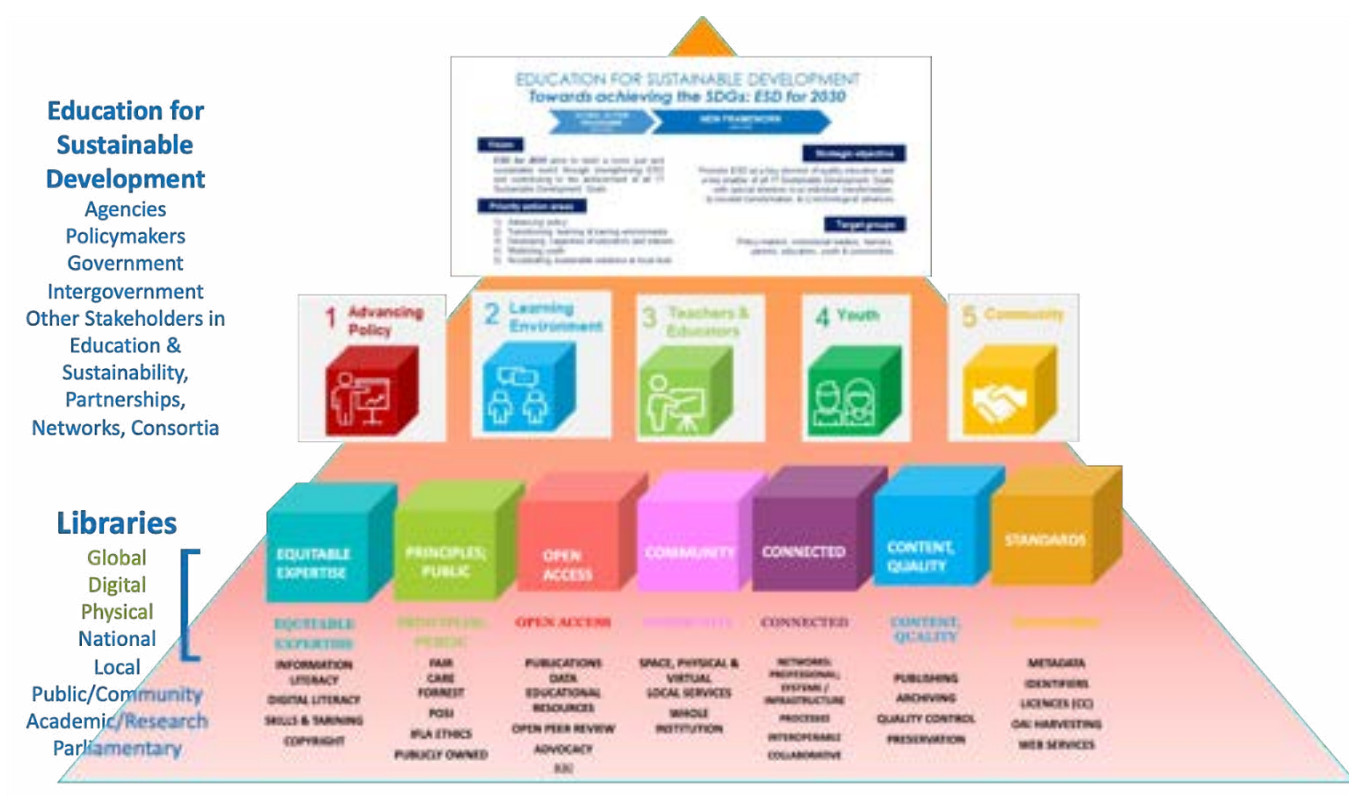
The research undertaken clearly demonstrates that the multi-varied competences, attributes and activities of library work, both traditional and cutting edge, make a vital contribution to ESD. Those competences, attributes and activities are presented below. The headings used and their underlying elements are derived from terms that have been mentioned repeatedly in the literature, interviews and case studies on the contribution of libraries to ESD.

EQUITABLE; EXPERTISE	PRINCIPLES; PUBLIC	OPEN ACCESS	COMMUNITY	CONNECTED	CONTENT; QUALITY	STANDARDS
INFORMATION LITERACY	FAIR	PUBLICATIONS	SPACE, PHYSICAL & VIRTUAL	NETWORKS:	PUBLISHING	METADATA
DIGITAL LITERACY	CARE	DATA	LOCAL SERVICES	PROFESSIONAL;	ARCHIVING	IDENTIFIERS
SKILLS & TRAINING	FOREST	EDUCATIONAL RESOURCES	WHOLE INSTITUTION	SYSTEMS / INFRASTRUCTURE	QUALITY CONTROL	LICENCES (CC)
Copyright	POSI	OPEN PEER REVIEW		PROCESSES	PRESERVATION	OAI HARVESTING
	IFLA ETHICS	ADVOCACY		INTEROPERABLE		
	PUBLICLY OWNED	RRI		COLLABORATIVE		
		TOOLS				
		PROCESSES				

‘EPOCS’ Categorization of Library Contributions to ESD

These library attributes are the building blocks of libraries’ contributions to ESD. Harnessed to the ESD Priority Action Areas, focused on transformation and on knowledge as a public good, embedded in community, powered by expertise and connected in worldwide partnerships, libraries are poised and ready to play a significant role in the development of the proposed Global Knowledge Commons for Education for Sustainable Development.

Libraries Contribution to ESD



8. Towards a Global Knowledge Commons for Education for Sustainable Development.¹⁴

Throughout this report we have seen that libraries make a significant contribution to ESD, but also that their potential contribution could be much greater given the right resourcing, the right strategies and direction, the right skills and training and the right policy environment. Libraries are characterized by equity and expertise, adherence to ethical principles and (usually) public ownership, open access systems and processes development and advocacy, deep community focus and local and worldwide connectedness, content curation and creation, knowledge management and standards development and compliance, inter- and transdisciplinarity, along with their positioning in schools, prisons, universities, professional organisations, hospitals, government agencies, parliamentary bodies, cultural organisations, corporate bodies, NGOs. As such, libraries are uniquely placed to play a key role in ESD, and particularly in the development of a Global Knowledge Commons for Sustainable Development.

However, we have also seen that libraries are generally omitted from ESD policies at both government and institutional levels. This is an indication of a fragmented and siloed global educational system which is far from optimal in terms of achieving ESD for 2030.

Fragmentation and lack of coherent policies at institutional and other levels are not the only problems facing ESD: other major challenges were identified in the literature review and in the interviews conducted for this report. As Edwards, Asadullah and Webb (2024)¹⁵ comment, based on UNESCO data, “Perhaps unsurprisingly, given the ambitious nature of SDG 4, progress has been difficult and slower than hoped. “ In the same article, the authors note in relation to Target 4.7 – Education for sustainable development and global citizenship:

What stands out for this target is that the necessary data are unavailable ... Where data are available they indicate, for example, that only 39 percent of countries have a national law, policy or strategically dedicated to climate change education, and that only 63 percent of teacher training includes a planned focus on climate change.

14 <https://sdgacademy.org/sdg-academy-launches-joint-committee-on-unesco-oer-recommendation/#:~:text=In%20September%202023%2C%20on%20the,UN%20Headquarters%20in%20New%20York.>

15 D. Brent Edwards Jr, M. Niaz Asadullah, Amber Webb, Critical perspectives at the mid-point of Sustainable Development Goal 4: Quality education for all—progress, persistent gaps, problematic paradigms, and the path to 2030, International Journal of Educational Development, Volume 107, 2024, 103031, 10.1016/j.ijedudev.2024.103031

In her interview for this report, Jayashri Sarah Wyatt (UN Academic Impact) noted numerous challenges in actualizing SDG 4 and Open Educational Resources (OER) development. Disparities in the global funding of education and poor support for training teachers are the two most significant challenges for SDG 4. The primary challenge for OER development – which is critical to the overall achievement of SDG 4 – is what UNESCO describes as “mainstreaming,” or the integration of OER into educational frameworks from childhood education into lifelong learning.

This is against the backdrop of emergencies from conflict and the rapidly worsening climate crisis where, between 2000 and 2019, sixty disasters disrupted education for over eleven million children, and the number of large-scale disasters is predicted to increase by 2030. As Wyatt observes, bridging the teaching and research nexus to policy and practice is critical to the implementation of strategic engagement with the SDGs.

Discoverability of OER is an issue in its own right. It’s worth repeating Otto and Kerres (2022) acknowledgement that OER are not available in a sufficient amount worldwide and also that those OER that are in existence are difficult to find, often due to poor or absent metadata. Otto and Kerres propose a distributed ‘learning ecosystem’ utilising technical solutions, including metadata standards and plugins, to link contents in repositories within ecosystems. The overarching objective is that the different repositories expand and improve the sustainable use of OER by merging into a distributed learning ecosystem. This is precisely the model proposed by the Global Knowledge Commons.

Walsh (2021) argues that the current knowledge in what might be considered the existing Global Science Commons is far inside the knowledge frontier required to create a sustainable operating space for humanity. Knowledge for use in education is not always stored in an open manner that meets FAIR principles (findability, accessibility, interoperability, and reusability via an explicit data-capable open license.) Nor is content reliably oriented to the SDGs.

Walsh calls for FAIR Open Educational Resource Repositories (OERRs) for the SDGs to be embedded in HEIs and related agencies as a norm or for existing institutional repositories to be adapted to accommodate FAIR OER. SDG knowledge for quality education/training at all levels needs to be available for all stakeholders across all nations. Stakeholders, particularly universities, need to take advantage of the digital innovation and platforms available in libraries in most countries, which can host open, FAIR and quality content for SDG Education.

HEIs and their networks need to be supported by governments, donor agencies and institutions worldwide to focus on creating FAIR Open Educational Resource Repositories (OERRs), or their equivalent in existing repositories, for SDG-relevant OER that feed into SDG Education and Training

Programs (such as Teacher Training, ESG Training and Masters programs). Organisations committed to this mission include members of SDG Academy, Mission 4.7, UN Headquarters' Library (Libraries network) OER Dynamic Coalition, UNESCO and IFLA. Multi-stakeholder partnerships, led by libraries, can harness the power of FAIR Open Educational Resource Repositories (OERRs) for the SDGs to create the Global Knowledge Commons needed to allow all people be educated and trained to implement the SDGs in any corner of the planet.

A Diamond Engagement for the Global Knowledge Commons for Sustainable Development

As noted in the Introduction to this report, UNESCO and the SDG Academy have jointly proposed a large-scale initiative to share quality-assured, peer-reviewed, standardized, OER in support of the UN 2030 Agenda to advance learning for sustainable development that is free, easily accessed and can be repurposed. This proposal, to develop a Global Knowledge Commons for Sustainable Development, addresses all five objectives of the UNESCO Recommendation on Open Educational Resources¹⁶:

- i. building capacity of stakeholders to create, access, re-use, adapt and redistribute OER.**
- ii. developing supportive policy.**
- iii. encouraging inclusive and equitable quality OER.**
- iv. nurturing the creation of sustainability models for OER, and**
- v. facilitating international cooperation.**

Also as outlined in the Introduction to this report, the 'OER platform' of the Global Knowledge Commons for Sustainable Development will create and curate high quality, validated content supporting ESD, which will be openly accessible, adaptable, and shareable globally. The platform will be founded upon established ethical and behavioral principles, on local, national and trans-national partnerships and networks, on existing and developing standards and infrastructures. In particular, it will leverage global developments in Open Research and Open Educational Resources and the content that is made openly and equitably accessible through hundreds of non-commercial open access repositories and similar sources worldwide.

16 <https://www.unesco.org/en/legal-affairs/recommendation-open-educational-resources-oer>

The graphical representation of the Global Knowledge Commons for Sustainable Development, first presented in this report's Introduction, is reproduced below. It presents a particular view of scholarly communication, where knowledge resources are often separated into the false dichotomy of Research Outputs versus Teaching and Learning Resources.

Not only are these knowledge resources usually considered separately, but they are valued differently in the established scholarly system. Research and its outputs are rewarded with attention to citation metrics, usage statistics, hits and downloads, news stories, policy references, impact case studies, etc. with incentivization of researchers via recruitment and academic promotion protocols. Teaching and learning and their related outputs have traditionally received little of that attention, despite frequently being research-led and created and delivered by the same researchers and academics responsible for the research. A shared characteristic of research and teaching outputs is that traditionally they have not been accessible outside of the institutions who subscribe to them (in the case of research outputs) or who create them (in the case of educational resources).

ESD, of necessity, must cross the research/teaching nexus and use relevant knowledge resources regardless of the conventions of their scholarly categorization. Research-led / research enabled teaching is essential for ESD. The subset of knowledge resources that are immediately open and readily accessible and reusable are even more important for ESD. Open Research and Open Educational Resources are presented here as connected, at the centre of the broader sphere of ESD and forming the core of the Global Knowledge Commons for Sustainable Development.

Of course, the proposed Global Knowledge Commons for the Sustainable Development Goals is not simply a digital platform for collating and providing access to a collection of high quality reusable learning resources. It is a dynamic global partnership for ESD based on what we call the 'Diamond Engagement'. The Diamond Engagement is derived from the Diamond model of Open Access publishing, where there are no financial barriers to authors to publish and share their work openly and no barriers to readers to access those works. The Diamond Engagement is a model to support Diamond OER publishing via the Global Knowledge Commons.

In order to succeed, the Global Knowledge Commons will require research funders, research performing higher education institutions, librarians and managers of distributed digital repositories, educators and those supporting educations, researchers and end users of knowledge resources to combine forces to foster a culture to ensure that all knowledge outputs of relevance to sustainable development are available in an open, traceable and interoperable manner.

In order to remain in the public domain and true to its objectives, it will need to be built upon a solid foundation of agreed principles for governance, ownership, respect and consideration



for other cultures, languages and knowledge systems, equity, diversity and inclusion, as well as principles associated with content policies, quality assurance, etc. The Diamond Engagement is the organisational, technical and cultural nexus required to fully realise the potential of OER and Open Research and maximise its benefits for ESD.

This approach underpins the concept of the Global Knowledge Commons and is represented in the following infographic.



Image template attribution: www.presentationgo.com

The Global Knowledge Commons for Sustainable Development is predicated upon a ‘Diamond Engagement’ based on a number of key facets:

- 1. Principles.** Examples of existing principles that will form the policy bedrock of the Global Knowledge Commons are: the CARE Principles for Indigenous Data Governance, the FAIR Principles, the FOREST Framework, the POSI Principles on Open Scholarly Infrastructure, the Helsinki Initiative on Multilingualism in Scholarly Communication and others.
- 2. Partnerships.** Policy makers, research funders, research performing higher education institutions, librarians, educators and those supporting educations, researchers and end users of knowledge resources need to form a global partnership to ensure that all knowledge outputs of relevance to sustainable development are findable, accessible, interoperable and reusable and that gaps in the knowledge resources are addressed through community-led creation and repurposing.
- 3. Standards and Interoperability.** OER need to be made more discoverable, more reusable and more shareable via interoperable infrastructures. Use of standardised metadata identifiers will improve interoperability, discoverability and traceability and reduce duplication as well as facilitating mechanisms supporting translation and repurposing.
- 4. Organisational Structure.** Includes both governance and operational structure. Operational structure involves a global network of researchers, academics, educators, librarians, citizen scientists who will take on the roles of content creators, peer reviewers, editors, open access experts and enablers.
- 5. Infrastructure.** A distributed network of institutional repositories, subject repositories and open educational resource repositories has developed across the world over the past twenty years. Standardized, harvestable and interoperable, these repositories can provide a foundational infrastructure facilitating local uploads, metadata creation, application of the UN Library's SDG taxonomy, application of digital identifiers, CC licenses, etc. The current COAR Notify Initiative¹⁷ is developing and accelerating community adoption of a standard, interoperable, and decentralised approach (using Linked Data Notifications) to link research outputs hosted in the distributed network of repositories with resources from external services, such as overlay-journals and open peer review services. This functionality can support a quality assurance process for SDG-relevant OER via peer review networks commissioned by the Global Knowledge Commons.
- 6. Community.** The importance of community was repeatedly stressed throughout this report's interview responses. Deep community connections are evidenced in the case studies of libraries' effective contributions to ESD. A global community of users and creators will grow the integrative and regenerative features of the Commons, will assist with monitoring of usage and feedback and will support the special place of local and indigenous knowledge systems.

17 <https://coar-repositories.org/what-we-do/notify/>

Accelerating progress to achieve the SDGs requires the strengthening of local digital ecosystems and collaborating with civil society to mainstream digital public goods – namely OER – to support inclusive knowledge sharing and innovation to accelerate progress across the entirety of the SDGs.

Of course, the Global Knowledge Commons will not solve all of the challenges associated with ESD and it will need to find solutions to its own challenges, particularly that of the digital divide. It will, however, address a number of the major issues associated with ESD. One of them is what Leonardo Garnier (2024), Special Adviser to the UN Secretary General on the Transforming Education Summit and former Minister of Education of Costa Rica calls the “glaring global inequality of educational investment.” Another issue it will address is the lack of availability of educational resources, or of the right kind of resources in the right place (addressing the current homogenization and unequal distribution of knowledges across regions and the failure to value Global South-generated knowledge). Another issue addressed by the Global Knowledge Commons is the current lack of data on the success or otherwise of ESD programmes. Concern about misinformation was articulated by several of our interviewees, including Masud Khokhar, (University Librarian and Keeper of the Brotherton Collection, University of Leeds, Chair, Research Libraries UK (RLUK), Knowledge Equity Network) who said:

Literacy is a critical attribute and we are struggling in a world full of misinformation, a world full of generative AI, a world where you can basically shift people’s opinions based on what information they are given. Educational capability, information literacy capability, understanding of the world and being able to have informed debates, even basic literacies around capabilities of reading and writing, are such critical elements that without them we are not going to develop a society that can thrive.

By providing validated knowledge resources aligned with the SDGs, the Global Knowledge Commons will address the issue of misinformation and fake news by supplying validated and reviewed OER and other SDGs-aligned knowledge sources.

When Steven Klees (2024) asked, “Why SDG 4 and the other SDGs are failing and what needs to be done?”, he concluded, “any sober assessment of SDG progress must recognize that we will never achieve these goals without drastic changes in how we live and organize ourselves on this planet.” The necessary changes include challenging the “assumptions underlying the SDGs that economic growth is the way forward and that the private sector can be the engine of ‘development’”

The Global Knowledge Commons will ensure that the OER platform, its distributed network of repositories and the knowledge resources they contain, will remain in the public domain and will never be monetized (with all of the access restrictions and other barriers that brings).

Reimers (2024) suggests that efforts towards achieving the SDGs should keep their eye on the big picture – that is, first, on the fact that SDGs are system goals, and, second, on the knowledge and skills that students will need to change the world, now and in the future.¹⁸

The Global Knowledge Commons is focused on the big picture and on the knowledge and skills learners need to achieve the Sustainable Development Goals. It is a global partnership of policy-makers, educators, researchers and citizens of all types, founded on a common commitment to principles such as FAIR, CARE, FOREST and POSI, on alignment with AmeliCA and with the UNESCO Recommendations on OER and on Open Access, on an understanding that education is a public good, that no one will be left behind, that place-specific, indigenous knowledge systems must be respected and protected, along with linguistic and other forms of diversity. It will utilise common standards and open, non-profit infrastructures, building upon existing global communities of networks, human and digital. And it will acknowledge and integrate the work of libraries, whose contribution will be central to its success.

The Global Knowledge Commons is focused on the big picture and on the knowledge and skills learners need to achieve the Sustainable Development Goals. It is a global partnership of policy-makers, educators, researchers and citizens of all types, founded on a common commitment to principles such as FAIR, CARE, FOREST and POSI, on alignment with AmeliCA and with the UNESCO Recommendations on OER and on Open Access, on an understanding that education is a public good, that no one will be left behind, that place-specific, indigenous knowledge systems must be respected and protected, along with linguistic and other forms of diversity. It will utilise common standards and open, non-profit infrastructures, building upon existing global communities of networks, human and digital. And it will acknowledge and integrate the work of libraries, whose contribution will be central to its success.

18 Reimers, F.M., 2024. The sustainable development goals and education, achievements and opportunities. *Int. J. Educ. Dev.* 104 <https://doi.org/10.1016/j>.

9. Recommendations

Recommendations for Policymakers

- Support the development of the Global Knowledge Commons for Sustainable Development.
- Include in education policies, including ESD policies, the basic principle that education is a public good, and that knowledge is a public good. Following from this, support Diamond Open Access and Diamond Open Education. Work to ensure that knowledge resources for ESD remain in the public domain and are not privatized and commercialized.
- Commit to implementation of the FAIR principles for OER and to the CARE Principles for Indigenous Data Governance, the FOREST Framework, the POSI Principles for Open Scholarly Infrastructure, the Helsinki Initiative on Multilingualism in Scholarly Communication, AmeliCA and related principles.
- Recognise that collaboration with libraries is essential for education for sustainable development. Trust libraries because there is strong evidence that libraries have the expertise, culture, infrastructures and networks to provide maximum effects.
- Lead by example by utilising the information and resources that are accessible and available (which is more impactful than just endorsing it).
- Develop Open Education in higher education with policies and task forces at the institutional level, incorporating incentives, recognition and rewards
- Use the expertise of the libraries in organising resources and providing long-term accessibility and preservation and in collecting meaningful statistics. This is a safeguard of good implementation as well as production and management of actual resources.
- Continue working on building and funding a more interoperable technical Open Education ecosystem between institutional repositories and other educational platforms for longer-term sustainability.
- Monitor and ensure that the research that is produced in these important topics is mandated to be made available on open access.
- Acknowledge and reward libraries for participating in these activities, consider them a stakeholder in all these discussions and involve them in policy planning, infrastructure planning, and any other related activities.
- Acknowledge that libraries have the best and unique expertise in terms of licenses, open licenses, creative commons licenses and reuse of the material.
- Policy makers and governments should consider the information and knowledge network that libraries provide as the public digital infrastructure that allows people to access online content services and discover new opportunities in the digital world (and is essential for sustainable

development). So the public library network and library networks generally should be considered as essential to advancing education for sustainable development.

- Governments and the international community need to increase funding to develop infrastructure and staff support at libraries worldwide to enhance libraries' contributions to ESD. With adequate resources libraries can develop programmes that engage the community with the principles of Sustainable Development and train their staff in ESD content.
- Policymakers should integrate libraries into national ESD frameworks and promote collaborative networks. Partnerships between relevant ESD actors and libraries, involving local communities, can also provide resources and expertise.
- Libraries, policy-makers, and other ESD actors need to prioritize collaboration, knowledge sharing and community engagement to ensure that diverse perspectives and voices are included in sustainability efforts.
- Invest in professional development and capacity-building for educators and other stakeholders, in order to effectively integrate ESD into learning environments.
- Set knowledge as a foundational attribute to meet any global challenge thereby ensuring it is given the right foundational level of support, importance, funding and mandates behind it.
- Literacy is a critical attribute in a world full of misinformation Literacy, including information literacy needs to be put at the heart of policies and developments.



Recommendations for Libraries

- Support the development of the Global Knowledge Commons for Sustainable Development.
- Include in libraries policies and strategies, the basic principle that education is a public good, and that knowledge is a public good. As a corollary, support Diamond Open Access and Diamond Open Education. Work to ensure that knowledge resources for ESD remain in the public domain and are not privatized and commercialized.
- Commit to implementation of the FAIR principles for OER and to the CARE Principles for Indigenous Data Governance, the FOREST Framework, the POSI Principles for Open Scholarly Infrastructure, the Helsinki Initiative on Multilingualism in Scholarly Communication, AmeliCA and related principles.
- Consider the library's budget in relation to its support for Diamond Open Access and for Diamond Open Education with a view to recognising and financially supporting high quality open access and open educational resources.
- Build synergies with other stakeholders and networks and remember that libraries are not alone
- Adopt ESG (environmental, social, and governance) standards as part of the library's profile and mission.
- Persuade educators that the library can help them.
- Match library principles and knowledge of the benefits of open education to the frameworks and values of policy-makers.
- Provide professional development programmes on Open Education for library staff to develop skills in a) leadership, including soft skills, and b) technical skills on learning design and how to make resources open.
- Know your audience. Tailor arguments around the existing missions and goals. Provide solutions and be problem solvers.
- Spend time on packaging the library's message about its contribution to ESD and sustainable development.
- Open up data and metadata for learning and research purposes.
- Monitor and collect more data and information about what happens after people have used different library services in the areas of digital and program training.
- Engage in the reuse, adoption, adaptation, remixing, and co-creation of OER.
- Encourage librarians to collaborate on Open Education projects with colleagues within the institution, as well as with others from outside the institution on regional, national, and international levels, learning from each other and finding solutions to solve local problems.
- Prioritize diversity, equity, collaboration, knowledge sharing and community engagement to ensure that diverse perspectives and voices are included in sustainability efforts.

Recommendations for Institutions

- Support the development of the Global Knowledge Commons for Sustainable Development.
- Include in institutional policies and strategies, the basic principle that education is a public good, and that knowledge is a public good. As a corollary, support Diamond Open Access and Diamond Open Education. Work to ensure that knowledge resources for ESD remain in the public domain and are not privatized and commercialized.
- Commit to implementation of the FAIR principles for OER and to the CARE Principles for Indigenous Data Governance, the FOREST Framework, the POSI Principles for Open Scholarly Infrastructure, the Helsinki Initiative on Multilingualism in Scholarly Communication, AmeliCA and related principles.
- Consider the institution's budget in relation to its support for Diamond Open Access and for Diamond Open Education with a view to recognising and financially supporting high quality open access and open educational resources.
- Recognise that libraries are key contributors to ESD and ensure that they are included at the earliest stage in policy frameworks and developments in ESD.
- Ensure that libraries are adequately funded and resourced to enable them to be fully active in ESD.
- Education for Sustainable Development aligns with responsible research integrity and decisions on how to offer this provision should be a priority for Institutions.
- Recognise and act on the need for capacity building, staff training and infrastructure on ESD through the institution, including in libraries..
- For people to succeed in the implementation of ESD and the SDGs, they must have support mechanisms around them.
- Grow Open Education in higher education with policies and task forces at the institutional level, incorporating incentives, recognition and rewards for open content creators and enablers. Engage with the library on content creation, program design, copyright, ensuring FAIR-compliant OER, archiving, accessibility and licensing.
- Work to create alliances with institutional stakeholders (faculty departments, pedagogues, innovation units, or CIOs) and international colleagues/networks to promote OE, develop policies and OE/OER support services.
- Recognise that OER needs to be embedded in the policies of universities and teaching institutes and that libraries are important stakeholders in the development of OER.
- Foster innovation and sustainable practices in ESD
- Help create DEI (Diversity, Equity and Inclusion) programmes and strategies to more consistently ensure more equitable, diverse, and inclusive open educational content for all.

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ANNEXES

Annex 1: Education for Sustainable Development Timeline

Annex 2: Glossary

Annex 3: Interview Questions

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Annex 1

Education for Sustainable Development Timeline

[adapted from Un SDG Roadmap 2019]

1972 United Nations Conference on the Human Environment, Stockholm

- The Declaration of the UN Conference on Human Environment proclaimed “to defend and improve the environment for present and future generations has become an imperative goal for mankind”.
- Recommendation 96 of the 1972 Stockholm Conference sees environmental education as a critical means to address the world’s environmental crises. Principle 19 of the Stockholm Declaration states, inter alia, that ‘Education in environmental matters, for the younger generation as well as adults, giving due consideration to the underprivileged, is essential in order to broaden the basis for an enlightened opinion and responsible conduct by individuals, enterprises and communities in protecting and improving the environment in its full human dimension.’

1977 First Intergovernmental Conference on Environmental Education in Tbilisi, Georgia

- The Conference laid out the role, objectives, and characteristics of environmental education, and provided several goals and principles for environmental education.
- The Tbilisi Declaration noted ‘the important role of environmental education in the preservation and improvement of the world’s environment, as well as in the sound and balanced development of the world’s communities’.

1987 ‘Our Common Future’ (Report of the World Commission on Environment and Development (also known as the Brundtland Report))

- ‘Sustainable development’ is defined as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs.’

1992 The United Nations Conference on Environment and Development (Rio Summit, Earth Summit)

- Chapter 36 of Agenda 21 consolidated international discussions on the critical role of education, training and public awareness in achieving sustainable development.
- ‘Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues.’
- **Climate change:** Article 6 of the **United Nations Framework Convention on Climate Change** is dedicated to education, training, public awareness and access to information related to climate change.
- **Biodiversity:** Article 13 of the **Convention on Biological Diversity** calls for ‘developing educational and public awareness programmes, with respect to conservation and sustainable use of biological diversity’ and its programme of work on Communication, Education and Public Awareness, notably Priority activity 10: Strengthen formal and informal education on Biodiversity

2002 World Summit on Sustainable Development (Johannesburg Summit)

- A proposal for a Decade of Education for Sustainable Development was included in the Johannesburg Plan of Implementation.
- UN General Assembly Resolution 57/254 designated 2005-2014 the United Nations Decade of Education for Sustainable Development (DESD) and UNESCO as lead agency.

2005 UN Decade of Education for Sustainable Development (2005-2014, DESD) UN Decade on ESD has ‘activated hundreds of thousands of people to reorient education globally towards a central goal: to learn to live and work sustainably.’

- **Disaster risk reduction:** Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters, and the subsequent Sendai Framework for Disaster Risk Reduction 2015-2030

2009 UNESCO World Conference on ESD in Bonn, Germany

- The Bonn Declaration emphasized ESD as a ‘life-saving measure’ for the future that empowers people for change, and recommended promoting ESD as ‘an investment in the future’.

2012 The United Nations Conference on Sustainable Development (Rio +20)

- ‘promote education for sustainable development and to integrate sustainable development more actively into education beyond the United Nations Decade of Education for Sustainable Development’
- Sustainable consumption and production: Sustainable Lifestyles and Education Programme of the 10-Year Framework of Programmes on Sustainable Consumption and Production 2012-2021

2014 UNESCO World Conference on ESD in Aichi-Nagoya (Japan)

- Launch of the Global Action Programme on ESD (2015-2019). The Global Action Programme aims ‘to generate and scale up action in all levels and areas of education and learning to accelerate progress towards sustainable development’. It focuses on five priorities, considered key leverage points to advance the ESD agenda.
- Aichi-Nagoya Declaration on ESD adopted at the UNESCO 2014 World Conference on ESD reaffirms ESD as a vital means of implementation for sustainable development.

2015 The Sustainable Development Goals (SDGs) and the 2030 Agenda for global transformation

- Target 4.7 urges that ‘by 2030 all learners acquire knowledge and skills needed to promote sustainable development...’
- Target 12.8 asks to ‘ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.’
- Target 13.3 calls to ‘improve education, awareness raising and human and institutional capacity on climate change...’

Incheon Declaration on Education 2030: ‘Our vision is to transform lives through education, recognizing the important role of education as a main driver of development and in achieving the other proposed SDGs’.

Global Action Programme on ESD (2015-2019) ‘Building on the achievements of the Decade, the GAP aims to generate and scale up concrete actions in ESD’

Paris Climate Conference of Parties (COP 21). Articles 11 and 12 of the Paris Agreement, the outcome document of COP21. Article 12: ‘Parties shall cooperate in taking measures... to enhance climate change education, training, public awareness, public participation and public access to information...’

2016 Sustainable cities and communities: New Urban Agenda adopted at the UN Conference on Housing and Sustainable urban Development (Habitat III)

2017 UN General Assembly Resolution 72/222 -- ESD's role as 'an integral element of the SDG on quality education and a key enabler of all other sustainable development goals' explicitly recognized.

Oceans: UN Ocean Conference Call for Action and UN Decade of Ocean Science for Sustainable Development (2021–2030).

→ 'to support plans to foster ocean-related education, to promote ocean literacy and a culture of conservation, restoration and sustainable use of our ocean'.

2019 40th Session of the UNESCO General Conference : Adoption of Framework for the implementation of ESD beyond 2019 'ESD for 2030' (2020-2030)

UN General Assembly Resolution 74/223 – 'Encourages Governments to increase efforts to systemically integrate and institutionalize education for sustainable development in the education sector and other relevant sectors'

2020 Education for Sustainable Development A roadmap

2022 Berlin Declaration on Education for Sustainable Development; Learn for our planet: act for sustainability

Annex 2

Glossary

Term	Definition	Source
Bibliodiversity	Cultural diversity applied to the world of books [writing and publishing]. Echoing biodiversity, it refers to the critical diversity of products (books, scripts, eBooks, apps, and oral literature) made available to readers.	Alliance internationale des éditeurs indépendants
Civic Engagement	Individual and collective actions designed to identify and address issues of public concern, often considered a cornerstone of democratic societies.	American Psychological Association (APA). (2017). Civic Engagement.
Climate Literacy	Understanding of the climate system, including the influence of human activities on climate, and the ability to make informed decisions related to climate change mitigation and adaptation.	NOAA, “Climate Literacy: The Essential Principles of Climate Science” (2009).
Creative Commons	Creative Commons licenses provide an easy way to manage the copyright terms that attach automatically to all creative material under copyright.	Creative Commons website
Cultural Diversity	The existence of a variety of cultural or ethnic groups within a society, which ESD promotes as essential for sustainable development	United Nations. (2001). Universal Declaration on Cultural Diversity
Diamond Open Access	A scholarly publication model in which journals and platforms do not charge fees to either authors or readers	Science Europe website
Diamond Publishing	A decentralized federation of local, regional, and global scholarly communities that represent a variety of identities, epistemic traditions, languages, and disciplines. These Diamond OA Communities (DOAC) implicitly or explicitly share the values expressed in the principles of Diamond OA.	COALition S, Johan Rooryck ‘Principles of Diamond Open Access Publishing: a draft proposal’

Education for Sustainable Development (ESD)	An approach to education that emphasizes the knowledge, skills, values, and actions needed to create a sustainable world.	UNESCO, “Education for Sustainable Development Goals: Learning Objectives” (2017).
Global Citizenship Education (GCED)	Education that aims to empower learners to engage and assume active roles in facing and resolving global challenges and to become proactive contributors to a more peaceful, tolerant, inclusive, and secure world.	UNESCO, “Global Citizenship Education: Topics and Learning Objectives” (2015)
Green Economy	An economy that aims for sustainable development without degrading the environment, incorporating aspects such as low carbon, resource efficiency, and social inclusivity	United Nations Environment Programme (UNEP). (2011). Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication.
Green Open Access	The full text of academic publications is deposited (self-archived) in a trusted repository, a publicly accessible database managed by a research organisation.	openaccess.nl
Institutional Repository	A digital archive for collecting, preserving, and disseminating digital copies of the intellectual output of an institution, particularly a research institution. Optimised metadata, standards, and identifiers supporting web-based harvesting, mining and networking, increasing findability, accessibility, interoperability and re-useability. The principle that current generations should make decisions that do not harm the prospects of future generations .	
Intergenerational Equity	The principle that current generations should make decisions that do not harm the prospects of future generations.	UNESCO. (2012). Education for Sustainable Development Sourcebook.
Library-Based Publishing		

Lifelong Learning	Continuous, self-motivated pursuit of knowledge for personal or professional reasons throughout an individual's life.	UNESCO, "Learning: The Treasure Within" (1996).
Mission 4.7		
Open Access	The practice of providing on-line access to scientific information that is free of charge to the user and that is re-usable.	European Commission (2016) Background Note On Open Access To Scientific Publications And Open Research Data..
Open Education	Open Education encompasses resources, tools and practices that are free of legal, financial and technical barriers and can be fully used, shared and adapted in the digital environment. Open Education maximizes the power of the Internet to make education more affordable, accessible and effective.	SPARC website
Open Educational Resources (OERs)	Teaching, learning, and research resources that are free of cost and access barriers, and which also carry legal permission for open use.	SPARC website
Open Peer Review	An umbrella term for a number of overlapping ways that peer review models can be adapted in line with the aims of Open Science, including making reviewer and author identities open, publishing review reports and enabling greater participation in the peer review process.	oss-Hellauer T. What is open peer review? A systematic review [version 2; peer review: 4 approved]. F1000Research 2017, 6:588 (https://doi.org/10.12688/f1000research.11369.2)
Open Pedagogy	Open pedagogy is a set of teaching practices built on the foundation of the open education community's shared values, including but not limited to student agency, sharing, diversity and inclusion, peer learning, renewable assignments, co-creation/collaboration, and active/experiential learning.	Edtechnica website
Open Policies		

Open Science (related terms: Open Research, Open Scholarship)	An approach to the scientific process that focuses on spreading knowledge as soon as it is available using digital and collaborative technology	European Commission, Research and Innovation website
Participatory Learning	An educational approach that actively involves students in the learning process, encouraging collaboration and critical thinking.	Freire, P. (1970). Pedagogy of the Oppressed.
SDG Taxonomy		
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.	Brundtland Commission Report, "Our Common Future" (1987).
Sustainable Development Goals (SDGs)	A collection of 17 global goals set by the United Nations in 2015 to address global challenges including poverty, inequality, climate change, environmental degradation, peace, and justice.	United Nations, "Transforming our World: the 2030 Agenda for Sustainable Development" (2015).
Systems Thinking	An approach to problem-solving that views problems as part of an overall system, rather than reacting to specific parts or outcomes.	Senge, P. M., "The Fifth Discipline: The Art and Practice of the Learning Organization" (1990).
Transformative Learning	Learning experiences that cause a shift in an individual's perspectives and assumptions, leading to a profound change in their worldview.	Mezirow, J., "Transformative Dimensions of Adult Learning" (1991).

Annex 3

Interview Questions for [Expert/Agency Name]

The aim of the interviews is to identify and document opinions from a variety of stakeholders on best practices and innovative approaches employed by libraries worldwide on SDG education and OER development (including integration of digital technology, community engagement strategies, and partnerships).

Questions

1. In what ways is [insert relevant name] demonstrably contributing to Education for Sustainable Development (ESD)? In what ways are libraries involved?
2. What ways do you see libraries generally contributing to Education for Sustainable Development?
3. What (in your opinion) are the characteristics of the most effective ESD programs and interventions led by/involving libraries or networks involving libraries?
4. What are the challenges and barriers faced by your organisation and / or libraries in effectively contributing to SDG education and OER development.
5. What are the issues related to funding, infrastructure, digital divide, and policy that impede the realisation of the full potential of libraries' contribution to ESD?
6. What recommendations can you offer for libraries, policy-makers and other ESD actors in order to enhance outcomes in relation to ESD?

Finally ...

7. Can you suggest other thought leaders/stakeholders/networks of relevance to this study?
8. Are you aware of any examples of libraries that are making notable contributions to Education for Sustainable Development and / or OER in support of sustainable development?

Annex 4

List of Interviewees

Dr Tel Amil, Universidad de Brasilia

Nicole Allen, SPARC

Dr Arianna Becerril-García, Redalyc & AmeliCA

Astra Bonini, United Nations

Masud Khokhar, University of Leeds & Knowledge Equity Network

Iryna Kuchma, EIFL Open Access Programme

Rima Kupryte, EIFL

Dr Thanos Giannakopoulos, UN Library (personal views)

Dr Cable Green, Creative Commons

Natalia Manola, OpenAIRE

Ramune Petuchovaite, EIFL Public Library Innovation Programme

Vanessa Proudman SPARC Europe

Dr Daisy Selematsela, University of the Witwatersrand Library, Johannesburg

Kristin Stebbins, JP Morgan Chase (personal views)

Dr Giannis Tsakonas, University of Patras Library

Jayashri Sarah Wyatt, U.N. Academic Impact

Annex 5

Case Studies: Criteria

A series of in-depth case studies was conducted on successful library programs to extract key lessons and insights. These case studies identified a representative set of existing library programs and initiatives that support education for sustainable development and the production of OER. They present the diversity of library services, resources, and initiatives in the area of SDG education and OER development and support, with a focus on content, impact, policies, standards, discoverability, inclusivity and accessibility. Particular attention was paid to traditionally under-represented countries and regions.

The case studies focused on:

1. Libraries' support SDG activities inside academic (teaching, research, student societies, etc.), inter-government, government, local government, enterprise, NGO institutions.
2. Libraries' contribution (creation, publishing and/or making openly accessible) of content to the global public good.
3. Libraries engagement with external partnerships for distance and open teaching and learning; capacities in parliaments/governments; in low resourced communities, in Citizen Science, etc.
4. Challenges and barriers faced by libraries in effectively contributing to SDG education and OER development.
5. Issues related to: funding, infrastructure, digital divide, and policy constraints that impede the realization of their full potential.

Case study assessment/selection factors will include:

- Aims
- Audience
- Access
- Use and re-use
- Societal/cultural/economic impact
- Educational outcomes
- Sustainability
- FAIR, CARE, FOREST and related principles.

The aim of the case studies is to identify and document best practices and innovative approaches employed by libraries worldwide on SDG education and OER development

